



GMX-152D

INSTALLATION AND FIELD
MAINTENANCE MANUAL

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 **INTER-TEL®**

GMX-152D

INSTALLATION AND FIELD MAINTENANCE MANUAL

Issue 1, August 1990

OVERVIEW

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INSTALLATION

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NOTICE

This *GMX-152D Installation and Field Maintenance Manual* is released by INTER-TEL, INCORPORATED as a guide for service personnel. It provides information necessary to properly install, program, operate, and maintain the system.

The contents of this manual, which reflect current INTER-TEL standards and which document software versions 827.3040, 827.3041, 827.3042, and 827.3043, are subject to revision or change without notice. Software packages released after the publication of this manual will be documented in addenda to the manual or succeeding issues of the manual.

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GMX-152D ISSUE 1 — INDEX OF NEW FEATURES

The Inter-Tel GMX-152D System is an upgraded version of the GX-120 System. For those individuals who are already familiar with Issue 2 of the GX-120 manual and its addendum, the following new items are documented in this manual. For complete information on each item, refer to the page numbers following the brief explanation.

Automated Attendant

Dial Through Recording: A single-line circuit may be designated as an automated attendant and may receive dialing tones while the automated attendant is playing its recording. This feature requires a Modem IV (MOD-IV) board, but only requires one single-line circuit and does not require an Automated Attendant Adapter. (See pages 2-9, 4-14, and 5-22.)

Digit Translation: Allows callers to dial a single digit to access a designated intercom number or hunt group pilot number. (See pages 4-14 and 5-41.)

Recall Destination: If programmed, automated attendant recalls go to the designated recall station rather than to the called party's attendant. (See pages 4-13 and 5-41.)

C.O. Reseize

To prevent users from disconnecting calls, by pressing the line key of the call they are on and reseizing the line, C.O. reseize can be disabled on a station-by-station basis. (See page 5-41.)

Keypad Speakerphone Disabled

The integrated speakerphone that is optional on GX keysets and standard on all other keysets may be disabled (for placing intercom calls and placing or receiving outside calls) on a station-by-station basis. Keysets with speakerphones disabled can still receive handsfree intercom calls. (See pages 4-29 and 5-41.)

Message Waiting Indications for Single-Line Sets

Single-line set users may now receive an audible indication if a message has been left for them. If the single-line set has a message waiting lamp, and is installed on a STN-B2 board, it can also have message waiting lamp indications. (See pages 2-8, 4-46, and 5-22.)

OVER Key

A station option allows the programmer to designate any line key on a keyset as an automatic out-of-range line selection/status key, called the overflow (OVER) key. This replaces the POOL key and pool line features. (See pages 4-32 and 5-41.)

STN-A1 Board

The STN-A1 board supports GMX-48 Keysets, Inter-Tel/DVK Keysets, and all models of DSS/BLF Units. It does not support GX Keysets. (At the date of this publication, Inter-Tel/DVK Keysets and DSS/BLF Units were not yet available.) The STN-A1 board also supports the off-hook voice announce (OHVA) feature and simultaneous voice/data transmission (with a data port module) by permitting these keysets to be installed with a secondary voice path. Each secondary voice path uses an additional STN-A1 circuit; therefore, for each secondary circuit, one less keyset can be installed on the board. (See pages 2-8, 3-19 to 3-21, 4-49, 4-81, and 5-41.)

STN-B2 Board

The STN-B2 board is an advanced version of the STN-B board that allows voice mail units to be connected directly to a single-line circuit (without involving a COU circuit). It also has a 600-ohm impedance to reduce impedance matching and level loss problems, and it supports AC-ringing single-line sets (on-premises single-line sets, playback devices, FAX machines, voice mail units, etc.) without an external HVRA. With a 48VDC power supply, it can also support message waiting lamps on single-line sets. (See page 2-8.)

GMX-152D ISSUE 1 – INDEX OF NEW FEATURES (Continued)

Voice Mail

Voice mail units can be installed on single-line circuits. (See pages 4-37 and 5-41.) When installed on a STN-B2 board, a voice mail unit can receive DTMF signals directly through the STN-B2 board, rather than using a COU circuit. (See page 2-8.)

A system option allows the system to check that the mailbox number entered by a transferring party corresponds to a system intercom number. (See pages 4-57 and 5-22.)

LCR Toll Call Forced Account Codes

A new type of account code is available on a station-by-station basis for stations with SCOS 6 (LCR Only). If required, a forced account code must be entered after LCR has determined that a toll number was dialed. (See pages 4-53 and 5-41.)

Forced Account Code Validation

A new option can be programmed on a station-by-station basis for stations with forced or LCR toll account codes. If set, the forced or LCR toll account code entered by the station user must match one of the account codes that appear in the database list of forced account codes. (See pages 4-53 and 5-41.)

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FCC REGULATIONS

IMPORTANT:

1. Customers connecting this equipment to the telephone network shall, before such connection is made, give notice to the telephone company of the particular line(s) to which such connection is to be made, and shall provide the telephone company with the following information:

- Complies with Part 68, FCC Rules
- FCC Registration Number: BE287V-69771-MF-E (for MF-rated systems) or BE287V-71752-KF-E (for KF-rated systems)
- Ringer equivalence number (REN) or service code: 0.9A
- Type and USOC number of the interface jack to be ordered from the telephone company: 2-Wire Loop, RJ21X
- Facility interface code by position: 02LS2

The telephone company should also be given notice upon final disconnection of this equipment from the particular line(s).

It is also the responsibility of the customer to provide the telephone company with registration numbers of any other devices which are configured for connection to the telephone network.

2. It is prohibited to make connections to party lines.
3. Under certain circumstances the telephone company may temporarily discontinue service and make changes in facilities and services which may affect the operation of this equipment; however, the customer shall be given adequate notice in writing to allow the customer an opportunity to maintain uninterrupted service.
4. Users should not adjust, repair, or attempt to service this equipment. In the event that a problem originates, contact the local authorized factory service representative.

In the event of trouble with the telephone line(s), this equipment must be disconnected from the telephone line(s). If trouble ceases, the equipment must be repaired by an authorized factory service representative. If the trouble continues to occur with the equipment disconnected, the telephone company should be notified that they have

a problem. If this is the case, repairs or adjustments made by the telephone company will be made at their expense.

NOTICE

THIS SYSTEM INCLUDES HEARING-AID COMPATIBLE HANDSETS THAT ARE IN COMPLIANCE WITH SECTION 68.316 OF THE FCC RULES.

WARNING:

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rule. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the KSU with respect to the receiver
- Check that the KSU and receiver are not on the same circuit; the KSU must be powered from an isolated, dedicated AC outlet

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00398-5.

If RFI problems persist, contact Inter-Tel Customer Support.

SAFETY REGULATIONS

At the date of this publication, the GMX-152D System was being submitted for updated safety approval from a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories Inc. (UL). If you receive a GMX-152D System prior to such approval, you may contact Customer Support at a later date to inquire about the specific NRTL(s) and the date(s) of approval. *Before installation, check your local electrical codes for installation of telephone and electronic equipment.*

The following safety information is reprinted from UL 1459, a product safety specification governing telephone equipment.

IMPORTANT SAFETY INSTRUCTIONS

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water (for example, in a wet basement).
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating; these openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated only from the type of power source indicated in the manual. If you are not sure of the type of power source to your building, consult your dealer or local power company.
8. This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
10. Do not use an extension cord with this product's AC power cord. The AC outlet for this product should not be used for any other electrical equipment.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified serviceman when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the product is subsequently used.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power supply cord or plug is damaged or frayed.
 - B. If liquid has been spilled into the product.
 - C. If the product has been exposed to rain or water.
 - D. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - E. If the product has been dropped or the cabinet has been damaged.
 - F. If the product exhibits a distinct change in performance.
14. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
15. Do not use the telephone to report a gas leak in the vicinity of the leak.

SAVE THESE INSTRUCTIONS

LIMITED WARRANTY

For a period of one (1) year from the date of shipment to Buyer, INTER-TEL warrants the Equipment (except for fuses and lamps) to be free from defects in material, workmanship, or both, and to comply with specifications for the Equipment, as set forth in the *Installation and Field Maintenance Manual*. Buyer's sole and exclusive remedy for breach of this Limited Warranty shall be to have the defective Equipment (or parts) repaired or replaced at INTER-TEL's option. Shipping costs incurred returning warranty work to INTER-TEL shall be paid for by the Buyer. **This Limited Warranty extends only to the Buyer, not to any customer, user, or third party.** This Limited Warranty does not apply to Equipment (or parts) damaged by improper handling, normal wear and tear, accidents, lightning damage, negligence, or improper use or maintenance, and does not apply to Equipment altered without authorization by INTER-TEL. This Limited Warranty does not extend to any claims, suits, damages, liabilities, costs, and expenses arising from any act, action, or inaction of Buyer. Although the Moss-Magnuson Act should not apply, in the event that it is held to apply by a court of competent jurisdiction, the implied warranty of fitness for a particular purpose shall extend for the one-year (1-year) period from the date that the Equipment was shipped to the Buyer.

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS LIMITED WARRANTY. IN NO EVENT SHALL INTER-TEL BE LIABLE FOR LOSS OF ANTICIPATED PROFITS, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF TIME OR OTHER LOSSES INCURRED BY BUYER IN CONNECTION WITH THE PURPOSE, POSSESSION, OPERATION, OR USE OF THE EQUIPMENT, SUCH CLAIMS BEING EXPRESSLY WAIVED BY THE INSTALLING COMPANY.

For complete information on returning equipment, refer to the current Inter-Tel Incorporated *Material Return Policy* (document part number 835.1065). This document includes specific information on the following subjects: warranty, procedures to follow when returning equipment, equipment damaged in shipment, insurance, repair policy, and advance replacement policy.

OVERVIEW

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1. INTRODUCTION

1.1 Inter-Tel's GMX-152D System is a unique electronic key telephone system that is designed to meet the needs of growing businesses. The modular design makes the system easy to install and service. The programmable features provide over 100 user-friendly applications to meet each customer's needs. Highlights of the system's design include:

- Advanced microprocessor technology.
- Flexible programming to customize many system and station features.
- Modular, easily replaceable hardware with add-on capabilities for optional features.
- Capacity for up to:
 - 32 Central Office (C.O.) Lines (Loop start lines installed in increments of four, depending on the number of Central Office Unit [COU] boards installed in the Key Service Unit [KSU].)
 - 120 Stations (Combinations of keysets, DSS/BLF Units, and single-line sets in eight-station increments, depending on the number and type of station [STN] boards installed in the KSU.)

NOTE: At least one STN-A or STN-A1 board must be installed to provide a display keypad that can program selected system data, receive system alarm messages, act as the attendant for unsupervised C.O. recalls, etc.

- 5 Direct Station Selection/Busy Lamp Field (DSS/BLF) Units (These can be single or tandem units.)

NOTE: Keysets and DSS/BLF units use separate STN-A or STN-A1 circuits. For each DSS/BLF Unit installed (single or tandem), one less keypad may be installed. See page 2-13 in the SPECIFICATIONS section of the manual for more information.

- 9 Private Intercom Channels (Minimum; more are allotted if fewer than 32 C.O. lines are used.)
- 5 Talkback Speakers

1.2 The GMX-152D System software is available in four software "packages" — two KF-rated and two MF-rated. The KF-rated systems permit only one line to be accessed per line key, and there can be only one auto line and only one line in each of the line groups. The MF-rated systems permit one-key access to multiple outgoing lines. The four software packages are listed on the next page.

• **MF-rated packages:**

- The MF-rated, *Extended* software package (part no. 827.3043) has all of the features described in this manual.
- The MF-rated, *Basic* software package (part no. 827.3042) has all features except least-cost routing (LCR) and station message detail accounting (SMDA).

• **KF-rated packages:**

- The KF-rated, *Extended* software package (part no. 827.3041) has all features except LCR.
- The KF-rated, *Basic* software package (part no. 827.3040) has all features except LCR and SMDA.

2. HARDWARE SUMMARY

2.1 The SPECIFICATIONS section of this manual explains environmental requirements of the system, describes the hardware, and gives pre-installation information. The hardware descriptions include: Key Service Unit (KSU), power supply, circuit boards, station instruments, and additional equipment needed for the optional features.

3. INSTALLATION AND MAINTENANCE SUMMARY

3.1 The modular design and self-diagnostic capabilities of the system facilitate installation and repair with minimal down-time. Strict quality control standards for manufacturing and thorough field testing provide the system with the reliability demanded by today's high-technology market.

3.2 The INSTALLATION section contains instructions for assembling the main distribution frame (MDF) and for installing the KSU, power supply, circuit boards, station instruments, and optional hardware.

3.3 After the system is installed, the flexible software allows you to customize the database to meet the customer's needs. A programming terminal is

used to perform this task. The PROGRAMMING section describes the procedures for initializing and programming the system features.

3.4 The TROUBLESHOOTING section gives instructions for correcting system problems and replacing defective parts. A list of part numbers and a recommended inventory of spare parts are located in the REPLACEMENT PARTS section.

4. FEATURES SUMMARY

4.1 System, keyset, single-line set, DSS/BLF Unit, and attendant features are listed below and on the following pages. *Those features marked with an asterisk (*) require additional equipment.* For descriptions and operating instructions, refer to the SPECIFICATIONS and FEATURES sections of this manual.

A. SYSTEM FEATURES

Hardware and General System Features

- Four software packages
- Flexible station instrument configuration and numbering plan
- RS-232-C connectors on the Application Processor (APP) board and the Input/Output Processor (IOP) board for connecting a programming terminal or an SMDR/SMDA output device
- Easily-accessible system voltage test points on the front of the IOP board
- Database battery back-up with voltage test point
- Adjustable baud rates for on-site programming (300, 1200, 4800, and 9600 baud)
- 300-baud or 1200-baud modem for remote programming (generally, only the 300 baud rate is used)
- Variable system timers
- Music-on-hold, silence, or chime selection
- * Optional external music source
- * Optional off-premises stations
- * Optional OPX repeaters
- * Programmable reports for toll restriction, least-cost routing (LCR), and station data — LCR available only in the MF-rated, *Extended* software package
- * Optional integrated multi-port voice mail system

- * Optional facsimile (FAX) machine
- * Optional doorbox
- * Optional system battery back-up
- * Optional power failure transfer
- * Optional night transfer to activate electrical devices
- * Optional external ringing devices
- * Optional talkback speakers
- * Optional station message detail recording (SMDR) and/or station message detail accounting (SMDA) output device(s) — SMDA available only in the *Extended* software packages
- * Optional Inter-Tel CallMaster/Accounting package for generating a variety of call statistics reports
- * Optional playback devices for use with the automated attendant and hunt group announcement/overflow station features

System Organization and Record Keeping Features

- Internal paging zones
- * Optional external paging zones
- * Station message detail recording (SMDR)
- * Station message detail accounting (SMDA) — available only in the *Extended* software packages
- Call cost accounting
- Forced, standard, and optional account codes, and LCR toll call forced account codes
- Flexible attendant arrangements
- Tenant groups and departments
- Hunt groups (can have overflow and announcement stations)
- System alarm display and reporting

C.O. Line Features

- Direct inward system access (DISA)
- Automated attendant
- Dual-tone multi-frequency (DTMF) signalling
- * Dial-pulse signalling
- Outgoing-access, allowed-answer, and ring-in assignments on a station-by-station basis
- Day and night modes of operation

- Toll restriction on a station-by-station basis (including provisions for three area/office code restriction user groups and PBX, absorbed-digit, and equal access dialing)
- Auto lines and line groups — restricted to one line each with the KF-rated software packages
- Automatic incoming line answer
- Automatic outgoing line selection — restricted to a single auto line with the KF-rated software packages
- Automatic out-of-range line selection/status on keysets (OVER key)
- Least-cost routing (LCR) — available only in the MF-rated, *Extended* software package
- C.O. reseat capability on a station-by-station basis

General Station Features

- Programmable feature codes for easy station operation
- Station-to-station intercom calls
- Off-hook voice announce (OHVA) calls (requires special installation and programming)
- Inter-station messages and message cancel
- Ring intercom always
- Automatic camp-on (station, C.O. line, and LCR)
- Busy line/station callback (queue)
- Individual hold
- System hold
- Call splitting
- Hold recall
- Call waiting
- Transfer to hold
- Transfer recall
- Call transfer to intercom numbers
- Call transfer to outside telephone numbers
- Reverse transfer and group call pick-up
- Three-way conference calls (amplified)
- Secretarial intercept
- Call forward to intercom numbers
- Call forward to outside telephone numbers
- System speed dialing (including non-display numbers)
- Station speed-dialing

- Redial (last number dialed or, at keysets only, last number saved)
- Do-not-disturb (with customized messages)
- Cancel miscellaneous operations
- Hookflash
- Hunt group remove/replace
- House phone

B. KEYSSET FEATURES

- Various 24-line, 12-line, and 8-line keyset models are available (for a complete listing of all the keyset models available and the optional equipment that may be installed on them, refer to pages 2-11 and 2-13 in SPECIFICATIONS)
- Inter-Tel/DVK keysets (which are 24-line, 12-line, and 8-line standard or display keysets equipped with audio integrated modules) allow the user to individually control voice and tone volume levels for intercom calls, outside calls, background music, etc. (At the date of this publication, Inter-Tel/DVK keysets and DSS/BLF Units were not yet available.)
- * Optional liquid crystal display (LCD) for viewing: numbers dialed; speed-dial numbers; interstation, do-not-disturb, and reminder messages; date/time; keyset identification; station programming; call cost data; etc. (not available on GMX 12-line keysets)
- LCD contrast adjustment on some GX and GMX keysets
- * Optional Data Port Module on GMX 24-line keysets and Inter-Tel/DVK keysets for installing a modem-equipped data device, or for installing a loud ringing adapter (LRA) and signalling device(s)
- * Optional loud ringing adapter (LRA) on GX keysets
- * Simultaneous voice/data communication on GMX 24-line keysets and Inter-Tel/DVK keysets (requires an optional Data Port Module, a modem-equipped data device, and special secondary voice path installation)
- 12-key pushbutton keypad
- Feature keys for one-key access to feature codes (some of the keys are user programmable)

- Speed-dial/busy lamp field (SPD/BLF) keys with light-emitting diode (LED) indicators
- Individual C.O. line keys with LED indicators (for incoming and outgoing call indication/access)
- Internal speaker and handsfree microphone on GX keysets (with microphone gain control)
- * Optional Speakerphone Module or external desk speaker on GX keysets (allows handsfree operation on outside calls; can be disabled on a station-by-station basis)
- Integrated speakerphone on GMX and Inter-Tel/DVK keysets (allows handsfree operation on outside calls and intercom calls; can be disabled on a station-by-station basis)
- Speaker(phone) on/off
- Slide-out directory card
- Ring and voice volume controls (Inter-Tel/DVK keysets have VOL UP and VOL DN keys)
- Adjustable ring pitch on GX keysets
- User-programmable ring tone on GMX and Inter-Tel/DVK keysets
- Self-test function
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting
- * Optional headset
- * Optional handset amplifier
- * Background music
- Microphone mute
- Handsfree answer enable/disable
- On-hook dialing/monitoring
- Page remove/replace
- Intercom and C.O. (system speed-dial) directories for display keyset users
- Automatic intercom and/or C.O. call access
- Station call monitoring (hunt group supervisors only)

C. SINGLE-LINE INSTRUMENT (SLI) FEATURES

- 12-key pushbutton keypad
- Four user-programmable feature keys for one-key access to feature codes
- Timed hookflash (FLASH) key
- Ring volume control

- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting
- Selectable AC/DC ringer
- Optional message waiting indication tones
- * Optional handset amplifier

D. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT FEATURES

- Up to five single and/or tandem units may be installed
- Each single unit has 60 keys with LED indicators for one-key access to up to 60 station intercom numbers, hunt group pilot numbers, talkback speaker intercom numbers, or modem access numbers (the LEDs show the status of the assigned stations and/or hunt groups)

E. ATTENDANT FEATURES

- System speed-dial number/name programming (can be reassigned to any keyset station)
- Remote cancelling of do-not-disturb and call forward for stations served
- System alarm reporting/clearing
- Night answer and night ring-in programming (primary attendant only)
- Enable/disable system night mode (primary attendant only)
- Set date and time of day (primary attendant only)
- Attendant recall
- * Immediate off-hook voice announce (OHVA) calls (requires a DSS/BLF Unit and special installation and programming)
- * Enable/disable background music to talkback speakers (primary attendant only)
- Transferring calls to the modem

F. MAXIMUM CAPACITIES

4.2 Some of the features have maximum capacities that are dependent on the availability of speech channels and/or circuits. The features that have capacities include the following:

Paging	
Internal zones	6
External zones	3
Simultaneous three-party conference calls	
	4
System speed dialing	
Numbers per system	100
Digits per number	32
Station speed dialing	
Numbers per station	10 C.O.,
— keyset	10 intercom
Numbers per station	10 C.O. or
— single-line set	intercom
Digits per entry	16 C.O.,
	4 intercom*
* The three-digit intercom number can be preceded with a pound (#) to speed dial private intercom calls to the station. Or, a "4" may be entered before a station intercom number or hunt group pilot number to quickly reverse transfer (pick up) calls from that station or hunt group.	
Redialing per station	1 number, 32 digits
LCR (MF-rated, <i>Extended</i> software only)	
Route groups	12
Facility groups	8
Lines per facility group	32
Dial rules (16 digits each)	8 (5 pro- grammable)
Facility group callback requests per system	25
Callback (queue) request per station	1
Camp on by a station	1
Stations camped on to a station	119
Stations camped on to a line	120
Inter-station messages per system	255
Programmable reminder messages	
Message requests per system	120

Do-not-disturb messages	20
Messages per system	120
Allowed long distance numbers	
Digits per number	10
Alternate carrier numbers	
Digits per number	10
Account codes	
Forced — all outgoing calls	120
Forced — LCR toll calls	120
Standard	32
Digits per code	4-8
SMDA account codes	119 (plus 1 overflow)
Attendants	
DSS/BLF-equipped keysets	5
Intercom numbers per single DSS/BLF Unit	60
Hunt groups	
Per system	15
Stations per hunt group	60 in hunt groups 1-2, 20 in hunt groups 3-15
Announcement stations per hunt group	1
Overflow stations per hunt group	1
Overflow count maximum	25
Supervisors per hunt group	1
Tenant groups	
Departments per tenant group	10
C.O. lines — MF-rated	
Auto lines	32
Line groups	8
Lines per line group	32
C.O. lines — KF-rated	
Auto lines	1
Line groups	8
Lines per line group	1
Keysets installed with secondary voice paths (for receiving OHVA calls and/or for simultaneous voice/data communication)	
	60**

** Two keyset circuits are needed for each keyset installed with a secondary voice path. Refer to SPECIFICATIONS, page 2-3, for more information.

SPECIFICATIONS

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1. INTRODUCTION

1.1 This section describes the following hardware:

- Cabling and the Main Distribution Frame (MDF)
- Key Service Unit (KSU)
- Station Instruments
- Optional System Equipment

1.2 The Inter-Tel GMX-152D System can be equipped with up to 32 loop start C.O. lines and up to 120 station instruments. The lines and stations are controlled by circuit boards in the Key Service Unit (KSU).

1.3 A wide variety of station instruments are available on the GMX-152D System, including:

- GX 24-Line Standard Keysets
- GX 24-Line Display Keysets
- GMX 24-Line Standard Keysets
- GMX 24-Line Display Keysets
- GMX 12-Line Keysets — non-display only
- Inter-Tel/DVK 24-Line Standard Keysets
- Inter-Tel/DVK 24-Line Display Keysets
- Inter-Tel/DVK 12-Line Standard Keysets
- Inter-Tel/DVK 12-Line Display Keysets
- Inter-Tel/DVK 8-Line Standard Keysets
- Inter-Tel/DVK 8-Line Display Keysets
- GX Direct Station Selection/Busy Lamp Field (DSS/BLF) Units — single or tandem
- GMX DSS/BLF Units — single only
- Inter-Tel/DVK DSS/BLF Units — single or tandem
- GX Single-Line Instruments (SLIs)

- Industry-standard single-line, dual-tone multi-frequency (DTMF) sets

NOTE: At the date of this publication, Inter-Tel/DVK keysets and DSS/BLF Units were not yet available.

1.4 A wide variety of optional system equipment can also be installed, including:

- Power failure transfer equipment; refer to pages 2-7 and 3-77.
- External music source; refer to pages 2-7 and 3-76.
- Paging speaker networks for three external paging zones; refer to pages 2-10 and 3-27.
- Talkback speakers; refer to pages 2-10 and 3-27.
- Signal devices; refer to pages 2-10 and 3-27.
- Electrical devices (such as alarms or lights) that can be turned on and off using the night transfer relay; refer to pages 2-10 and 3-27.
- Off-premises stations and OPX repeaters; refer to pages 2-14 and 3-23.
- Playback devices; refer to pages 2-15 and 3-72.
- System battery back-up; refer to pages 2-17 and 3-74.
- Output device(s) for the station message detail recording (SMDR), error recording, and station message detail accounting (SMDA) features; refer to pages 2-17 and 3-76.
- Doorbox; refer to page 2-18.
- Voice mail equipment; refer to page 2-19.
- Facsimile (FAX) machine; refer to page 2-19.
- Inter-Tel CallMaster/Accounting package; refer to page 2-20.

2. CABLING AND THE MAIN DISTRIBUTION FRAME (MDF)

2.1 Connections between the central office (C.O.) lines, station instruments, external equipment, and the circuit boards in the KSU are made at the MDF. The MDF is made up of industry-standard 66M1-50-type terminal blocks. Bridging clips are used on all terminal blocks to complete the connections. Blocks used include:

- 1-2 blocks for C.O. line and Central Office Unit (COU) board terminations (24 lines on one block; 8 on the second).
- 1-15 blocks for station cabling and Station (STN) board terminations (STN-A, STN-A1, STN-B, or STN-B2).
- 1 block for a Modem-III (MOD-III) or Modem-IV (MOD-IV) board and optional equipment terminations.
- Optional block(s) for off-premises station(s); one block is needed for each High Voltage Ring Adapter (HVRA) Unit and/or power supply and ring generator.

2.2 The MDF requires a 4 x 8-foot (1.2 x 2.4-meter), $\frac{3}{4}$ -inch plywood backboard. This allows room to mount all terminal blocks and peripheral equipment.

A. STATION CONNECTIONS

2.3 For each keyset, DSS/BLF Unit, SLI, single-line DTMF set, and playback device, three-pair cable is run from the station location to the MDF. All station cables are terminated on blocks at the MDF and on six-conductor modular jack assemblies at the station locations.

NOTE: It is recommended that three-pair cable and six-conductor modular jacks be used for all station connections. This allows the various types of station instruments to be easily interchanged, if necessary. However, if desired, SLIs, single-line DTMF sets, and playback devices can be installed using one-pair cable and four-conductor modular jacks.

2.4 Industry-standard, 25-pair telephone cable is used to connect the station blocks to their corresponding STN boards. Female 50-pin amphenol-type connectors on the cables attach to the male connectors on the STN boards in the KSU.

2.5 If desired, the system can be configured to allow GMX 24-line keyset users and Inter-Tel/DVK keyset users to receive off-hook voice announce (OHVA) calls and/or to use the *simultaneous* voice/data communication feature. To accomplish this, the keyset is installed on an odd-numbered STN-A1 circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the following even-numbered circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path.

NOTE: To simply *place* OHVA calls (from any station instrument if properly programmed) or to use the *standard* data communication feature (GMX 24-line keysets and Inter-Tel/DVK keysets only), no special secondary voice path installation is necessary. However, for data communication (whether standard or simultaneous voice/data), GMX 24-line keysets and Inter-Tel/DVK keysets must be equipped with optional Data Port Modules. GX 24-line keysets and GMX 12-line keysets cannot have Data Port Modules installed.

2.6 Although secondary voice path-equipped keysets are installed with three-pair cable as usual, the configuration at the station block is somewhat different than the standard configuration. In standard installations, the KSU uses the first pair for power and ground, the second pair for the primary voice path, and the third pair for auxiliary transmissions between the keyset and the KSU. To create a secondary voice path, the auxiliary pair is not used; instead, the primary pair from the following even-numbered STN-A1 circuit is used in its place. (Refer to INSTALLATION, pages 3-19 to 3-21, for complete instructions.)

2.7 Because the primary path of the even-numbered circuit is used to create a secondary voice path for the preceding odd-numbered circuit, the even-numbered circuit cannot have a station instrument installed on it. The maximum number of GMX 24-line keysets and Inter-Tel/DVK keysets that may be equipped with a secondary voice path is 60.

2.8 Each secondary voice path keyset must have its corresponding STN-A1 circuit strap set in the O (OHVA) position. When a secondary voice path is not installed, the strap must be in the N (normal) position. Also, each secondary voice path circuit must be designated as such in database programming. (See PROGRAMMING, page 5-41, for details.)

B. C.O. LINE CONNECTIONS

2.9 The C.O. lines are terminated on telephone company RJ-type blocks, as required by FCC regulations. Cross-connect cable is used to connect the RJ-type blocks to the terminal blocks on the MDF. The C.O. lines are then connected to the COU boards using industry-standard, 25-pair cable. Female 50-pin amphenol-type connectors on the cables attach to the male connectors on the COU boards.

2.10 It is recommended that gas discharge tubes with silicon avalanche suppressors be installed on the C.O. lines and OPX lines for lightning protection. Also, in areas with frequent occurrences of lightning, it is recommended that the cable between the telephone company termination and the gas discharge tubes be at least 75 feet long (the cable may be coiled up if desired).

2.11 The GMX-152D System has the following C.O. line characteristics:

CHARACTERISTICS

Loss from:	
CO to keyset	0dB (@1kHz, 0 ft.)
CO to single-line set	0dB (@1kHz, 0 ft.)
CO to CO	2dB (@1kHz, 0 ft.)
Ringer equivalence	0.9A
Ringing voltage	40VRMS minimum
Ring frequency	20-30Hz
Loop current	20mA minimum
Impedance:	
COU circuit	910 ohms
HVRA to OPX	600 ohms

PROTECTION

Tip-to-ring	360V transient
-------------	----------------

C. MODEM-III (MOD-III) AND MODEM-IV (MOD-IV) BOARD CONNECTIONS

2.12 The MOD-III or MOD-IV board connects to the MOD block on the MDF using industry-standard, 25-pair cable and a female 50-pin amphenol-type connector. The cable is attached to the MOD block for the electrical devices that are controlled by the night transfer relay, the external paging equipment, the talkback speakers, and the signal devices.

3. KEY SERVICE UNIT (KSU)

A. KSU DESCRIPTION

3.1 The KSU houses the system power supply, a 27-slot cardfile assembly, and the circuit boards. It performs the switching activities for the system, detects incoming calls, processes data-controlled features, and controls the interaction of station instruments, C.O. lines, and intercom channels. Refer to Figure 2-1 on page 2-21 for a photograph. KSU dimensions are as follows:

Height	25.5 in. (63.8 cm.)
Width	27.0 in. (67.5 cm.)
Depth	19.0 in. (47.5 cm.)
Weight	100 lbs. (45 kg.)
	(loaded)

3.2 The system is a microprocessor-controlled, time-division multiplex system. Memory includes 352k bytes ROM and 96k bytes RAM on the Application Processor (APP) board (16-bit processor) and the Input/Output Processor (IOP) board (8-bit processor). Each keyset contains an 8-bit microprocessor that communicates with the microprocessors on the APP/IOP boards.

3.3 The system has 41 speech channels, including 32 C.O. lines and 9 intercom channels. Unused C.O. line time slots are automatically available for intercom use. Also, the system will allot more than 9 intercom channels if less than 32 C.O. lines are installed (one intercom channel for each C.O. line not installed).

3.4 The KSU and the station instruments require the following environmental conditions:

REQUIREMENTS	IN OPERATION	IN STORAGE
Temperature – KSU	32° to 104° F 0° to 40° C	-40° to 185° F -40° to 85° C
Temperature – Station Instruments	32° to 113° F 0° to 45° C	-40° to 185° F -40° to 85° C
Relative Humidity (Non-Condensing)	5% to 95%	5% to 95%
Altitude	Up to 10,000 ft. (3,048 m.)	Up to 40,000 ft. (12,192 m.)

NOTE: It is recommended that the maximum operating temperatures (as stated above) *never be exceeded*.

Therefore, when installing the KSU and the station instruments, allow a sufficient margin for error in case of air conditioning failure, routine mechanical maintenance, plant shutdown, etc. As a general guideline, if the conditions are suitable for office personnel, they are also suitable for KSU and station instrument operation. A properly controlled environment will help to extend the operating life of the equipment.

B. SYSTEM POWER SUPPLY

3.5 The 690.0100 or 690.0200 power supply provides power to the KSU and all stations. The power supply must have an isolated, dedicated, 105-125VAC, 15A, 57-63Hz, single-phase commercial power source (for details, refer to the first NOTE on page 3-3 of the INSTALLATION section).

3.6 The 690.0200 power supply is equipped to charge batteries that will provide back-up power in the event of a power failure or brownout condition. For the 690.0100 power supply, an uninterruptable power supply (UPS) unit or a standby power supply (SPS) unit can be used for battery back-up. The batteries are optional and are provided by the customer. Refer to page 2-17 for more information.

3.7 Maximum power outputs of the power supplies are:

- +5VDC, 40A (logic)
- 12VDC, 1A (RS-232-C, audio)
- +30VDC, 12A (keyset)
- +34.5VDC battery float voltage, 2A (690.0200 only)

3.8 The fuse values of the power supplies are:

- AC line – 125 or 250VAC, 15A
- Battery – 250VAC, 4A, 3AG, fast-blow (690.0200 only)

3.9 The KSU has two ground lugs on the base or shelf of the cabinet. One is used for grounding the power supply and cardfile to the cabinet. The other is for connecting the cabinet to an earth ground.

3.10 To reduce the effects of AC voltage surges and spikes that may cause system malfunctions, false logic, and/or damage to the electronic components, it is recommended that a surge/spike protector be installed.

3.11 Check the manufacturer's specifications to ensure that the surge/spike protector meets the following requirements:

- Clamp voltage transients at 300VDC within 5 nanoseconds when exposed to waveforms as described in the ANSI/IEEE Standard C62.41-1980 (IEEE 587).
- Reduce RFI/EMI noise by at least 20dB at frequencies between 5kHz and 30MHz.

C. PRINTED CIRCUIT BOARDS

3.12 The KSU contains the circuit boards that control and coordinate the functions of the system. Up to 27 boards may be installed. They are:

1	Application Processor (APP)
1	Input/Output Processor (IOP)
1-15*	Station-A (STN-A) or Station-A1 (STN-A1) — up to eight keysets each**
0-14*	Station-B (STN-B) or Station-B2 (STN-B2) — up to eight single-line sets each
1-8	Central Office Unit (COU) — up to four C.O. lines each
1	Conference (CNF)
1	Modem-III (MOD-III) or Modem-IV (MOD-IV)

* Refer to page 2-11 for station capacities.

** There can be as many as five DSS/BLF-equipped keysets in the system. Each DSS/BLF Unit (single or tandem) uses a STN-A or -A1 circuits that is separate from the keyset's circuit. Boards with a single or a tandem unit can have only seven keysets. Boards with two single units can have only six keysets.

3.13 Descriptions of the printed circuit boards are given in the following paragraphs. Photographs of the boards are located in the INSTALLATION section.

Application Processor (APP) Board and Input/Output Processor (IOP) Board

3.14 The APP and IOP boards contain the main controlling microprocessors and associated control logic and memory circuits. They are under the control of a program, stored in the ROM, which is activated when the system is powered up. EPROMs containing the system software must be installed on the APP and IOP boards before the boards are installed in the cardfile.

3.15 The APP board contains the following:

- **RS-232-C connector** (25-pin subminiature "D" female connector) is the interface for an SMDR/

SMDA output device or a programming terminal. (There is also an RS-232-C connector on the IOP board.)

- **RS-232-C straps** for selecting the communications handshake between the programming terminal and the APP board. For more information about the RS-232-C connector, refer to page 2-17.
- **Reset switch** is used to manually reset the system during troubleshooting. This is a software reset (minor reset), not a hardware reset (major reset). Pushing this switch does the following:

- Preserves the battery-backed database information, non-conference calls in progress, outside calls being dialed, inter-station messages, calls on individual hold, do-not-disturb messages, and reminder messages. A call on system hold is changed to individual hold at the station that placed it on hold.

- Restores DTMF decoders, modem access, and speech channels and resets the station clocks to match the system clock. Updates line key, DSS/BLF key, SPD/BLF key, and feature key lamp status.

- Interrupts system operation, which disconnects calls that use a conference circuit (including CO-to-CO unsupervised conferences, CO-to-CO DISA calls, calls in progress that have been forwarded or transferred to the public network), calls to talkback speakers, and pages in progress. Calls ringing in are interrupted, but not disconnected. Camped-on calls are disconnected and queue requests are cancelled.

- Terminates system and user programming in progress.

- **Database back-up battery** (3.5V lithium battery) that can support the database for at least three months of accumulated system down time. If the battery voltage is not greater than 2.5VDC, the board must be returned to Inter-Tel for repair. When the APP board is taken out of service for repair or storage, the battery strap should be placed over pins 2 and 3 (OFF) to preserve the battery charge.

- **Battery voltage test point** (located above the reset switch) for measuring the voltage level of the lithi-

um battery when the power is off. The battery cannot protect the database if less than 2.5VDC is present.

- **Battery strap** for activating the database back-up battery. The strap should be placed in the ON position (over pins 1 and 2) before the APP board is installed. When the board is taken out of service for repair or storage, the strap should be placed in the OFF position (over pins 2 and 3) to preserve the battery charge.

NOTE: Placing the strap in the OFF position crases the database.

- **LED indicators** show proper operation (APP RUN), communication with the IOP board (FIFO), and battery strap placement (BATT OFF). Refer to TROUBLESHOOTING for detailed LED information.

3.16 The IOP board contains the following:

- **RS-232-C connector** (25-pin subminiature "D" female connector) is the interface for an SMDR/SMDA output device or a programming terminal. (There is also an RS-232-C connector on the APP board.)
- **Baud rate DIP switches** are used to individually select the baud rates for the APP and IOP RS-232-C interfaces. (The modem baud rates are permanently set to 300 and 1200 baud.)
- **Music-on-hold strap** is used to select an external music source, silence, or a doorbell-type chime (three chimes every 15 seconds) for callers to hear when they are placed on hold or camped on.
- **Music-on-hold connector** ($\frac{1}{8}$ -inch, two-conductor, miniature phone jack with an input impedance of 9k ohms) on the front edge of the board is the input connection for an external music source (such as a radio, tape player, etc.). An AGC circuit automatically holds the volume to a predetermined level that is slightly lower than the normal

voice volume, as required by FCC regulations. Optimal input level is 0.775VRMS (0dB).

- **Fuse** ($\frac{1}{16}$ -amp micro-fuse) protects the system music-on-hold circuitry.
- **Voltage test points** on the front edge of the board for checking the system +30VDC, +5VDC, -12VDC, and +12VDC levels. To measure system voltage levels, voltmeter probes are inserted into the ground point and the desired voltage test point.
- **LED indicators** show system alarms (MAJOR ALARM and MINOR ALARM), database error occurrences (DATABASE ERR), proper operation (IOP RUN), and system voltages (+30VDC, +5VDC, and -12VDC). Refer to TROUBLESHOOTING for more LED information.
- **Power failure transfer relay** (RCA-type phono jack) is used with additional equipment to connect one or more single-line sets to predetermined C.O. lines in the event of a processor board failure or power failure. The output is a normally-open SPDT relay that is held closed during system operation. Additional equipment needed includes a PFT relay card and card mounting case. Inter-Tel recommends the Starcom URC-3 relay card and the ST-101 card mounting case. This equipment is available from Starcom, Inc., 4287 N.W. First Avenue, Boca Raton, Florida 33431, (407) 392-7001.

3.17 The power failure transfer specifications are as follows:

POWER FAILURE CONTACT RATINGS

- 1A, 24VDC (rated load)
- 0.3A, 110VAC (resistive load)
- 125VDC maximum (switching voltage)
- 125VAC maximum (switching voltage)

RELAY CARD SPECIFICATIONS

- Relay coil - 915 ohms
- Minimum coil voltage - 17.6VDC
- Maximum coil voltage - 46.9VDC

RELAY CARD CONTACT RATINGS

- 1A, 100V maximum

Station (STN-A, STN-A1, STN-B, and STN-B2)

3.18 Station instruments are connected to Station (STN) boards in the KSU. Keysets and DSS/BLF Units are connected to STN-A or STN-A1 boards. Single-Line Instruments (SLIs), industry-standard single-line DTMF sets, playback devices, and other single-line devices are connected to STN-B or STN-B2 boards. Station instrument configuration depends on the number and type of STN boards installed in the KSU. There can be any combination of STN boards allowing up to 120 stations in eight-station increments. There can be a maximum of 120 keysets (if all 15 are STN-A or STN-A1 boards) or 112 single-line sets (using 14 STN-B or STN-B2 boards).

NOTE: At least one STN-A or STN-A1 board should be installed to provide a display keyset that will receive system alarm messages and act as the attendant for unsupervised C.O. recalls.

3.19 Station-A (STN-A): These boards are used to provide circuits for connecting GX keysets and GX, GMX, and Inter-Tel/DVK DSS/BLF Units to the system. If the maximum of five circuits is used for DSS/BLF Units (single or tandem), five fewer keysets can be installed. Each STN-A board can support only one tandem DSS/BLF Unit or up to two single DSS/BLF Units. Generally, there are two 1.6A or 2A, 125VAC, slow-blow fuses on the STN-A board, although some boards may have only one fuse.

3.20 Station-A1 (STN-A1): These boards are used to provide circuits for connecting GMX keysets, Inter-Tel/DVK keysets, and GX, GMX, and Inter-Tel/DVK DSS/BLF Units to the system. If the maximum of five circuits is used for DSS/BLF Units (single or tandem), five fewer keysets can be installed. Each STN-A1 board can support only one tandem DSS/BLF Unit or up to two single DSS/BLF Units. There is one 1.6A, 125VAC, slow-blow fuse on the STN-A1 board.

3.21 Each STN-A1 board has secondary voice path straps for enabling an odd-numbered station circuit to use the primary voice path of the following even-numbered station circuit for off-hook voice announce and/or simultaneous voice data communication. (Refer to pages 3-19 to 3-21 for more information and special installation instructions.) If a GMX 24-line

keyset or an Inter-Tel/DVK keyset is to have a secondary voice path, place the associated strap on the board in the O (OHVA) position. Or, for normal station installation, place the strap in the N (normal) position.

3.22 STN-B and STN-B2 boards can be installed to connect GX SLIs, single-line DTMF sets, playback devices, off-premises stations, voice mail units, FAX machines, and other single-line devices.

3.23 Station-B (STN-B): These boards are used for SLIs with ringers set for DC and single-line DTMF sets that have DC ringers. Off-premises stations can be connected using additional equipment. AC ringers can be used if the sets are connected to an HVRA.

3.24 Station-B2 (STN-B2): These boards allow voice mail units to be connected directly to the system (without involving a COU circuit). They also have a 600-ohm impedance to reduce possible impedance matching and level loss problems. For each circuit on the board, there are AC/DC straps that allow the installer to attach devices with either AC or DC ringers. If devices with AC ringers are connected to the board, a 48VDC power supply and a 110VAC ring generator are required. Off-premises stations can be connected using an HVRA Unit, power supply, and ring generator.

NOTE: If an *on-premises* single-line set with a message waiting lamp is installed on a STN-B2 circuit (and the STN block is equipped with a 48VDC power supply), the lamp will light when the station receives a message.

3.25 Each STN board has circuitry for up to eight station instruments. Each of the eight circuits is assigned a number according to the board's slot in the KSU and the location of the circuit on the board. For example, station circuit 1.2 is the second circuit on the first STN board.

3.26 The initialized configuration of the system assigns station circuit 1.1 to intercom number 100, circuit 1.2 to intercom number 101, and so on until circuit 15.8 is assigned to intercom number 219. Intercom number assignments may be changed through database programming. Only circuit 1.1 is equipped (for the primary attendant's keyset) when the system is initialized. Refer to page 5-41 in PROGRAMMING for more information.

Central Office Unit (COU)

3.27 The GMX-152D KSU can have a maximum of eight Central Office Unit (COU) boards installed. Each COU board has circuitry for up to four loop start C.O. lines, providing a system capacity of 32 lines.

3.28 COU boards are configured for DTMF signaling when shipped. Some or all of the lines can be converted to dial-pulse signalling using the Rotary Conversion Kit (part no. 828.1032) available from Inter-Tel. Each kit converts two C.O. lines.

NOTE: Single-line sets generate their own DTMF tones when dialing. If numbers are manually dialed on dial-pulse lines, both the DTMF tones generated by the phone and the dial-pulse signals generated by the system are sent to the central office, which may be a problem if the central office recognizes both. To avoid this problem, single-line sets should be restricted to LCR only when using dial-pulse lines. Then, only the LCR-generated dial-pulse signals will be sent to the central office.

3.29 The C.O. line circuits are assigned numbers according to the board's slot in the KSU and the location of the circuit on the board. For example, C.O. line circuit 2.4 is the fourth circuit on the second COU board.

3.30 Line key numbers are assigned on a tenant-by-tenant basis. Up to 24 lines can be assigned to the line keys and distributed among the tenant groups using five different line key arrangements (one for each tenant group). Refer to FEATURES, page 4-15, and PROGRAMMING, page 5-30, for more information about tenant service.

3.31 When the system is initialized, C.O. line circuits 1.1-6.4 are assigned to line keys 1-24 in all tenant groups; circuit 1.1 is under line key 1, circuit 1.2 is under line key 2, and so on. C.O. line circuits 7.1 to 8.4 are not equipped when the system is initialized and no auto lines or line groups are programmed.

3.32 The database contains a station option which allows the programmer to designate any keyset line key as an automatic out-of-range line selection key, called the OVER key. If this option is enabled, the designated key may be used to access incoming calls on the out-of-range C.O. lines. (The ANSWER key

may also be used to access incoming calls on these lines.) Refer to FEATURES, page 4-32, for more information.

Conference (CNF)

3.33 The Conference (CNF) board provides circuitry for up to four simultaneous three-way conferences. It also supports the call forward, call transfer, and DISA features when two C.O. lines are connected. Conferencing is amplified.

3.34 Conference calls can involve two stations and one outside party, one station and two outside parties, or three stations.

Modem-III (MOD-III) or Modem-IV (MOD-IV)

3.35 The MOD-III and MOD-IV boards are similar in design and function. However, the MOD-IV board has special circuitry for use with the automated attendant "dial through recording" feature. If this feature will be used, the MOD-IV board must be installed. Both the MOD-III and the MOD-IV boards provide the following:

- **Direct inward system access (DISA) interface** for placing intercom and C.O. calls from remote locations. A DISA user can call in from any DTMF telephone and access the system's stations, hunt groups, C.O. line groups, auto lines, or the modem. A security code can be assigned for day and/or night mode to limit access to either the modem and C.O. lines or to the entire system.
- **300-baud (full-duplex) and 1200-baud (half-duplex) modem interface** to the APP/IOP for remote programming. In the default database, the 300-baud modem is assigned intercom number 260, and the 1200-baud modem is assigned intercom number 270. Any attendant can transfer a call to the modem, or it can be accessed directly using the DISA feature.

NOTE: To ensure accurate data transmissions, use only the 300 baud rate for remote programming.

- **DTMF decoding circuits (four)** are used when single-line sets are dialing and when features such as DISA and automated attendant are used. These decoders convert DTMF signals to the

- digital code used by the system. They are in use only while the dialed number is being processed, not for the duration of the call. If all DTMF decoders are busy, the user may camp-on.
- **Tone generators** are used to produce all of the system tones (busy, reorder, do-not-disturb, etc.) heard by single-line set, DISA, and automated attendant users. (Keysets generate their own system tones.)
- **Circuitry for three external paging zones** for connecting an amplifier and three external paging speaker networks to allow paging to large areas, such as warehouses or loading docks.
- **Circuitry for five talkback speakers** (8-100 ohm) that can be attached to the 500mW outputs on the MOD-III or MOD-IV board. A talkback speaker can be accessed for half-duplex (voice-switched) handsfree intercom conversation by dialing an intercom number (initialized to 221-225). The

speakers may also receive background music and internal zone pages.

- **Three signal device relays** (normally open) for activating external signalling devices when a call rings in on assigned C.O. lines. These dry contacts follow the normal keyset C.O. ringing cycle (two seconds on/four seconds off). Ring-in for the relays can be programmed for day and/or night modes in the database.
- **A night transfer relay** is activated when the primary attendant places the system in night mode, causing the swing connection to move from the "break" to the "make" position. The contact can be used for turning on or off lights, an alarm system, or other devices.

3.36 All MOD-III and MOD-IV board relay contacts have a maximum rating of 1A, 24VDC/0.3A, 100VAC.

4. STATION INSTRUMENTS

4.1 A variety of station instruments can be used on the Inter-Tel GMX-152D System. The combination of station instruments depends on the Station (STN) board installation (refer to page 2-8). The system capacity for stations is:

Total Station Instruments	120
Keysets	0-120*
Single-Line Sets	0-112*
DSS/BLF Units (single or tandem)	0-5**

* At least one STN-A or STN-A1 circuit should be equipped with a display keyset to receive system alarm messages and act as attendant for unsupervised C.O. recalls. When the system is initialized, circuit 1.1 is designated as a keyset and the primary attendant/alarm station.

** Keysets and DSS/BLF Units use separate STN-A or STN-A1 circuits. Therefore, for each DSS/BLF Unit installed (single or tandem), one less keyset may be installed.

A. KEYSETS

4.2 A maximum of 120 keysets can be connected to the system. GX keysets, GMX 24-line keysets, and Inter-Tel/DVK keysets are available as standard or display models. (At the date of this publication, Inter-Tel/DVK keysets and DSS/BLF Units were not yet available.) For drawings of the keysets, refer to Figures 2-2 to 2-7 on pages 2-22 to 2-27. Keyset dimensions are:

<u>GX/GMX 24-LINE KTS</u>	<u>GMX 12-LINE KTS</u>
Height 3.5 in. (8.9 cm.)	Height 3.5 in. (8.9 cm.)
Width 8.8 in. (22.3 cm.)	Width 7.5 in. (19.1 cm.)
Length 9.0 in. (22.9 cm.)	Length 9.0 in. (22.9 cm.)
Weight 2.8 lb. (1.3 kg.)	Weight 2.5 lb. (1.1 kg.)
<u>IT/DVK 24-LINE KTS</u>	<u>IT/DVK 12-/8-LINE KTS</u>
Height 3.8 in. (9.7 cm.)	Height 3.8 in. (9.7 cm.)
Width 9.2 in. (23.5 cm.)	Width 7.0 in. (17.8 cm.)
Length 9.5 in. (24.1 cm.)	Length 9.5 in. (24.1 cm.)
Weight 2.8 lb. (1.3 kg.)	Weight 2.5 lb. (1.1 kg.)

4.3 Each keyset model has:

- 12-key pushbutton keypad
- A variety of feature keys (some of which are user programmable)
- 8 or 10 speed dial/busy lamp field (SPD/BLF) keys with light-emitting diode (LED) indicators
- 8, 12, or 24 direct access C.O. line keys with LED indicators

- Internal speaker and handsfree microphone (GX keysets) or integrated speakerphone (GMX and Inter-Tel/DVK keysets)
- Handsfree microphone gain control (GX keysets)
- Ring and voice volume controls (Inter-Tel/DVK keysets have VOL UP and VOL DN volume keys)
- Slide-out directory card
- Adjustable ring pitch using DIP switches on the keyset (GX keysets) or user-programmable ring tone (GMX and Inter-Tel/DVK keysets)
- Liquid crystal display (LCD) contrast adjustment (some GX and GMX display keysets)
- Self-test feature (for testing keyset functions)
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting

Handsfree Operation

4.4 Full-duplex, handsfree answering of intercom calls is a standard feature of the GX keyset. If desired, an optional Speakerphone Module or an external desk speaker can be installed to provide handsfree operation on outside calls.

4.5 A built-in, integrated speakerphone is standard on all GMX and Inter-Tel/DVK keysets. The integrated speakerphone allows users to place and receive outside calls and intercom calls without lifting the handset. Once a call is connected, the keyset user may speak handsfree over the speakerphone or lift the handset to speak privately. When using the handset, the user may switch to the speakerphone by pressing the SPKR key and replacing the handset. If enabled, pages and/or background music may be broadcast over the speaker when the keyset is not being used. (If desired, the integrated speakerphone can be disabled on a station-by-station basis through database programming.)

Optional Speakerphone Modules or External Desk Speakers

4.6 Speakerphone Modules (part no. 828.1077) or external 8-ohm desk speakers can be connected to GX keysets for handsfree conversations on outside calls.

4.7 If the Speakerphone Module is installed, complete information and installation instructions are

included with the kit. If an external desk speaker is installed, the speaker is connected to the keyset by a mod-to-mod line cord and is turned on and off using the SPKR key. A strap on the bottom of the keyset must also be set to enable the handsfree microphone for outside calls.

Liquid Crystal Display (LCD)

4.8 Each display keyset has a liquid crystal display (LCD) with two 16-character lines. The display helps the user to process calls more efficiently and professionally. There are display messages for date and time, numbers dialed, call cost data, reminders, do-not-disturb, incoming calls, station and system status, system alarms, and programming. These displays are indicated throughout the FEATURES section of the manual.

4.9 All standard keysets, except GMX 12-line keysets, can be converted to display sets by installing an LCD Unit. GX and GMX 24-line keysets use the *large* LCD Kit (part no. 828.1052). Inter-Tel/DVK 24-line keysets use the *large* LCD Kit (part no. 828.1168). Inter-Tel/DVK 12-line and 8-line keysets use the *small* LCD Kit (part no. 828.1166).

Optional Headsets

4.10 A headset may be attached to any keyset by unplugging the headset from the headset jack on the base of the keyset, plugging the headset into the headset jack, and entering a feature code to enable the headset. The SPKR key, which is used to turn the headset on and off, is lit when placing and receiving calls and unlit when the headset is not in use. The keysets are compatible with industry-standard, four-conductor, modular headsets that have dynamic microphones, or carbon-microphone headsets that are connected to the keyset through an externally-powered jackset (which makes the headset dynamic-compatible). Refer to page 3-62 for installation instructions.

Optional Handset Amplifiers

4.11 Although Inter-Tel keysets and SLIs are equipped with hearing aid-compatible (HAC) handsets, a user may wish to have a handset amplifier installed. Inter-Tel recommends the Walker Modular

Handset Amplifier (part no. W10). It is an external device that plugs into the keyset, then the handset is plugged into it. Receiver voice volume is controlled by turning a thumbwheel located on the amplifier. The amplifier is equipped with a transformer that requires a 110VAC outlet. Contact Walker Equipment Corporation, P.O. Box 829, Highway 151 South, Ringgold, Georgia 30736, (404) 935-2600, for buying information. Refer to page 3-62 for installation instructions.

Optional Loud Ringing Adapters (LRAs)

4.12 GX keysets can have optional loud ringing adapters (LRAs) installed (part no. 828.1051 — contact Inter-Tel Customer Support for details). The LRA provides dry contacts used in controlling an external ringing device. The dry contacts follow the ring cycle of the piezoelectric ringer of the keyset. The LRA is not affected by the ring pitch DIP switches on the bottom of the keyset or the ringer volume control. LRA contact ratings are:

LRA CONTACT RATINGS

500mA (DC) maximum
100mA (AC) maximum
30VDC maximum
110VAC maximum

NOTE: Do not connect an external signalling device directly to the keyset without using an LRA.

Optional Data Port Module

4.13 GMX 24-line keysets and Inter-Tel/DVK keysets may be equipped with optional Data Port Modules (part number 828.1094). The module board contains a four-conductor, RJ11 modular jack that can be used to connect *either* a data device (such as a personal computer equipped with a modem) *or* a loud ringing adapter (LRA) and an external signalling device (such as a loud bell, horn, flashing light, etc.) to the keyset. The Data Port Module is a source for 20-26mA of loop current (constant current source). Refer to page 3-63 for instructions on installing the optional Data Port Module. GX keysets and GMX 12-line keysets cannot have Data Port Modules installed.

4.14 Specifications for modem-equipped data device: The data device must have a direct-connection modem. The modem must be externally powered (or capable of operating on 20mA of loop current) and have an RJ11 C.O. line interface. The data device can

be used with the keyset to communicate with remote data equipment over the C.O. lines or intercom channels. Refer to pages 3-63 and 4-81 for installation and operation instructions.

4.15 Specifications for loud ringing adapter (LRA):
An external LRA may be connected to the Data Port Module to provide a relay for controlling external signalling devices. The LRA is connected to the Data Port Module, and the external signalling device is connected to the LRA. Refer to page 3-65 for installation instructions. Each time the keyset rings, the Data Port Module provides 20-26mA of loop current to the LRA. This causes the LRA contacts to close and activates the signalling device. The LRA is not affected by the ring tone or the ringer volume of the keyset. The LRA must be capable of operating on 20mA current (0-20VDC).

NOTE: Do not connect an external signalling device directly to the keyset without using an LRA.

4.16 Some types of signalling devices generate a current/voltage rating that could damage the LRA. The following Wheelock products have been found to work properly with the GMX 24-line keysets and Inter-Tel/DVK keysets.

- Wheelock DCI-24-24 is an adapter that is used with any of a wide variety of Wheelock signalling devices.
- Wheelock CRT-D-37 is a dry contact relay that is used with other manufacturer's signalling devices.

4.17 The LRA output of the Data Port Module is connected to the dry contact input on the Wheelock unit. Wheelock products can be ordered from a local supply house, or call Wheelock directly at (201) 222-6880. Installation and operation instructions are included with each device.

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNITS

4.18 There may be a maximum of five DSS/BLF-equipped keysets in the system, using a maximum of five STN-A or STN-A1 circuits. A DSS/BLF Unit consists of either a single unit or two units connected together to form a tandem unit. Only GX and Inter-Tel/DVK DSS/BLF Units can be used to create tandem units. However, two single units of any kind

can be assigned to one keyset, if necessary. Each individual unit provides one-key access to 60 intercom numbers, while tandem units provide access to 120 intercom numbers. They are programmed to be used with specific keysets but are not physically attached to the keysets.

4.19 Each DSS/BLF Unit (single or tandem) requires a STN-A or STN-A1 circuit that is separate from the keyset's circuit. If the maximum of five STN circuits is used for DSS/BLF Units, five fewer keysets can be installed. Each STN-A or STN-A1 board can support one tandem unit or up to two single units.

4.20 For drawings of the DSS/BLF Units, refer to Figures 2-8 and 2-9 on pages 2-28 and 2-29. DSS/BLF Unit dimensions are:

GX AND GMX DSS/BLF UNITS

Height 3.5 in. (8.9 cm.)
Width 8.8 in. (22.3 cm.)
Length 9.0 in. (22.9 cm.)
Weight 2.0 lb. (0.9 kg.)

INTER-TEL/DVK DSS/BLF UNITS

Height 3.8 in. (9.7 cm.)
Width 7.0 in. (17.8 cm.)
Length 9.5 in. (24.1 cm.)
Weight 2.5 lb. (1.1 kg.)

4.21 The intercom numbers accessed by the keys are programmed in the database on a system-wide basis. They may be station intercom numbers, talkback speaker intercom numbers, hunt group pilot numbers, or the modem access numbers. The intercom number/key assignments are programmed in two lists, DSS 1 and DSS 2. Single DSS/BLF Units of any kind can be assigned with either list. Tandem GX and Inter-Tel/DVK units are assigned with the DSS 1 list, then an internal DIP switch (GX units) or an internal strap (Inter-Tel/DVK units) is set to identify the key arrangement each individual unit will use.

4.22 The lamps in the keys create a busy lamp field that indicates the status of each station (talkback speakers, hunt groups, and the modems will not show status if assigned to keys). The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm.

C. SINGLE-LINE SETS

4.23 Up to 112 single-line sets may be installed on the system. They can be GX Single-Line Instruments (SLIs) or industry-standard, single-line DTMF sets. Refer to Figure 2-10 on page 2-30 for a drawing of the SLI. The dimensions of the SLI are:

Height	3.5 in.	(8.8 cm.)
Width	7.5 in.	(18.8 cm.)
Length	9.0 in.	(22.5 cm.)
Weight	2.0 lb.	(0.9 kg.)

4.24 SLI design features include:

- Four user-programmable feature keys and a non-programmable timed hookflash (FLASH) key
- A ring volume thumbwheel control
- Hearing aid-compatible (HAC) handset (may be equipped with a handset amplifier as described on page 2-12)
- Reversible baseplate for wall mounting
- A ringer that can be set for AC or DC by moving a strap located on the control board

4.25 Single-line set users access some station features simply by lifting the handset and pressing a feature key (or entering a feature code). Others features are accessed using a combination of a hookflash (FLASH key) and a feature key or code. Refer to the FEATURES section of this manual for details.

4.26 Equipment required for using single-line sets includes STN-B or STN-B2 boards, and a MOD-III or MOD-IV board to provide the DTMF decoders that allow single-line sets to dial.

4.27 If STN-B boards are used, the single-line sets can be connected two ways: directly to the STN-B board or through a high-voltage ringing adapter (HVRA) Unit. If connected directly to the board, the single-line DTMF sets must have DC ringers and the SLI ringers must have internal straps set for DC ringing. If connected through an optional HVRA Unit, they must have AC ringers.

4.28 If STN-B2 boards are used, on-premises single-line sets may have AC ringers or DC ringers as long as the AC/DC strap for the associated STN-B2 circuit is set correctly. Off-premises single-line sets

must be equipped with AC ringers and an HVRA Unit (refer to the next section for additional OPX requirements). When installing an on-premises, AC ringer-equipped single-line set on a STN-B2 circuit, the following equipment is required:

- A customer-provided 48VDC power supply. Multiply the number of SLIs and single-line DTMF sets in the system by 50mA to determine the minimum current rating of the power supply.
- A customer-provided 110VAC (30Hz) ring generator. Total the ringer equivalence numbers of all single-line sets in the system to determine the REN of the ring generator(s). For example, three sets, each with a ringer equivalence of 0.9A, would require a 2.7REN ring generator to ring all sets at once. The SLI has a ringer equivalence of 0.9A. Check the manufacturer's specifications for the ringer equivalence of other single-line sets used.

D. OFF-PREMISES SINGLE-LINE STATIONS

4.29 The off-premises station is a single-line DTMF set that is placed in a remote location and connected to the system through a telephone company OPX line or a customer-provided line.

4.30 The OPX lines provided by the telephone company are identified with Facility Interface Codes (FIC): Class A, OL13A; Class B, OL13B; or Class C, OL13C. The service order code is 9.0F (fully protected private line). If the impedance does not exceed a loop measurement of 800 ohms (loop of 15,600 feet using 24AWG wire), a customer-provided line between the remote location and the system may be used.

4.31 The 800-ohm loop limitation is usually suitable for accessing on-premises stations from off-premises stations. However, for applications where one off-premises station will be calling another through the STN board, the impedance between the two off-premises stations (both lines added together) must be less than 800 ohms (loop measurement). In this situation, a Class A or B FIC line is preferable, since the STN board does not amplify voice levels (see paragraph 4.34 for an alternate solution).

4.32 Some OPX lines do not recognize the GMX-152D System's intercom, callback, and recall ring signals. On such lines, the ring tones are gener-

ated by the system, but are not carried over the telephone company lines to the off-premises station(s). To make the GMX-152D System compatible with these lines, an OPX software kit (part no. 828.1152) can be installed on the IOP board. The OPX software makes the "ring on" time longer for intercom, callback, and recall ring signals so that the telephone company lines can recognize them.

NOTE: This OPX software update is not required for installations that use customer-provided lines. Also, installing this software changes the ring time for *all single-line stations* in the system.

4.33 Off-premises stations are connected to either a STN-B or STN-B2 board (up to eight circuits each). Additional equipment needed to install an off-premises station includes:

- One High Voltage Ringing Adapter (HVRA) Unit (part no. 680.73-2) for every two off-premises stations.
- A 48VDC power supply with a current rating of at least 140mA per HVRA Unit.
- A 110VAC (30Hz) ring generator. Total the ringer equivalence numbers of the off-premises stations to determine the REN of the ring generator. For example, three single-line sets, each with a ringer equivalence of 0.9A, would require a minimum 2.7REN ring generator to ring all sets at once.

NOTE: If the power supply and ring generator will be connected to both an HVRA and a STN-B2 board, include in the calculations the current (mA) and ringer equivalence rating for all affected stations.

- One terminal block (66M1-50 type) and a supply of bridging clips for each HVRA Unit.
- 25-pair cable to connect the HVRA Unit to the HVRA block.
- One 50-pin female amphenol-type connector for each HVRA Unit. Used to connect the cable to the HVRA Unit.
- Cross-connect cable to run from the HVRA block to the station block.
- 10AWG wire for grounding the power supply.

- Two screws for mounting the HVRA Unit to the MDF backboard. (Drilling may be necessary.)
- Cabling for customer-provided line, if used.

4.34 In certain off-premises applications, voice volume levels may not be acceptable. This degradation in voice volume is due to the natural voice frequency range limitations of the telephone company or customer-provided line. To increase the frequency range, Inter-Tel recommends the use of one of the following "repeater" products: the Tellabs 7201 2-Wire Switched Gain Repeater, or the R-TEC UM1000 L3 Switched Gain Repeater. Both products provide from 0-15 decibels of voice volume gain and allow regulation of the gain in each direction when simultaneous voice transmission occurs. The switching sensitivity on both units is adjustable. For more complete information, refer to the manufacturer's specifications provided with each product.

4.35 Both products are installed at the MDF between the High Voltage Ringing Adapter (HVRA) Unit and the cabling to the off-premises single-line station. (Refer to page 3-23 for OPX installation instructions.) When ordering a repeater unit, consult with the supplier for ordering the proper mounting shelf and power supply for the unit. The table below outlines the connections necessary for proper installation with the GMX-152D System.

CONNECT	TO R-TEC PIN	TO TELLABS PIN
-Battery (-24 to -56VDC)	K	35
Ground	M	17
System - Tip	E	51
System - Ring	H	33
OPX - Tip	5	41
OPX - Ring	7	49

4.36 Additional information on operating and adjusting the repeater unit is included with the product.

E. PLAYBACK DEVICES

4.37 A playback device is an answering machine that answers the call, plays a message, and then disconnects from the call. Playback devices are installed like single-line sets, using three-pair cable and six-conductor modular jacks (or, if desired, one-pair cable and four-conductor modular jacks). The device must be capable of the following functions: detect ringing, provide ring trip, and automatically disconnect when the announcement is completed.

4.38 Inter-Tel's Digital Attendant (part no. 828.1150) provides these capabilities and more. It is a solid-state, digital voice recording unit that can be played an unlimited number of times without any loss of fidelity. The Digital Attendant is designed to detect either AC or DC ringing, thereby eliminating the need for expensive ring generators and power supplies. Other types of playback devices that respond only to AC ring signals are attached to STN-B2 boards and are equipped with a 48VDC power supply and a ring generator. Or, they can be attached to a STN-B board using an HVRA Unit.

4.39 Hunt groups can have two special stations to help process calls: announcement stations and overflow stations. These stations can be equipped with station instruments or with playback devices. Automated attendant stations can also be equipped with playback devices.

4.40 The playback device is programmed as a regular single-line station and is assigned an intercom number. If the device is sensitive to camp-on tones, causing it to disconnect calls, the programmer can disallow camp-on tones for that circuit (see page 5-41).

5. OPTIONAL SYSTEM EQUIPMENT

A. PROGRAMMING TERMINAL AND SMDR/SMDA OUTPUT DEVICE REQUIREMENTS

5.1 The programming terminal and the output devices for the station message detail recording (SMDR) and station message detail accounting (SMDA) features must have the characteristics described in the following paragraphs.

5.2 The terminal and output devices must be RS-232-C compatible with a male 25-pin subminiature "D" connector. Consult the owner's guide for the device to verify that the pin functions are the same as those of the APP or IOP board (as shown below). If necessary, rewire the connector on the device to match the requirements for the processor board.

SIGNAL NAME	FUNCTION	PIN
Protective Ground	Ground — tied to pin 7	1
Transmit Data (TXD)	Data to APP/IOP	2
Receive Data (RXD)	Data from APP/IOP	3
Request to Send (RTS)	Signal to APP (not on IOP)	4
Clear to Send (CTS)	Signal from APP/IOP (always true* on IOP)	5
Data Set Ready (DSR)	Signal from APP/IOP (always true*)	6
Signal Ground	Ground — tied to pin 1	7
Data Carrier Detect (DCD)	Signal from APP/IOP (always true*)	8
Data Terminal Ready (DTR)	Signal to APP (not on IOP)	20

*True = steady signal > +7V

5.3 Pins 4 and 20 of the RS-232-C connector on the APP board can be set high or low by moving the RS-232-C handshake straps (J4 for pin 4 and J5 for pin 20) located on the APP board. (The connector on the IOP board cannot be changed.) On each of the straps, connect pins 1 and 2 for the high (true) setting, or connect pins 2 and 3 for the low (false) setting. Check the owner's guide for the terminal to determine the proper setting:

- If the terminal does not supply signal on the line (DTR or RTS), set the associated strap for high.
- If the terminal supplies a signal on either line or requires handshaking, set the associated strap for low. The low setting also detects RS-232-C "cable disconnected" and/or "out of paper" signals.

(Some terminals may not send an "out of paper" signal, or the signal may not be associated with this pin.)

5.4 The programming terminal or output device must communicate at 300, 1200, 4800, or 9600 baud if connected to the APP board. If connected to the IOP board, it must communicate at 300 or 1200 baud. System baud rates are set by placing the DIP switches on the front of the IOP board in the desired position. (The settings are shown in step 2 on page 3-37 in INSTALLATION.) Other specifications include:

- The device must be formatted for standard ASCII.
- Parity is off (ignored).
- Communication is full duplex.
- There is one start bit and one stop bit.
- The device uses asynchronous transmission with 8 data bits (standard ASCII format).

5.5 The SMDR output device must be able to print reports with a width of either 60 or 80 characters. SMDA reports are 80 characters wide. The devices must not have cables longer than 50 feet (15 meters).

5.6 For remote programming, the terminal must also have a Bell System 103A (300 baud, full-duplex), 202 (1200 baud, half-duplex), or equivalent modem.

NOTE: To ensure accurate data transmissions, use only the 300 baud rate for remote programming.

5.7 For save/restore operation, the storage device (e.g., datacassette or personal computer) must be capable of storing a minimum of 140k bytes of text. All other characteristics are the same as described for the programming terminal.

B. SYSTEM BATTERY BACK-UP

5.8 Customer-provided batteries may be connected to the system to prevent loss of service in the event of a power failure or brownout condition. Inter-Tel recommends Globe Battery's lead calcium grid Type B battery line, based on cost, compatibility with power supply chargers, back-up time, number of batteries required, and availability.

5.9 Batteries may be placed in a Battery Compartment (part no. 823.1075). The compartment

measures 12 inches high, 19 inches wide, and 9 inches deep. To protect the wires coming out of the compartment, use either $\frac{1}{2}$ -inch electrical-metallic tubing (EMT) with strain relief clamps or use two 10AWG HEYCO-type strain relief connectors.

5.10 The 690.0200 power supply requires a 30V battery pack which consists of *one* of the following:

- Five Globe #GC6200 batteries (6V, 20.0 AH @ 20 hr. rate) connected in series to provide $\frac{1}{2}$ to $1\frac{1}{2}$ hours of back-up time. The batteries fit inside one battery compartment. *OR*,
- Three Globe #GC10800 batteries (10V, 80 AH @ 20 hr. rate) connected in series to provide $1\frac{1}{2}$ to 7 hours of back-up time. The batteries fit inside three battery compartments and weigh 50 pounds each.

5.11 The 690.0100 power supply requires the use of a customer-provided 1000VAC uninterruptible power supply (UPS) unit or standby power supply (SPS) unit, and a Globe GC12800 battery (12V, 80.0 AH @ 20 hr. rate).

5.12 Batteries connected in series form a "string." The voltage of the string is equal to the sum of the individual battery voltages. For example, five 6V batteries connected in series form a 30V battery pack. If desired, connect two strings in parallel to double the amp/hour rating, which results in longer discharge rates; the voltage level remains the same as a single string.

5.13 Batteries must be fully charged when installed. Charge each individually using a constant-voltage, current-limited charger with less than three percent ripple. The charge voltage must be set to 2.3V per cell. Be careful not to damage the batteries by overcharging them. New Globe batteries require 25 days of float voltage or 25-30 discharge cycles to attain full capacity. Initial capacity is 80 percent of rated capacity.

5.14 All batteries should be of the same age and ampere-hour (AH) rating. Globe dates batteries by stamping them with a date code, such as 410-B, where 4 = last digit of year, 10 = month, and B = type of electrolyte.

5.15 If a battery in a string needs to be replaced, the age of the string will determine if a fresh battery can be added. If the string is two to three years old, adding a fresh battery will reduce the life of the entire string. This is because a fresh battery will be overcharged, while the older batteries are undercharged.

5.16 Batteries may give off explosive and/or corrosive gases. To reduce the effects of these gases, place the batteries (or battery compartment) in a well-ventilated room and coat the terminals with an anti-corrosive agent.

5.17 Avoid storing batteries; they will self-discharge and their capacity decreases with age. If batteries must be stored, recharge them every six months. Recharge time may vary depending on the charger's current limit and the battery's state of charge.

5.18 If it is necessary to consider another manufacturer's battery, or if the system requires longer system battery back-up time, contact Inter-Tel's Customer Support Department.

5.19 When the system is running on battery back-up power, the power supply will automatically turn off before the batteries are fully discharged (at approximately 26.5V). This prevents damage to the batteries and allows them to be fully recharged by the power supply when AC power is restored.

C. DOORBOX

5.20 For a doorbox application, Inter-Tel recommends the Valcom V-2901 Universal Door Answering Unit. This unit, along with the Valcom V-1070A Door Plate Speaker, is hooked up to a COU circuit on the GMX-152D System. When a person presses a button on the door plate speaker, the unit generates ringing on the C.O. line. By answering the ringing line, a system user can talk with the person at the door. If the door is equipped with an electric strike plate, the system user may allow access by dialing a code or pressing an external button. To call the Valcom doorbox, the system user goes off hook and presses the line key assigned to the unit (or dials the appropriate C.O. line access code).

5.21 In database programming, the COU circuit assigned to the Valcom unit should be programmed as "not subject to toll restrict." It should also be assigned a C.O. line identification name, such as: DOOR 1.

5.22 The Valcom door answering unit and talkback speaker can be ordered from a local supply house. Installation and operation instructions are included with the unit.

D. VOICE MAIL

5.23 If desired, an optional single- or multi-port voice mail system can be connected directly to a STN-B2 circuit on the GMX-152D System. Depending on the specific capabilities of the voice mail system used, calls can easily be placed, transferred, or forwarded to the voice mail unit. After a message is recorded, a message waiting indication is left at the appropriate station location, and the message can easily be retrieved by the user.

5.24 For additional information and for specific voice mail unit recommendations, contact Customer Support.

E. EXTERNAL SIGNALLING DEVICES

5.25 GMX 24-line keysets and Inter-Tel/DVK keysets can be equipped with optional Data Port Modules for installing LRAs and external signalling devices. Refer to page 2-12 for more information.

5.26 GX keysets can be ordered with optional LRAs installed. These LRAs (installed by Inter-Tel) provide dry contacts for use in controlling external signalling devices. The MOD-III and MOD-IV boards also have dry contacts for external signalling devices. Some types of signalling devices generate a current/voltage rating that could damage the keyset LRA or the modem board. (For maximum contact ratings, see page 2-12.) The Wheelock DCI-24-24 adapter has been found to work properly with the GMX-152D System.

5.27 The LRA output of the keyset or the modem board relay is connected to the dry contact input of the DCI-24-24 unit. Any of a wide variety of Wheelock 24VDC signalling devices can then be connected to the adapter.

5.28 Wheelock products can be ordered from a local supply house or call Wheelock directly at (201) 222-6880. Installation and operation instructions are included with each device.

F. FAX MACHINE

5.29 A facsimile (FAX) machine allows the transmission of a picture, drawing, or document over a standard phone line to be reproduced by another machine at the receiving end. This can be an efficient, cost-effective communication tool.

5.30 Standard installation procedures for FAX machines involve connecting the machine to a dedicated line for sending and receiving documents. With the GMX-152D System, the FAX facilities are integrated with the telephone system and make use of many of the GMX-152D call processing and money saving features. Some of the special capabilities that a GMX-152D System can add to a FAX installation include the following:

- Outgoing FAX calls can be placed using least-cost routing (LCR) to make the best use of long distance lines and reduce costs.
- Incoming FAX calls can ring in directly to a FAX machine or a group of machines, and/or they can be answered by an attendant (human or automated) and transferred to the FAX machine. This allows FAX calls to come in on any line; there is no need for a dedicated line.
- Multiple FAX machines can be placed in a hunt group or in a "call forward no-answer" chain. Incoming FAX calls can then be sent to a single intercom number where they can be processed even if one machine is busy or out of service.
- Assigning forced account codes to the FAX stations can prevent unauthorized use of the machines or their telephones.
- The SMDR and SMDA features can help track outgoing FAX calls for billing purposes.
- The GMX-152D System is compatible with standard FAX machines; there are no special requirements.

5.31 A FAX machine can be installed on any unused STN-B2 circuit. The station can be placed in a hunt group, assigned incoming and outgoing lines, assigned a forced account code, assigned a user name, etc.

5.32 Following is an example of a FAX installation that uses the automated attendant and hunt group features. In this example:

- Incoming calls are answered by an automated attendant.
- Three FAX machines are connected to STN-B2 circuits.
- The FAX machines are in a hunt group.
 - (1) A call rings in and is answered by the automated attendant.
 - (2) The caller hears a message such as, "Thank you for calling. Dial 1 for Sales, 2 for Service, or 3 to send a FAX."
 - (3) The caller dials 3.
 - (4) FAX #1 is busy (being used to send or receive a document) so the call goes to the next machine in the hunt group.
 - (5) FAX #2 is out of service and does not answer so the call goes to the third machine in the hunt group.
 - (6) FAX #3 answers the call and receives the FAX transmission.

5.33 The following example shows the use of LCR, forced account codes, and SMDR/SMDA records. The FAX circuit has been programmed with LCR-only and a forced account code.

- (1) Using the FAX machine telephone, the user dials the LCR feature code (default is 80) and the assigned forced account code.
- (2) The system checks the account code. If it is not valid, the user hears reorder tones. If the code is valid, the user can dial the telephone number of the receiving FAX machine.
- (3) The system checks LCR and places the call on the selected line.
- (4) The receiving FAX machine answers and the user transmits the document.
- (5) The system logs the call and its account code in the SMDR and SMDA records.

G. INTER-TEL CALLMASTER/ACCOUNTING

5.34 The Inter-Tel CallMaster/Accounting software, when used with the PollCat (Pollable Call Accounting Terminal) call record buffer box, can be used to generate a variety of call record reports. The PollCat unit is connected to an RS-232-C port on the GMX-152D System (in place of an SMDA/SMDR output device) and to a communications port on a personal computer (PC) containing the CallMaster/Accounting software.

5.35 Call statistics from the GMX-152D System are stored in the PollCat buffer box. This information is then extracted by the CallMaster/Accounting software and sorted to create any of the following report types for specific dates, times, users, and/or account codes:

- System
- Tenant
- Tenant/Department
- User
- C.O. Line
- Account Code

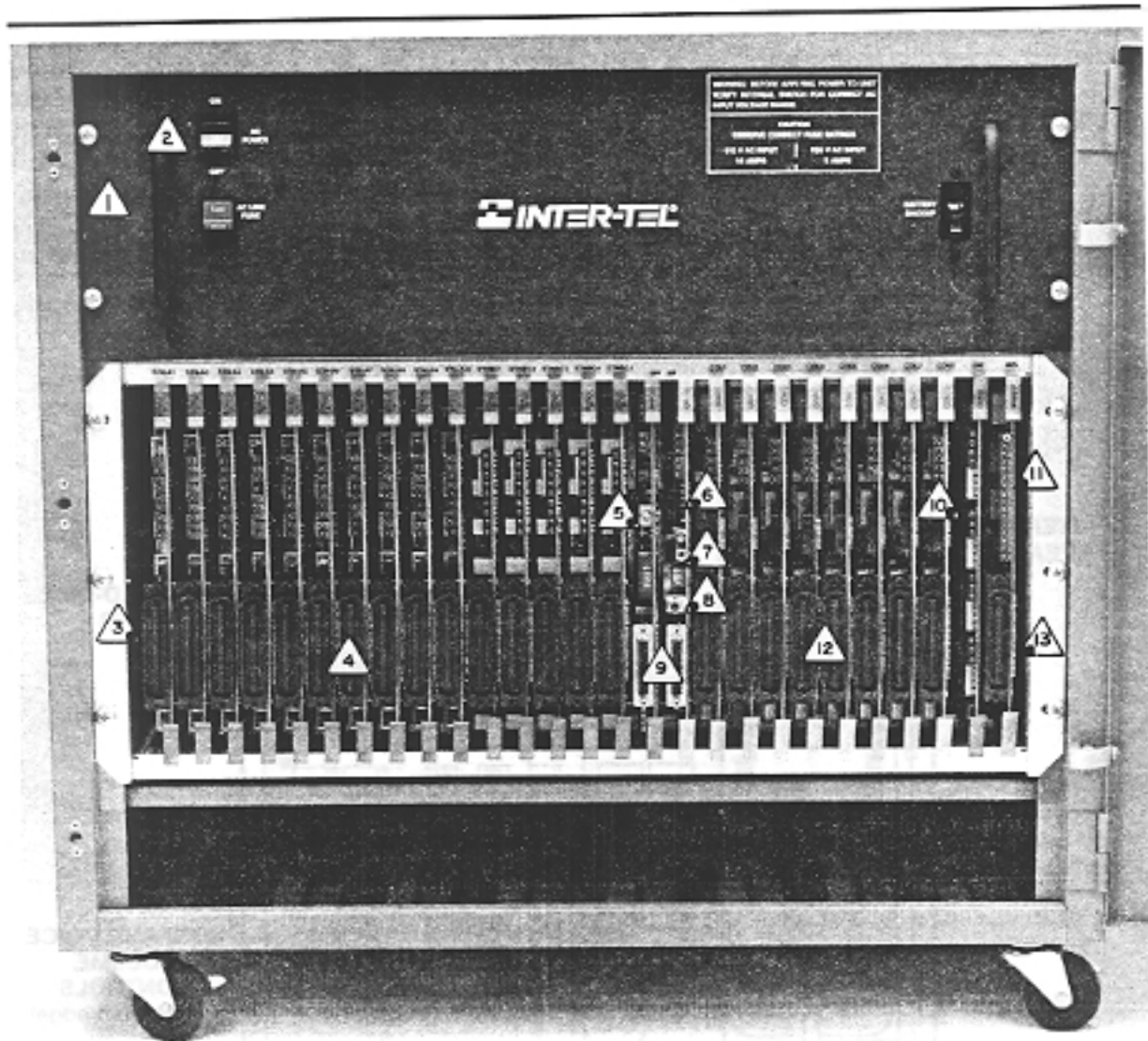
5.36 The reports can include information sorted by the following options:

- Detailed list of calls by date and time
- Detailed list of calls by date and cost
- Detailed list of calls by number dialed, date, and time
- Summary total cost of calls
- Summary total length of calls
- Summary total number of calls

5.37 The CallMaster/Accounting reports can be printed on paper or displayed on the PC's monitor. If desired, the information can be archived (saved) on the hard disk or on a floppy disk for future reference.

5.38 The complete CallMaster/Accounting package (part no. 828.1151) consists of the software, the PollCat unit, and an installation and maintenance manual. The PC used to store the CallMaster/Accounting software must be provided by the customer. For additional information, refer to the manual included with the package.

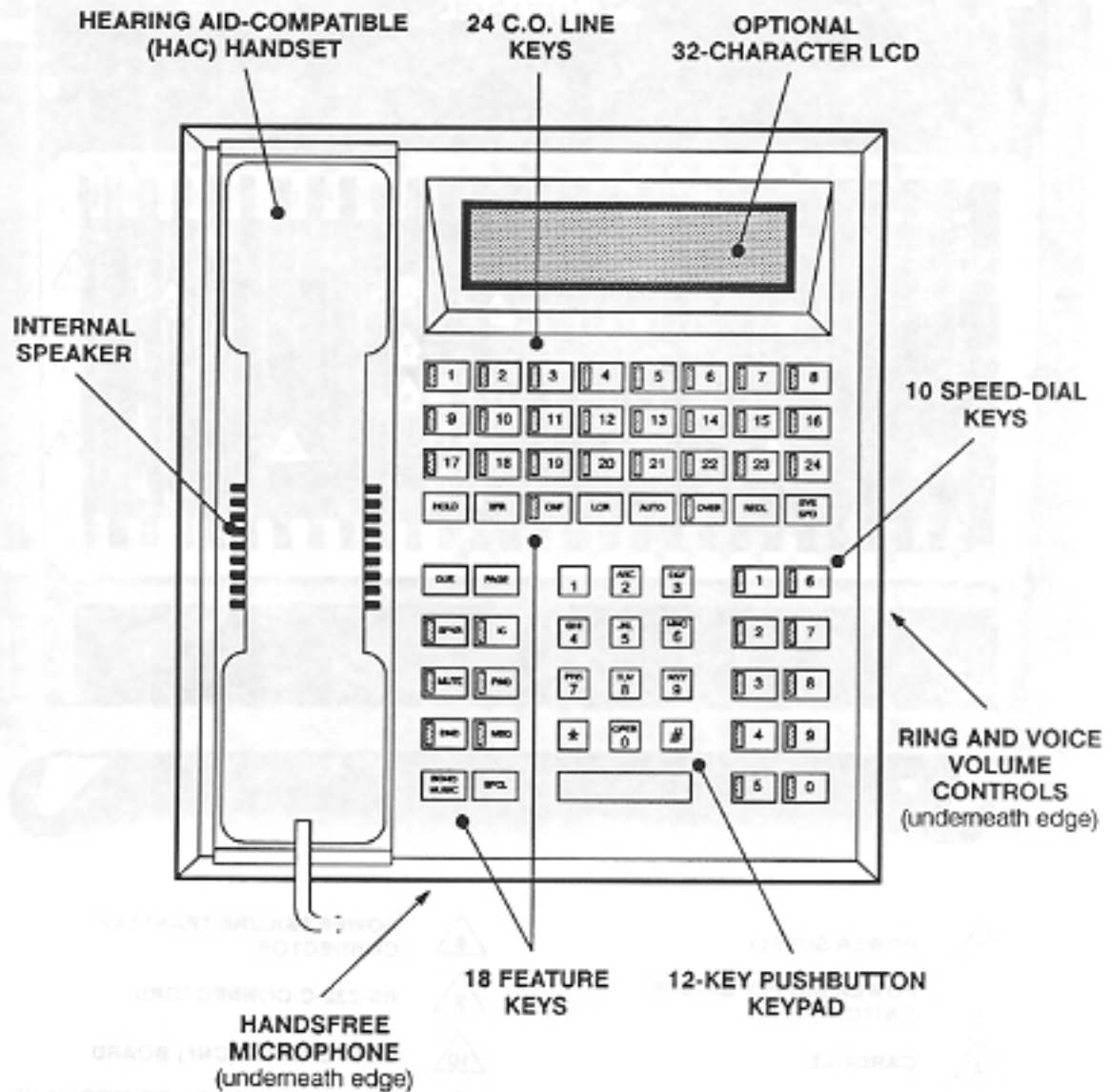
FIGURE 2-1. KEY SERVICE UNIT (KSU)



SPECIFICATIONS

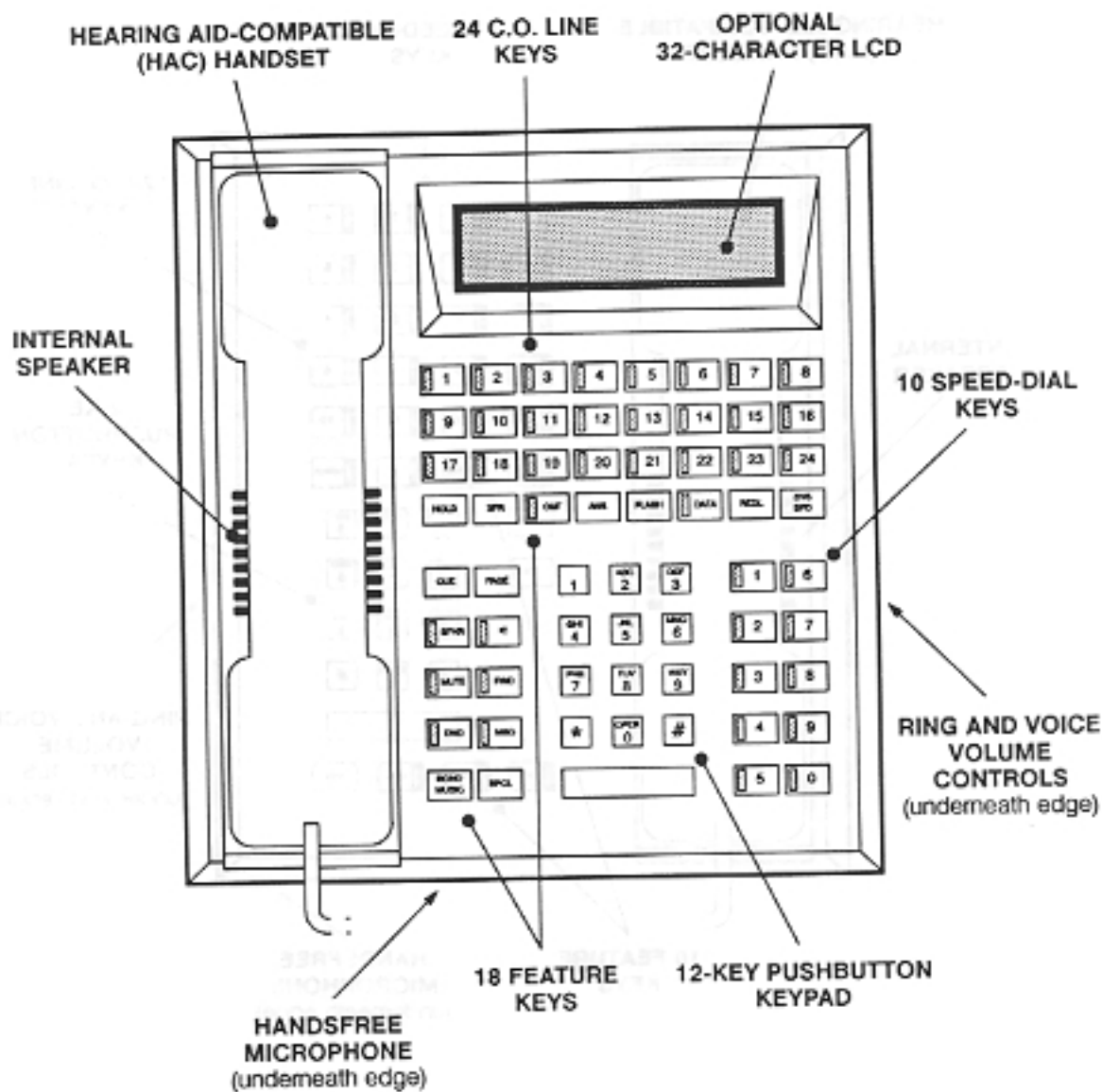
- | | | | |
|---|--------------------------------|----|--|
| 1 | POWER SUPPLY | 8 | POWER FAILURE TRANSFER CONNECTOR |
| 2 | POWER SUPPLY ON/OFF SWITCH | 9 | RS-232-C CONNECTORS |
| 3 | CARDFILE | 10 | CONFERENCE (CNF) BOARD |
| 4 | STATION CONNECTORS | 11 | MODEM-III (MOD-III) OR MODEM-IV (MOD-IV) BOARD |
| 5 | RESET SWITCH | 12 | C.O. LINE CONNECTORS |
| 6 | VOLTAGE TEST POINTS | 13 | MISCELLANEOUS EQUIPMENT CONNECTOR |
| 7 | MUSIC-ON-HOLD SOURCE CONNECTOR | | |

FIGURE 2-2. GX 24-LINE KEYS



NOTE: The keys are shown as they appear in the default configuration. On some keysets, the OVER key may be labelled POOL.

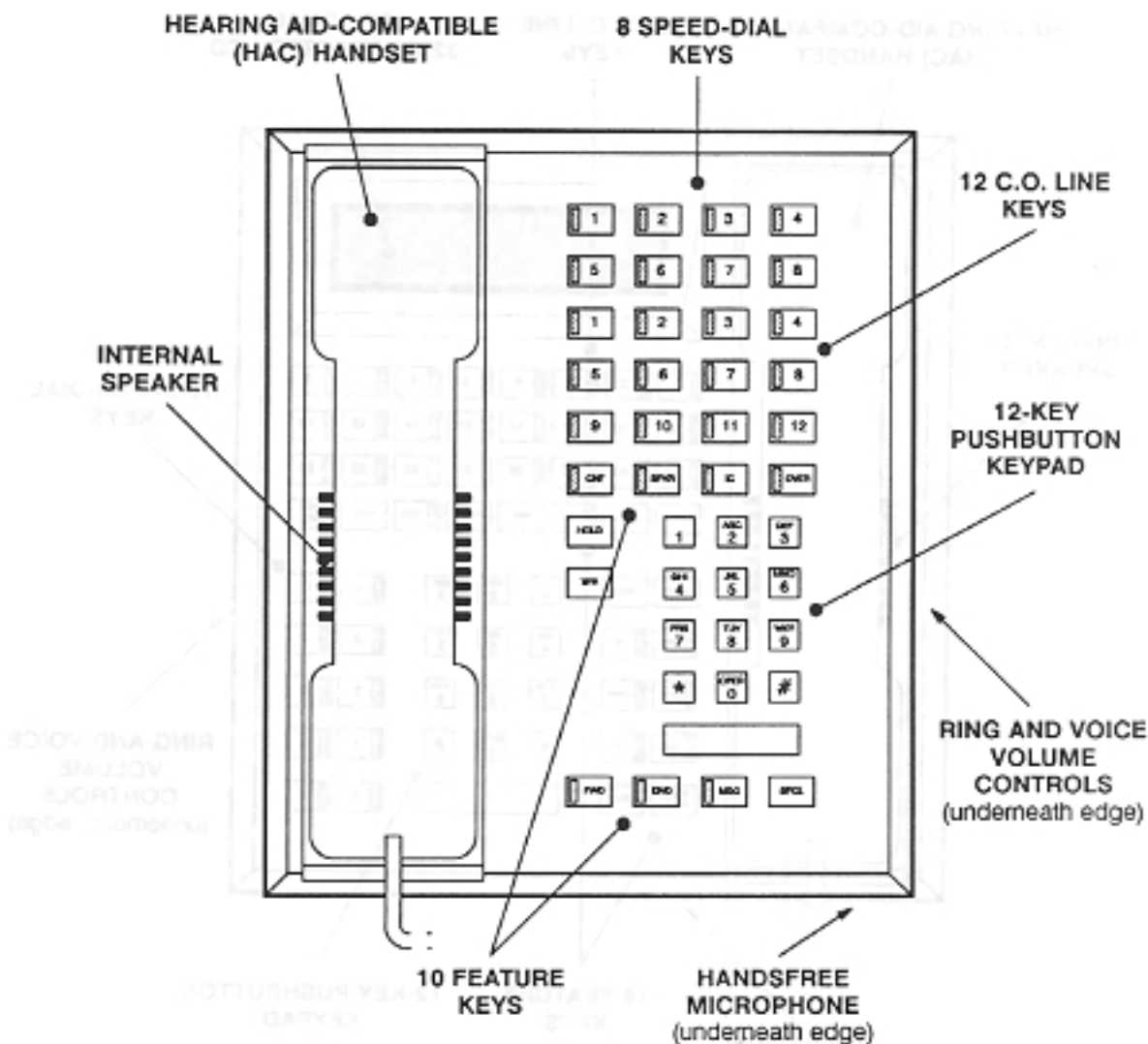
FIGURE 2-3. GMX 24-LINE KEYS



NOTE: The keys are shown as they appear in the default configuration.

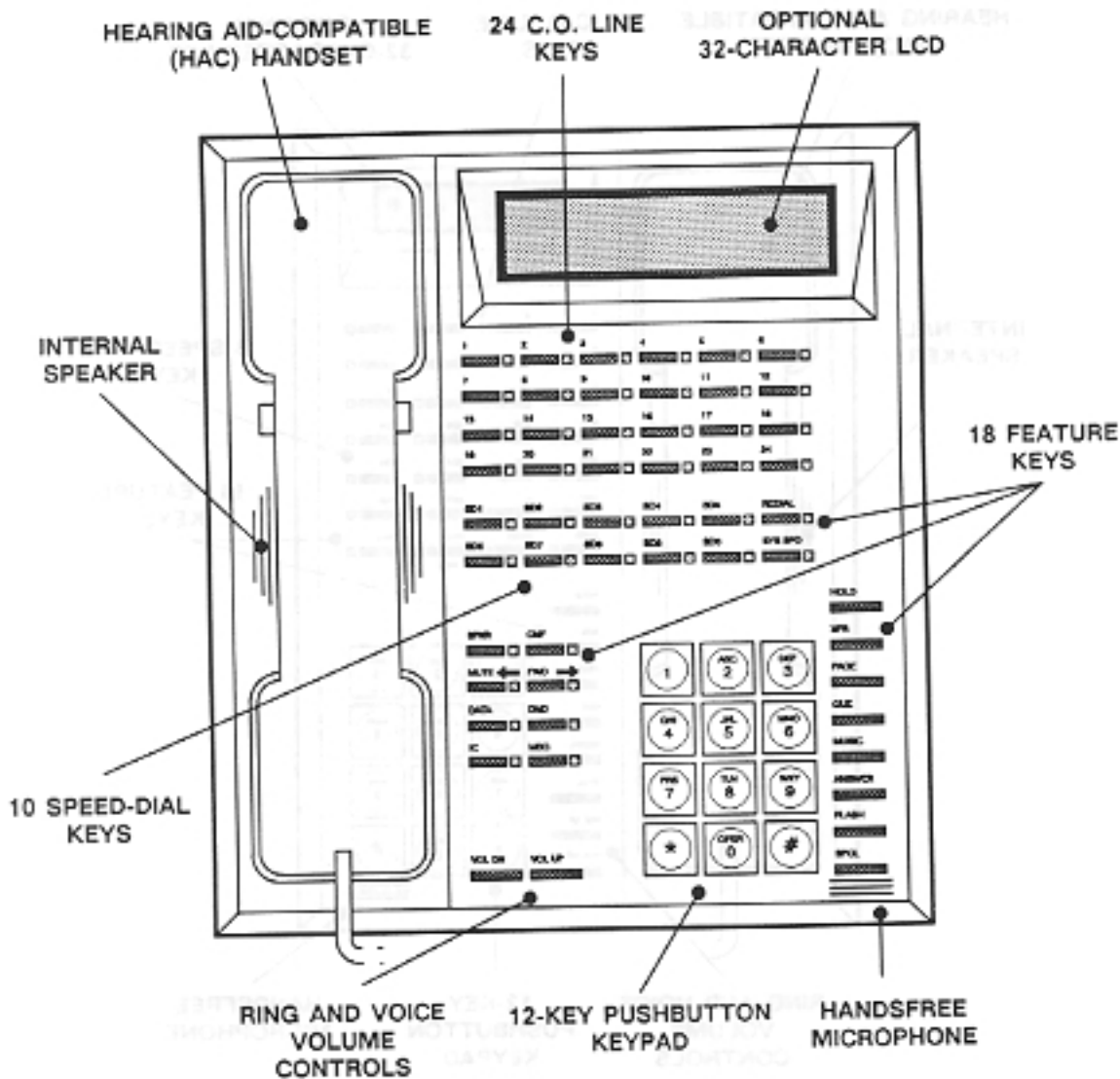
SPECIFICATIONS

FIGURE 2-4. GMX 12-LINE KEYS



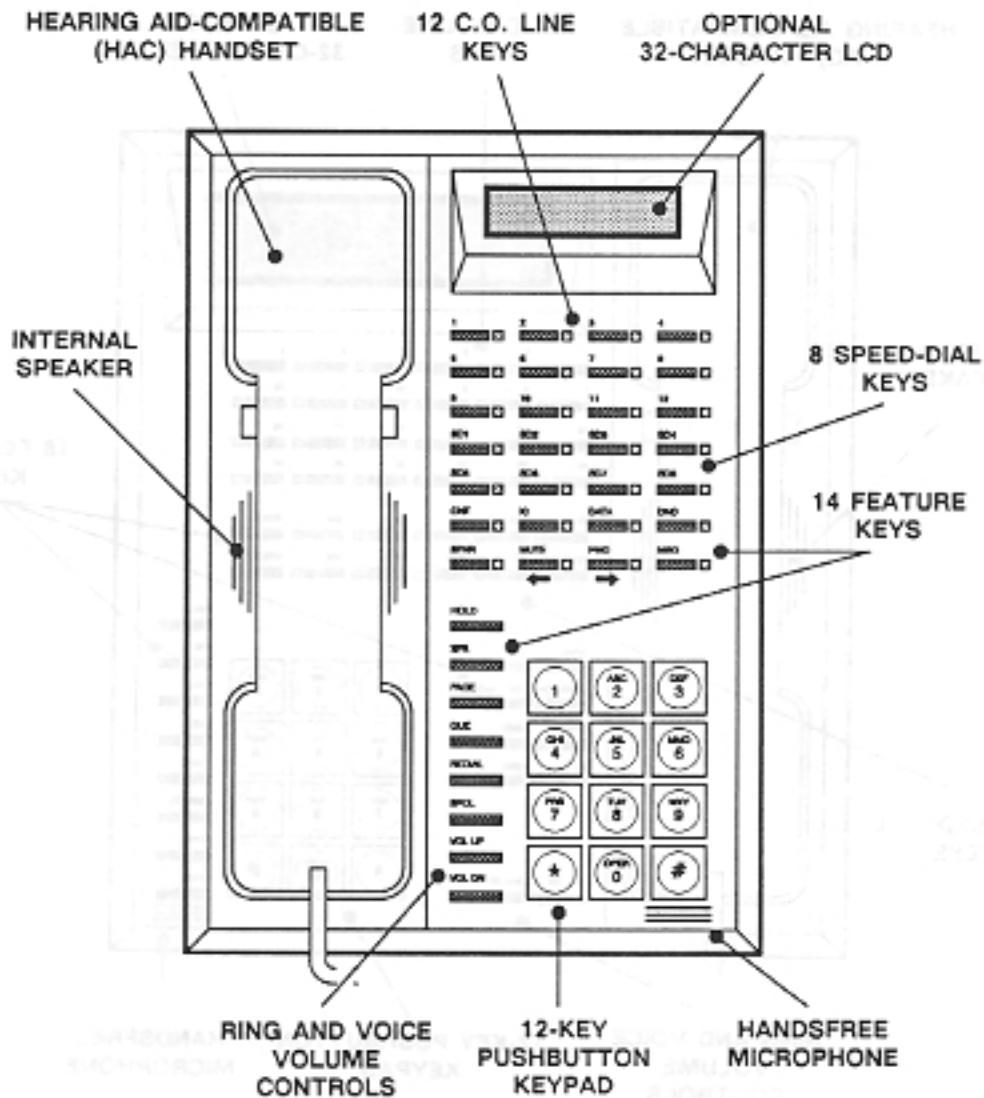
NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2-5. INTER-TEL/DVK 24-LINE KEYS



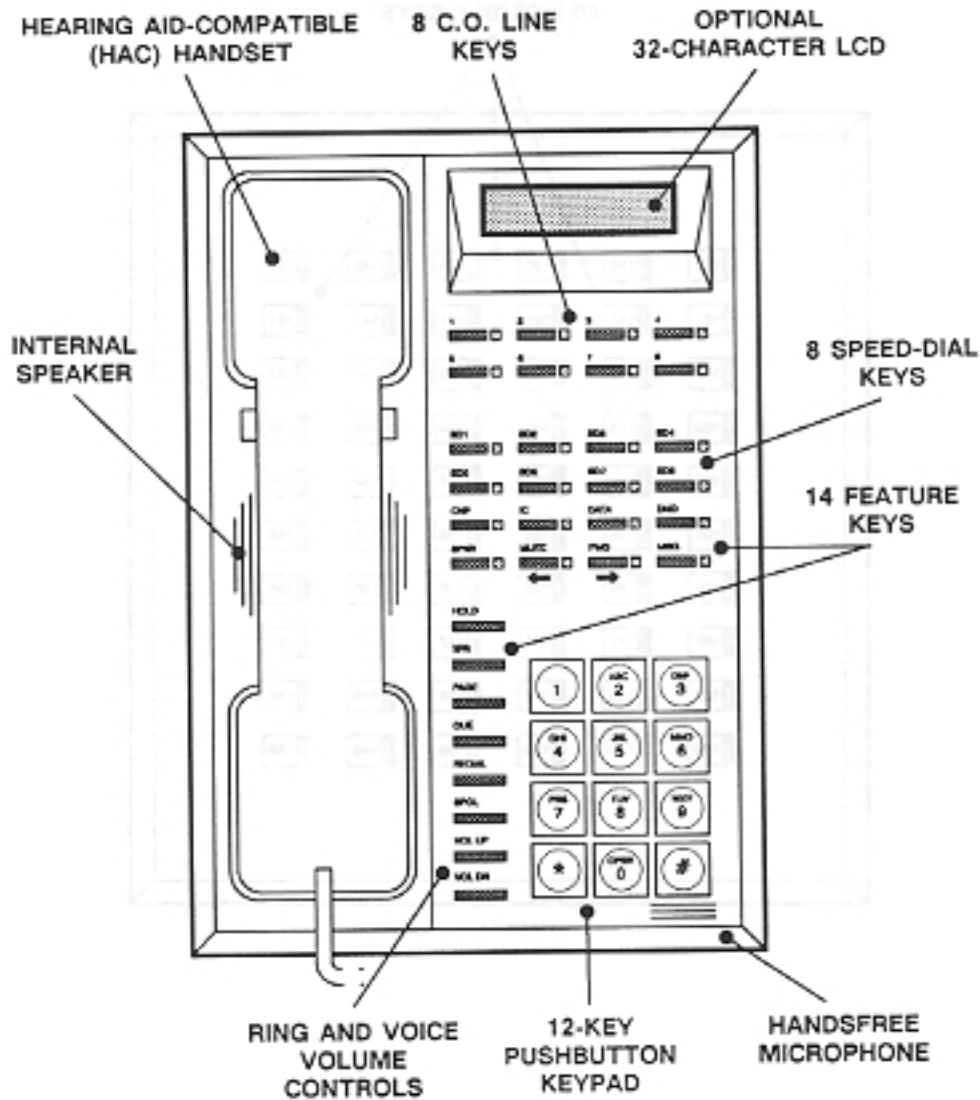
NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2-6. INTER-TEL/DVK 12-LINE KEYS



NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2-7. INTER-TEL/DVK 8-LINE KEYS



NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2-8. GX/GMX DIRECT STATION SELECTION/BUSY LAMP FIELD
(DSS/BLF) UNIT

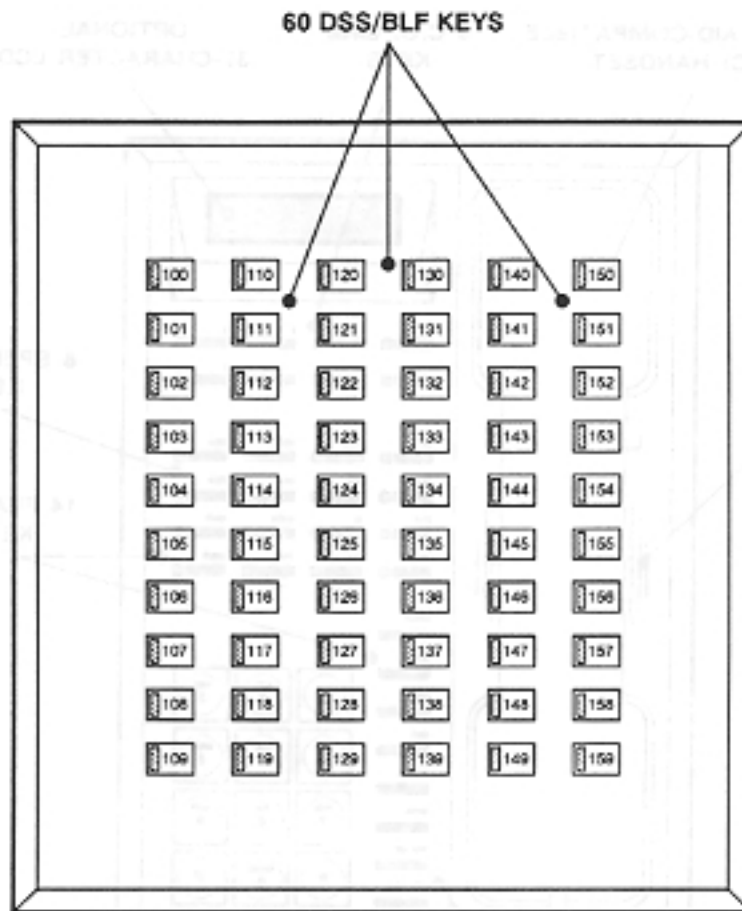
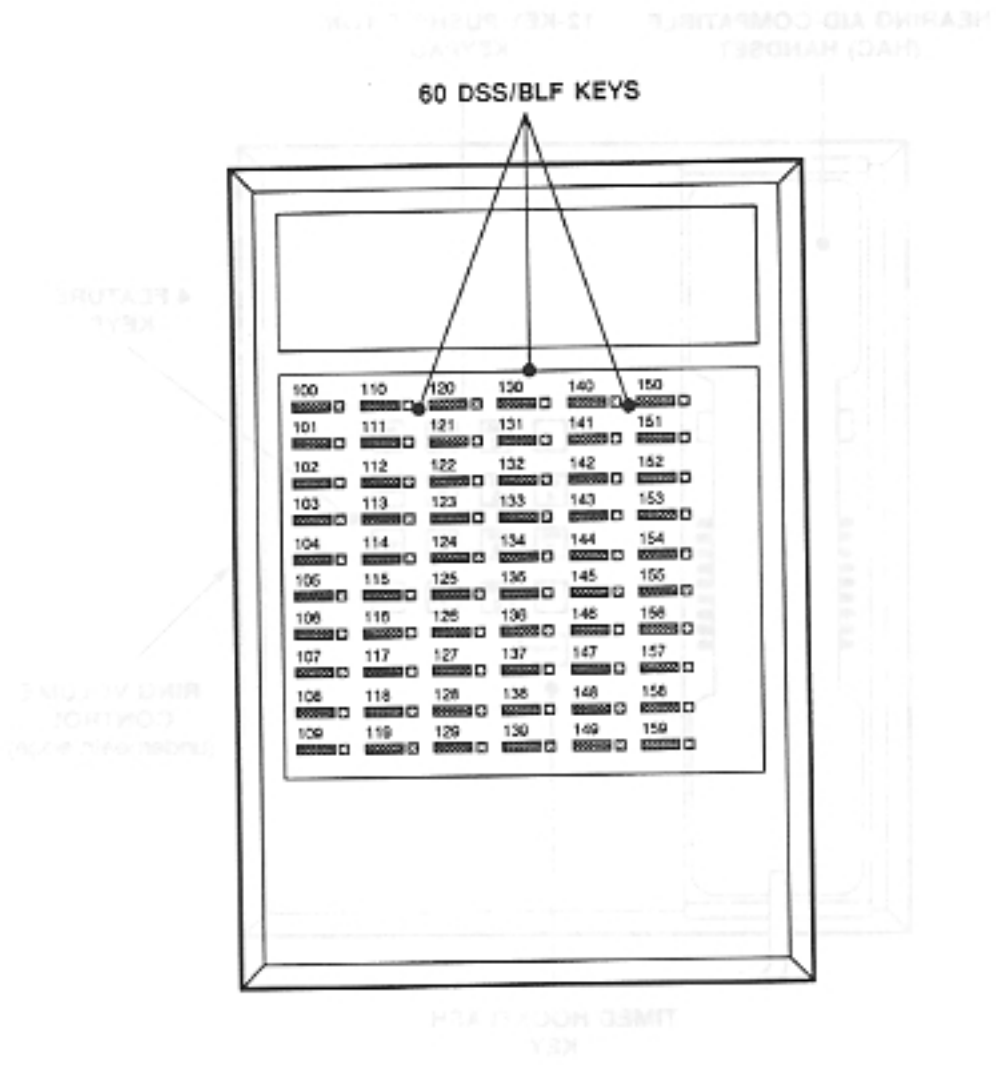
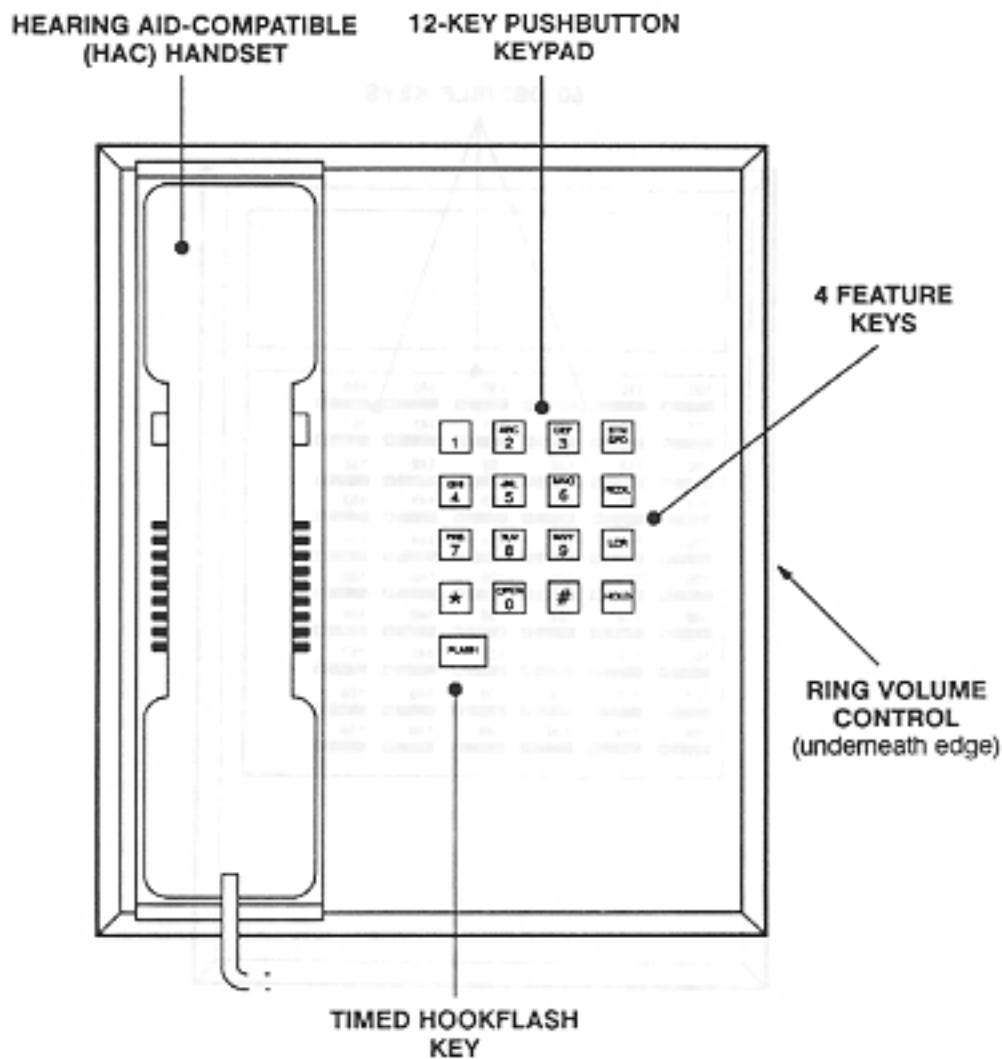


FIGURE 2-9. INTER-TEL/DVK DIRECT STATION SELECTION/BUSY LAMP
FIELD (DSS/BLF) UNIT



SPECIFICATIONS

FIGURE 2-10. GX SINGLE-LINE INSTRUMENT (SLI)



NOTE: The keys are shown as they appear in the default configuration.

INSTALLATION

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1. INTRODUCTION

1.1 This section describes the recommended procedures for installing the system hardware. Refer to SPECIFICATIONS for hardware descriptions.

2. SYSTEM INSTALLATION OUTLINE

2.1 System installation is performed in the following order. Detailed instructions and figures for each step are located throughout the INSTALLATION section.

- (1) Plan the installation, including the Key Service Unit (KSU) location, main distribution frame (MDF) location, station locations, cable runs, and optional equipment.
- (2) Run cables to the keysets, single-line sets, Direct Station Selection/Busy Lamp Field (DSS/BLF) Units, and playback devices. Run wiring to any optional equipment that will be attached to the Modem-III (MOD-III) or Modem-IV (MOD-IV) board, such as an external paging network, signal devices, talkback speakers, etc.
- (3) Terminate the station cables on modular jack assemblies at the station locations.
- (4) Mount the MDF backboard and assemble the terminal blocks on the backboard.
- (5) Connect the C.O. lines, station cables, and circuit board cables to the corresponding terminal blocks.
- (6) Perform the station loop resistance test for each station cable.
- (7) Assemble and install the KSU cardfile.
- (8) Install the KSU power supply.

- (9) Ground the KSU and perform the power supply electrical test.
- (10) Install the circuit boards in the KSU and connect them to the cables that run from the MDF blocks.
- (11) Install the station instruments and any optional station equipment, such as headsets, handset amplifiers, Speakerphone Modules, and Data Port Modules.
- (12) Install any optional equipment, such as system back-up batteries, output devices for station message detail recording (SMDR) and station message detail accounting (SMDA), external music source, external paging network, signal devices, power failure transfer equipment, voice mail, facsimile (FAX) machines, etc.
- (13) Ensure that all equipment is working properly.
- (14) Refer to the PROGRAMMING section of this manual to initialize and program the system.

NOTICE

This *GMX-152D Installation and Field Maintenance Manual* instructs field technicians on the proper installation practices for the GMX-152D System. This manual does *not* provide step-by-step instructions for premises wiring practices as dictated by the National Electrical Code, which includes, but is not limited to, cable layouts, cable installation, AC power installation, proper AC grounding, eliminating or preventing external interferences (including, but not limited to, RFI, EMI, lightning, AC power disturbances, static discharge), and other telephony practices standard within the industry. Cable installers, electricians, and field technicians are expected to be properly trained and, if applicable, licensed in their trade practices.

3. PRE-INSTALLATION CHECKLIST

3.1 To make installation easier, use the checklist on the following pages when preparing to install the system. (Hardware specifications are included in the SPECIFICATIONS section.)

A. ESTABLISH SUITABLE ENVIRONMENTAL CONDITIONS FOR THE SYSTEM

- Place the KSU within 5 feet (1.5 meters) of an isolated, dedicated, 105-125VAC, 57-63Hz, 15A, single-phase commercial power source.

NOTE: This *must* be an isolated, dedicated AC circuit for proper operation. All three wires (power, neutral, and ground) must be run separately from the outlet to the breaker panel without being bonded to any other wire or circuit. Do not plug any other equipment into this outlet. To maintain the protection provided by the isolated, dedicated circuit, the length of the AC power cord limits the distance between the power supply and the outlet; **DO NOT** use an extension cord. Also, to protect the system from AC voltage surges, a surge/spike protector is recommended (refer to page 2-6 for specifications).

- Select the KSU location to minimize cable run length. Station instruments connected to the system must not exceed the resistance limits (using 24AWG wire) listed in the table on page 3-22. The loop measurements are in ohms; the maximum one-way measurements from the KSU are in feet and meters.
- The KSU location should not be exposed to direct sunlight, high humidity, heat, dust, or strong magnetic fields (such as those generated by heavy motors and large copy machines).
- The MDF requires a 4 x 8-foot (1.2 x 2.4-meter), 3/4-inch plywood backboard. This is sufficient room for all blocks and peripheral equipment. Allow additional room for HVRA blocks, 48VDC power supplies, and ring generators, if used.
- Ample air space should be provided for the KSU since the power supply is convection cooled. *The*

KSU should not be placed less than 4 inches from any wall. Never place anything on top of the KSU.

- Allow room near the KSU for system back-up batteries. Also, the SMDR/SMDA output device(s) must not have cables longer than 50 feet (15 meters).
- The equipment should be located in a climate-controlled room with the following environmental conditions:

REQUIREMENTS	IN OPERATION	IN STORAGE
Temperature – KSU	32° to 104° F 0° to 40° C	-40° to 185° F -40° to 85° C
Temperature – Station Instruments	32° to 113° F 0° to 45° C	-40° to 185° F -40° to 85° C
Relative Humidity (Non-Condensing)	5% to 95%	5% to 95%
Altitude	Up to 10,000 ft. (3,048 m.)	Up to 40,000 ft. (12,192 m.)

NOTE: It is recommended that the maximum operating temperatures (as stated above) *never* be exceeded. Therefore, when installing the KSU and station instruments, allow a sufficient margin for error in case of air conditioning failure, routine maintenance, plant shutdown, etc. As a general rule, if conditions are suitable for office personnel, they are also suitable for KSU and station instrument operation. A properly controlled environment will help to extend the operating life of the equipment.

From UL 1459, a product safety specification governing telephone equipment:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

B. ASSEMBLE THE NECESSARY TOOLS AND SUPPLIES

- Industry-standard, three-pair (six-conductor) cable to run from the MDF to all station instruments, including: keysets, DSS/BLF Units, SLIs, single-line DTMF sets, and playback devices. (See also the NOTE on page 3-6.)
- Six-conductor modular jack assemblies for all station instruments. (See also the NOTE on page 3-6.)
- A high-impedance digital multimeter to check the power supply and ensure correct wiring of the modular jack assemblies. Multimeter accuracy must be $\pm 0.5\%$ or better.
- Standard terminal blocks (66M1-50 type) and bridging clips for constructing the MDF.
- Industry-standard, 25-pair cable for connecting the MDF blocks to the Central Office Unit (COU), Station (STN), and Modem-III (MOD-III) or Modem-IV (MOD-IV) circuit boards in the KSU.
- 50-pin female amphenol-type connectors and a connecting machine.
- If AC ringer-equipped single-line sets are connected to Station-B2 (STN-B2) boards, a 48VDC power supply and ring generator are needed. (Refer to page 2-14 for specifications.)
- Gas discharge tubes with silicon avalanche suppressors for lightning protection on the C.O. lines.
- Voltage surge/spike protector. (See page 2-6 for specifications.)
- Grounding terminal and 10AWG wire for grounding the KSU, the back-up batteries if used, and the 48VDC power supply if used (unless the power supply is connected to both a STN-B2 board and an HVRA; see the NOTE to step 6 on page 3-24).
- Standard telephone hand tools and the mounting hardware for the MDF backboard, STN and COU blocks, modular jack assemblies, etc.

- Programming terminal for initializing and customizing the database (refer to page 2-17 for specifications).

C. PLAN STATION LOCATIONS AND TYPES OF STATION INSTRUMENTS

- Prepare a cable identification plan using station *circuit* numbers; do not use intercom numbers (see page 3-6 for details).
- **Keysets:** The system has the capacity for up to 120 keysets. Keysets are available in GX 24-line (standard or display), GMX 24-line (standard or display), GMX 12-line (non-display only), Inter-Tel/DVK 24-line (standard or display), Inter-Tel/DVK 12-line (standard or display), or Inter-Tel/DVK 8-line (standard or display) models. All standard keysets (except the GMX 12-line keyset) can be converted to display keysets by installing optional Liquid Crystal Display (LCD) Units. (At the date of this publication, Inter-Tel/DVK keysets and DSS/BLF Units were not yet available.)

NOTE: GX keysets are installed on STN-A boards, while GMX and Inter-Tel/DVK keysets are installed on STN-A1 boards.

- **DSS/BLF Units:** Up to five DSS/BLF Units can be installed on the system. They can consist of *single* GX, GMX, or Inter-Tel/DVK units, or they can consist of *tandem* GX or Inter-Tel/DVK units (two units connected together). Each unit (single or tandem) requires one STN-A or STN-A1 board circuit and its own cabling. Each board can support one tandem unit or up to two single units.

NOTE: GX, GMX, and Inter-Tel/DVK DSS/BLF Units can be installed on either STN-A or STN-A1 boards.

- **Single-Line Sets:** Up to 112 single-line sets can be installed on the system. Single-line sets can be Inter-Tel Single-Line Instruments (SLIs) or industry-standard, single-line DTMF sets.
- **Playback Devices:** Playback devices, such as the Inter-Tel Digital Attendant (part no. 828.1150), can be used in place of single-line stations. They are especially useful as hunt group overflow/announcement stations and automated attendants. (Refer to page 2-15 for playback device specifications.)

D. ASSEMBLE THE OPTIONAL EQUIPMENT

- Headsets for keyset stations, and handset amplifiers for keyset and single-line set stations.
- Speakerphone Modules or external desk speakers for GX keysets.
- Data Port Modules for GMX 24-line keysets and Inter-Tel/DVK keysets. These are installed on the keysets and are used for hooking up either modem-equipped data terminals or loud ringing adapters and external signalling devices.
- System back-up batteries, cabling, connectors, and battery compartment(s).
- SMDR/SMDA output device(s). These devices must not have cables longer than 50 feet (15 meters).
- Power failure transfer equipment (PFT relay card, card mounting case, and RCA-type phono plug).
- 48VDC power supply, ring generator, and High Voltage Ringing Adapter (HVRA) Unit for

- off-premises stations. (This can be the same power supply and ring generator connected to the STN-B2 board. Refer to page 3-23 for procedures.)
- OPX repeater(s) for amplifying voice volume levels, if necessary.
- External music source with 1/8-inch mini-phone plug).
- External paging speakers and amplifier.
- Talkback speakers.
- Signal devices.
- Electronic equipment (alarms, lights, etc.) to connect to night transfer relay.
- Doorbox equipment.
- Voice mail equipment.
- Facsimile (FAX) machine.
- Inter-Tel CallMaster/Accounting package.

INSTALLATION

4. STATION CABLING

4.1 Floor plans should be developed to aid in proper station cabling in a star (home run) configuration from the KSU. The cables are run from the station locations to the station blocks at the MDF. Refer to page 3-4 for cabling requirements.

4.2 Both ends of each cable should be labeled with the station's circuit number. The circuit number (X.Y) designates the Station (STN) board's position in the KSU (X = 1-15) and the circuit on the board (Y = 1-8). For example, station circuit number 4.7 identifies the seventh circuit on the fourth STN board in the KSU.

4.3 When the system is initialized, the intercom numbers are assigned in order from circuit 1.1 (intercom number 100) to circuit 15.8 (intercom number 219). The intercom numbers can be changed in database programming.

4.4 Each DSS/BLF Unit (single or tandem) requires a STN-A or STN-A1 circuit and cabling that is separate from the keyset's circuit and cabling. If the maximum of five STN circuits are used for DSS/BLF Units, five fewer keysets can be installed. Each STN-A or STN-A1 board can support one tandem unit or up to two single units.

4.5 In order to use the off-hook voice announce feature and/or the simultaneous voice data feature, GMX 24-line keysets and Inter-Tel/DVK keysets can be installed with secondary voice paths. To accomplish this, the keyset is installed on an odd-numbered STN-A1 circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the primary voice pair from the following even-numbered circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path. Therefore, for every secondary voice path keyset installed, the following even-numbered circuit cannot have a station instrument installed. Refer to pages 3-19 to 3-21 for complete secondary voice path installation instructions.

A. RUNNING CABLE

NOTE: It is recommended that three-pair cable and six-conductor modular jacks be used for all station

connections. This allows the various types of station instruments to be easily interchanged, if necessary. However, if desired, SLIs, single-line DTMF sets, and playback devices can be installed using one-pair cable and four-conductor modular jacks.

4.6 From the MDF location, run industry standard, three-pair (six-conductor) cable to keysets, DSS/BLF Units, SLIs, single-line DTMF sets, and playback devices. Follow these guidelines:

- Install proper type cable for the application according to the National Electrical Code and local building codes.
- Avoid cable runs parallel to fluorescent light fixtures or AC lines not in conduit. If these obstacles are unavoidable, run the cables across them at right angles.
- Do not run station cables inside electrical conduit already occupied by AC power cable. (To do so is a violation of the National Electrical Code.)
- Do not run station cables near equipment with electric motors or through strong magnetic fields, such as those generated by large copy machines, arc welding equipment, heavy motors, etc.
- Do not place station cables where they can be stepped on or where they can be rolled over by office furniture.
- If using multi-pair (e.g., 25-pair) cable runs to multiple station locations do not include AC-ringing single-line sets, AC-ringing auxiliary equipment, or C.O. lines in a cable being used for keysets. Keysets should be included in separate multi-pair cable runs. Also, any unused pairs should be properly grounded to prevent interference.
- Do not exceed the loop limit measurements (using 24AWG wire) for the station cable lengths as outlined in the table on page 3-22. The loop measurements (resistance) are in ohms; the maximum one-way measurements from the KSU are in feet and meters.

B. TERMINATING THE CABLES AT STATION LOCATIONS

4.7 Terminate the keyset, DSS/BLF Unit, SLI, single-line DTMF set, and playback device station cables on six-conductor modular jack assemblies at the station location. (For exceptions to this, refer to the NOTE under "Running Cable" on the previous page.)

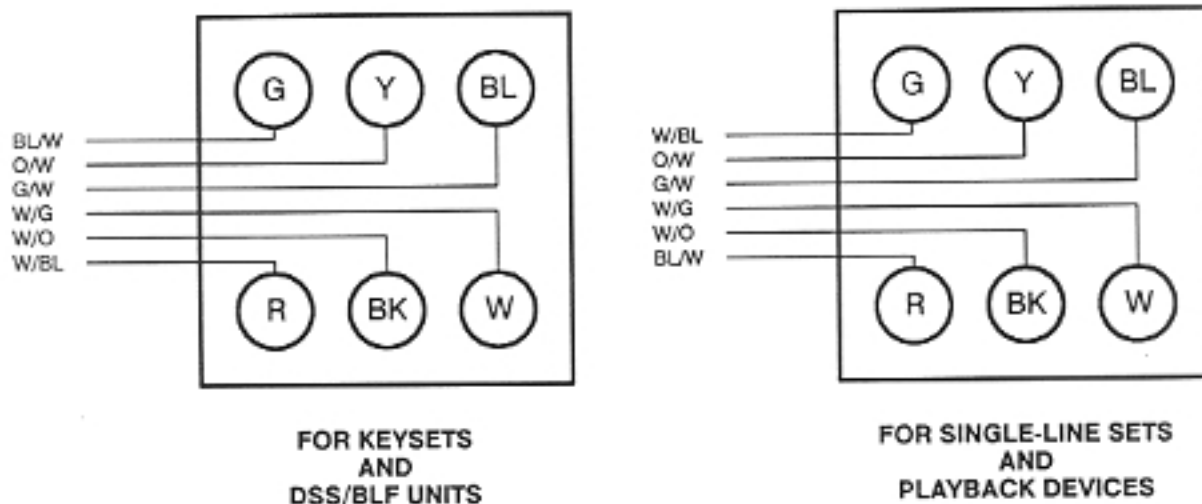
4.8 Do not mount the assemblies on the wall at this time; they will be wall mounted later when the station

instruments are installed. Refer to Figure 3-1 below for a wiring diagram.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a keyset or DSS/BLF Unit will open the fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to that board. If tip and ring (W/BL, BL/W) is reversed for single-line sets, the instrument may ring continuously.

FIGURE 3-1. MODULAR JACK ASSEMBLY WIRING



NOTE: The W/BL and BL/W conductors for the two types of stations are reversed. If the type of station instrument is changed, the modular jack must be rewired.

5. ASSEMBLING THE MAIN DISTRIBUTION FRAME (MDF) BACKBOARD

5.1 The MDF is the point at which the KSU, station instruments, C.O. lines, and miscellaneous equipment are connected to one another. It is extremely important that the connections be made accurately.

5.2 Assemble the MDF as follows:

- (1) Mount a 4 x 8-foot (1.2 x 2.4-meter), $\frac{3}{4}$ -inch plywood backboard at the MDF location.
- (2) Attach the 66M1-50-type terminal blocks to the plywood backboard. Refer to Figure 3-2 on the next page for a suggested MDF block layout and cable assignments. Blocks include:

- One or two blocks for connecting C.O. lines and the 25-pair cable(s) for the COU boards. C.O. lines 1-24 connect to the first block; lines 25-32 connect to the second.
- Up to 15 blocks for connecting station cables and the 25-pair cables for the STN boards (STN-A or STN-A1 blocks for key-sets and DSS/BLF Units; STN-B or STN-B2 blocks for single-line stations and playback devices).
- One block for connecting optional equipment and the 25-pair cable for the MOD-III or MOD-IV board.
- Optional block(s) for off-premises stations. One block is used for each HVRA (two stations). The block is also used to connect the power supply and ring generator to the off-premises station(s).

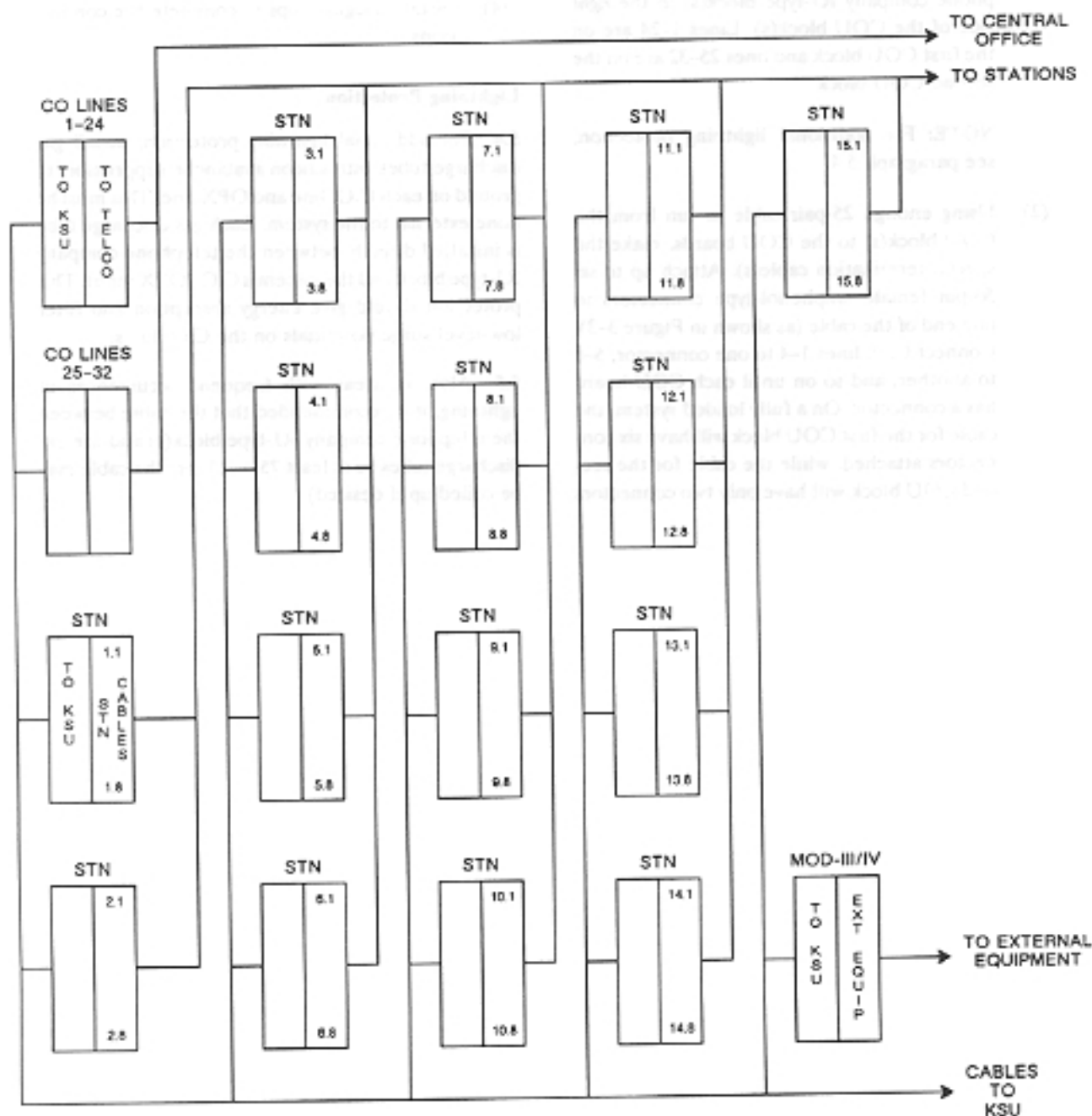


FIGURE 3-2
MDF BLOCK LAYOUT FOR
PLAYBACK DEVICES



FIGURE 3-3
MDF BLOCK LAYOUT FOR
DSS/BLF UNITS

FIGURE 3-2. SUGGESTED MDF BLOCK LAYOUT AND CABLE ASSIGNMENTS



INSTALLATION

A. CONNECTING THE C.O. CABLES TO THE MDF

5.3 Connect the C.O. lines and COU cables as follows. Refer to Figure 3-3 on the next page.

- (1) Cross-connect the C.O. lines from the telephone company RJ-type block(s) to the *right* side of the COU block(s). Lines 1-24 are on the first COU block and lines 25-32 are on the second COU block.

NOTE: For additional lightning protection, see paragraph 5.4.

- (2) Using enough 25-pair cable to run from the COU block(s) to the COU boards, make the special termination cable(s). Attach up to six 50-pin female amphenol-type connectors to one end of the cable (as shown in Figure 3-3). Connect C.O. lines 1-4 to one connector, 5-8 to another, and so on until each COU board has a connector. On a fully loaded system, the cable for the first COU block will have six connectors attached, while the cable for the second COU block will have only two connectors

attached. These connectors will be attached to the COU boards after they are installed in the KSU.

- (3) Terminate the other end of the 25-pair cable(s) on the *left* side of the appropriate COU block.
- (4) Install bridging clips to complete the connections.

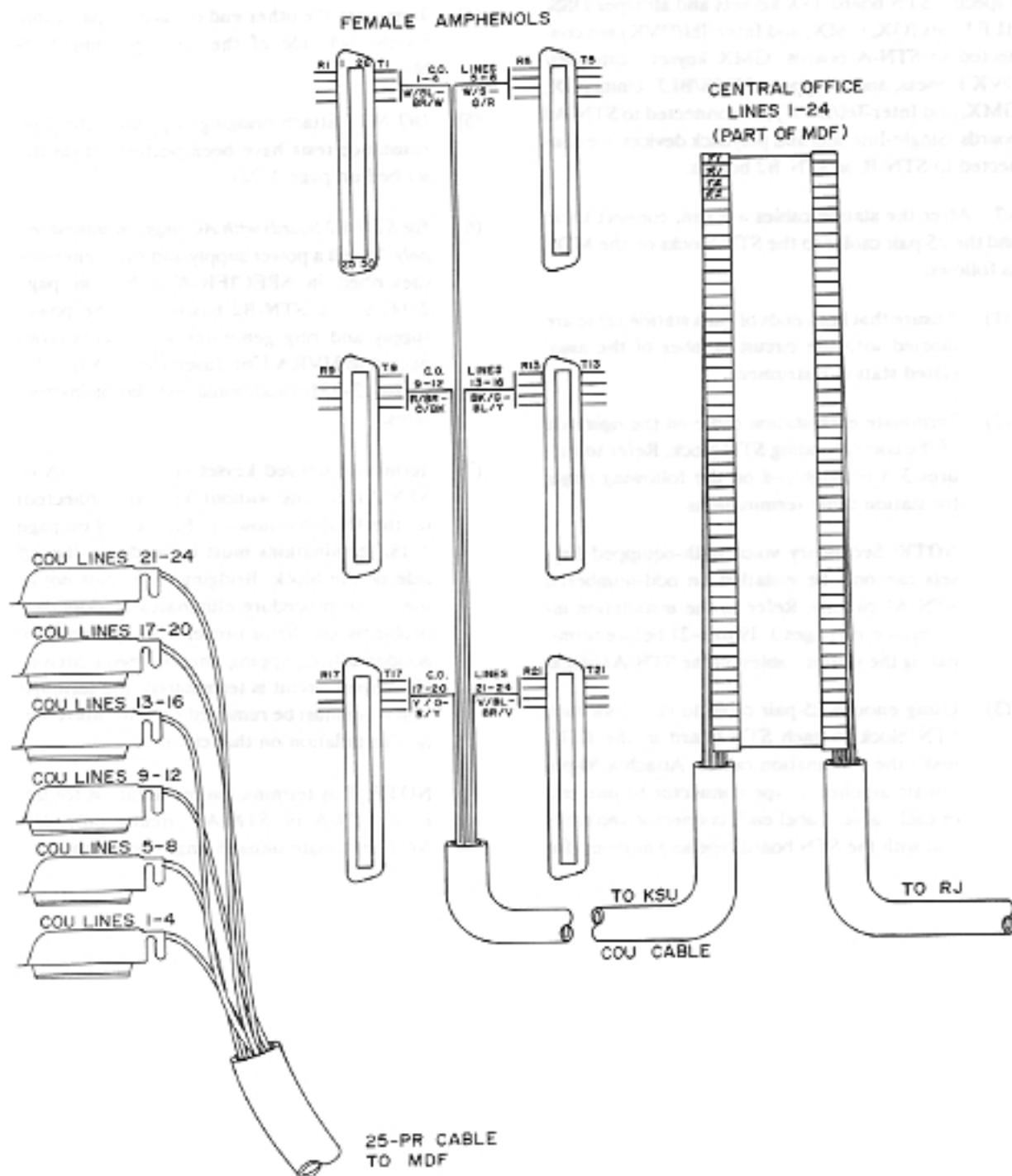
Lightning Protection

5.4 For additional lightning protection, install gas discharge tubes with silicon avalanche suppressors to ground on each C.O. line and OPX line. This must be done external to the system. Each gas discharge tube is installed directly between the telephone company RJ-type block and the system's C.O./OPX input. This protection should give energy absorption and filter low-level surge potentials on the C.O. lines.

5.5 Also, in areas with frequent occurrences of lightning, it is recommended that the cable between the telephone company RJ-type block(s) and the gas discharge tubes be at least 75 feet long (the cable may be coiled up if desired).



FIGURE 3-3. COU BLOCK LINE TERMINATIONS



INSTALLATION

B. CONNECTING THE STATION CABLES TO THE MDF

5.6 Each type of station instrument is connected to a specific STN board. GX keysets and all types DSS/BLF Units (GX, GMX, and Inter-Tel/DVK) are connected to STN-A boards. GMX keysets, Inter-Tel/DVK keysets, and all types of DSS/BLF Units (GX, GMX, and Inter-Tel/DVK) are connected to STN-A1 boards. Single-line sets and playback devices are connected to STN-B or STN-B2 boards.

5.7 After the station cables are run, connect them and the 25-pair cables to the STN blocks on the MDF as follows:

- (1) Ensure that both ends of each station cable are labeled with the circuit number of the associated station instrument.
- (2) Terminate each station cable on the *right* side of the corresponding STN block. Refer to Figures 3-4 through 3-8 on the following pages for station cable terminations.

NOTE: Secondary voice path-equipped keysets can only be installed on odd-numbered STN-A1 circuits. Refer to the installation information on pages 3-19 to 3-21 before terminating the station cables on the STN-A1 block.

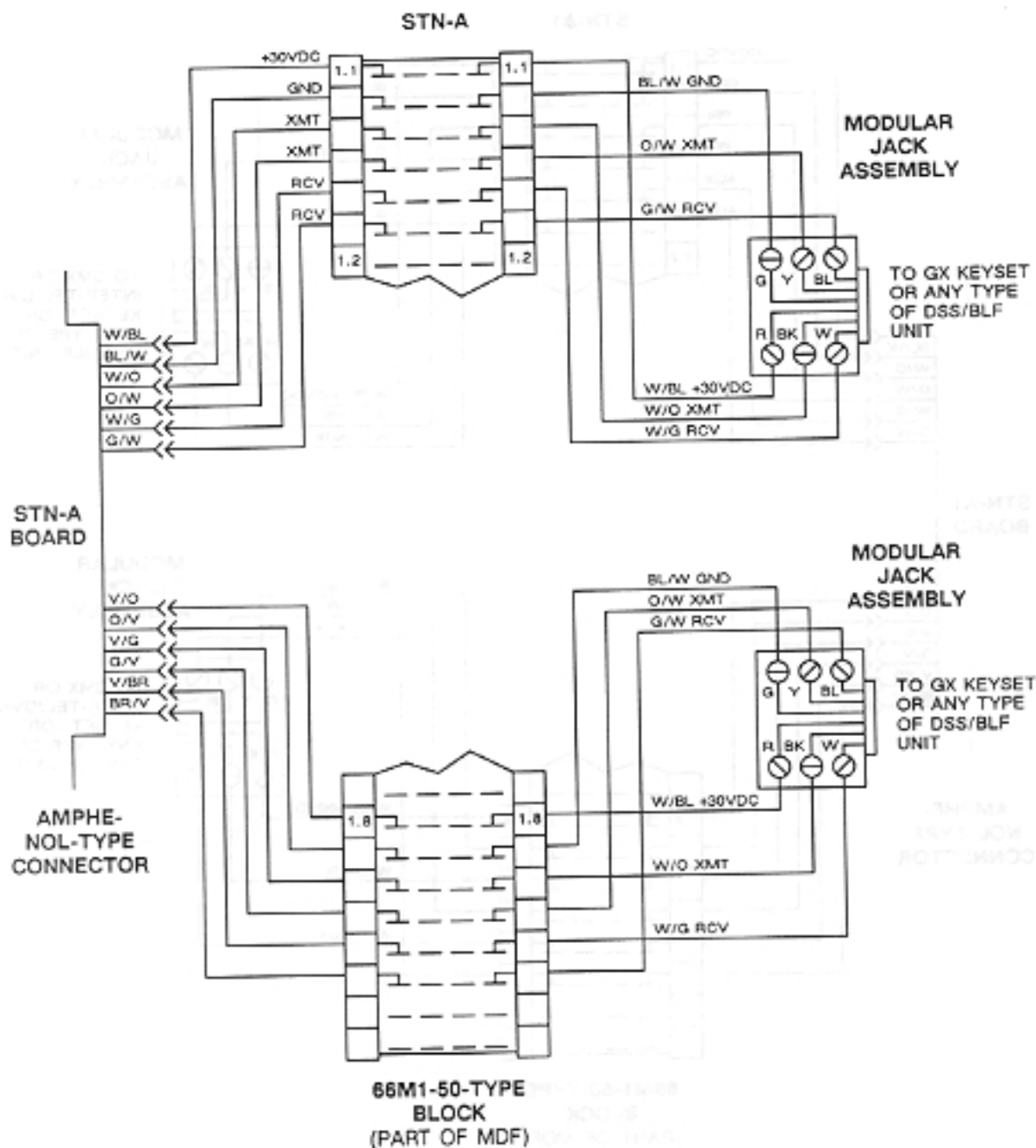
- (3) Using enough 25-pair cable to run from each STN block to each STN board in the KSU, make the termination cables. Attach a 50-pin female amphenol-type connector to one end of each cable. Label each connector and cable end with the STN board type and number (for

example, STN-A 3). These connectors will be attached to the STN boards after they are installed in the KSU.

- (4) Terminate the other end of each 25-pair cable on the *left* side of the corresponding STN block.
- (5) *DO NOT* attach bridging clips until the loop resistance tests have been performed (as described on page 3-22).
- (6) *For STN-B2 boards with AC ringer-equipped sets only:* Install a power supply and ring generator (described in SPECIFICATIONS on page 2-14) to the STN-B2 block(s). If the power supply and ring generator will also be connected to HVRA Unit (used for OPXs), refer to page 3-23 for additional installation instructions.
- (7) Terminate unused keyset circuits (STN-A or STN-A1 circuits without keysets connected) on the MDF as shown in Figure 3-9 on page 3-18. Terminations must be made on the *left* side of the block. Bridging clips *must not be used*. This procedure eliminates random data problems and helps prevent the system from accidentally equipping unused keyset circuits. If a keyset circuit is terminated, the termination strap must be removed prior to future station installation on that circuit.

NOTE: This termination procedure is for unused STN-A or STN-A1 circuits only. *DO NOT* terminate unused single-line circuits.

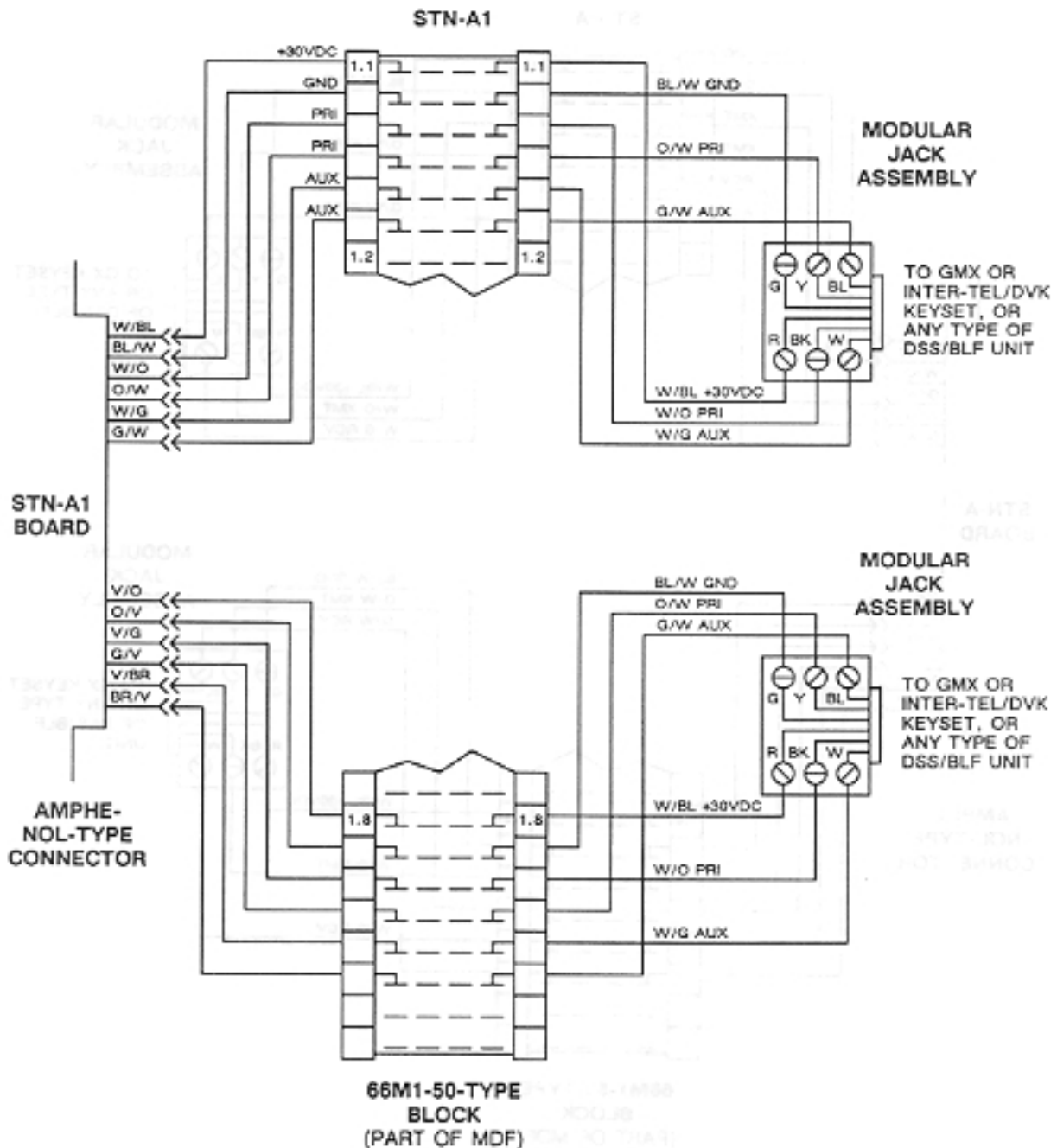
FIGURE 3-4. STN-A BLOCK TERMINATIONS



NOTE: For proper keyset operation, all three pairs (power/ground, transmit, and receive) are required.

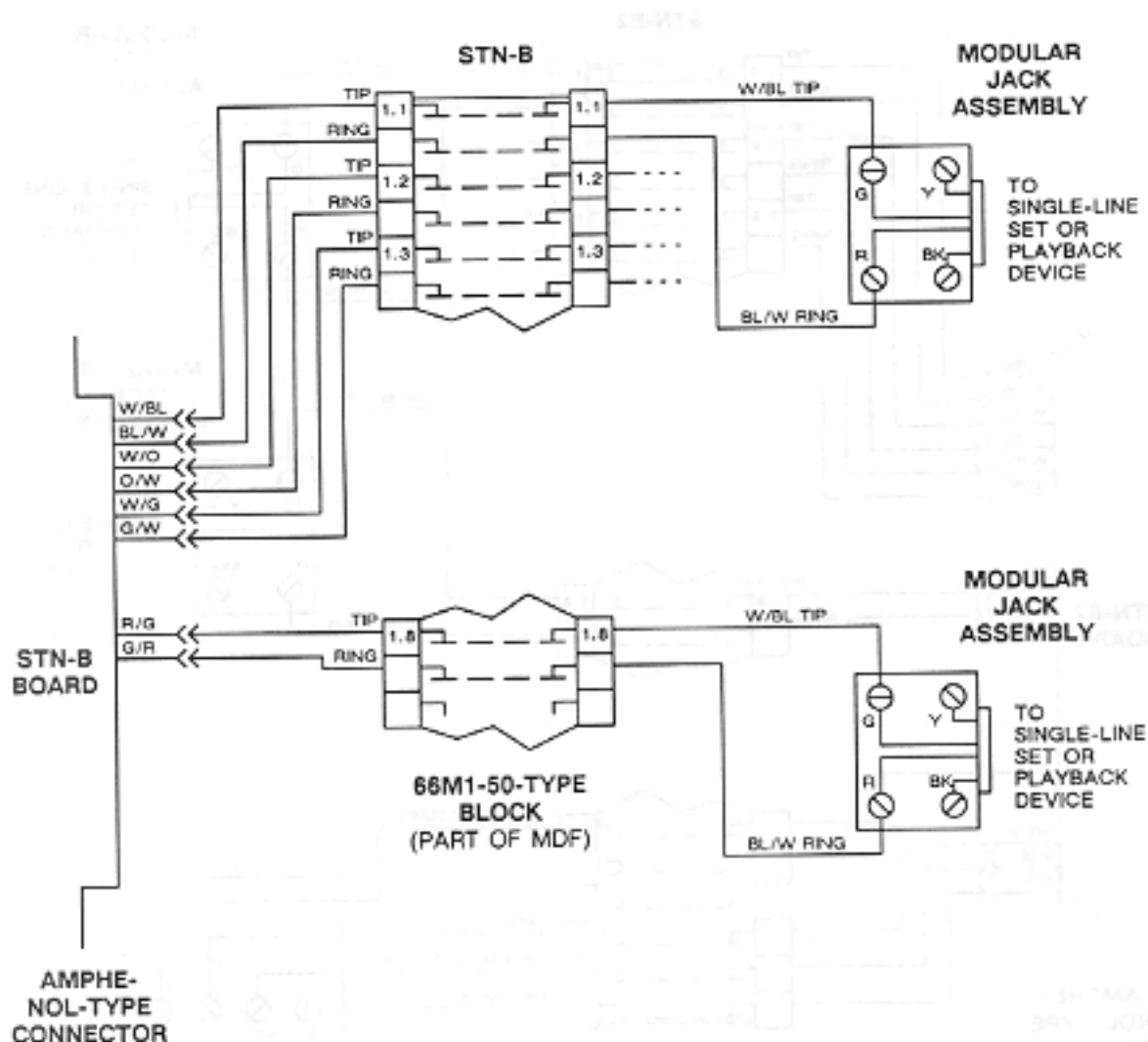
INSTALLATION

FIGURE 3-5. STANDARD STN-A1 BLOCK TERMINATIONS



NOTE: For proper keyset operation, all three pairs (power/ground, primary, and auxiliary) are required.

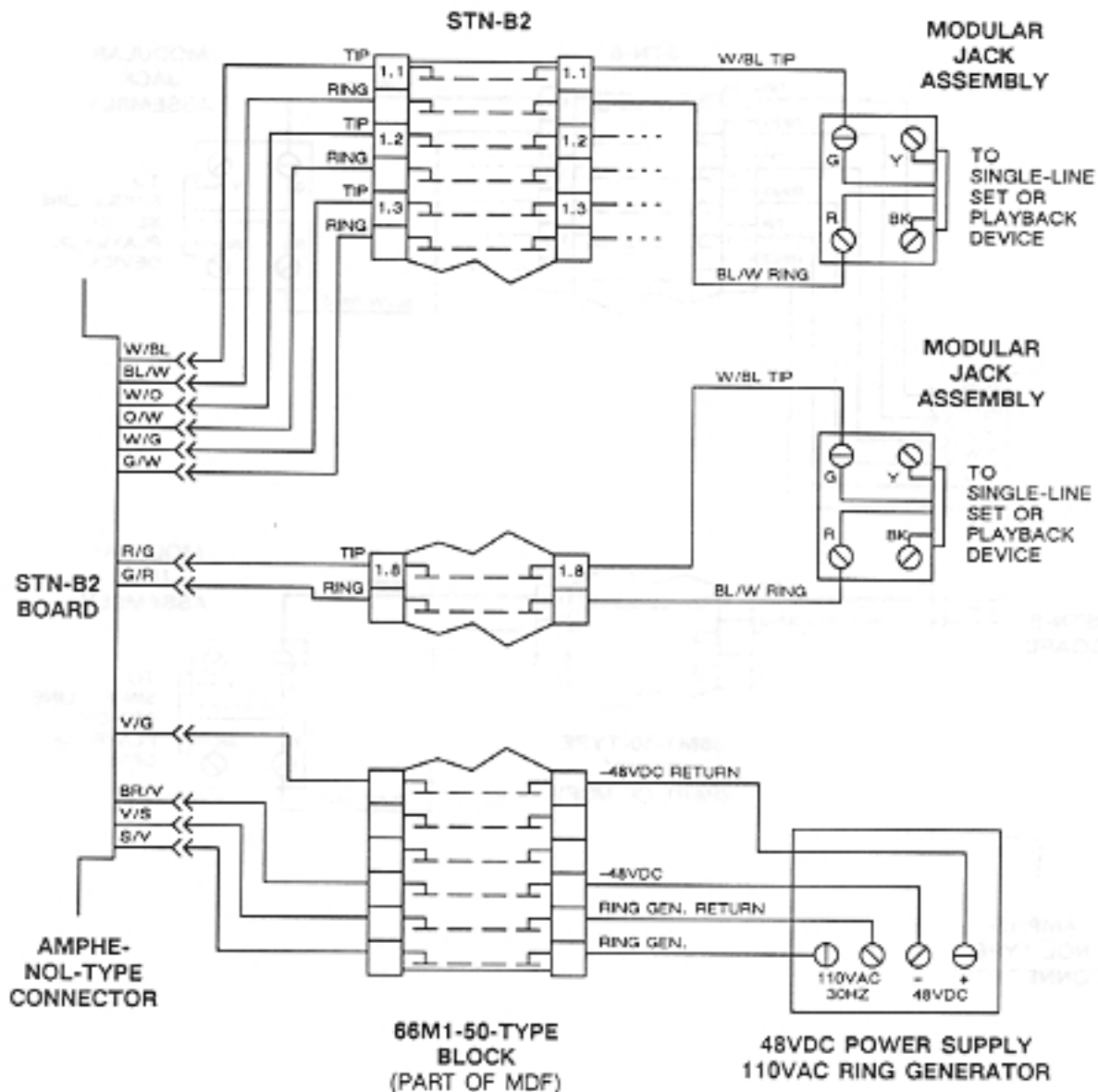
FIGURE 3-6. STN-B BLOCK TERMINATIONS



NOTE: For simplicity, this figure shows single-line sets and playback devices being installed using one-pair cable and four-conductor modular jacks. Of course, if three-pair cable and six-conductor modular jacks are used instead (as is recommended), extra terminal blocks and the use of cross-connect wiring techniques are required.

INSTALLATION

FIGURE 3-7. STN-B2 BLOCK TERMINATIONS



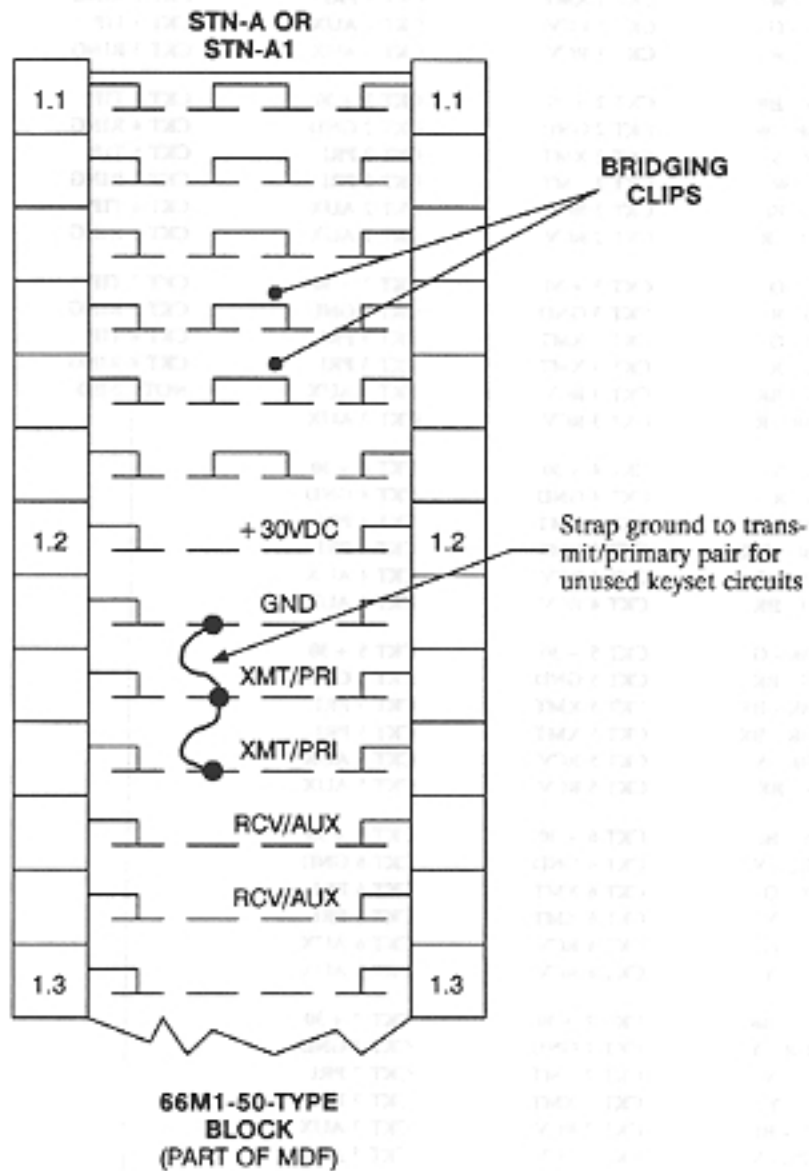
NOTE: The 48VDC power supply and the AC ring generator are attached only to STN-B2 boards equipped with at least one AC ringing single-line set. The V/G, BR/V, V/S, and S/V wires are not used on STN-B2 boards equipped with only DC ringing single-line sets. Also, for simplicity, this figure shows single-line sets and playback devices being installed using one-pair cable and four-conductor modular jacks. Of course, if three-pair cable and six-conductor modular jacks are used instead (as is recommended), extra terminal blocks and the use of cross-connect wiring techniques are required.

FIGURE 3-8. STANDARD STATION CABLE TERMINATIONS ON THE STN BLOCK

Amphenol	Cable Pair	STN-A	STN-A1	STN-B	STN-B2
26	W - BL	CKT 1 + 30	CKT 1 + 30	CKT 1 TIP	CKT 1 TIP
1	BL - W	CKT 1 GND	CKT 1 GND	CKT 1 RING	CKT 1 RING
27	W - O	CKT 1 XMT	CKT 1 PRI	CKT 2 TIP	CKT 2 TIP
2	O - W	CKT 1 XMT	CKT 1 PRI	CKT 2 RING	CKT 2 RING
28	W - G	CKT 1 RCV	CKT 1 AUX	CKT 3 TIP	CKT 3 TIP
3	G - W	CKT 1 RCV	CKT 1 AUX	CKT 3 RING	CKT 3 RING
29	W - BR	CKT 2 + 30	CKT 2 + 30	CKT 4 TIP	CKT 4 TIP
4	BR - W	CKT 2 GND	CKT 2 GND	CKT 4 RING	CKT 4 RING
30	W - S	CKT 2 XMT	CKT 2 PRI	CKT 5 TIP	CKT 5 TIP
5	S - W	CKT 2 XMT	CKT 2 PRI	CKT 5 RING	CKT 5 RING
31	R - BL	CKT 2 RCV	CKT 2 AUX	CKT 6 TIP	CKT 6 TIP
6	BL - R	CKT 2 RCV	CKT 2 AUX	CKT 6 RING	CKT 6 RING
32	R - O	CKT 3 + 30	CKT 3 + 30	CKT 7 TIP	CKT 7 TIP
7	O - R	CKT 3 GND	CKT 3 GND	CKT 7 RING	CKT 7 RING
33	R - G	CKT 3 XMT	CKT 3 PRI	CKT 8 TIP	CKT 8 TIP
8	G - R	CKT 3 XMT	CKT 3 PRI	CKT 8 RING	CKT 8 RING
34	R - BR	CKT 3 RCV	CKT 3 AUX	NOT USED	+ 30VDC RET
9	BR - R	CKT 3 RCV	CKT 3 AUX		
35	R - S	CKT 4 + 30	CKT 4 + 30		
10	S - R	CKT 4 GND	CKT 4 GND		
36	BK - BL	CKT 4 XMT	CKT 4 PRI		
11	BL - BK	CKT 4 XMT	CKT 4 PRI		
37	BK - O	CKT 4 RCV	CKT 4 AUX		
12	O - BK	CKT 4 RCV	CKT 4 AUX		
38	BK - G	CKT 5 + 30	CKT 5 + 30		
13	G - BK	CKT 5 GND	CKT 5 GND		
39	BK - BR	CKT 5 XMT	CKT 5 PRI		
14	BR - BK	CKT 5 XMT	CKT 5 PRI		
40	BK - S	CKT 5 RCV	CKT 5 AUX		
15	S - BK	CKT 5 RCV	CKT 5 AUX		
41	Y - BL	CKT 6 + 30	CKT 6 + 30		
16	BL - Y	CKT 6 GND	CKT 6 GND		
42	Y - O	CKT 6 XMT	CKT 6 PRI		
17	O - Y	CKT 6 XMT	CKT 6 PRI		
43	Y - G	CKT 6 RCV	CKT 6 AUX		
18	G - Y	CKT 6 RCV	CKT 6 AUX		
44	Y - BR	CKT 7 + 30	CKT 7 + 30		
19	BR - Y	CKT 7 GND	CKT 7 GND		
45	Y - S	CKT 7 XMT	CKT 7 PRI		
20	S - Y	CKT 7 XMT	CKT 7 PRI		
46	V - BL	CKT 7 RCV	CKT 7 AUX		
21	BL - V	CKT 7 RCV	CKT 7 AUX		
47	V - O	CKT 8 + 30	CKT 8 + 30		+ 30VDC RET
22	O - V	CKT 8 GND	CKT 8 GND		+ 30VDC
48	V - G	CKT 8 XMT	CKT 8 PRI		-48VDC RET
23	G - V	CKT 8 XMT	CKT 8 PRI		NOT USED
49	V - BR	CKT 8 RCV	CKT 8 AUX		NOT USED
24	BR - V	CKT 8 RCV	CKT 8 AUX		-48VDC
50	V - S	NOT USED	NOT USED		RING GEN RET
25	S - V	NOT USED	NOT USED		RING GEN

INSTALLATION

FIGURE 3-9. STANDARD TERMINATION OF UNUSED KEYSSET CIRCUITS



NOTE: To later install a station instrument on an unused keyset circuit that has been terminated as shown above, first remove the termination strap.

C. SECONDARY VOICE PATH INSTALLATION

5.8 If desired, the system can be configured to allow GMX 24-line and Inter-Tel/DVK keyset users to receive off-hook voice announce (OHVA) calls and/or to use the *simultaneous* voice/data communication feature. To accomplish this, the keyset is installed on an odd-numbered STN-A1 circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the following even-numbered STN-A1 circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path.

NOTE: To simply place OHVA calls (from any station instrument if properly programmed) or to use the *standard* data communication feature (GMX 24-line and Inter-Tel/DVK keysets only), no special secondary voice path installation is necessary. However, for data communication (whether standard or simultaneous voice/data), GMX 24-line and Inter-Tel/DVK keysets must be equipped with optional Data Port Modules. GX keysets and GMX 12-line keysets cannot have Data Port Modules installed.

5.9 Although secondary voice path-equipped keysets are installed with three-pair cable as usual, the configuration at the station block is somewhat different than the standard configuration as outlined on pages 3-12 to 3-18. In standard installations, the KSU uses the first pair for power and ground, the second pair for the primary voice path, and the third pair for auxiliary transmissions between the keyset and the KSU. (**NOTE:** All three pairs are required.) To create a secondary voice path, the auxiliary pair is not used; instead, the primary pair from the following even-numbered circuit is used in its place. Refer to Figures 3-10 and 3-11 on the following pages for secondary voice path terminations.

5.10 Because the primary pair of the even-numbered circuit is used to create a secondary voice path for the preceding odd-numbered circuit, the even-numbered circuit cannot have a station instrument installed on it.

5.11 If desired (and if cabled correctly), each STN-A1 board can have a combination of keysets with

secondary voice paths and keysets without secondary voice paths.

5.12 Follow these procedures for each secondary voice path installation:

- (1) Ensure that the station cables have been connected to the STN blocks on the MDF as outlined on page 3-12.

NOTE: Secondary voice path-equipped keysets can only be installed on odd-numbered station circuits.

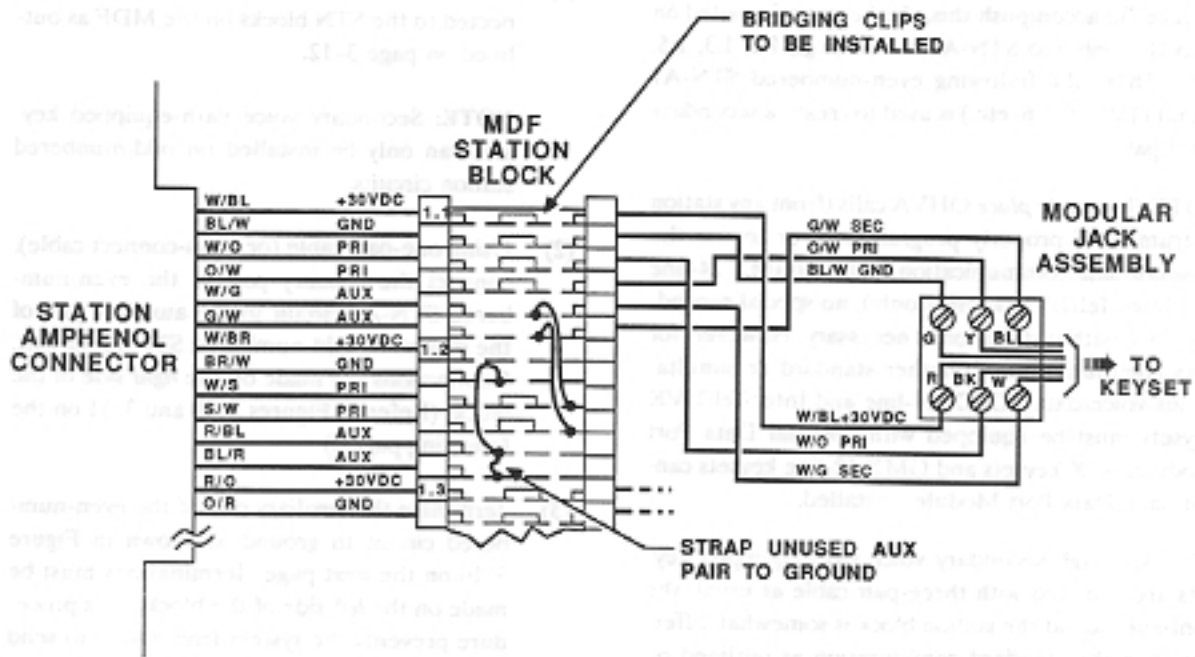
- (2) Using one-pair cable (or cross-connect cable), connect the primary pair of the even-numbered STN-A1 circuit to the auxiliary pair of the preceding odd-numbered STN-A1 circuit. Connections are made on the *right* side of the block. (Refer to Figures 3-10 and 3-11 on the following pages.)

- (3) Terminate the auxiliary pair of the even-numbered circuit to ground as shown in Figure 3-10 on the next page. Terminations must be made on the *left* side of the block. This procedure prevents the system from trying to send system data transmissions over the auxiliary pair.

- (4) After performing the loop resistance tests (as described on page 3-22), attach bridging clips *only* in the positions indicated in Figure 3-10. The third pair of the odd-numbered circuit and the first and third pair of the even-numbered circuit will *not* have bridging clips installed.

5.13 Later, when the STN-A1 circuit boards are installed, each secondary voice path keyset must have its corresponding STN-A1 circuit strap set in the O (OHVA) position. If a secondary voice path is not installed, the strap must be in the N (normal) position. (See Figure 3-22 on page 3-44 for strap locations.) Also, each secondary voice path circuit must be designated as such in database programming. (Refer to PROGRAMMING, page 5-41, for details.)

FIGURE 3-10. STATION CABLE TERMINATIONS FOR SECONDARY VOICE PATH KEYSETS



NOTE: For proper keyset operation, all three pairs (power/ground, primary, and secondary) are required.

FIGURE 3-11. STN-A1 BLOCK TERMINATIONS FOR SECONDARY VOICE PATH KEYSETS

AMPHENOL	CABLE PAIR	STN-A1
26	W - BL	CKT 1 + 30VDC
1	BL - W	CKT 1 GND
27	W - O	CKT 1 PRIMARY PATH
2	O - W	CKT 1 PRIMARY PATH
28	W - G	NOT USED
3	G - W	NOT USED
29	W - BR	NOT USED
4	BR - W	NOT USED
30	W - S	CKT 1 SECONDARY PATH
5	S - W	CKT 1 SECONDARY PATH
31	R - BL	NOT USED
6	BL - R	NOT USED
32	R - O	CKT 3 + 30VDC
7	O - R	CKT 3 GND
33	R - G	CKT 3 PRIMARY PATH
8	G - R	CKT 3 PRIMARY PATH
34	R - BR	NOT USED
9	BR - R	NOT USED
35	R - S	NOT USED
10	S - R	NOT USED
36	BK - BL	CKT 3 SECONDARY PATH
11	BL - BK	CKT 3 SECONDARY PATH
37	BK - O	NOT USED
12	O - BK	NOT USED
38	BK - G	CKT 5 + 30VDC
13	G - BK	CKT 5 GND
39	BK - BR	CKT 5 PRIMARY PATH
14	BR - BK	CKT 5 PRIMARY PATH
40	BK - S	NOT USED
15	S - BK	NOT USED
41	Y - BL	NOT USED
16	BL - Y	NOT USED
42	Y - O	CKT 5 SECONDARY PATH
17	O - Y	CKT 5 SECONDARY PATH
43	Y - G	NOT USED
18	G - Y	NOT USED
44	Y - BR	CKT 7 + 30VDC
19	BR - Y	CKT 7 GND
45	Y - S	CKT 7 PRIMARY PATH
20	S - Y	CKT 7 PRIMARY PATH
46	V - BL	NOT USED
21	BL - V	NOT USED
47	V - O	NOT USED
22	O - V	NOT USED
48	V - G	CKT 7 SECONDARY PATH
23	G - V	CKT 7 SECONDARY PATH
49	V - BR	NOT USED
24	BR - V	NOT USED
50	V - S	NOT USED
25	S - V	NOT USED

NOTE: For proper keyset operation, all three pairs (power/ground, primary, and secondary) are required.

D. STATION LOOP RESISTANCE TEST

5.14 Perform the loop resistance test for each station cable individually.

- (1) Ensure that bridging clips have not been installed on the STN blocks and that the station instrument is not connected to the modular jack assembly.
- (2) Place a short across the RED and GREEN wires on the modular jack assembly.
- (3) At the MDF, measure the resistance across the WHITE/BLUE and BLUE/WHITE wires on the *right* side of the STN block. The reading should not exceed the limits (for 24AWG wire) listed in the table below (ohm values are the loop measurements; feet/meter values are the

maximum one-way measurements from the KSU).

NOTE: Excessive and/or improperly made connections increase the resistance of a cable, which reduces the allowable cable run length.

- (4) Remove the short after the test is complete.
- (5) Repeat this test for each station cable.
- (6) Install bridging clips on the STN blocks to complete the cable connections.

NOTE: Do *not* install bridging clips on unused keyset circuits that have been terminated to ground (as shown in Figure 3-9 on page 3-18). For secondary voice path-equipped circuits, refer to Figure 3-10 on page 3-20 for proper bridging clip locations.

TYPE OF INSTRUMENT	LOOP LIMITS
GX 24-Line Keysets (standard or display)	80 ohms/1550 ft. (472 m.)
GX 24-Line Keysets with Speakerphone Modules	65 ohms/1260 ft. (384 m.)
GMX 24-Line Keysets (standard or display)	65 ohms/1260 ft. (384 m.)
GMX 24-Line Keysets with Data Port Modules	50 ohms/970 ft. (295 m.)
GMX 12-Line Keysets	65 ohms/1260 ft. (384 m.)
Inter-Tel/DVK Keysets (standard or display)	82 ohms/1595 ft. (486 m.)
Inter-Tel/DVK Keysets with Data Port Modules	66 ohms/1280 ft. (390 m.)
GX DSS/BLF Units (single or tandem)	80 ohms/1550 ft. (472 m.)
GMX DSS/BLF Units	65 ohms/1260 ft. (384 m.)
Inter-Tel/DVK DSS/BLF Units (single or tandem)	65 ohms/1260 ft. (384 m.)
SLJs (AC or DC) Installed on STN-B2 Boards	450 ohms/8750 ft. (2667 m.)
SLJs (AC or DC) Installed on STN-B Boards	200 ohms/3890 ft. (1185 m.)
Single-Line DTMF Sets (AC or DC)	175 ohms/3400 ft. (1036 m.)
Playback Devices (AC or DC)	175 ohms/3400 ft. (1036 m.)
Talkback Speakers	50 ohms/970 ft. (295 m.)

E. CONNECTING OPTIONAL OFF-PREMISES STATIONS

5.15 To connect off-premises stations to the system, use AC ringer-equipped single-line sets. Off-premises stations, which are installed on STN-B or STN-B2 boards, require an HVRA Unit, a 48VDC power supply, a ring generator, a 66M1-50-type terminal block, and cabling. (Refer to page 2-14 for equipment requirements.)

5.16 The HVRA Unit provides isolation from the telephone company OPX line(s) and converts the DC ringing used in the system to the AC ringing used by the off-premises stations. Each HVRA Unit allows two off-premises stations to access the single-line features. Multiple HVRA Units may be installed, if desired.

5.17 Each STN-B and STN-B2 board can support up to eight off-premises stations. On STN-B2 boards, the associated AC/DC strap must be set for DC ringing to allow an external HVRA to be installed. (NOTE: AC ringing will damage the HVRA.) Set the strap for each off-premises station circuit in the DC position before installing the STN-B2 board. (Figure 3-24 on page 3-46 shows the circuit straps.)

NOTE: The FCC requires that an *external* HVRA Unit be installed when connecting an off-premises station. The STN-B2 onboard HVRA (AC setting) may not be used.

5.18 In certain off-premises applications, voice volume levels may not be acceptable. This degradation in voice volume is due to the natural voice frequency range limitations of the telephone company or customer-provided line. To increase the voice frequency range, installation of a 2-wire, negative impedance repeater unit is recommended. (Refer to page 2-15 for specifications.)

5.19 The repeater unit is installed at the MDF between the HVRA Unit and the cabling to the off-premises single-line station. For proper installation with the GMX-152D System, the following are connected to the appropriate "pins" on the repeater unit (refer to the manufacturer's instructions for proper pin locations): -Battery (-24 to -56VDC), Ground, System Tip, System Ring, OPX Tip, and

OPX Ring. Information on operating and adjusting the repeater unit is included with the product.

5.20 Some OPX lines do not recognize the GMX-152D System's intercom, callback, and recall ring signals. On such lines, the ring tones are generated by the system, but are not carried over the telephone company lines to the off-premises station(s). To make the GMX-152D System compatible with these lines, an OPX software kit (part no. 828.1152) can be installed on the IOP board. The OPX software makes the "ring on" time longer for intercom, callback, and recall ring signals so that the telephone company lines can recognize them.

NOTE: This OPX software update is not required for installations that use customer-provided lines. Also, installing this software changes the ring time for *all single-line stations* in the system.

5.21 Install the off-premises stations as follows (refer to Figure 3-12 on page 3-25):

- (1) Mount the HVRA Unit(s) on the MDF backboard.
 - a. Disassemble the HVRA Unit by removing the four base screws.
 - b. Insert two mounting screws through the holes in the top of the HVRA Unit and screw the HVRA Unit top to the MDF backboard. (Some units do not have these holes and drilling is required.)
 - c. Reassemble the HVRA Unit on the MDF backboard.
- (2) Mount a 66M1-50-type terminal block on the MDF backboard near the HVRA Unit.
- (3) Connect the HVRA Unit to the MDF backboard as follows:
 - a. Using enough 25-pair cable to run from the HVRA Unit to the MDF location, attach a 50-pin female amphenol-type connector to one end of the cable. Label the connector "HVRA".
 - b. Terminate the other end of the 25-pair cable on the *left* side of the HVRA block.

- c. Attach the connector on the cable to the male connector on the HVRA Unit.
- (4) Mount the power supply and ring generator on the MDF backboard.
- (5) Connect the power supply and ring generator to the *right* side of the HVRA connecting block as follows:
 - a. *If the power supply and ring generator are connected to an HVRA only, refer to Figure 3-12 on page 3-25.*
 - b. *If the power supply and ring generator are connected to a STN-B2 board and an HVRA, connect the power supply and ring generator as shown in Figure 3-13 on page 3-26.*
- (6) If the power supply and ring generator are connected to *an HVRA Unit only*, attach a length of 10AWG wire to the -48VDC return terminal (+ side) on the power supply. Connect the other end to the grounding terminal on the MDF backboard (refer to Figure 3-12, and see the grounding requirements on page 3-34).

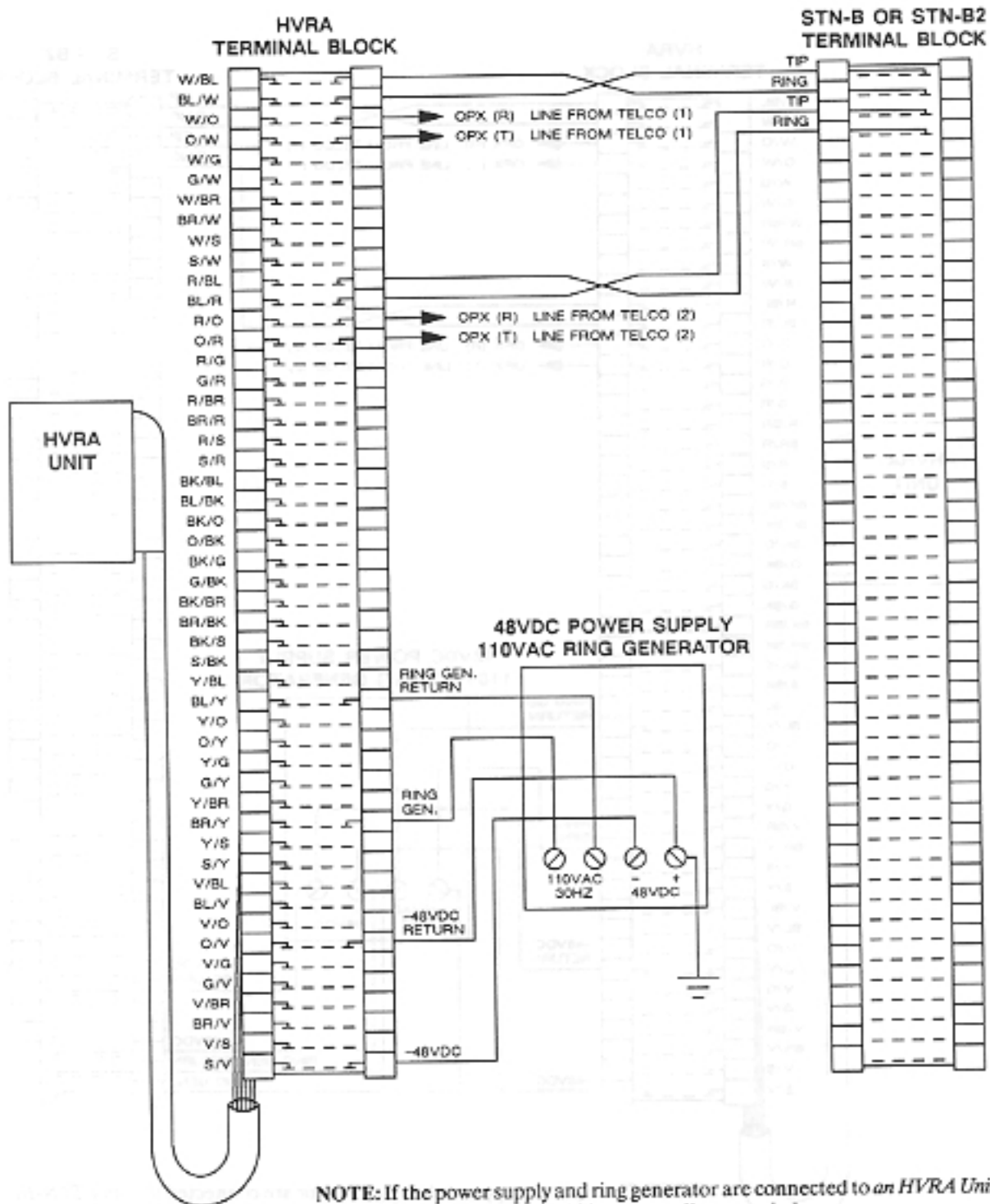
NOTE: If the power supply and ring generator are connected to *both a STN-B2 board and an HVRA Unit*, the power supply should not be externally grounded (refer to Figure 3-13).

- (7) Use cross-connect cable(s) to connect the STN block with the HVRA block as follows:
 - a. Terminate one end of the cross-connect cable on the *right* side of the STN block on the pins associated with the off-premises station's circuit.
 - b. Terminate the other end of the cross-connect cable on the *right* side of the HVRA block on the W/BL or R/BL pairs (depending on the HVRA circuit being used).
- (8) Terminate the telephone company OPX line(s) or customer-provided line(s) on the *right* side of the HVRA block.

NOTE: Be sure that tip and ring connections are made as shown in Figure 3-12. Reversing tip and ring on the OPX line inhibits the station from ringing.

- (9) Install bridging clips on the HVRA and STN blocks to complete the connection.

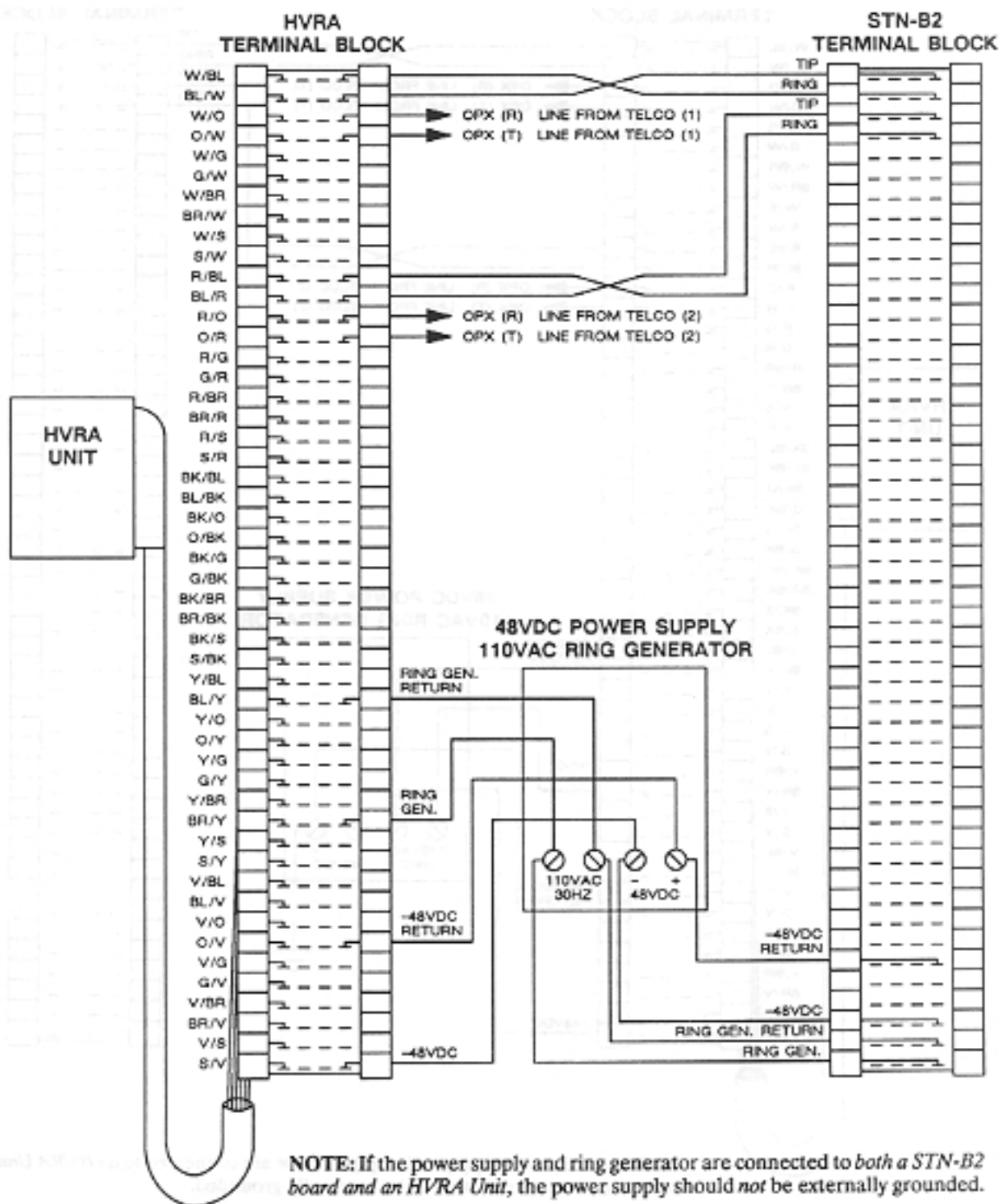
FIGURE 3-12. HVRA CONNECTION TO THE MDF



INSTALLATION

NOTE: If the power supply and ring generator are connected to an HVRA Unit only, the power supply should be externally grounded.

FIGURE 3-13. POWER SUPPLY CONNECTION TO THE STN-B2 BOARD AND THE HVRA UNIT



F. CONNECTING THE MODEM-III (MOD-III) OR MODEM-IV (MOD-IV) BOARD TO THE MDF

5.22 The MOD-III or MOD-IV board must be connected to the MDF to access the talkback speakers, external paging equipment, signal device relays, and night transfer relay. See SPECIFICATIONS, page 2-9, for additional information. Connect it following the steps below:

- (1) Using enough 25-pair cable to run from the MOD block to the MOD-III or MOD-IV board in the KSU, make a termination cable. Attach a 50-pin female amphenol-type connector to the KSU end of the cable. Label the connector "MOD". This connector will be attached to the MOD-III or MOD-IV board it is installed in the KSU.
- (2) Terminate the other end of the cable on the left side of the MOD block.
- (3) Connect the optional equipment to the MOD block as follows:
 - a. **External paging equipment:** Terminate the external paging amplifier and speaker net-

works on the *right* side of the MOD block as shown in Figure 3-14 on the next page.

- b. **Talkback speakers:** Terminate the talkback speaker cables on the *right* side of the MOD block as shown in Figure 3-15 on the next page.
 - c. **Signal devices:** Terminate the signal devices on the following pins on the *right* side of the MOD block (refer to page 2-10 in SPECIFICATIONS for relay contact information):

Signal Device 1	Pins 37 and 12
Signal Device 2	Pins 38 and 13
Signal Device 3	Pins 39 and 14
 - d. **Night transfer relay:** On the *right* side of the MOD block, terminate the equipment (alarms, electronic devices, etc.) on pins 35 and 10 (break and swing) or pins 10 and 36 (swing and break).
- (4) Install bridging clips on the MOD block to complete the installation.

FIGURE 3-14. SUGGESTED EXTERNAL PAGE EQUIPMENT CONNECTIONS

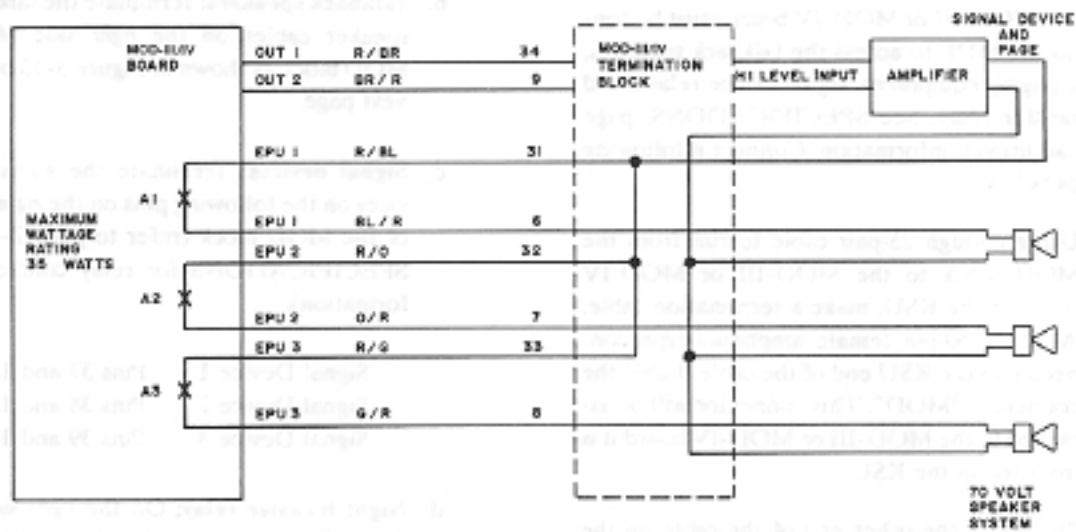
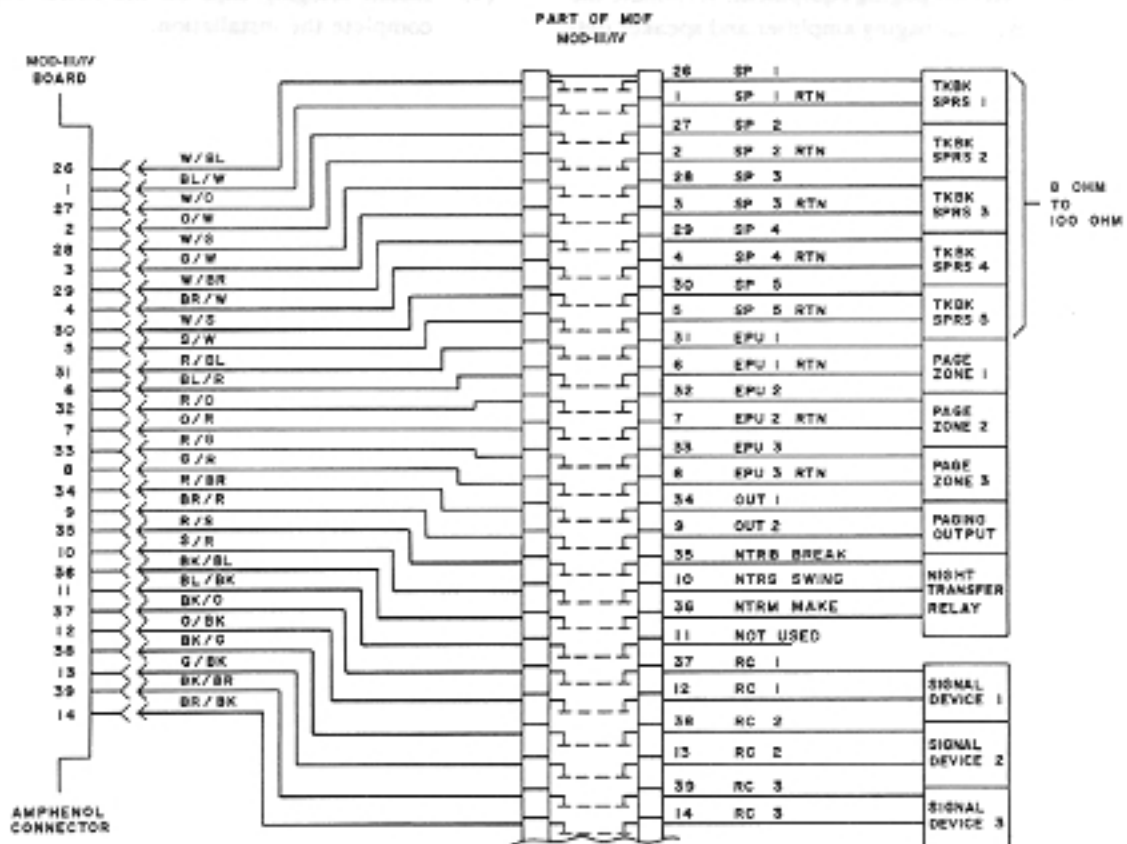


FIGURE 3-15. MOD-III OR MOD-IV BOARD TERMINATIONS



6. KEY SERVICE UNIT (KSU) INSTALLATION

A. UNPACK THE EQUIPMENT

6.1 Unpack and inspect the KSU equipment following these guidelines.

- (1) Check the KSU components against the packing slip and inspect them for damage. If any equipment is missing or damaged, contact Inter-Tel's Order Processing Department immediately.
- (2) Check all circuit board assemblies as follows:

NOTE: The boards contain static-sensitive components. Handle all boards by the edges only; however, avoid touching the gold contacts on the side of the board that plugs into the KSU. (For additional precautionary information, refer to the CAUTION on page 3-37.)

- a. Check each board to ensure there is no shipping foam or tape attached.
- b. Inspect each board for shorted components.
- c. If the COU board is configured for DTMF signalling, integrated circuits are missing from sockets U21A, U21B, U21C, and U21D. Refer to Figure 3-25 on page 3-25 for socket locations.
- d. Return all boards to their protective anti-static bags until they are ready to be installed in the KSU.

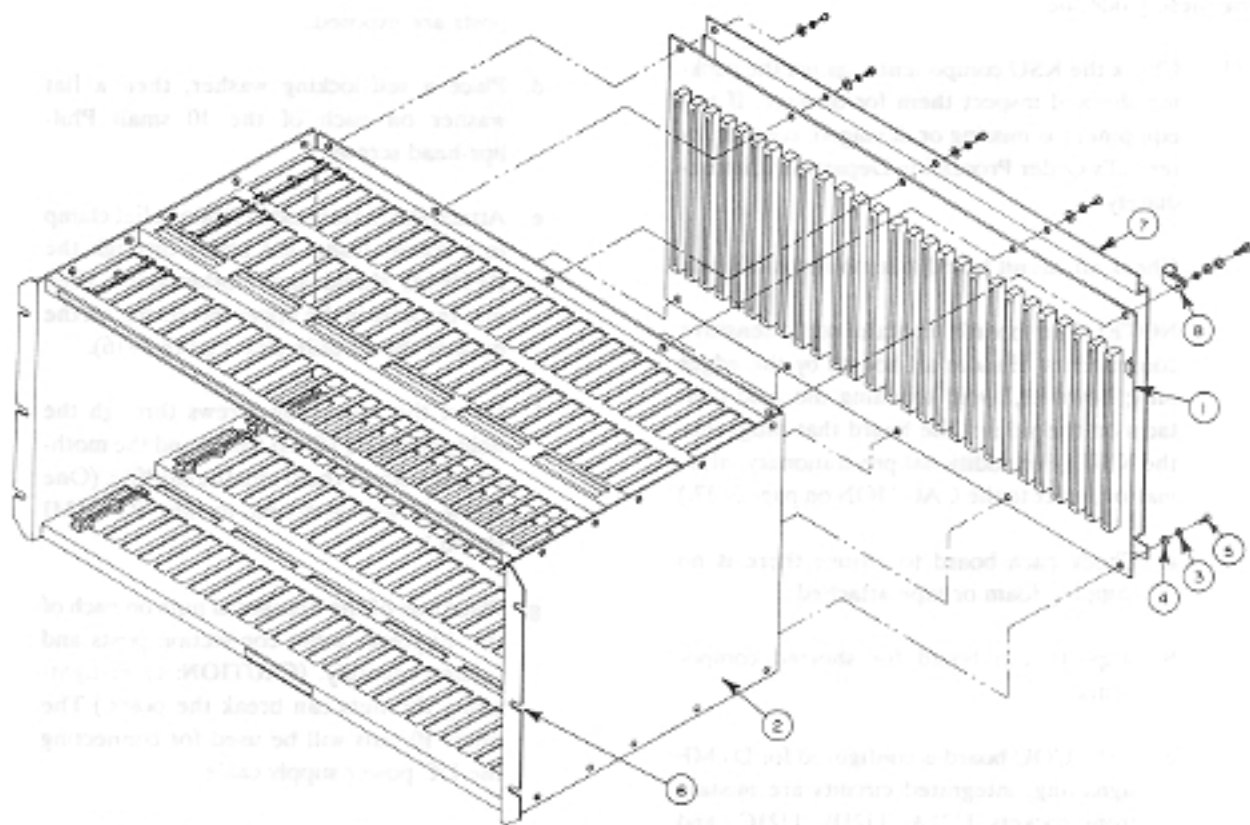
B. CARDFILE ASSEMBLY AND INSTALLATION (IF NECESSARY)

6.2 To assemble and install the cardfile (if necessary), follow the instructions below and refer to Figure 3-16 on page 3-30.

- (1) Assemble the cardfile:
 - a. Set the cardfile on a flat surface with the KSU mounting screw slots facing down.

- b. Place the motherboard on the back of the cardfile so that the edge with the power cable connection posts is above the red (STN) card slots. The posts must face out.
 - c. Place the RFI/EMI shield over the motherboard so that the power cable connection posts are exposed.
 - d. Place a self-locking washer, then a flat washer on each of the 10 small Phillips-head screws.
 - e. Attach the battery cable strain relief clamp to a screw. Insert the screw through the RFI/EMI shield and motherboard, then into the hole in the upper left corner on the back of the cardfile (see Figure 3-16).
 - f. Insert the remaining screws through the holes in the RFI/EMI shield and the motherboard; screw them into the cardfile. (One screw is not attached to the RFI/EMI shield.)
 - g. Place one of the hexagonal nuts on each of the 10 power cable connection posts and tighten securely. (CAUTION: Over-tightening the nuts can break the posts.) The other 10 nuts will be used for connecting the DC power supply cable.
- (2) Install the cardfile assembly in the KSU cabinet:
 - a. Lay the KSU cabinet on its back. Support the door so that the hinges are not bearing the full weight of the open door.
 - b. Remove the bottom three mounting screws from each side of the cabinet and set them aside. (The other four mounting screws will be used for installing the power supply.)
 - c. Insert the assembled cardfile (with slot labels facing up) into the lower section of the cabinet, lining up the mounting screw slots with the bottom three holes on each side of the cabinet.
 - d. Replace and tighten the mounting screws.

FIGURE 3-16. CARDFILE ASSEMBLY



① MOTHERBOARD

② CARDFILE

③ SELF-LOCKING WASHER

④ FLAT WASHER

⑤ PHILLIPS-HEAD SCREW

⑥ MOUNTING SCREW SLOTS

⑦ RFI/EMI SHIELD

⑧ BATTERY CABLE STRAIN
RELIEF CLAMP

C. POWER SUPPLY INSTALLATION

6.3 The 690.0200 or 690.0100 power supplies can be used on the GMX-152D System. The 690.0200 provides trickle-charging for battery back-up. The 690.0100 does not provide battery charging for system battery back-up, but if battery back-up is desired, an uninterruptible power supply (UPS) unit or a standby power supply (SPS) unit may be used. Both power supplies require customer-provided batteries. Refer to page 2-17 for more battery information.

CAUTION

Before installing the power supply, make sure the AC POWER and BATTERY BACK-UP switches are turned off.

6.4 If the power supply was shipped with the DC power cable unattached, attach it to the power supply by connecting the wires to the terminal as shown in the chart below:

690.0100		690.0200	
Terminal	Wire Color	Terminal	Wire Color
1 (+S, front)	Green	1 (-12V, top)	Red
2 (+V1)	Orange	2 (-12V RTN)	Red/Black
3 (+V1)	Blue	3 (+29V)	White
4 (+V1)	Not Used	4 (+29V RTN)	White/Black
5 (COM)	Not Used	5 (+5V SNS)	Green
6 (COM)	Blue/Black	6 (+5V DC)	Blue
7 (COM)	Orange/Black	7 (+5V DC)	Orange
8 (-S)	Green/Black	8 (+5V DC)	Not Used
9 (COM)	Not Used	9 (+5V RTN)	Not Used
10 (+V2)	Jumper	10 (+5V RTN)	Orange/Black
11 (-V3)	Red	11 (+5V RTN)	Blue/Black
12 (COM)	Red/Black	12 (-5V SNS)	Green/Black
13 (+V4)	Not Used		
14 (RTN)	White/Black	+V BAT (bottom connector on circ. breaker)	Black
15 (+V5, back)	White and Jumper	-V BAT (connector behind circuit breaker)	Black/White

6.5 For both power supplies, complete the installation by following the steps below.

- Locate the 115/220 line voltage switch inside the power supply, behind the barrier strip where the AC cord connects to the PCB. Verify that the red slide-switch is set for 115V (moved in the direction away from the fuse).
- Check the value of the fuse(s). The AC line fuse should be 125 or 250VAC, 15A. The 690.0200 also has a battery fuse; it should be 250VAC, 4A, 3AG, fast-blow.
- Place the power supply on its back on top of the KSU. Route the DC power cable in through the front of the KSU and over the top of the cardfile.
- Connect the unattached end of the DC power cable to the cardfile backplane as specified below and shown in Figure 3-17 on page 3-33:

POWER CABLE	BACKPLANE CONNECTION POST
Blue (+5V)	1 (top)
Orange (+5V)	2
Green (+5V Sense)	3
White/Black (+30V Return)	4
Red (-12V)	5
White (+30V)	6
Blue/Black (+5V Return)	7
Green/Black (+5V Sense Return)	8
Orange/Black (+5V Return)	9
Red/Black (-12V Return)	10 (bottom)
Black (Positive battery - 690.0200 only)	To battery pack
Black/White (Negative battery - 690.0200 only)	To battery pack

- Install the power supply in the KSU cabinet as follows:
 - Route the AC power cord in through the front of the KSU and over the top of the cardfile.
 - Remove the four power supply mounting screws shipped with the KSU cabinet.
 - Position the power supply in the cabinet above the cardfile. While doing this, keep

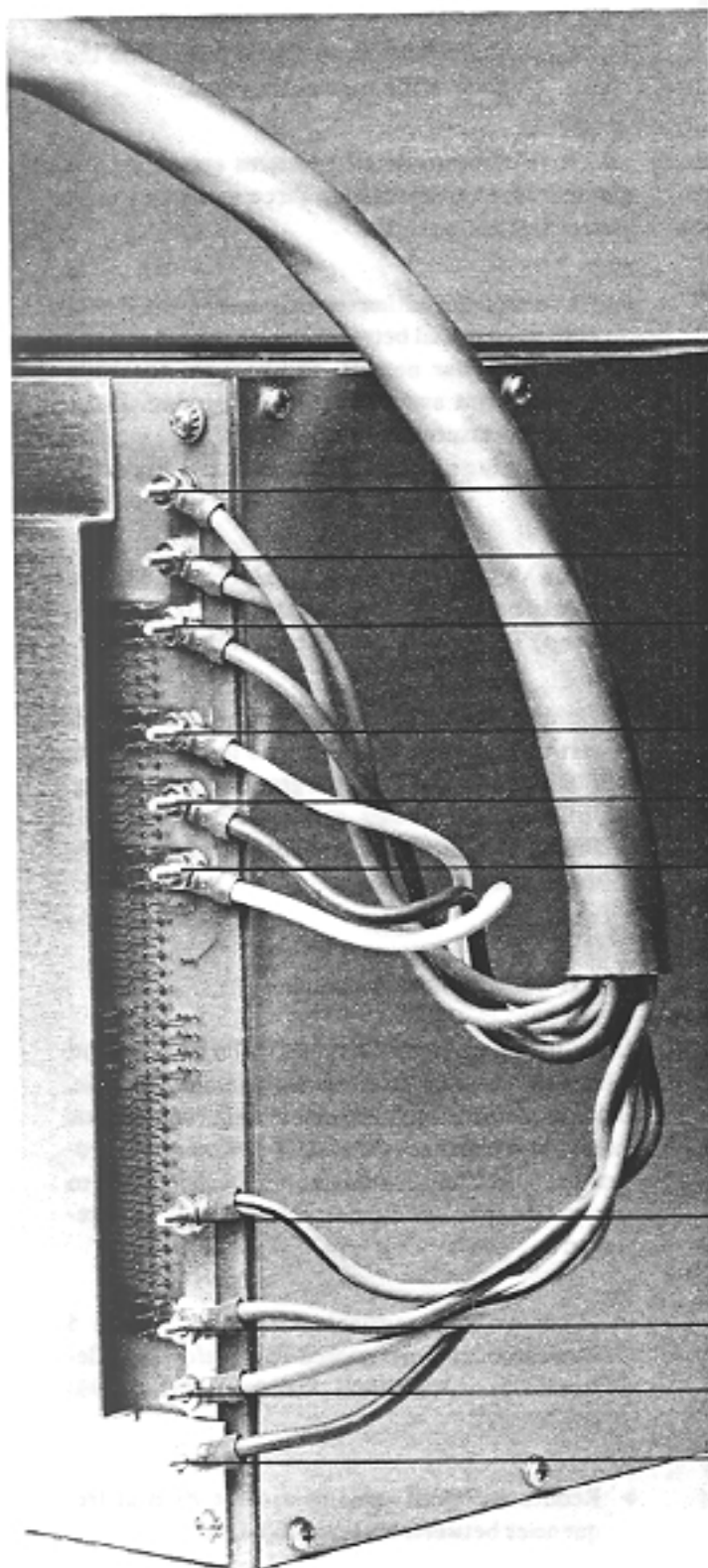
- the AC and DC power cables behind the power supply and route them across the top of the cardfile.
- d. Replace and tighten the mounting screws.
- (6) If the KSU cabinet has knock-out holes on the back, remove the large round knock-out and attach the protective grommet (supplied with the cabinet) around the edge of the hole. If you will be installing battery back-up, also remove one small knock-out and attach a 1/2-inch electrical-metallic tubing (EMT) with a strain relief clamp, or remove two small knockouts and use two 10AWG HEYCO-type strain relief connectors.
- NOTE:** The grommet(s) may need trimming to fit securely. Use an adhesive to keep the grommet(s) in place, if desired.
- (7) Depending on the type of KSU cabinet, route the AC power cord through the large knock-out hole in the back, the slot in the bottom, or the hole in the side.

- (8) Secure the 10AWG Black and Black/White battery wires to the cardfile with the strain relief clamp located in the upper-left corner of the cardfile. Loosen the screw that holds the clamp in place, thread the wires through the clamp, then tighten the screw.
- (9) If you will be installing battery back-up, route the battery wires out through one or two of the small knock-out holes on the back of the cabinet. If you will not be using battery back-up, tape and store the wires.
- (10) Ground the system according to the instructions on page 3-34.
- (11) Perform the electrical test as specified on page 3-36.
- (12) To install batteries, refer to page 3-74.

CAUTION

The system power supply should not be shipped or moved any great distance while mounted in the cabinet.

FIGURE 3-17. KSU BACKPLANE AND VOLTAGE TEST POINT LOCATIONS



TEST POINT 1
BLUE (+5V)

ORANGE (+5V)

GREEN (+5V SENSE)

TEST POINT 2
WHITE/BLACK (+30V RETURN)

TEST POINT 3
RED (-12V)

TEST POINT 4
WHITE (+30V)

BLUE/BLACK (+5V RETURN)

GREEN/BLACK (+5 SENSE RETURN)

ORANGE/BLACK (+5 RETURN)

RED/BLACK (-12V RETURN)

TEST POINT 5
(4 PL)

Grounding Requirements

6.6 The KSU must be properly grounded to an earth ground point. A copper, cold water pipe is usually a good ground point.

NOTE: According to UL 1459, "an insulated grounding conductor that is not smaller in size and equivalent in insulation material and thickness to the grounded and ungrounded branch-circuit supply conductors, except that it is green with or without one or more yellow stripes, is to be installed as part of the circuit that supplies the product or system." Also, "the attachment-plug receptacles in the vicinity of the product or system are all to be of a grounding type, and the grounding conductors serving these receptacles are to be connected to earth ground at the service equipment."

6.7 The grounding wire should be 10AWG or larger and should not exceed 25 feet (7.5 meters) to help provide RFI/EMI protection or 10 feet (3 meters) to help provide RFI/EMI and lightning protection.

6.8 To ground the system (see Figure 3-18 on the next page):

- (1) Ensure that the power supply is not plugged into the AC outlet and battery back-up is not on.
- (2) Mount a grounding terminal on the MDF backboard and connect it to:
 - a. An earth ground.
 - b. The ground lug on the floor or shelf of the KSU cabinet.
 - c. Each HVRA power supply, if used (see the NOTE to step 6 on page 3-24).
 - d. Battery compartment(s), if used.
 - e. C.O./OPX gas discharge tubes, if used.
 - f. AC voltage surge/spike protector, if used (and if recommended by the manufacturer)
- (3) Connect the KSU cabinet to the cardfile by running approximately 7 inches (19 cm.) of wire between:

- a. The ground lug on the floor or shelf of the KSU cabinet (refer to Figure 3-18 on the next page).
- b. One of the bottom four terminals on the back of the cardfile backplane.

6.9 If AC power-related problems appear on the system, one of the following three methods can be used to test the ground.

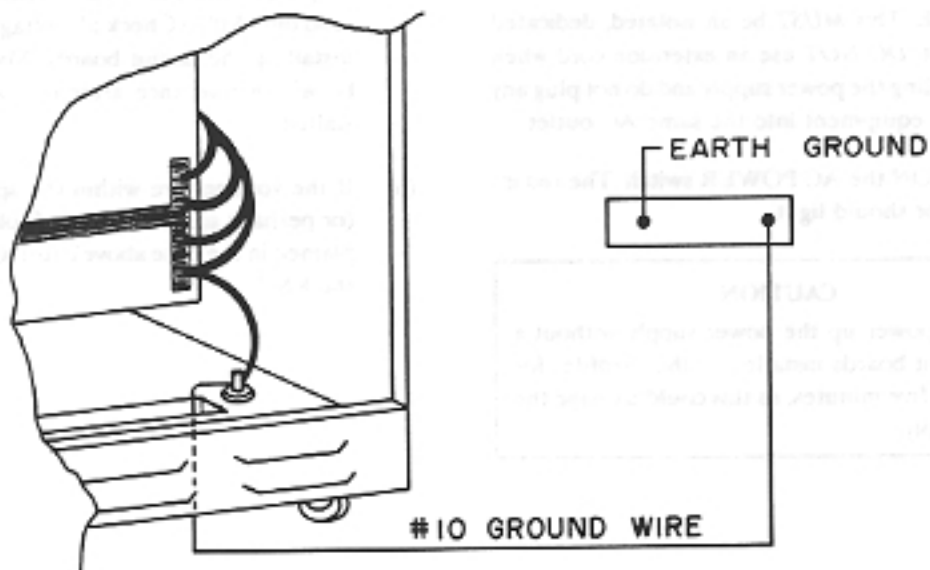
- Use a digital multimeter to measure the difference of potential between the KSU ground point and the power neutral, and between the KSU ground point and the third wire ground. If the voltage measurement exceeds 0.5V, noise may develop on the system. If this occurs, call an electrician.
- Use a Megger to test the ground point. (A Megger should be available through the local power company.) The reading should be 5 ohms or less.
- Unplug the AC power cord from the outlet and insert a ground isolation plug into the outlet. Plug the AC power cord into the ground isolation plug. If the problem ceases, call an electrician. When finished, remove the ground isolation plug to restore ground protection.

Voltage Surge/Spike Protection

6.10 To reduce the effects of AC voltage surges and spikes that can cause system malfunctions, false logic, and/or damage to the electronic components, Inter-Tel recommends the use of a surge/spike protector. Check the manufacturer's specifications to ensure that the device meets the following requirements:

- Clamp voltage transients at 300VDC within 5 nanoseconds when exposed to waveforms as described in ANSI/IEEE Standard C62.41-1980 (IEEE 587).
- Reduce RFI/EMI noise by at least 20dB at frequencies between 5kHz and 30MHz.

FIGURE 3-18. KSU GROUNDING



INSTALLATION

Power Supply Electrical Test

6.11 Before plugging in the AC power cord and turning on the system power, perform the following electrical check:

- (1) Ensure that the AC POWER and BATTERY BACKUP switches are off. Also, make sure no circuit boards are installed.
- (2) Check the value of the fuse(s). The AC line fuse should be 125 or 250VAC, 15A. The 690.0200 also has a battery fuse; it should be 250VAC, 4A, 3AG, fast-blow.
- (3) Plug the AC power cord into a 105-125VAC, 57-63Hz, 15A, single-phase commercial power source.

NOTE: This *MUST* be an isolated, dedicated circuit. *DO NOT* use an extension cord when installing the power supply and do not plug any other equipment into the same AC outlet.

- (4) Turn ON the AC POWER switch. The red indicator should light.

CAUTION

DO NOT power up the power supply without a load (circuit boards installed in the cardfile) for more than five minutes, as this could damage the power supply.

- (5) Referring to Figure 3-17 on page 3-33, measure the following voltages on the back of the cardfile backplane. A digital voltmeter of $\pm 0.5\%$ accuracy is required. If voltage measurements are not within the limits, *DO NOT PROCEED*; Contact Inter-Tel's Customer Support Department.

TEST POINTS	VOLTAGE
TP 1 to TP 5	+5.1 ± 0.1 VDC
TP 3 to TP 5	-12.0 ± 1.0 VDC
TP 4 to TP 2	+30.0 ± 6.0 VDC

NOTE: Without boards installed in the cardfile, the voltage measurements may be out of tolerance. (For example, on 690.0200 power supplies, the -12V measurement may read only 0.6V, and the +30V measurement may read only 5.0V.) Check all voltages again after installing the circuit boards. Voltages should be within tolerance after the boards are installed.

- (6) If the voltages are within the specified limits (or perhaps somewhat out of tolerance as explained in the note above), turn OFF power to the KSU.

D. CIRCUIT BOARD INSTALLATION

6.12 Each type of circuit board has a specific slot in the KSU cardfile. The labels on the front of the cardfile indicate the type of board and position. For example, the slot labeled COU 1 is for the first COU board.

6.13 Before installing the IOP and APP boards, install the eleven EPROMs (one on the IOP board, ten on the APP board) and the two PALs (both on the APP board) that contain the software, as described below.

CAUTION

The boards and components are static sensitive. Handle the boards by the edges only and keep replacement components in their protective case until they are to be installed. Do not bend or touch the pins of the components or subject them to a static charge. When working with the boards, use an anti-static wrist strap and cover the work surface with the anti-static bag that protected the board during shipping. Any static charge (no matter how small the charge) must be discharged from the body before touching the boards or components. *The warranty for this equipment does not cover damage caused by static or mishandling. Boards or components damaged in such a manner will not be replaced.*

- (1) Check the part numbers on the labels of the software components. They must all be the same number and should match the number of the software package the customer purchased. The available software packages and their part numbers are:
 - a. KF-rated, basic-software: 827.3040
 - b. KF-rated, extended-software: 827.3041
 - c. MF-rated, basic-software: 827.3042
 - d. MF-rated, extended-software: 827.3043
- (2) Check the socket numbers printed on the labels. There should be one of each of the following: U23, U37, U38, U51, U52, U53, U54, U55, U65, U66, U67, U68, and U69.

- (3) Carefully install EPROM U23 in socket U23 of the IOP board. The notch on the EPROM must match the notch of the outline that is silkscreened on the board.
- (4) Carefully install the remaining EPROMs and the two PALs in the corresponding sockets on the APP board (e.g., EPROM U51 in socket U51, etc.). The notches on the EPROMs and PALs must match the notches of the outlines that are silkscreened on the board.
- (5) Check that all components are seated securely in their sockets and that no pins are bent.

Input/Output Processor (IOP) Board

6.14 Install the IOP board (part no. 690.2100) as described below. Refer to Figure 3-19 on page 3-40 for a photograph.

- (1) Place the music-on-hold strap (J3) over the top two pins (labeled MUSIC) if connecting an external music source, over the second two pins (OFF) to turn the music off, or over the bottom two pins (CHIME) to select a doorbell-like chime.
- (2) Set the baud rate DIP switches on the front edge of the board. Switches 1 through 3 set the APP RS-232-C port baud rate; switch 4 sets the IOP port baud rate. The settings are as follows (1 = open or away from the board, 0 = closed):

	SWITCH			
	1	2	3	4
IOP:				
300 baud	-	-	-	0
1200 baud	-	-	-	1
APP:				
300 baud	0	0	1	-
1200 baud	0	1	1	-
4800 baud	1	0	0	-
9600 baud	1	1	0	-

- (3) Check all integrated circuits for proper seating in their sockets.
- (4) *Make sure the KSU power supply and batteries are turned off. Installing the IOP board with the power on can damage the processor.*

- (5) Install the IOP board with the components facing left in the IOP cardfile slot.

Application Processor (APP)

6.15 Install the APP board (part no. 690.2200) as described below. Refer to Figure 3-20 on page 3-41 for a photograph.

- (1) Place the database backup battery strap (J3) in the ON position (over pins 1 and 2). If the strap is in the OFF position (over pins 2 and 3), the BATT OFF LED lights when the board is installed and AC power is on.

NOTE: The BATT OFF LED will not light if the strap is missing.

- (2) If attaching an SMDR/SMDA output device or a programming terminal, refer to SPECIFICATIONS, page 2-17, for RS-232-C pin settings.
- (3) Check the integrated circuits for proper seating in their sockets.
- (4) Make sure the KSU power supply and batteries are turned off. Installing the APP board with the power on can damage the processor.
- (5) Install the APP board with the components facing left in the APP cardfile slot.
- (6) Turn on the KSU power supply and observe the LED indicators on the front edge of each board for the following indications. If they are incorrect, check the system voltages as outlined in step 7 and then contact Inter-Tel Customer Support.

APP LED INDICATORS		
POSITION	NAME	CORRECT INDICATION
Top	APP RUN	Lit
Second	FIFO	Off*
Bottom	BATT OFF	Off

- * The FIFO LED lights (flashes) only when the system is powered up or under extreme traffic conditions.

IOP LED INDICATORS		
POSITION	NAME	CORRECT INDICATION
Top	MAJOR ALARM	Off
Second	DATABASE ERR	Off**
Third	MINOR ALARM	Off**
Fourth	IOP RUN	Lit
Fifth	+ 30V	Lit
Sixth	+ 5V	Lit
Bottom	-12V	Lit

- ** When a new system is installed, the DATABASE ERR LED remains lit until the system database has been initialized or programmed. The MINOR ALARM LED may also be lit and can later be cleared from an attendant station using the Clear System Alarm feature code (default is 019).

- (7) Measure the four system voltages on the front edge of the IOP board. Insert the "common" voltmeter probe into the ground point and insert the other probe into the desired voltage test point. (Test points are shown in Figure 3-19 on page 3-40). If the voltages are within tolerance, proceed to step 8. If the voltages are out of tolerance:

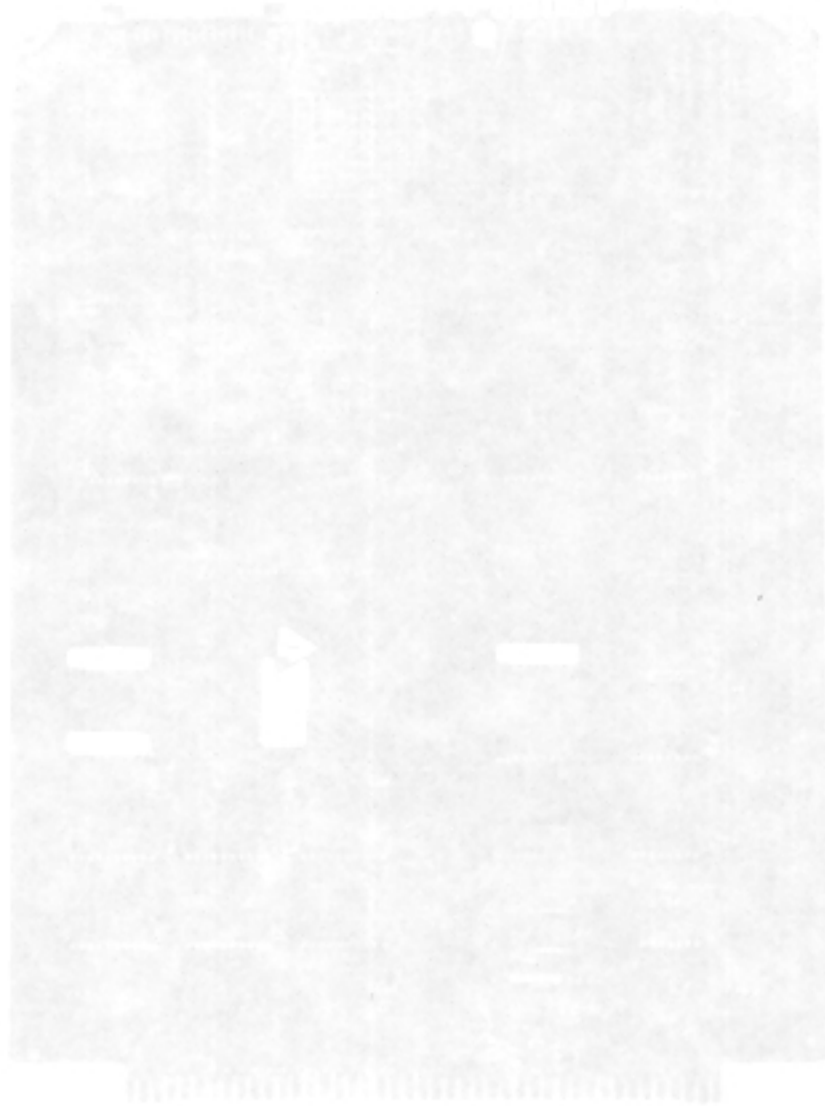
NOTE: On some IOP boards, the +30VDC measurement may read approximately 1.5V lower than the measurement on the cardfile.

- Turn off the AC power to the KSU.
 - Take out the boards and check for shorted components.
 - Replace the boards, turn on the power, and check the voltages again.
 - If still out of tolerance, turn off the power and contact Inter-Tel Customer Support for assistance.
- (8) Turn off AC power to the KSU.
- (9) Measure the battery voltage by inserting the voltmeter probes into the battery voltage test point on the APP board and the ground point on the IOP board. If the voltage is not greater than 2.5VDC, return the board to Inter-Tel for repair.

NOTE: The system AC power must be off when testing the battery voltage. If not, the measurement will read approximately +5VDC — the system voltage minus diode drop.

- (10) After the APP and IOP boards have been installed, optional equipment may be connected to the IOP board at any time.

- a. To install an external music source, see page 3-76.
- b. To install an SMDR/SMDA output device, see page 3-76.
- c. To install power failure transfer equipment, see page 3-77.



INSTALLATION

FIGURE 3-19. INPUT/OUTPUT PROCESSOR (IOP) BOARD

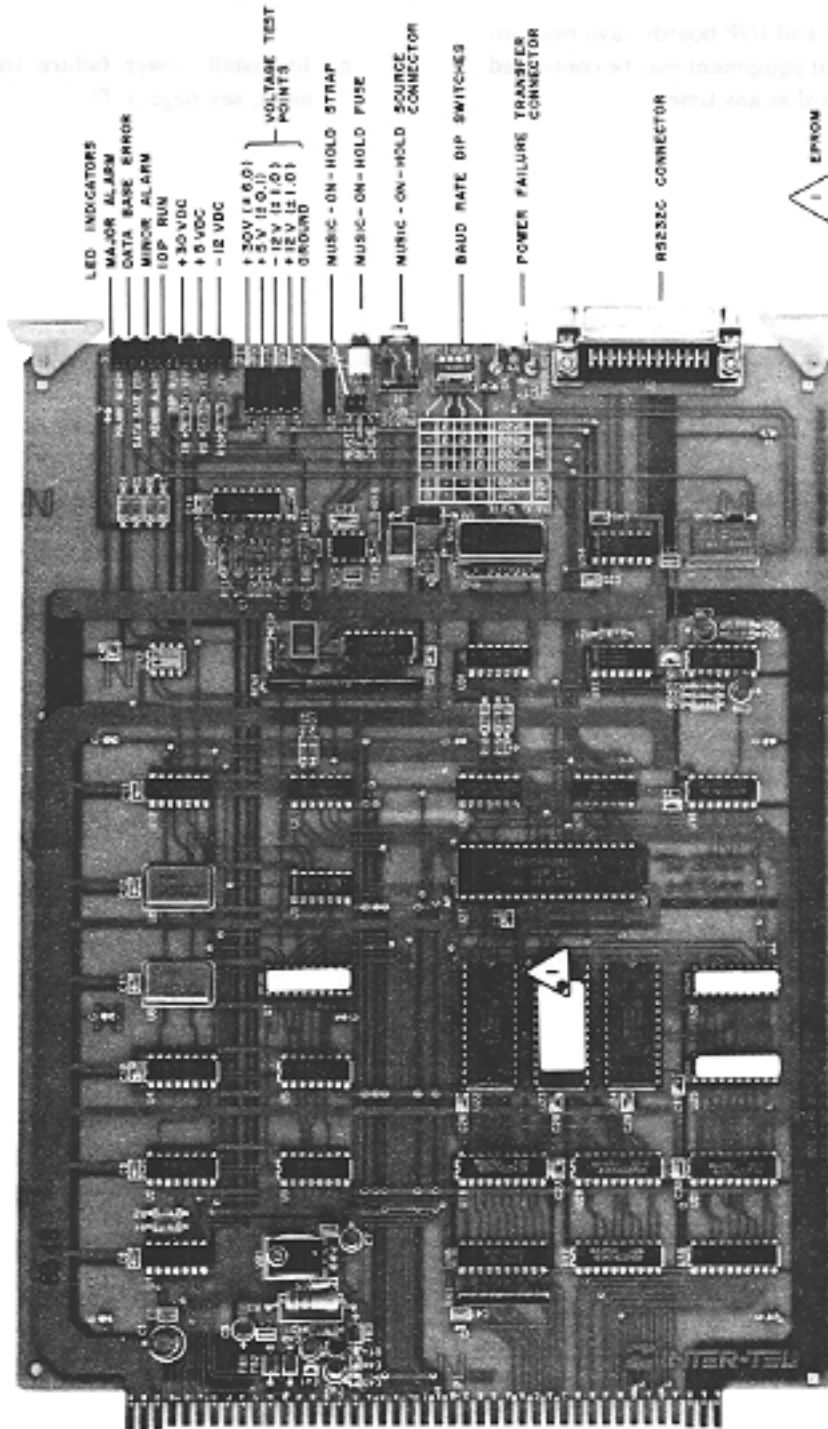
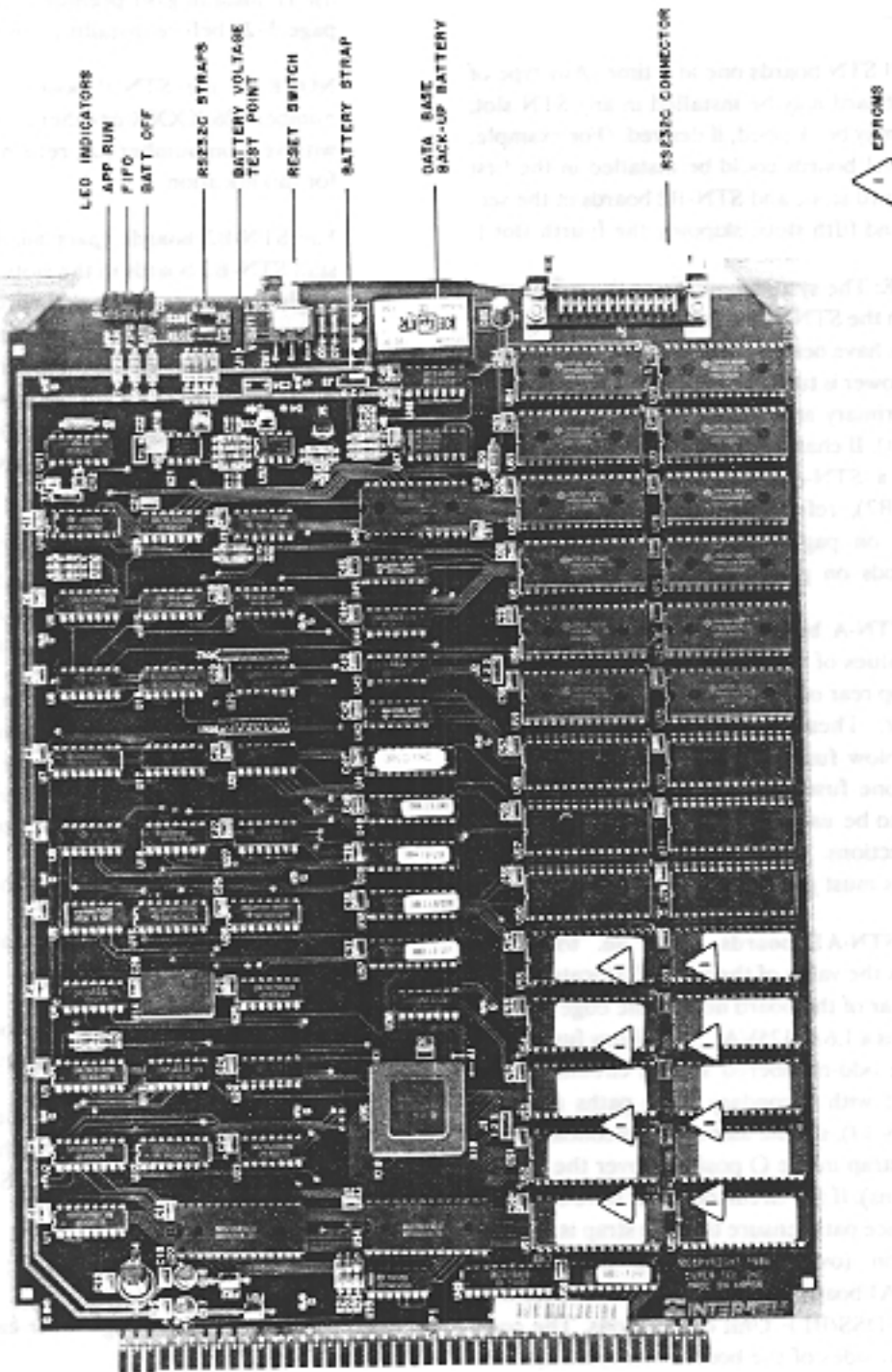


FIGURE 3-20. APPLICATION PROCESSOR (APP) BOARD



Station Boards (STN-A, STN-A1, STN-B, and STN-B2)

6.16 Install the STN boards as described below. Refer to Figures 3-21 to 3-24 on pages 3-43 to 3-46 for photographs.

- (1) Install STN boards one at a time. Any type of STN board may be installed in any STN slot; slots may be skipped, if desired. (For example, STN-A1 boards could be installed in the first and third slots, and STN-B2 boards in the second and fifth slots, skipping the fourth slot.)

NOTE: The system configures the software to match the STN boards when the station instruments have been connected to the STN boards and power is turned on. Circuit 1.1 is preset for the primary attendant (a STN-A or STN-A1 circuit). If changing board types (i.e., changing from a STN-A or STN-A1 to a STN-B or STN-B2), refer to the programming procedures on page 5-43 and to station cabling methods on page 3-6.

For STN-A boards (part no. 680.30): Check the values of the fuses (F1 and F2) located at the top rear of the board next to the edge connector. These are 1.6A or 2A, 125VAC, slow-blow fuses. (Some STN-A boards have only one fuse.) Install STN-A boards in the slots to be used for keyset or DSS/BLF Unit connections. The component sides of the boards must *face left*.

For STN-A1 boards (part no. 690.2500): Check the value of the fuse (F2) located at the top rear of the board next to the edge connector; it is a 1.6A, 125VAC, slow-blow fuse. If any of the odd-numbered station circuits are installed with secondary voice paths (refer to page 3-19), set the associated secondary voice path strap in the O position (over the bottom two pins). If the circuit does not have a secondary voice path, ensure that the strap is in the N position (over the top two pins). Install STN-A1 boards in the slots to be used for keyset or DSS/BLF Unit connections. The component sides of the boards must *face left*.

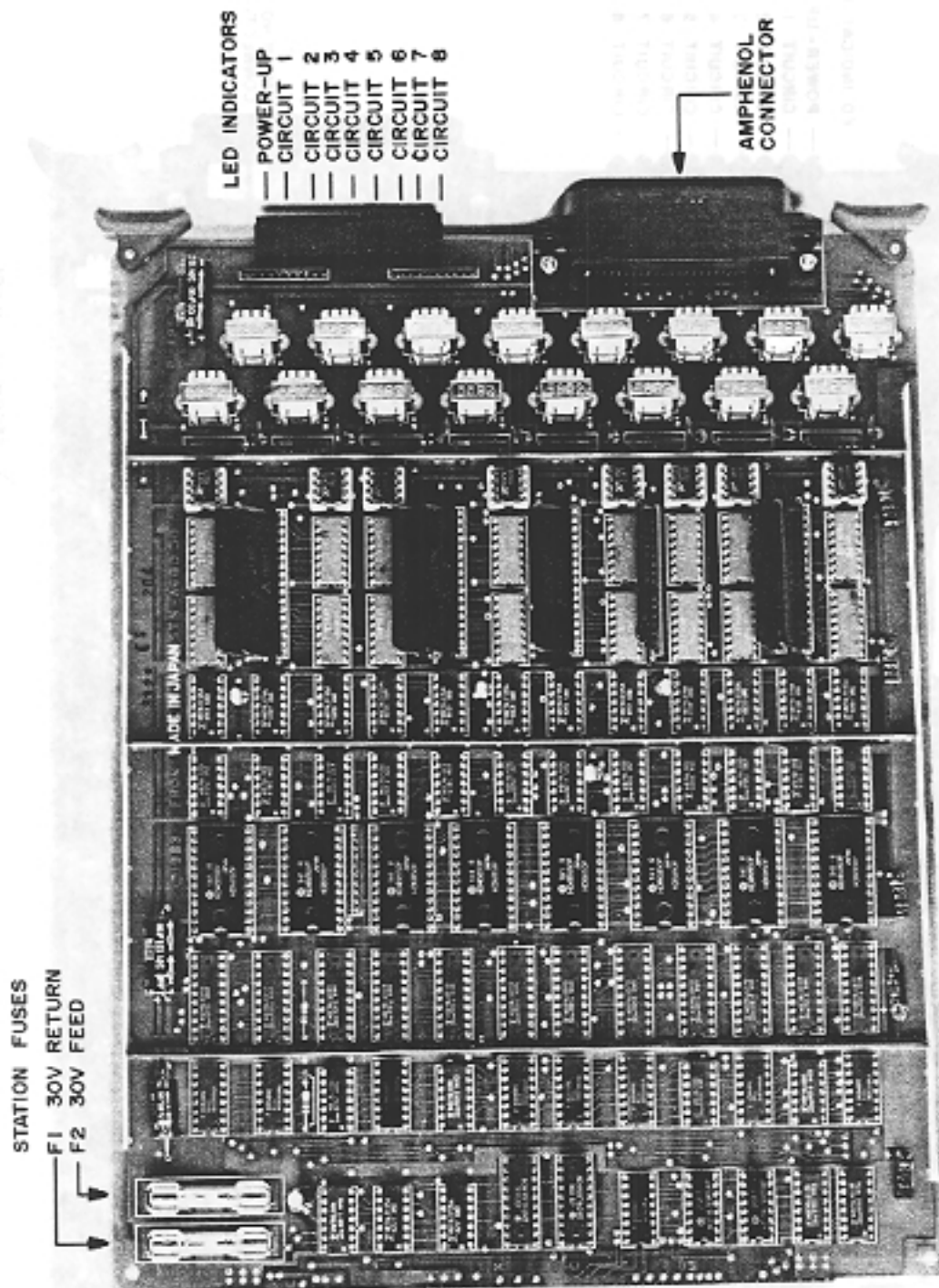
For STN-B boards (part no. 680.31): Install STN-B boards in the slots to be used for single-line set or playback device connections. The component sides of the boards must *face left*. (If installing off-premises stations, refer to page 3-23 before installing the boards.)

NOTE: If the STN-B board is not artwork number 826.XXXX or other artwork numbers with version number 2.6, return it to Inter-Tel for modification.

For STN-B2 boards (part no. 690.2600): Install STN-B2 boards in the slots to be used for single-line set or playback device connections. The component sides of the boards must *face left*. Be sure the AC/DC strap for each circuit is in the proper position for the type of station instrument being installed. (If installing off-premises stations, refer to page 3-23 before installing the boards.)

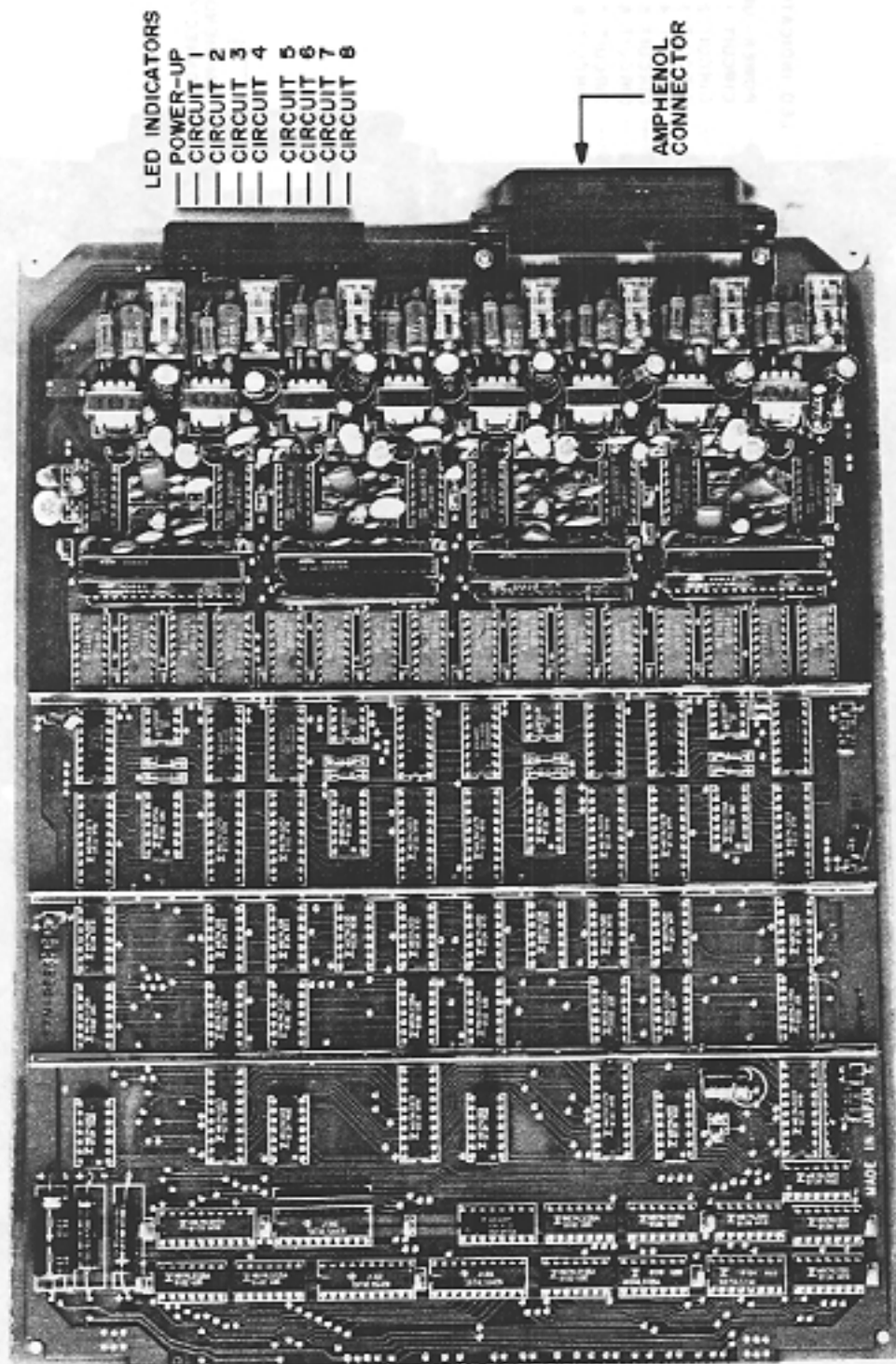
- (2) Turn on AC power to the KSU. The power-up (top) LED indicator on the board lights for one to two seconds and then goes out; if not, refer to TROUBLESHOOTING, page 6-2.
- (3) Measure the system voltages using the test points on the front edge of the IOP board (shown in Figure 3-19 on page 3-40). If the voltages are within tolerance, proceed to step 4. *If the voltages are out of tolerance:*
 - a. Turn off the AC power to the KSU.
 - b. Take out the STN board and check for shorted components.
 - c. Re-insert the board, turn on AC power, and check the voltages again.
 - d. If out of tolerance, try another board. If still out of tolerance with the new board, contact Inter-Tel Customer Support for assistance.
- (4) Turn off AC power to the KSU.
- (5) Repeat steps 1 through 4 for each additional STN board.

FIGURE 3-21. STATION-A (STN-A) BOARD



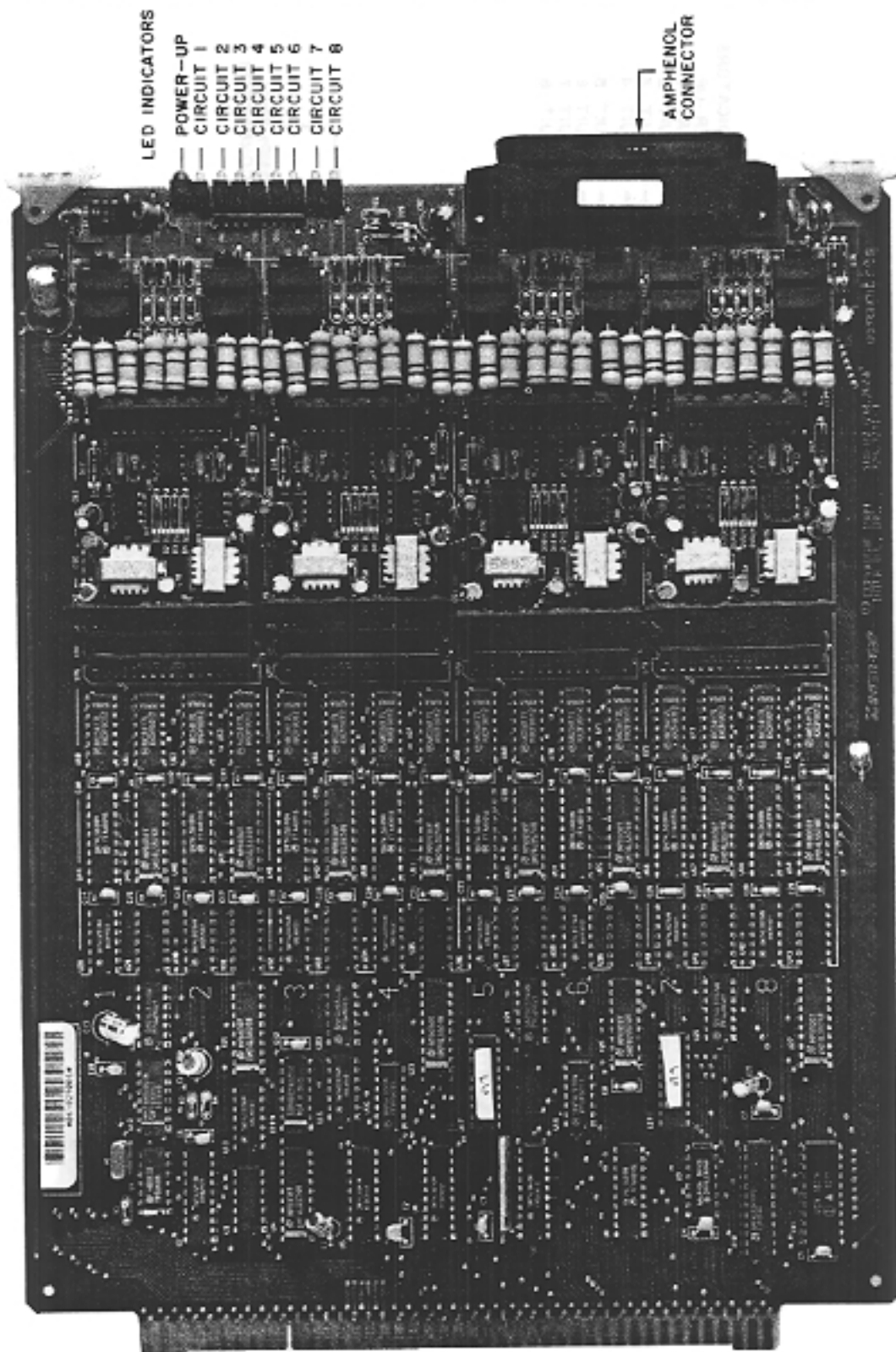
INSTALLATION

FIGURE 3-23. STATION-B (STN-B) BOARD



INSTALLATION

FIGURE 3-24. STATION-B2 (STN-B2) BOARD



Central Office Unit (COU) Board

6.17 Install the COU boards (part no. 680.20) as described below. Refer to Figure 3-25 on page 3-48 for a photograph of a COU board configured for DTMF signalling.

NOTE: The COU boards come configured for DTMF signalling. If desired, any or all lines can be converted to dial-pulse signalling using the Rotary Conversion Kit (part no. 828.1032). Installation instructions are included in the kit.

6.18 If DISA or automated attendant callers experience problems with the system recognizing DTMF tones, a modification may be made to any COU board circuit that is used for a DISA or automated attendant dial-in line. This modification, which lowers the receive level approximately 3dB to compensate for the DTMF tones being too loud, can only be made on a COU board with 2:4 wire hybrids.

NOTE: If the DISA or automated attendant line is removed, the modification must be removed from that circuit.

- (1) Determine the version of the hybrid. The part number on the hybrid should be one of the following: 5U24A49 followed by a date code and B or D that identifies the version, or KCR5094. If the board does not have one of these hybrids, obtain a new board.
- (2) For **5U24A49 version B:** Install a 47K-ohm, .25 watt resistor between hybrid pins 21 and 23 on the solder side of the board. (Pin 1 is the first pin in the lower left when looking at the printed side of the hybrid, identified by a box around the pin.)

For 5U24A49 version D: Install a .022uF, 50V (or greater), monolithic, ceramic capacitor between hybrid pins 20 and 21 on the solder side of the board.

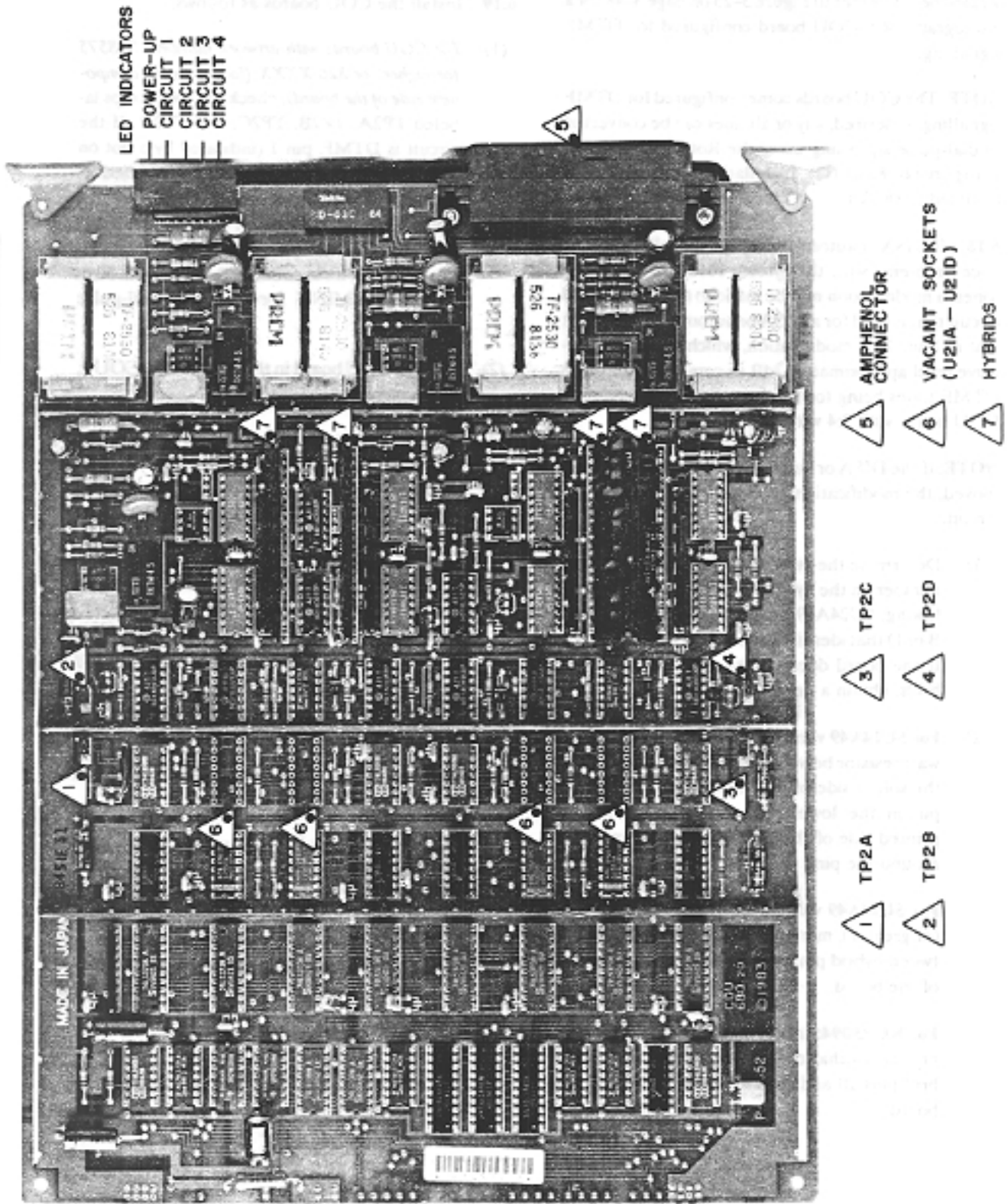
For KCR5094: Install a .022uF, 50V (or greater), monolithic, ceramic capacitor between hybrid pins 20 and 21 on the solder side of the board.

- (3) Place a label on the board that identifies the modified circuit.

6.19 Install the COU boards as follows:

- (1) For COU boards with artwork numbers P48575 (or higher) or 826.XXXX (found on the component side of the board), check the four straps labeled TP2A, TP2B, TP2C, and TP2D. If the circuit is DTMF, pin 1 (indicated by a dot on the board) and pin 2 should be connected. If the circuit is dial pulse, connect pins 1 and 2 for a 39% make/break ratio, or connect pins 2 and 3 for a 33% ratio. (In the U.S., a 39% make/break ratio is most common.) See page 5-30 in PROGRAMMING for specifying dial-pulse lines.
- (2) Insert a COU board in the slot labeled COU 1, with components facing left.
- (3) Turn on AC power to the KSU. The power-up (top) LED indicator on the board lights for one or two seconds and then goes out. If the LED does not perform as described, refer to TROUBLESHOOTING, page 6-2.
- (4) Measure the system voltages using the test points on the IOP board (shown in Figure 3-19 on page 3-40). If the voltages are within tolerance, proceed to step 5. *If the voltages are out of tolerance:*
 - a. Turn off the AC power to the KSU.
 - b. Take out the board and check for shorted components.
 - c. Re-insert the board, turn on AC power, and check the voltages again.
 - d. If out of tolerance, try another board. If still out of tolerance with the new board, contact Inter-Tel Customer Support for assistance.
- (5) Turn off AC power to the KSU.
- (6) Repeat steps 1 through 5 for each additional COU board.

FIGURE 3-25. CENTRAL OFFICE UNIT (COU) BOARD



Conference (CNF) Board

6.20 Install the CNF board as described below. Refer to Figure 3-26 on the next page for a photograph.

- (1) Install the CNF board (part no. 680.40) in the slot marked CNF, with components *facing left*.
- (2) Turn on AC power to the KSU. The power-up (top) LED indicator on the board lights for one to two seconds and then goes out. If the LED does not perform as described, refer to TROUBLESHOOTING, page 6-2.
- (3) Measure the system voltages using the test points on the front edge of the IOP board (shown in Figure 3-19 on page 3-40). If the

voltages are within tolerance, proceed to step 4. *If the voltages are out of tolerance:*

- a. Turn off the AC power to the KSU.
 - b. Take out the board and check for shorted components.
 - c. Re-insert the board, turn on AC power, and check the voltages again.
 - d. If out of tolerance, try another board. If still out of tolerance with the new board, contact Inter-Tel Customer Support for assistance.
- (4) Turn off AC power to the KSU.

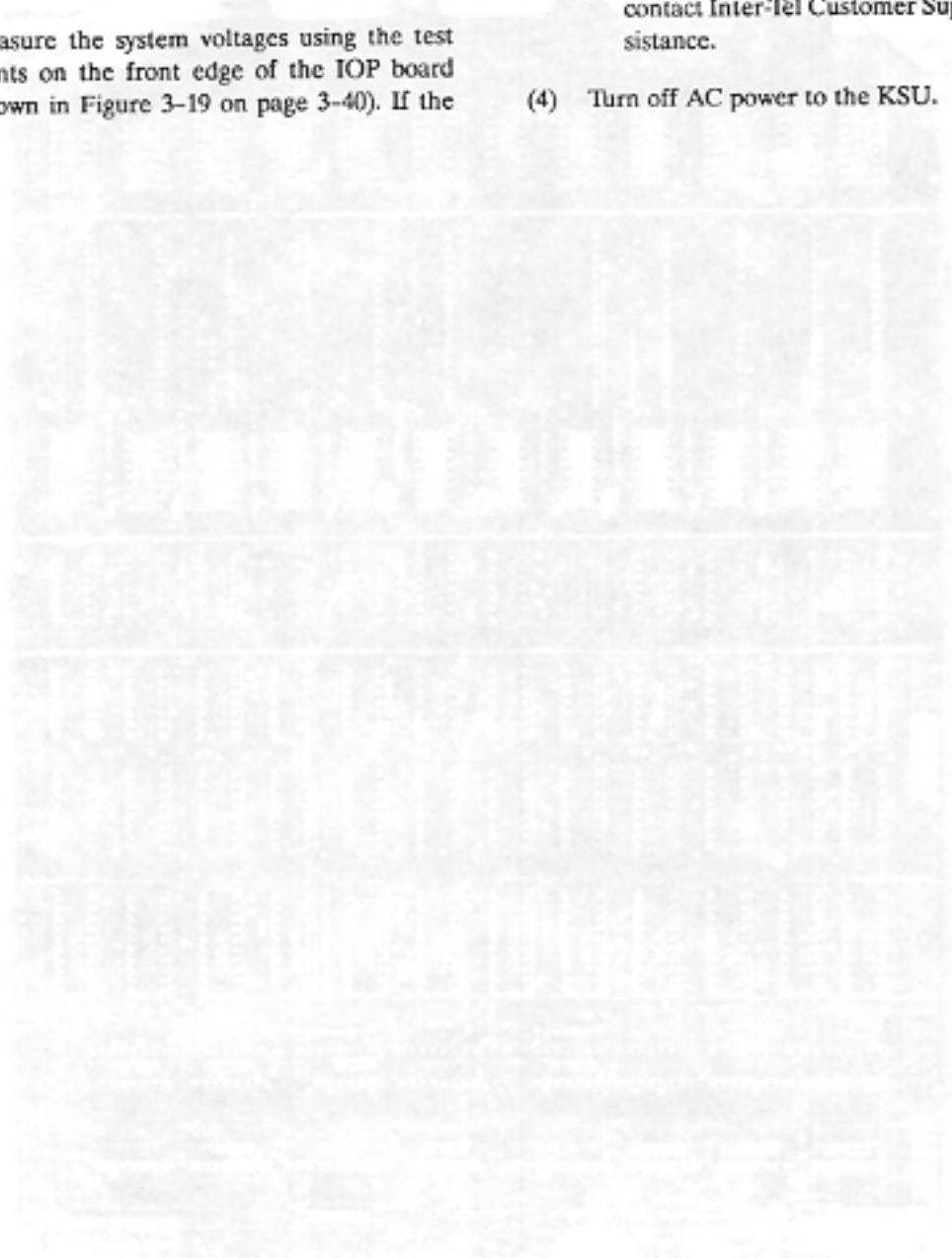
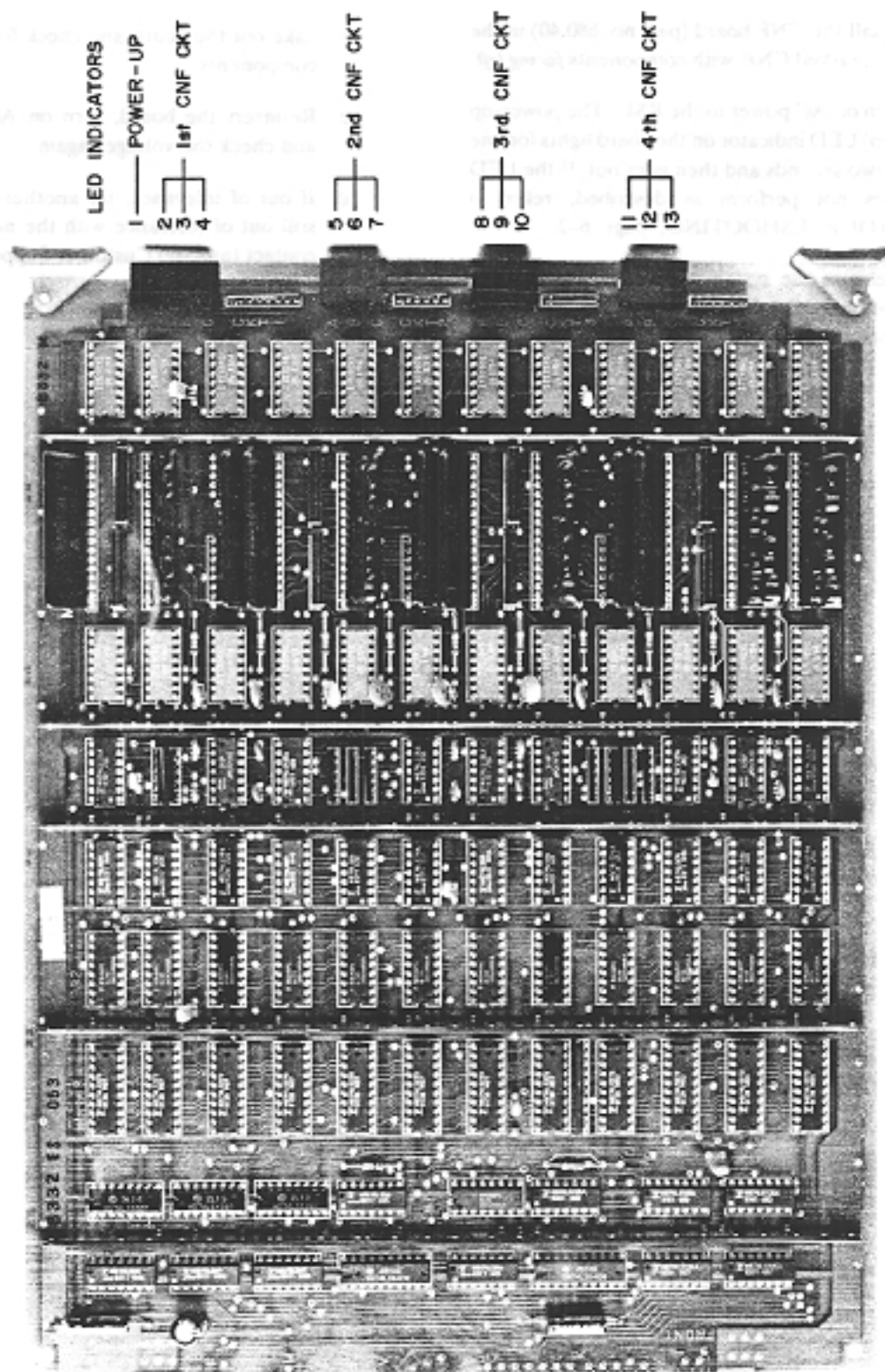


FIGURE 3-26. CONFERENCE (CNF) BOARD



Modem-III (MOD-III) or Modem-IV (MOD-IV) Board

6.21 Install the MOD-III or MOD-IV board as described below. Refer to Figure 3-27 on the next page for a photograph of the Modem board.

- (1) Install the MOD-III board (part no. 690.2300) or MOD-IV board (part no. 690.2800) in the slot labeled MISC, with components *facing left*.
- (2) Turn on AC power to the KSU. The power-up (top) LED indicator on the board lights for one to two seconds and then goes out. If the LED does not perform as described, refer to TROUBLESHOOTING, page 6-2.
- (3) Measure the system voltages using the test points on the front edge of the IOP board

(shown in Figure 3-19 on page 3-40). If the voltages are within tolerance, proceed to step 4. *If the voltages are out of tolerance:*

- a. Turn off the AC power to the KSU.
 - b. Take out the board and check for shorted components.
 - c. Re-insert the board, turn on AC power, and check the voltages again.
 - d. If out of tolerance, try another board. If still out of tolerance with the new board, contact Inter-Tel Customer Support for assistance.
- (4) Turn off AC power to the KSU.

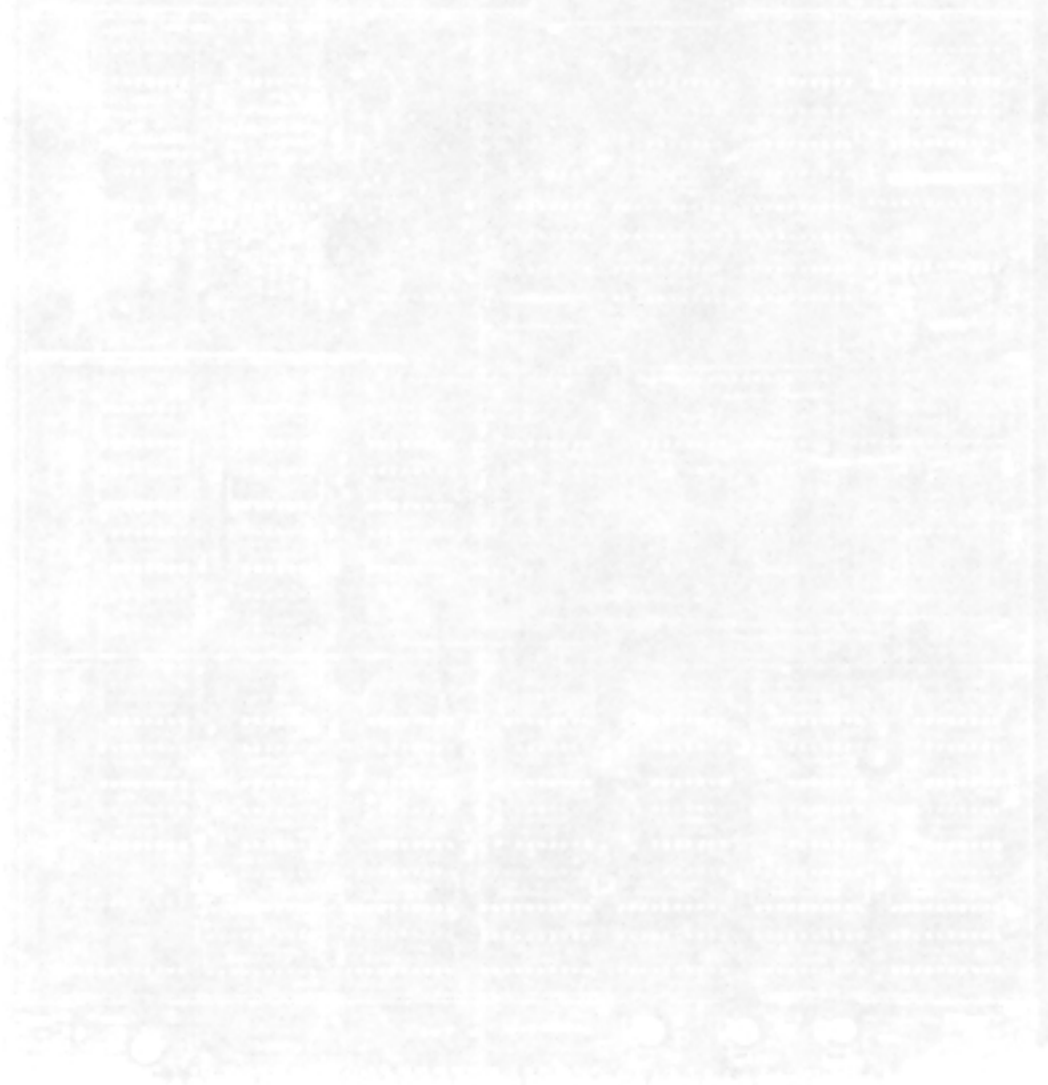
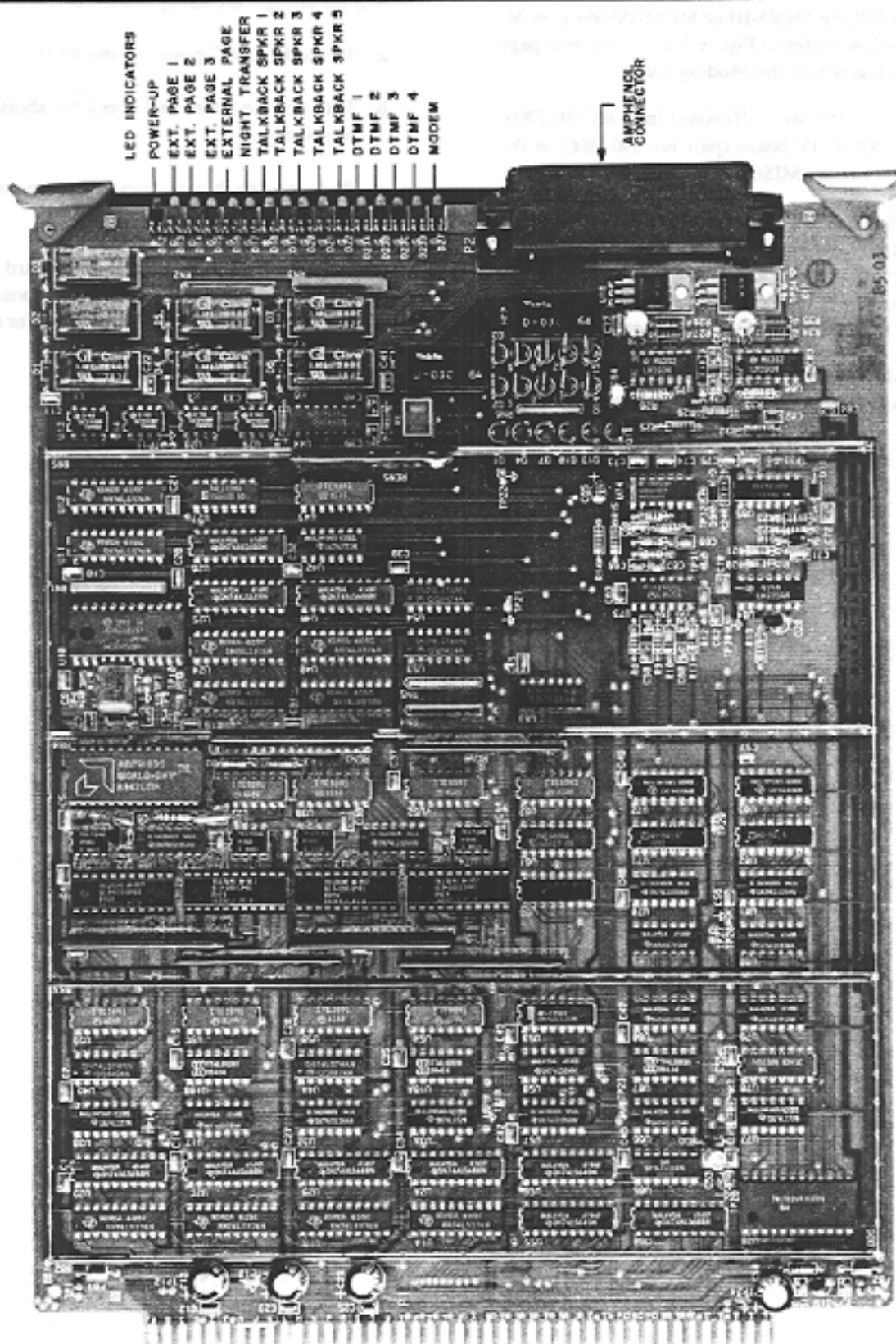


FIGURE 3-27. MODEM-III (MOD-III) OR MODEM-IV (MOD-IV) BOARD



E. CONNECTING CIRCUIT BOARD CABLES FROM MDF TO KSU

6.22 Connect the unattached ends of the termination cables to the circuit boards as described in the following steps. Each cable must have a female 50-pin amphenol-type connector attached.

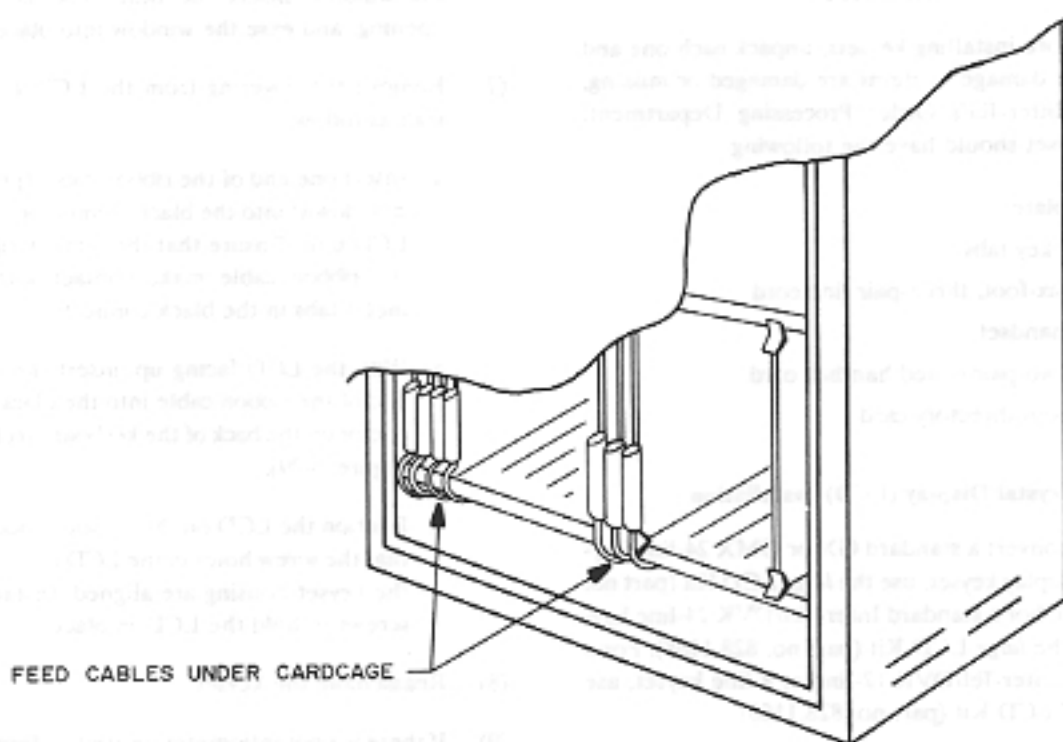
- (1) Make sure the KSU power supply and batteries are turned off.

- (2) Feed the cables through the access cutout on the bottom of the KSU cabinet, and then under the cardfile. Refer to Figure 3-28 below.

- (3) Connect each labeled female amphenol-type connector to the 50-pin male connector on the corresponding board.

- (4) Turn on AC power to the KSU.

FIGURE 3-28. CABINET CABLE FEED



7. STATION INSTALLATION

7.1 GX keysets and all types DSS/BLF Units (GX, GMX, and Inter-Tel/DVK) are connected to STN-A boards. GMX keysets, Inter-Tel/DVK keysets, and all types of DSS/BLF Units (GX, GMX, and Inter-Tel/DVK) are connected to STN-A1 boards. SLIs, single-line DTMF sets, and playback devices are connected to STN-B or STN-B2 boards

NOTE: At the date of this publication, Inter-Tel/DVK keysets and DSS/BLF Units were not yet available.

CAUTION

Connecting a station instrument to the wrong type of STN board can damage the instrument and the board.

A. KEYSET INSTALLATION

7.2 Before installing keysets, unpack each one and check for damage. If items are damaged or missing, contact Inter-Tel's Order Processing Department. Each keyset should have the following:

- Baseplate
- Extra key tabs
- One six-foot, three-pair line cord
- One handset
- One two-pair coiled handset cord
- Slide-out directory card

Liquid Crystal Display (LCD) Installation

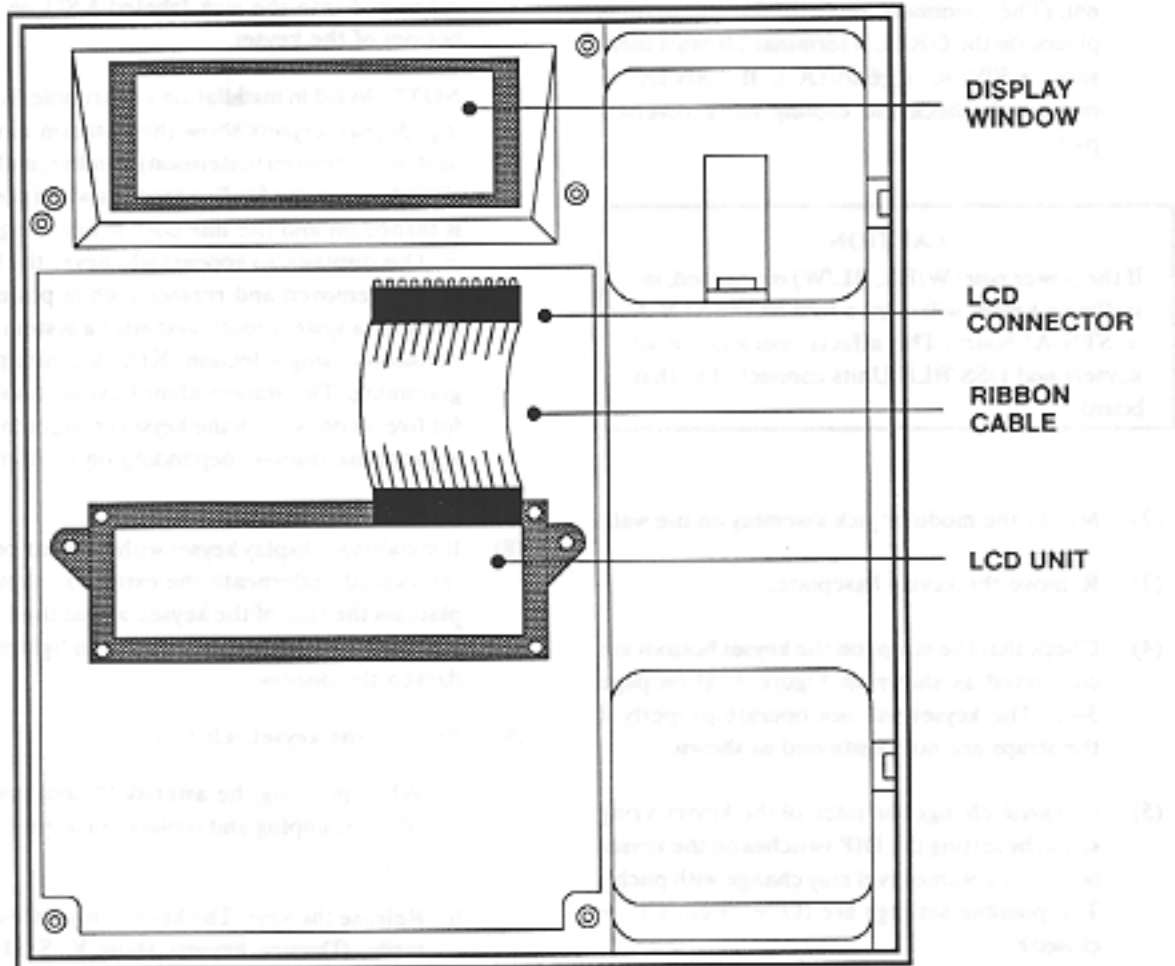
7.3 To convert a standard GX or GMX 24-line keyset to a display keyset, use the *large* LCD Kit (part no. 828.1052). For a standard Inter-Tel/DVK 24-line keyset, use the *large* LCD Kit (part no. 828.1168). For a standard Inter-Tel/DVK 12-line or 8-line keyset, use the *small* LCD Kit (part no. 828.1166).

7.4 Install the appropriate LCD Kit as follows:

- (1) Unpack the LCD Kit. There should be a clear plastic display window, an LCD unit, a ribbon cable, and two small Phillips-head screws.

- (2) Remove the keyset baseplate.
- (3) Remove the line cord and handset cord from the keyset. Then, loosen the four screws on the bottom of the keyset (enough so that the keyset can be opened).
- (4) Carefully open the keyset to expose the back of the keyboard that has the LCD connector. (Refer to Figure 3-29 on the next page.)
- (5) Remove the cover from the display opening in the top housing of the keyset by releasing the tabs from the inside of the housing and pushing out the cover.
- (6) From the front of the keyset, insert one end of the clear plastic window in the display opening, with the painted side of the dark edging facing the inside of the keyset. Then, slightly bend the window, insert the other end into the opening, and ease the window into place.
- (7) Remove the covering from the LCD and install as follows:
 - a. Insert one end of the ribbon cable (printed side down) into the black connector on the LCD unit. Ensure that the metal strips on the ribbon cable make contact with the metal tabs in the black connector.
 - b. With the LCD facing up, insert the other end of the ribbon cable into the black connector on the back of the keyboard (refer to Figure 3-29).
 - c. Position the LCD on the plastic window so that the screw holes in the LCD unit and in the keyset housing are aligned. Install the screws to hold the LCD in place.
- (8) Reassemble the keyset.
- (9) If there is a potentiometer located underneath the extension number plate on the face of the keyset (on some GX and GMX models), the LCD contrast can be adjusted after the keyset is installed. (Refer to the information beginning on page 3-56.)

FIGURE 3-29. KEYSSET LCD INSTALLATION



INSTALLATION

GX Keypad Installation

7.5 Install GX 24-line standard and display keysets as follows:

- (1) Before mounting the modular jack assembly and connecting the keyset, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a keyset will open a fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to that board.

- (2) Mount the modular jack assembly on the wall.
- (3) Remove the keyset baseplate.
- (4) Check that the straps on the keyset bottom are connected as shown in Figure 3-30 on page 3-58. The keyset will not operate properly if the straps are not positioned as shown.
- (5) *If desired*, change the pitch of the keyset's ring signal by setting the DIP switches on the keyset bottom. (Volume level may change with pitch.) The possible settings are (O = open, CL = closed):

RING PITCH	SWITCH POSITION			
	1	2	3	4
High 1	CL	O	O	O
2	O	CL	O	O
3	O	O	CL	O
Low 4	O	O	O	CL
Off	O	O	O	O

NOTE: Combine two settings (close two or more switches) for additional pitch settings, if desired. It is easiest to select the ring pitch af-

ter the keyset is installed and while the keyset is ringing.

- (6) Attach the coiled handset cord to the handset and to the handset jack on the left side of the keyset. Place the handset on hook.
- (7) Plug one end of the line cord into the wall-mounted modular jack assembly. Plug the other end into the jack labeled KSU on the bottom of the keyset.

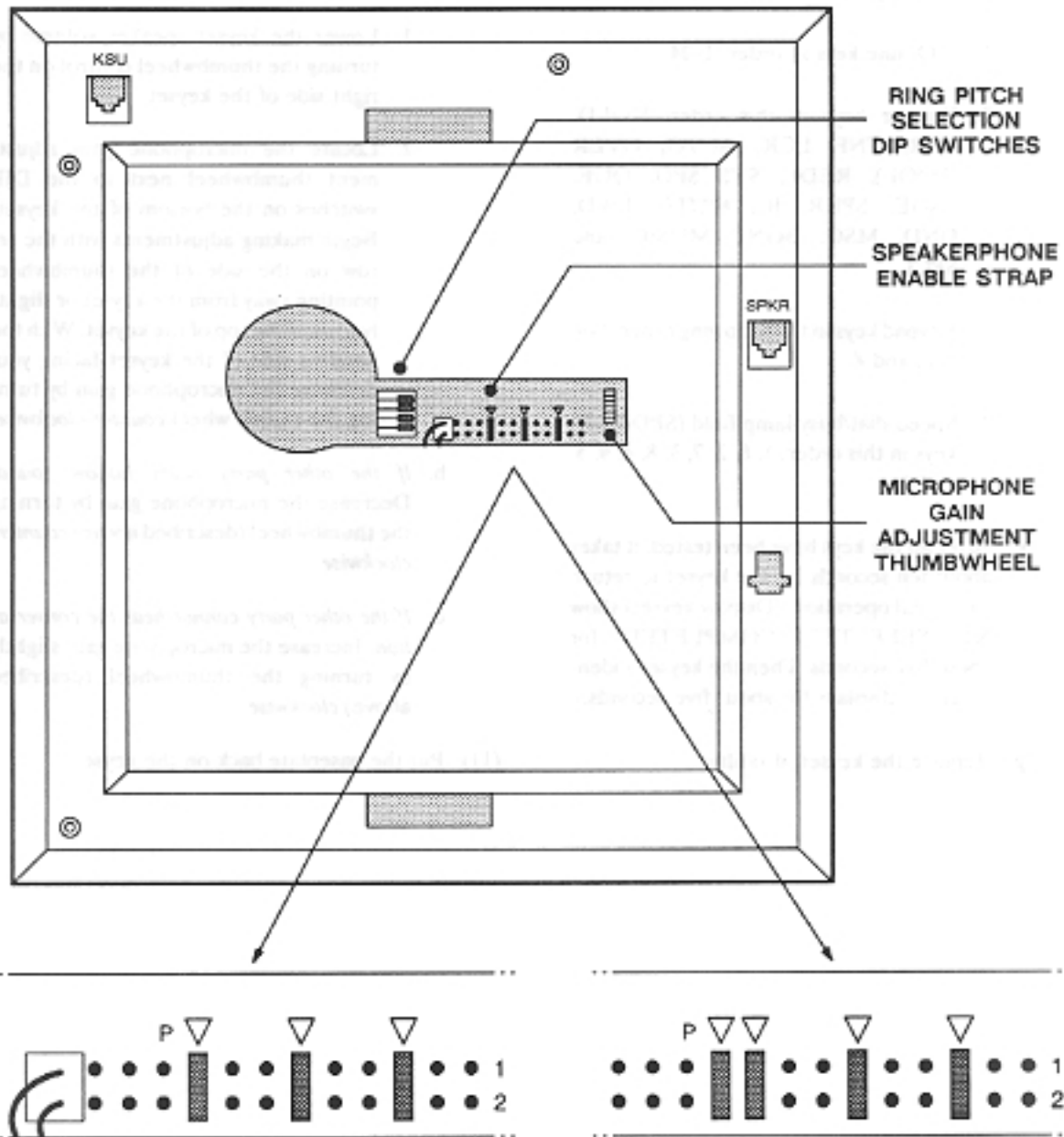
NOTE: To aid in installation and troubleshooting, display keysets show their station circuit number, intercom (extension) number, and assigned user name for five seconds when power is turned on and the line cord is first plugged in. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, and after a system initialization using selection [K] in database programming. The station identification displays for five seconds, then the keyset changes to the appropriate display, depending on its current status.

- (8) If installing a display keyset with a potentiometer located underneath the extension number plate on the face of the keyset, adjust the LCD contrast. Turn the potentiometer to lighten or darken the display.
- (9) Perform the keyset self-test:
 - a. While pressing the asterisk (*) and pound (#) keys, unplug and replace the keyset line cord.
 - b. Release the keys. The keyset rings momentarily. (Display keysets show KTS SELF TEST HOOK-SWITCH.)
 - c. Lift and replace the handset to test the hookswitch. The LED-equipped keys light and the keyset rings momentarily. (Display keysets show KTS SELF TEST LED MATRIX.) *If any of the LEDs do not light*, return the keyset to Inter-Tel for repair.
 - d. Lift and replace the handset. The keyset rings momentarily and all of the LEDs go out. (Display keysets show KTS SELF TEST KEY MATRIX.)

- e. Press keys in the following order. A progress tone is heard and the keyset rings momentarily if the key is functioning properly. *If the signals are not heard, the key was either pressed out of order or is faulty. Return the keyset to Inter-Tel for repair if any key is faulty.*
1. C.O. line keys in order: 1-24.
 2. Feature keys in this order: HOLD, XFR, CNF, LCR, AUTO, OVER (POOL), REDL, SYS SPD, QUE, PAGE, SPKR, IC, MUTE, FWD, DND, MSG, BGND MUSIC, and SPCL.
 3. Keypad keys in the following order: 1-9, *, 0, and #.
 4. Speed-dial/busy lamp field (SPD/BLF) keys in this order: 1, 6, 2, 7, 3, 8, 4, 9, 5, and 0.
- f. After all the keys have been tested, it takes about ten seconds for the keyset to return to normal operation. (Display keysets show KTS SELF TEST COMPLETED! for about five seconds. Then the keyset's identification displays for about five seconds.)
- g. Replace the keyset, if faulty.
- (10) Test the keyset internal speaker and handsfree microphone by receiving a handsfree intercom call. If problems such as feedback, hollow sound, or weak transmission develop, use the following methods to correct them.
- a. *If feedback occurs:*
 1. Lower the keyset speaker volume by turning the thumbwheel control on the right side of the keyset.
 2. Locate the microphone gain adjustment thumbwheel next to the DIP switches on the bottom of the keyset. Begin making adjustments with the arrow on the side of the thumbwheel pointing away from the keyset or slightly toward the top of the keyset. With the handset side of the keyset facing you, decrease the microphone gain by turning the thumb wheel *counter-clockwise*.
 - b. *If the other party hears hollow sound:* Decrease the microphone gain by turning the thumbwheel (described above) *counter-clockwise*.
 - c. *If the other party cannot hear the conversation:* Increase the microphone gain slightly by turning the thumbwheel (described above) *clockwise*.
- (11) Put the baseplate back on the keyset.

INSTALLATION

FIGURE 3-30. GX KEYSET BOTTOM



NOTE: There are two possible types of strap arrangements. Depending on the pin configuration of the keyset, use one of the strap settings shown above.

GMX Keypad Installation

7.6 Install GMX 24-line standard and display keysets and GMX 12-line (non-display) keysets as follows:

- (1) Before mounting the modular jack assembly and connecting the keypad, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a keypad will open a fuse on the SIN-A or SIN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to that board.

- (2) Mount the modular jack assembly on the wall.
- (3) Attach the coiled handset cord to the handset and to the handset jack on the right side on the bottom of the keypad. Place the handset on hook.
- (4) Plug one end of the line cord into the wall-mounted modular jack assembly. Plug the other end into the jack labeled KSU near the upper-left corner on the bottom of the keypad.

NOTE: To aid in installation and troubleshooting, display keysets show their station circuit number, intercom (extension) number, and assigned user name for five seconds when power is turned on and the line cord is first plugged in. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, and after a system initialization using selection [K] in database programming. The station identification displays for five seconds, then the keypad changes to the appropriate display, depending on its current status.

- (5) If installing a display keypad with a potentiometer located underneath the extension number

plate on the face of the keypad, adjust the LCD contrast. Turn the potentiometer to lighten or darken the display.

- (6) Perform the keypad self-test:
 - a. While pressing the asterisk (*) and pound (#) keys, unplug and replace the keypad line cord.
 - b. Release the keys. The keypad rings momentarily. (Display keysets show KTS SELF-TEST HOOKSWITCH.)
 - c. Lift and replace the handset to test the hookswitch. The LED-equipped keys light and the keypad rings momentarily. (Display keysets show KTS SELF-TEST LEDs.) If any of the LEDs do not light, return the keypad for repair.
 - d. Lift and replace the handset. The keypad rings momentarily and all of the LEDs go out. (Display keysets show KTS SELF-TEST KEYS.)
 - e. Press keys in the following order. A progress tone is heard and the keypad rings momentarily if the key is functioning properly. If the signals are not heard, the key was either pressed out of order or is faulty. Return the keypad for repair if any key is faulty.

24-Line Keypads:

1. The C.O. line keys in order: 1-24.
2. Feature keys in this order: HOLD, XFR, CNF, ANS, FLASH, DATA, REDL, SYS SPD, QUE, PAGE, SPKR, IC, MUTE, FWD, DND, MSG, BGND MUSIC, and SPCL.
3. Keypad keys in the following order: 1-9, *, 0, and #.
4. Speed-dial/busy lamp field (SPD/BLF) keys in this order: 1, 6, 2, 7, 3, 8, 4, 9, 5, and 0.

12-Line Keypads:

1. The speed-dial/busy lamp field (SPD/BLF) keys in order: 1-8.

2. C.O. line keys in order: 1-12.
 3. Feature keys in this order: CNF, SPKR, IC, OVER, HOLD, and XFR.
 4. Keypad keys in the following order: 1-9, *, 0, and #.
 5. Feature keys in this order: FWD, DND, MSG, and SPCL.
- f. After all the keys have been tested, it takes about ten seconds for the keyset to return to normal operation. (Display keysets show KTS SELF-TEST DONE for about five seconds. Then, the keyset's identification, as described in the NOTE to step 4, displays for about five seconds.)
- g. Replace the keyset if faulty.
- (7) The keyset ring tone can be changed by performing the steps described in the FEATURES section on page 4-30.

Inter-Tel/DVK Keypad Installation

7.7 Install Inter-Tel DVK 24-line, 12-line, and 8-line standard and display keysets as follows:

- (1) Before mounting the modular jack assembly and connecting the keyset, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a keyset will open a fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to that board.

- (2) Mount the modular jack assembly on the wall.
- (3) Remove the baseplate.

- (4) Attach the coiled handset cord to the handset and to the handset jack on the right side on the bottom of the keyset. Place the handset on hook.
- (5) Plug one end of the line cord into the wall-mounted modular jack assembly. Plug the other end into the jack labeled KSU near the upper-left corner on the bottom of the keyset.

NOTE: To aid in installation and troubleshooting, display keysets show their station circuit number, intercom (extension) number, and assigned user name for five seconds when power is turned on and the line cord is first plugged in. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, and after a system initialization using selection [K] in database programming. The station identification displays for five seconds, then the keyset changes to the appropriate display, depending on its current status.

- (6) Perform the keyset self-test:
 - a. While pressing the asterisk (*) and pound (#) keys, unplug and replace the keyset line cord.
 - b. Release the keys. The keyset rings momentarily. (Display keysets show a dark display — all pixels lit.)
 - c. Lift and replace the handset. The keyset rings momentarily. (Display keysets show a blank display — no pixels lit.)
 - d. Lift and replace the handset. The keyset rings momentarily and all LED-equipped keys light. (Display keysets show KTS SELF-TEST LED MATRIX.) If any of the LEDs do not light, return the keyset for repair.
 - e. Lift and replace the handset. The keyset rings momentarily and all of the LEDs go out. (Display keysets show KTS SELF-TEST KEY MATRIX.)
 - f. One at a time, press each of the keys on the keyset in any order. A progress tone (or a

DTMF tone for keypad keys) is heard if the key is functioning properly. If the signals are not heard, the key is faulty. Return the keyset for repair if any key is faulty.

- g. Lift and replace the handset. The audio integrated module tones are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM TONES.)
- h. Lift and replace the handset. Audio integrated module tones of various volume levels, from softest to loudest, are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM TONE VOLUME.)
- i. Lift and replace the handset. Tones of various volume levels, from softest to loudest, are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM SPK VOLUME.)
- j. Lift the handset, then press and release the hookswitch. Tones of various volume levels, from softest to loudest, are broadcast over the handset receiver. (Display keysets show KTS SELF-TEST AIM HS VOLUME.)
- k. Press and release the hookswitch. A continuous tone is broadcast over the handset receiver using the primary voice path. (Display keysets show KTS SELF-TEST AIM XMT/RCV PRL)
- l. Press and release the hookswitch. A continuous tone is broadcast over the handset receiver using the secondary voice path. (Display keysets show KTS SELF-TEST AIM XMT/RCV SEC.)

NOTE: If the associated STN-A1 circuit is not equipped with a secondary voice path, no tone will be heard; continue with the next step.

- m. Press and release the hookswitch. The handset transmitter is connected to the

handset receiver via the primary voice path. (Display keysets show KTS SELF-TEST HOT HANDSET PRI.)

- n. While speaking into the handset transmitter, determine that sidetone is being received over the handset receiver.
- o. Press and release the hookswitch. The handset transmitter is connected to the handset receiver via the secondary voice path. (Display keysets show KTS SELF-TEST HOT HANDSET SEC.)

NOTE: If the associated STN-A1 circuit is not equipped with a secondary voice path, proceed to step q.

- p. While speaking into the handset transmitter, determine that sidetone is being received over the handset receiver.
- q. Press and release the hookswitch. The speakerphone microphone is connected to the handset receiver. (Display keysets show KTS SELF-TEST SPKRPHONE MIC.)
- r. While speaking into the speakerphone microphone (or rubbing a finger over the opening to the microphone), determine that the sound is being broadcast over the handset receiver.
- s. Place the handset back on hook. The keyset rings momentarily. It then takes about ten seconds for the keyset to return to normal operation. (Display keysets show KTS SELF-TEST COMPLETED for about five seconds. Then, the keyset's identification, as described in the NOTE to step 5, displays for about five seconds.)

- t. Replace the keyset if faulty.

(7) Replace the baseplate.

(8) The keyset ring tone can be changed by performing the steps described in the FEATURES section on page 4-30.

Wall Mounting Keysets

7.8 To mount the keyset on a wall:

- (1) Remove the keyset baseplate.
- (2) Reverse the baseplate so that the mounting holes are at the top and position the plate in the desired location on the wall.
- (3) Mark the location of the keyset mounting holes on the wall. Set the baseplate aside.
- (4) Drive a screw into the center of each mounting hole marking. Allow the head of the screw to protrude approximately $\frac{1}{4}$ inch.
- (5) Replace the baseplate on the keyset with the mounting holes at the top.
- (6) Position the mounting holes of the baseplate over the screws and slide the keyset into position on the wall.

Optional Headsets

7.9 Refer to SPECIFICATIONS, page 2-12, for headset requirements. To attach a headset to a keyset:

- (1) Remove the coiled handset cord from the handset jack on the base of the keyset. Leave the handset on hook.
- (2) Insert the headset modular plug into the jack. Plug in the headset power source, if used.
- (3) If the headset has an on/off switch, turn on the headset.
- (4) On the keyset, press the SPCL key and enter the headset enable feature code (default value is 315).
- (5) *To disable the headset*, press SPCL and enter the headset disable feature code (default value is 316). Then unplug the headset and reconnect the handset.

Optional Handset Amplifiers

7.10 Users may wish to have a handset amplifier installed. Inter-Tel recommends the Walker Modular

Handset Amplifier or other similar amplifiers. Typically, the amplifier is an external unit that is placed between the keyset and the handset (refer to page 2-12 for specifications).

7.11 To install such an amplifier:

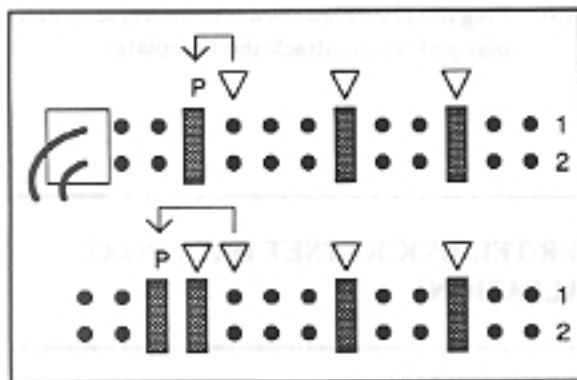
- (1) Unplug the coiled handset cord from the keyset.
- (2) Plug the coiled handset cord into the amplifier jack labeled HANDSET.
- (3) Plug the amplifier line cord (coming from the jack labeled TELEPHONE) into the keyset handset jack.
- (4) Plug the amplifier power supply cord into an AC outlet.
- (5) Turn on the amplifier.
- (6) The handset volume can be increased or decreased, using the thumbwheel located on the amplifier. Verify that the amplifier is functioning correctly by placing a call and adjusting the volume from low to high.

Optional GX Speakerphone Modules or External Desk Speakers

7.12 For handsfree operation on outside calls, GX keysets can be equipped with optional Speakerphone Modules (part no. 828.1077) or external 8-ohm desk speakers (refer to page 2-12 for specifications). To install a Speakerphone Module, refer to the instructions included with the kit.

7.13 To install an external desk speaker on a GX keyset, follow these steps:

- (1) Remove the baseplate and disconnect the keyset line cord.
- (2) Remove the modular shorting plug from the SPKR jack on the base of the keyset.
- (3) Connect the modular plug on the end of the external speaker cord to the SPKR jack on the base of the keyset.
- (4) Move the speakerphone enable strap to the pins labeled P as shown on the next page.



NOTE: There are two possible types of strap arrangements. Depending on the pin configuration of the keyset, use one of the strap settings shown above.

- (5) Replace the baseplate and reconnect the keyset line cord. Then, test the speaker as described in step 10 on page 3-56.

Optional GMX and Inter-Tel/DVK Data Port Modules

7.14 GMX 24-line keysets and Inter-Tel/DVK keysets may be equipped with optional Data Port Modules (part no. 828.1094). The Data Port Module contains a four-conductor modular jack that can be used to connect *either* a data device (such as a personal computer with a direct-connect modem) *or* an LRA and an external signalling device (such as a loud bell, horn, flashing light, etc.) to the keyset.

7.15 Install the Data Port Module as outlined below. For a diagram, see Figure 3-31 on page 3-64.

- (1) Remove the keyset baseplate.
- (2) Unplug the line cord from its modular jack.
- (3) Remove the 10-pin shorting plug located on the keyset control board.

NOTE: On GMX 24-line keysets, the back cover of the keyset does not need to be removed in order to reach the shorting plug.

- (4) Save the shorting plug by taping it to the bottom cover of the keyset or to the inside of the baseplate. The plug must be replaced if the Data Port Module is later removed.

- (5) Align the Data Port Module over the appropriate screw holes (see Figure 3-31) on the back cover of the keyset and insert the screws (do not over tighten).
- (6) Plug the Data Port Module cable into the pins on the keyset control board where the shorting plug was previously located. Make sure the cable connector is securely seated.
- (7) Place straps SP1, SP2, SP3, and SP4 on the Data Port Module in the appropriate positions. Depending on how the Data Port Module will be used, refer to one of the three possible settings outlined in Figure 3-31.
- (8) *If connecting a modem-equipped data device, refer to paragraphs 7.16 through 7.18.*

If connecting a loud ringing adapter and an external signalling device, refer to paragraphs 7.19 through 7.21.

7.16 To Connect A Modem-Equipped Data Device:

The optional Data Port Module can be used to connect a data device (such as a personal computer) equipped with a direct-connection modem to a GMX 24-line keyset or an Inter-Tel/DVK keyset. The data device can be used with the keyset to communicate with remote data equipment over C.O. lines or intercom channels. The data device's modem must be externally powered (or capable of operating on 20mA of loop current) and have an RJ11 C.O. line interface.

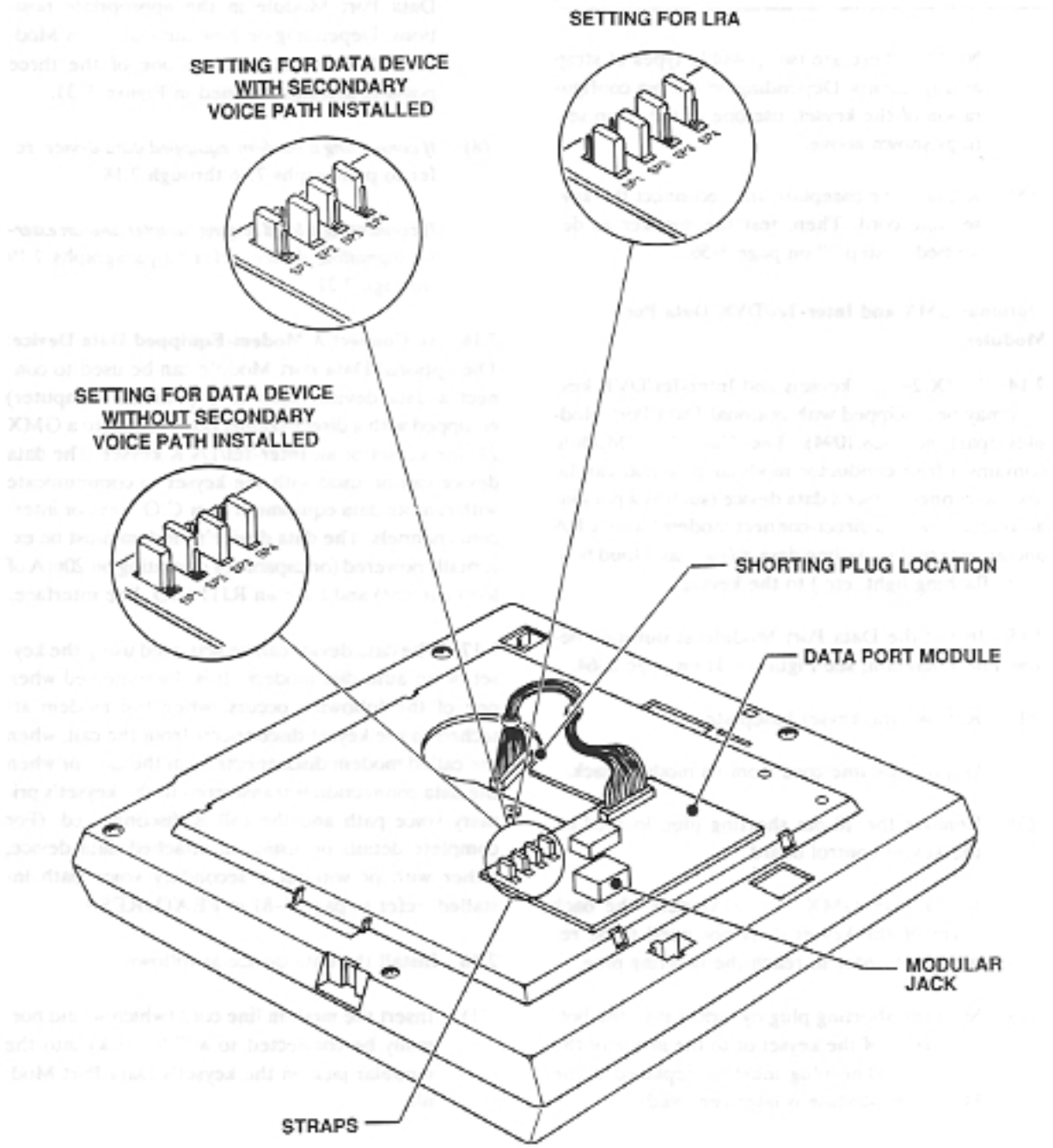
7.17 The data device can be activated using the keyset or an auto-dial modem. It is disconnected when one of the following occurs: when the modem attached to the keyset disconnects from the call, when the called modem disconnects from the call, or when the data connection is transferred to the keyset's primary voice path and the call is disconnected. (For complete details on using an attached data device, either with or without a secondary voice path installed, refer to page 4-81 in FEATURES.)

7.18 Install the data device as follows:

- (1) Insert the modem line cord (which would normally be connected to a C.O. jack) into the modular jack on the keyset's Data Port Module.

- (2) Ensure that the straps on the Data Port Module are set to the proper *data device* positions (either *with* a secondary voice path or *without* a secondary voice path). See Figure 3-31 below.
- (3) Plug the keyset line cord into the keyset's modular jack and reattach the baseplate.

FIGURE 3-31. GMX 24-LINE AND INTER-TEL/DVK KEYSET DATA PORT MODULE INSTALLATION



7.19 To Connect A Loud Ringing Adapter (LRA): The optional Data Port Module can be used to connect external signalling equipment such as loud bells, horns, flashing lights, etc. to a GMX 24-line or Inter-Tel/DVK keyset. This application is useful in areas where the normal ring tone of the keyset cannot be heard, such as warehouses and loading docks. The signalling device follows the normal ringing patterns of the keyset.

NOTE: Since handsfree intercom calls may be difficult to hear in noisy areas, keysets with LRAs installed should be programmed for handsfree disable so that users are alerted to incoming intercom calls by continuous double ring tones. (Refer to FEATURES, page 4-43.)

7.20 An electromechanical LRA device is placed between the keyset Data Port Module and the external signalling equipment to provide the necessary interface relay. Refer to page 2-12 for LRA device specifications and recommendations. A diagram of a typical set-up is shown in Figure 3-32 below.

7.21 Install the LRA as follows:

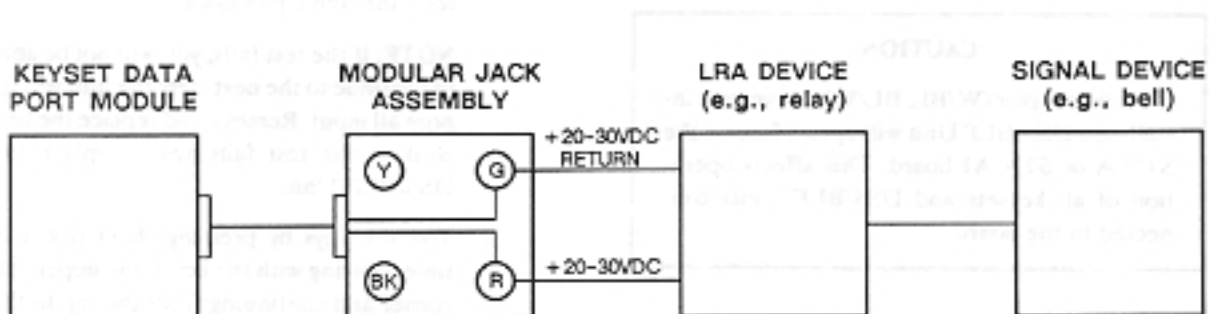
- (1) Using 24AWG wire, connect the LRA device input (coil circuit) to the RED and GREEN

wires on a modular jack assembly. Some devices require that polarity be observed between the LRA input and the modular jack.

NOTE: In order for the LRA device to operate properly, the maximum resistance from the modular jack to the LRA should be kept under 100 ohms.

- (2) Attach a mod-to-mod line cord to the modular jack assembly and to the modular jack on the keyset's Data Port Module.
- (3) Ensure that the straps on the Data Port Module are set in the proper LRA positions. Refer to Figure 3-31 on the previous page.
- (4) Connect the LRA device output (contacts) to the signalling device according to the manufacturer's instructions. Use the appropriate gauge wire for handling the current/voltage rating of the signalling device.
- (5) Plug the keyset line cord into the modular jack on the back of the keyset and reattach the baseplate.

FIGURE 3-32. GMX 24-LINE AND INTER-TEL/DVK KEYSET LRA SET-UP



NOTE: Each time the keyset rings, the Data Port Module provides 20-26mA of loop current to the LRA. This causes the LRA contacts to close and activates the signalling device. The LRA is not affected by the ring tone or the ringer volume of the keyset. The LRA must be capable of operating on 20mA current (approximately 20VDC).

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT INSTALLATION

7.22 Up to five DSS/BLF Units can be installed on the system. They require three-pair cabling and are attached to STN-A or STN-A1 circuits (up to a maximum of five circuits). Each STN-A or STN-A1 board can support one tandem unit or up to two single units. The units are assigned in database programming to be used by designated keysets. Each single unit has 60 keys for direct access to 60 intercom numbers. Two GX or two Inter-Tel/DVK units can be connected to create a tandem unit that has access to 120 numbers. Or, two single units can be assigned to one keyset, if necessary.

7.23 Unpack and inspect the DSS/BLF Units before installing them. Each DSS/BLF Unit is shipped with a 7-foot line cord. GX units also have a 2-foot cord for connecting tandem units.

GX DSS/BLF Unit Installation

7.24 To install GX DSS/BLF Units, follow these steps:

- (1) Before connecting the DSS/BLF Unit to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a DSS/BLF Unit will open a fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to the board.

- (2) Mount the modular jack assembly on the wall.
- (3) Remove the baseplate on the DSS/BLF Unit and locate the four DIP switches on the bottom of each unit (see Figure 3-33 on page 3-68.)

NOTE: On most GX DSS/BLF Units, the DIP switches can be reached through the cutout in the bottom cover (as shown in the figure). With other units, the four screws on the bottom must be removed and the bottom cover must be opened to access the switches.

- (4) If the unit will be using the programmed key arrangement for DSS/BLF 1, set DIP switch 2 in the open position, labeled DSS1. If the unit will be using the programmed key arrangement for DSS/BLF 2, set DIP switch 2 in the closed position, labeled DSS2. (Switch 1 will be used in step 5. Switches 3 and 4 are not used.) Refer to Figure 3-33 on page 3-68.

NOTE: Tandem units should have one unit set for DSS1 and one unit set for DSS2. If tandem units have the same DIP switch settings, there will be erroneous indications on the DSS/BLF Units and the keyset, and there may be errors throughout the system.

- (5) Perform the GX DSS/BLF Unit self-test:

NOTE: Tandem units are tested separately before they are connected together.

- a. Set DIP switch 1 to the closed position, labeled TEST. (If the bottom cover was previously opened, reassemble the unit without replacing the screws.)
- b. Plug one end of the line cord into the modular jack assembly and plug the other end into the KSU jack on the bottom of the DSS/BLF Unit. The system automatically tests the unit's processor.

NOTE: If the test fails, you will not be able to continue to the next step; the unit will ignore all input. Remove and replace the line cord. If the test fails again, replace the DSS/BLF Unit.

- c. Test the keys by pressing them one at a time, starting with the key in the upper-left corner and continuing from the top to the bottom of each column. As each key is pressed, the LED lights and remains lit. If an LED does not light, either the key was pressed out of order, the key is faulty, or the LED is faulty; the DSS/BLF Unit must be replaced.

- d. Return DIP switch 1 to the open position, labeled RUN.
 - e. Reassemble the DSS/BLF Unit.
 - f. To test the second unit (if used), unplug the first unit and repeat this test procedure for the second unit.
- (3) Perform the GMX DSS/BLF Unit self-test:
 - a. Remove the baseplate on the DSS/BLF Unit and locate the four DIP switches on the bottom of each unit (see Figure 3-33 on page 3-68.)

NOTE: On most GMX DSS/BLF Units, the DIP switches can be reached through the cutout in the bottom cover (as shown in the figure). With other units, the four screws on the bottom must be removed and the bottom cover must be opened to access the switches.

7.25 To connect two GX DSS/BLF Units together to create one tandem unit:

- (1) Insert one end of the 2-foot cord into the DSS jack on the base of DSS/BLF Unit 1.
- (2) Insert the other end of the 2-foot cord into the KSU jack on the base of DSS/BLF Unit 2. (The DSS jack on DSS/BLF Unit 2 will not be used.)
- (3) Insert one end of the 7-foot line cord into the KSU jack on the base of DSS/BLF Unit 1.
- (4) Insert the other end of the 7-foot line cord into the wall-mounted modular jack assembly.

- b. Set DIP switch 1 to the closed position, labeled TEST. (If the bottom cover was previously opened, reassemble the unit without replacing the screws.)
- c. Plug one end of the line cord into the modular jack assembly and plug the other end into the KSU jack on the bottom of the DSS/BLF Unit. The system automatically tests the unit's processor.

NOTE: If the test fails, you will not be able to continue to the next step; the unit will ignore all input. Remove and replace the line cord. If the test fails again, replace the DSS/BLF Unit.

GMX DSS/BLF Unit Installation

7.26 To install GMX DSS/BLF Units, follow these steps:

- (1) Before connecting the DSS/BLF Unit to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

- d. Test the keys by pressing them one at a time, starting with the key in the upper-left corner and continuing from the top to the bottom of each column. As each key is pressed, the LED lights and remains lit. If an LED does not light, either the key was pressed out of order, the key is faulty, or the LED is faulty; the DSS/BLF Unit must be replaced.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a DSS/BLF Unit will open a fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to the board.

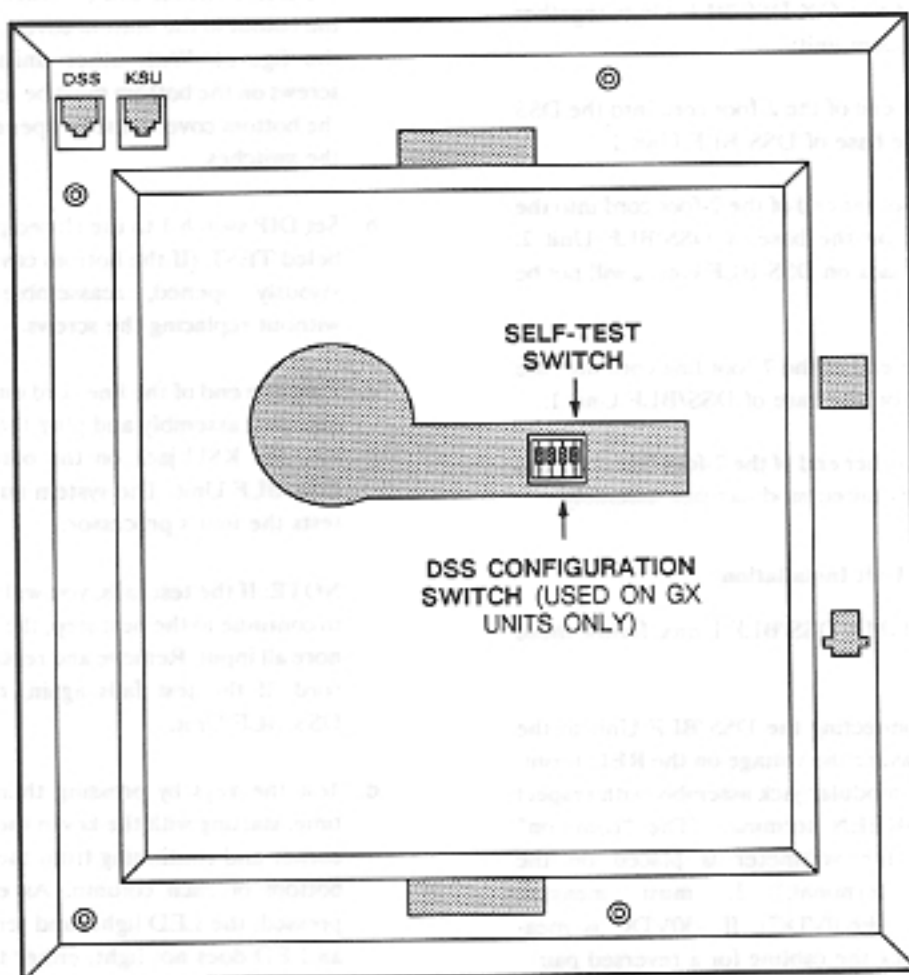
- e. Return DIP switch 1 to the open position, labeled RUN.

NOTE: The other three DIP switches (2-4) are not used.

- (2) Mount the modular jack assembly on the wall.

- f. Reassemble the DSS/BLF Unit and replace the screws.

FIGURE 3-33. GX/GMX DSS/BLF UNIT BOTTOM



NOTE: On most GX and GMX DSS/BLF Units, the DIP switches can be reached through the cutout in the bottom cover (as shown above). With other units, the four screws on the bottom must be removed and the bottom cover must be opened to access the switches.

Inter-Tel/DVK DSS/BLF Unit Installation

7.27 To install Inter-Tel/DVK DSS/BLF Units, follow these steps:

- (1) *If installing a tandem unit, connect a second modular jack assembly in parallel with the existing modular jack assembly. One jack will be used for the first DSS/BLF Unit, while the other jack will be used for the second DSS/BLF Unit.*
- (2) Before connecting the DSS/BLF Unit to the KSU, measure the voltage on the RED terminal of the appropriate modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (± 6.0 VDC). If -30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a DSS/BLF Unit will open a fuse on the STN-A or STN-A1 board. This affects operation of all keysets and DSS/BLF Units connected to the board.

- (3) Mount the appropriate modular jack assembly on the wall.
- (4) Remove the four screws on the bottom of the DSS/BLF Unit and remove the bottom cover.
- (5) Locate the strap (J2) in the lower-right corner of the control board (see Figure 3-34 on page 3-70).

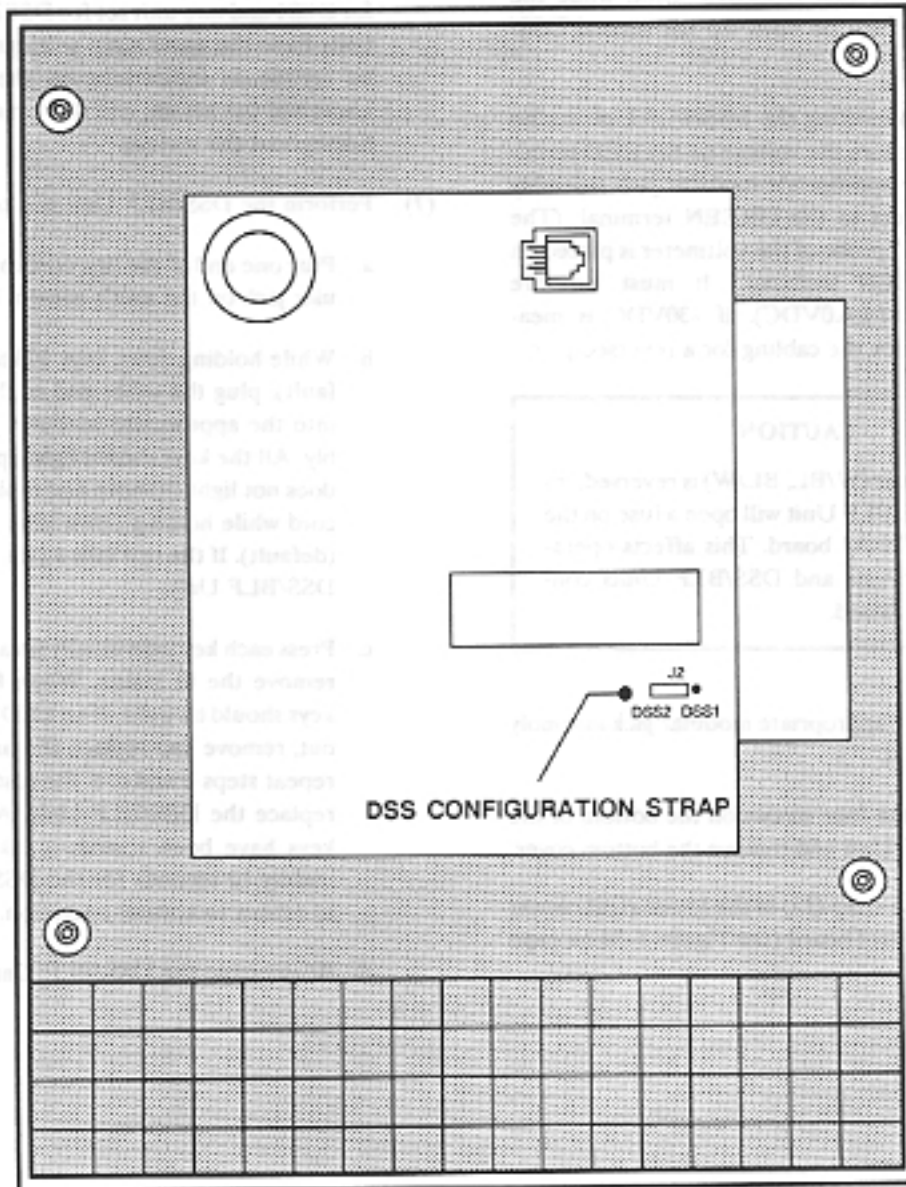
- (6) *If the unit will be using the programmed key arrangement for DSS/BLF 1, place the strap in the DSS1 position (over the right two pins). If the unit will be using the programmed key arrangement for DSS/BLF 2, place the strap in the DSS2 position (over the left two pins).*

NOTE: Tandem units should have one unit set for DSS1 and one unit set for DSS2. If tandem units have the same strap settings, there will be erroneous indications on the DSS/BLF Units and the keyset, and there may be errors throughout the system.

- (7) Perform the DSS/BLF Unit self-test:
 - a. Plug one end of the line cord into the modular jack on the unit's control board.
 - b. While holding down keys 100 and 110 (default), plug the other end of the line cord into the appropriate modular jack assembly. All the keys should light up. If an LED does not light, remove and replace the line cord while holding down keys 100 and 110 (default). If the test fails again, replace the DSS/BLF Unit.
 - c. Press each key individually (in any order) to remove the lit status. When finished, all keys should be unlit. If an LED does not go out, remove and replace the line cord and repeat steps b and c. If the test fails again, replace the DSS/BLF Unit. After all the keys have been tested, it takes approximately 10 seconds for the DSS/BLF Unit to return to normal operation.
 - d. Reassemble the DSS/BLF Unit.



FIGURE 3-34. INTER-TEL/DVK DSS/BLF UNIT CONTROL BOARD



**C. SINGLE-LINE SET AND PLAYBACK
DEVICE INSTALLATION**

Single-Line Sets

7.28 Two types of single-line sets can be used on the GX system. They are connected to STN-B or STN-B2 boards.

7.29 Inter-Tel Single-Line Instruments (SLIs): An internal strap can be moved to set the ringer for AC or DC. For STN-B boards, the ringer must be set to DC; for STN-B2 boards, the ringer may be set to either AC or DC to match the setting on the board. Be sure the strap is set correctly for the installation; incorrect installation will cause damage to the SLI. Refer to Figure 3-36 on page 3-73 for strap settings.

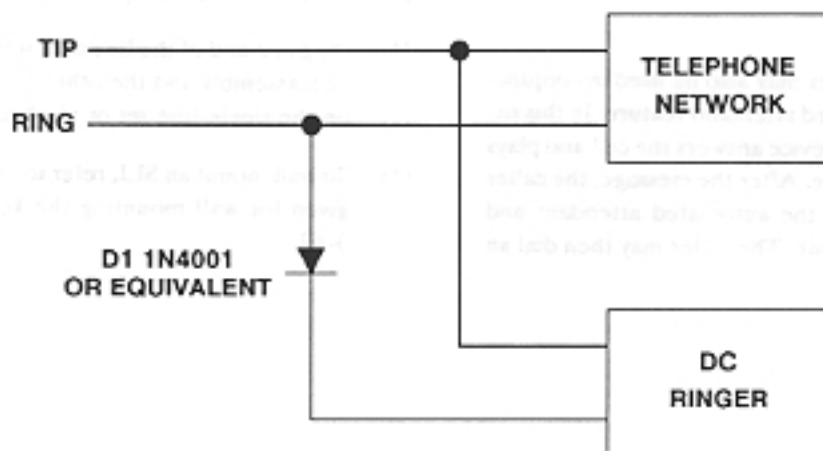
7.30 Industry-standard single-line DTMF sets: If single-line DTMF sets are used as off-premises stations, they must be equipped with AC ringers and connected through an external HVRA Unit. When used on premises, single-line DTMF sets may have

AC or DC ringers. They may have AC ringers if connected directly to STN-B2 boards through an HVRA (onboard or external), or if connected to STN-B boards through an external HVRA Unit. If connected to STN-B or STN-B2 boards without any type of HVRA, they must have DC ringers installed as follows:

- (1) Disassemble the single-line DTMF set and disconnect the AC ringer. Tape and store the unused leads.
- (2) Install a 24VDC ringer by connecting one lead to the set's tip side. Connect the other lead to the set's ring side, using a 1N4001 (or equivalent) diode as shown in Figure 3-35 below. A suitable ringer is a low-pitch DC ringer that operates from 15-36VDC (available at most electronic supply outlets). The PBX-2L manufactured by Floyd Bell Inc. is one example.
- (3) Reassemble the set.

INSTALLATION

FIGURE 3-35. DC RINGER CONNECTION TO SINGLE-LINE SET



Playback Devices

7.31 Playback devices, such as the Inter-Tel Digital Attendant (part no. 828.1150), can be used in place of single-line sets on STN-B and STN-B2 circuits. These devices answer an incoming call, play a recorded message, and automatically disconnect from the call. They are installed like single-line sets, using the same cabling and modular jack assemblies. Refer to SPECIFICATIONS, page 2-15, for additional information.

7.32 If the playback device responds to AC ring signals, it can be connected directly to a STN-B2 board that is strapped for AC ringing, or to a STN-B board if connected through an HVRA Unit. If the playback device responds to DC ringing, it may be connected directly to a STN-B board, or directly to a STN-B2 board that is strapped for DC ringing. A playback device uses the intercom number that is associated with its STN circuit.

7.33 Playback devices are especially useful in hunt groups to speed call processing. Hunt groups can have two types of special stations: announcement stations and overflow stations. Either type of station can be equipped with a station instrument that operates as a regular station or with a playback device that answers the call, then disconnects to transfer the call back to the hunt group. Refer to FEATURES, page 4-15, for more information.

7.34 Playback devices may also be used in conjunction with the automated attendant feature. In this situation, the playback device answers the call and plays a prerecorded message. After the message, the caller is disconnected from the automated attendant and hears intercom dial tone. The caller may then dial an

intercom number or a hunt group pilot number. Refer to FEATURES, page 4-12, for more information.

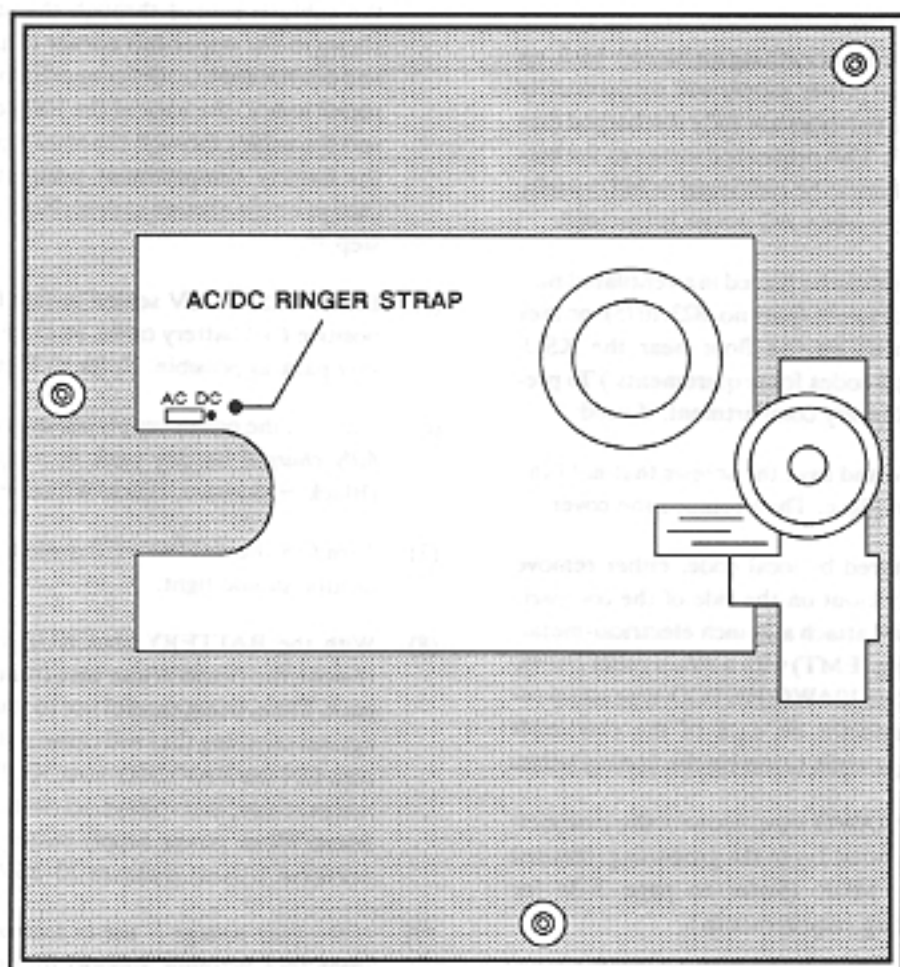
Single-Line Set and Playback Device Installation

7.35 Inspect the SLIs before installing them. If any parts are damaged, contact Inter-Tel's Order Processing Department.

7.36 To install a single-line set (SLI or single-line DTMF set) or a playback device:

- (1) *If installing an SLI:*
 - a. Remove the baseplate and open the phone to expose the control board.
 - b. Place the AC/DC strap in the desired position. Refer to Figure 3-36 on the next page.
 - c. Re-assemble the phone.
- (2) Before connecting the single-line set or playback device to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure $-30\text{VDC} \pm 6\text{VDC}$. If $+30\text{VDC}$ is measured, check the cabling for a reversed pair.
- (3) Mount the modular jack assembly on the wall.
- (4) Plug one end of the line cord into the modular jack assembly and the other end into the jack on the single-line set or playback device.
- (5) To wall mount an SLI, refer to the instructions given for wall mounting the keysets on page 3-62.

FIGURE 3-36. SINGLE-LINE INSTRUMENT (SLI) CONTROL BOARD



8. SYSTEM BATTERY BACK-UP INSTALLATION

8.1 To install optional system battery back-up (using customer-provided batteries) on the 690.0200 power supply, follow the instructions below. To install a UPS or SPS unit on the 690.0100 power supply, follow the instructions provided with the UPS/SPS unit. For detailed battery information, refer to SPECIFICATIONS, page 2-17.

8.2 When the system is running on battery back-up power, the 690.0200 power supply will automatically turn off before the batteries are fully discharged (approximately 26.5V). This prevents damage to the batteries and allows them to be recharged to full capacity by the power supply when AC power is restored.

- (1) The batteries can be placed in a ventilated Battery Compartment (part no. 823.1075), or they can be placed on the floor near the KSU. (Check local codes for requirements.) To prepare each battery compartment, if used:
 - a. Remove and save the screws that hold the cover in place. Then remove the cover.
 - b. As required by local code, either remove the knock-out on the side of the compartment and attach a 1/2-inch electrical-metallic tubing (EMT) with a strain relief clamp, or use one 10AWG HEYCO-type strain relief connector on each of the two small openings when inserting the battery wires.
 - c. Using 10AWG wire, connect the compartment ground lug to the grounding terminal on the MDF. (Refer to page 3-34 for grounding requirements.)
 - d. Place the batteries in the compartment(s).
- (2) Using 10AWG wire, connect the selected batteries in series. All connecting wires must be the same length to ensure stable float voltage. *Batteries connected in series must be fully charged and of the same ampere-hour (AH) rating and age.* Refer to Figure 3-37 on the next page for a wiring diagram.

NOTE: If desired, connect two strings in parallel. This increases the AH rating and length-

ens the discharge rates. The voltage level remains the same. Connect the batteries as shown in Figure 3-37.

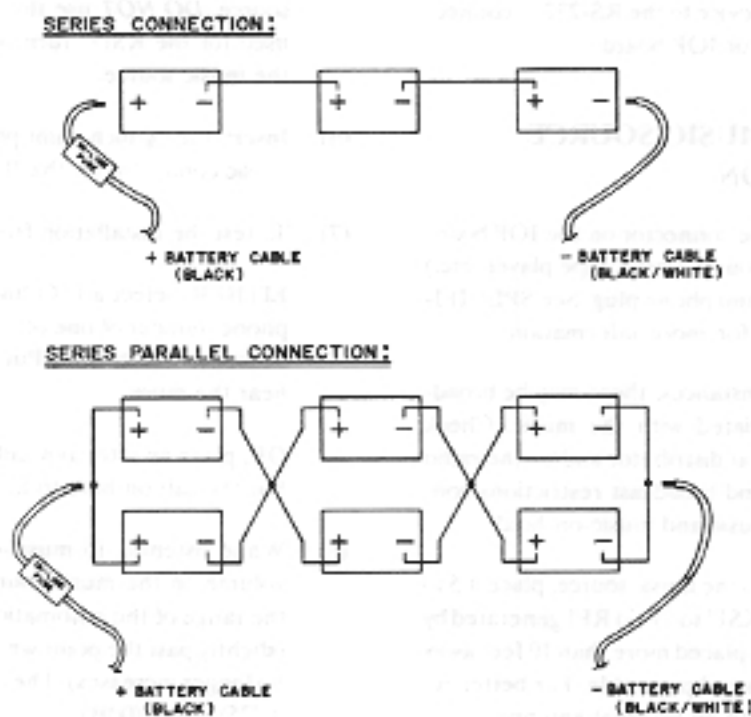
- (3) Turn off the AC POWER and BATTERY BACKUP switches on the KSU power supply.
- (4) Ensure that the battery cable is connected to the power supply in proper polarity (BLACK = positive, BLACK/WHITE = negative) and the cable is routed through the strain relief clamp in the upper-left corner of the cardfile and out the strain relief connector on the small round hole in the back of the KSU cabinet. Insert the cables through the small opening(s) in the battery compartment using strain relief clamps or connectors as described for wiring in step 1b.
- (5) Install a 25A, 125V sealed in-line fuse on the positive (+) battery cable, as close to the battery pack as possible. Refer to Figure 3-37.
- (6) Connect the power supply battery cables to the *fully charged* battery pack in proper polarity (Black = positive, Black/White = negative).
- (7) Turn ON the AC POWER switch. The red indicator should light.
- (8) With the BATTERY BACKUP switch OFF, remove the Black/White wire from the battery pack. Then, being careful not to touch the wire against anything that will cause a short-circuit, turn ON the BATTERY BACKUP switch and measure the float voltage across the Black and Black/White power supply battery cable connections. It must measure 33-35VDC.
- (9) *If the float voltage is not in tolerance, contact Inter-Tel Customer Support for assistance.*

If the float voltage is in tolerance, turn OFF the BATTERY BACKUP switch and reconnect the Black/White wire to the battery pack's negative terminal.
- (10) *To "enable" the battery back-up circuit, the power supply must be powered up in the following order:*
 - a. Turn OFF the AC POWER switch.

NOTE: This will drop all calls in progress.

- b. Turn ON the BATTERY BACKUP switch.
 - c. Turn ON the AC POWER switch.
- NOTE:** If AC power is turned on before battery back-up, the system will keep the batteries charged, but will not switch over to the batteries during a power failure.
- (11) Turn OFF the AC POWER switch and measure the system voltages using the test points on the front of the IOP board. (If the batteries are properly charged, turning the AC POWER switch OFF will test the battery back-up.) If the voltages are out of tolerance, the batteries may not be fully charged, or the batteries or power supply could be faulty; contact Customer Support for assistance.
 - (12) Turn ON the AC POWER switch.
 - (13) If used, place the cover on the battery compartment(s) and install the screws.
 - (14) To verify that the power supply is providing charging current for the batteries:
 - a. With the BATTERY BACKUP switch OFF, measure the DC voltage across the battery string.
 - b. With the BATTERY BACKUP switch ON, measure the DC voltage across the battery string. If the voltage measurement increased to 33-35VDC with the switch ON, then the power supply is providing adequate charging current. (If desired, the actual battery charging current can be measured by placing an ammeter in series with one leg of the battery string.)

FIGURE 3-37. BATTERY PACK CONNECTIONS



9. SMDR/SMDA OUTPUT DEVICE INSTALLATION

9.1 The output device(s) for the station message detail recording (SMDR) and station message detail accounting (SMDA) features must meet the requirements and match the RS-232-C pinout described in SPECIFICATIONS on page 2-17. The devices must not have cables longer than 50 feet (15 meters).

9.2 To connect the output device to the APP or IOP board:

- (1) Match the baud rates on the output device and the board (APP or IOP) to which it will be attached. Refer to page 3-37 for the proper IOP baud rate switch settings.
- (2) If necessary, move the handshake straps for the RS-232-C connector on the APP board (described in SPECIFICATION on page 2-17).
- (3) Turn on the AC power to both the device and the system *before* connecting the RS-232-C cable to the board. This prevents any electrical surges from being transmitted by the interface.
- (4) Carefully connect the RS-232-C interface cable from the device to the RS-232-C connector on the APP or IOP board.

10. EXTERNAL MUSIC SOURCE INSTALLATION

10.1 There is a female connector on the IOP board for an external music source (radio, tape player, etc.) that accepts a $\frac{1}{8}$ -inch mini phone plug. See SPECIFICATIONS, page 2-7, for more information.

NOTE: In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.

10.2 If using a radio as the music source, place it 5 to 10 feet away from the KSU to avoid RFI generated by the KSU. If the radio is placed more than 10 feet away from the KSU, use twisted pair cable. For better reception, use a radio with an external antenna.

10.3 To install the external music source:

- (1) Set the music-on-hold strap (J3) on the IOP board in the MUSIC position (top two pins).
- (2) Inspect the $\frac{1}{16}$ A fuse on the front edge of the IOP board. Replace it if open.
- (3) Attach a $\frac{1}{8}$ -inch, two-conductor, mini-phone plug to one end of a 5- to 10-foot (1.5- to 3.0-meter) length of coaxial or twisted pair cable.
- (4) **EITHER**, connect the other end of the cable to the speaker output terminals of the music source.

OR, if the music source has an earphone jack, attach a $\frac{1}{8}$ -inch mini-phone plug (or other specified connector) to the other end of the cable, and plug it into the earphone jack on the music source.

NOTE: If the earphone jack is "padded" so that the optimal volume level cannot be reached, the first procedure above (beginning with **EITHER**) may be more effective.

- (5) Plug in the AC power cord for the music source. **DO NOT** use the outlet that is being used for the KSU. Turn on the AC power to the music source.
- (6) Insert the $\frac{1}{8}$ -inch mini-phone plug into the music connector on the IOP board.
- (7) To test the installation from a keyset:

EITHER, select a C.O line and dial the telephone number of one of the other lines to call back into the system. Put the call on hold to hear the music.

OR, place an intercom call to another station. Put the call on hold to hear the music.

- (8) While listening to music-on-hold, adjust the volume on the music source to a level within the range of the automatic gain control circuit (slightly past the point where the volume level no longer increases). The optimal input level is 0.775VRMS (0dB).

11. POWER FAILURE TRANSFER EQUIPMENT INSTALLATION

11.1 An RCA-type phono jack on the front of the IOP board is the power failure transfer relay (labeled CO CUT-THRU). In the event of a power or processor board failure, the relay contacts open to connect one or more single-line sets to predetermined C.O. lines.

11.2 The output is a normally-open SPDT relay which is held closed (energized) during normal operation. If the system loses power or a processor board fails, the relay opens to make the connection between the C.O. line(s) and the single-line set(s).

11.3 Equipment needed to install the power failure transfer feature includes 24AWG wire, a $\frac{1}{8}$ -inch male RCA-type phono plug, a PFT relay card, and a card mounting case. Refer to SPECIFICATIONS, page 2-7, for more information.

11.4 To connect the recommended Starcom power failure transfer equipment:

CAUTION

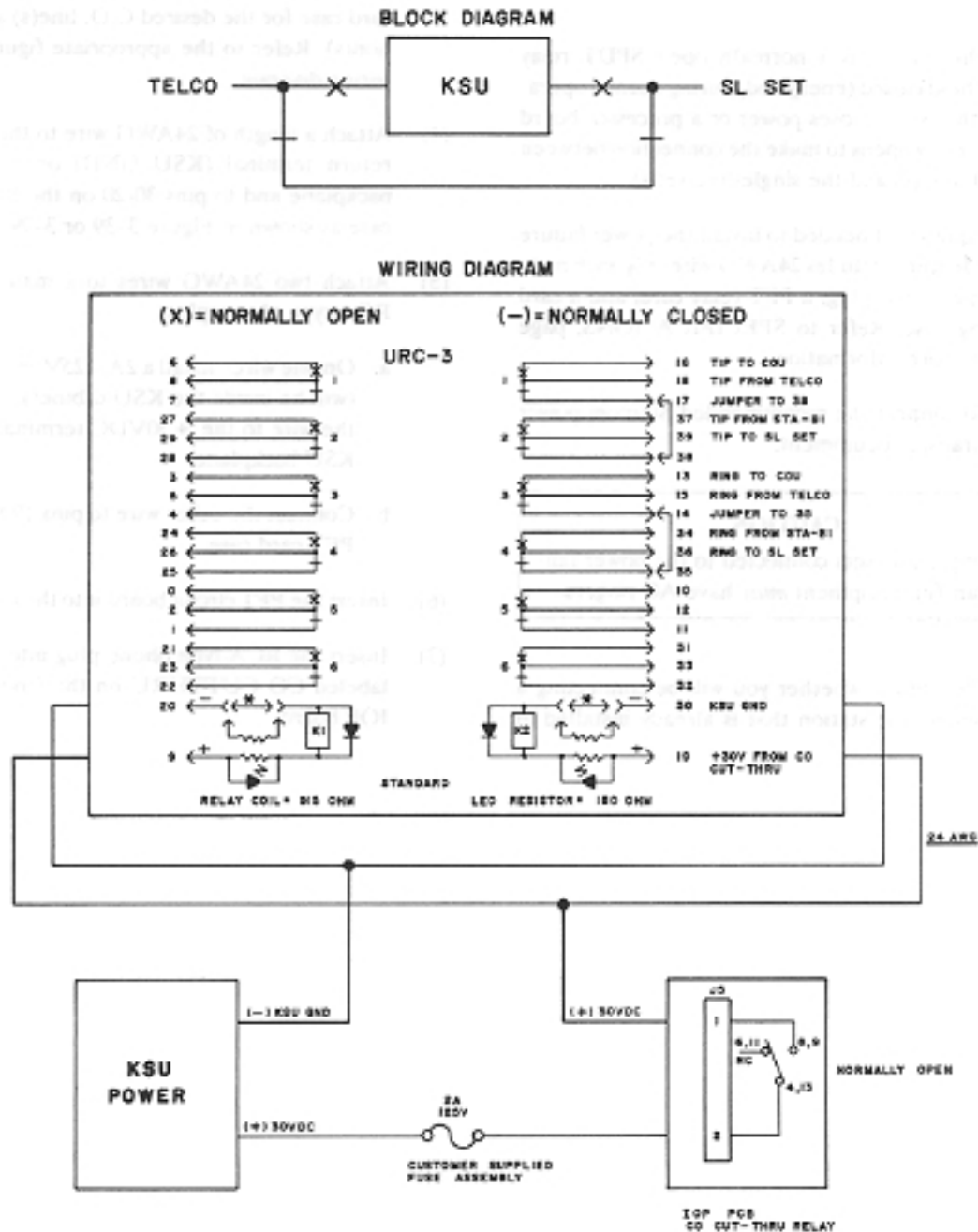
The single-line sets connected to the power failure transfer equipment *must* have AC ringers.

- (1) Determine whether you will be connecting a single-line station that is already installed in

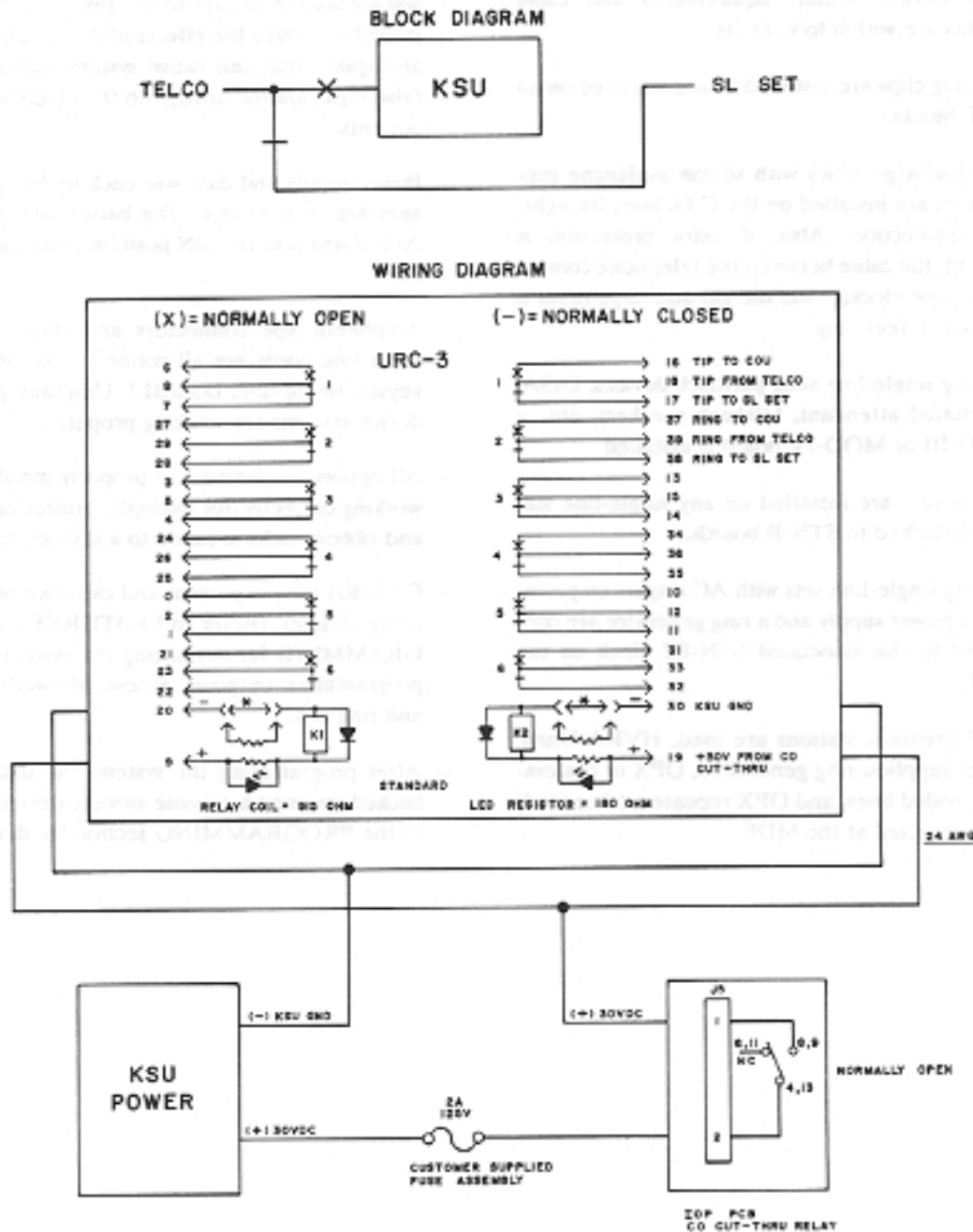
the system (refer to Figure 3-38 on the next page) or a single-line set that is not attached to the KSU (refer to Figure 3-39 on page 3-79).

- (2) Mount the PFT card mounting case on the MDF backboard.
- (3) Run cross-connect cable from the COU block circuit(s) and STN block circuit(s) to the PFT card case for the desired C.O. line(s) and station(s). Refer to the appropriate figure for a wiring diagram.
- (4) Attach a length of 24AWG wire to the +30V return terminal (KSU GND) on the KSU backplane and to pins 30/20 on the PFT card case as shown in Figure 3-39 or 3-79.
- (5) Attach two 24AWG wires to a male $\frac{1}{8}$ -inch RCA-type phono plug.
 - a. On one wire, install a 2A, 125V, in-line fuse (will be inside the KSU cabinet). Connect the wire to the +30VDC terminal on the KSU backplane.
 - b. Connect the other wire to pins 19/9 on the PFT card case.
- (6) Insert the PFT circuit board into the card case.
- (7) Insert the RCA-type phono plug into the jack labeled CO CUT-THRU on the front of the IOP board.

FIGURE 3-38. POWER FAILURE TRANSFER TO SINGLE-LINE SET WITHIN THE SYSTEM



**FIGURE 3-39. POWER FAILURE TRANSFER TO SINGLE-LINE SET
OUTSIDE THE SYSTEM**



INSTALLATION

12. POST-INSTALLATION CHECKLIST

12.1 To ensure that the system has been installed properly, review the installation outline on page 3-2. Then review the items on the following list as a final check.

- KSU, MDF, and station locations, and cable runs meet environmental requirements and cable lengths are within loop limits.
- Bridging clips are installed where required on all MDF blocks.
- Gas discharge tubes with silicon avalanche suppressors are installed on the C.O. lines for lightning protection. Also, if extra protection is desired, the cable between the telephone company RJ-type block(s) and the gas discharge tubes is at least 75 feet long.
- If using single-line sets, playback devices, DISA, automated attendant, talkback speakers, etc., a MOD-III or MOD-IV board is installed.
- DC ringers are installed on any single-line stations attached to STN-B boards.
- If using single-line sets with AC ringers on premises, a power supply and a ring generator are connected to the associated STN-B2 block on the MDF.
- If off-premises stations are used, HVRA Units, power supplies, ring generators, OPX or customer-provided lines, and OPX repeaters (if needed) are connected at the MDF.
- The KSU, battery compartment(s), HVRA(s), 48VDC power supply(s), C.O./OPX gas discharge tubes, and voltage surge/spike protector (if applicable) are attached to an approved earth ground.
- The KSU power supply is on an isolated, dedicated circuit, and no other equipment has been plugged into the same outlet. An extension cord was *not* used. A voltage surge/spike protector is installed to reduce the effects of AC voltage surges and spikes that can cause system malfunctions, false logic, and/or damage to the electronic components.
- Power supply and database back-up battery voltages are in tolerance. The battery strap on the APP board is in the ON position (over pins 1 and 2).
- Amphenol-type connectors and station instrument line cords are all connected securely. All keyset, single-line, DSS/BLF Unit, and playback device stations are working properly.
- All optional equipment is properly installed and working correctly (for example, printer has paper and ribbon, radio is tuned to a station, etc.).
- C.O. dial tone is present and calls can be placed using all lines. (Refer to FEATURES and PROGRAMMING for initializing the system and for programming outgoing access, allowed answer, and ring in.)
- After programming the system, the database is backed up using a reliable storage device. (Refer to the PROGRAMMING section for details.)



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1. INTRODUCTION

1.1 The GMX-152D System, in addition to its sleek, modular appearance and easy installation and programming, provides over 120 user-friendly features. To describe the system features, this portion of the manual has been divided into the following sections:

- **Accessing the Features:** This section contains a list of the feature codes and their definitions.
- **System Organization:** This section describes possible attendant arrangements, automated attendants, tenant groups and hunt groups.
- **Central Office (C.O.) Line Features:** This section explains the C.O. line functions and programmable features, including: dual-tone multi-frequency (DTMF) or dial-pulse signalling; outgoing-access, allowed-answer, and ring-in assignments; day and night mode of operation; C.O. line and station toll restriction; auto line and line group assignments; least-cost routing (LCR); and direct inward system access (DISA).
- **Station Instruments:** This section describes the station instruments of the GMX-152D System. Available station instruments include keysets, single-line sets, and Direct Station Selection/Busy Lamp Field (DSS/BLF) Units.
- **General Station Features:** Several sections explain the use of the system's intercom call features, outside call features, and special features for both keysets and single-line sets.
- **Attendant Features:** This section explains the special attendant-only features and the use of the DSS/BLF Unit.
- **Record Keeping and Maintenance Features:** For record keeping purposes, the GMX-152D System offers station message detail recording (SMDR) and station message detail accounting (SMDA) features. The system error reporting feature provides self-diagnostic information to make the system easier to service.

2. ACCESSING THE FEATURES

A. FEATURE CODES

2.1 Each of the station features is assigned a feature code. Using the station's keypad, these codes are entered to access C.O. lines, process calls, and use special features. Complete explanations of the features and instructions for using them are covered later in this section of the manual.

2.2 The codes shown on the following pages are the values that are assigned when the system is initialized. If desired, they can be changed in database programming to any one- to three-digit value.

CAUTION

Changing a feature code may affect the accessibility of other feature codes. See PROGRAMMING, page 5-28, for details.

B. FEATURE KEYS

2.3 Keysets and Single-Line Instruments (SLIs) have feature keys that allow one-key dialing of feature codes. The keysets have fixed-function feature and user-programmable feature keys. All SLI feature keys are user-programmable.

C. SPCL AND FLASH KEYS

2.4 In some instances, feature codes are entered immediately after lifting the handset or pressing the SPKR key. Other times, the user must signal the system by pressing a designated key before entering the feature code. Keyset users signal the system by pressing the SPCL key. SLI users press the FLASH key, and single-line DTMF set users perform a hookflash (press and release the hookswitch quickly).

D. C.O. LINE ACCESS CODES

2.5 The feature codes used to access C.O. lines are listed below. If a default feature key may be used in place of a code, it is indicated at the end of the explanation.

FEATURE NAME	CODE	DEFINITION
Automatic Line Selection	89	Answers the call that has been ringing or holding the longest at that station. Refer to page 4-24 for the priority list. Or, if no call is ringing or holding, the highest-numbered available auto line is selected for an outgoing call. There can be up to 32 auto lines on an MF-rated system; but there can be only one auto line on a KF-rated system. (Keysets use line keys or the ANS key)
Least-Cost Routing (LCR)	80	Allows the system to select the desired route for placing a call. This is available only on MF-rated, extended-software systems. (GX Keysets and SLIs have an LCR key)
Select Line Group 1-8	81-87, 9	Selects an available line from a programmed group of lines. On MF-rated systems, each group can contain any combination of up to 32 equipped lines. KF-rated systems can have only one line per line group.

E. GENERAL FEATURE CODES

2.6 The following pages list the general feature codes. Most of them can be used at any station; however, some codes are for keysets only and/or require a display and some require a Data Port Module (not available on GMX 12-line or GX 24-line keysets). If a default feature key may be used in place of a code, it is indicated at the end of the explanation. Refer to pages 4-33 for a complete listing of the default feature keys.

FEATURE NAME	CODE	DEFINITION
Automatic Intercom Access	362	<i>(Keysets only)</i> Allows the user to determine how ringing intercom calls will be answered: simply by lifting the handset (automatic access), or by lifting the handset and pressing the IC key.
Cancel Automatic Intercom Access	363	
Automatic Line Access	360	<i>(Keysets only)</i> Allows the user to determine how ringing outside calls will be answered: simply by lifting the handset (automatic access), or by lifting the handset and pressing a line key or the ANS key.
Cancel Automatic Line Access	361	
Automatic Line Answer	350	Station users with allowed answer can pick up lines that are ringing into the system, but are not actually ringing at the stations themselves. This feature does not pick up transferred calls or recalls that are ringing at the station. (Keysets use line keys)

FEATURE NAME	CODE	DEFINITION
Background Music On/Off	313	<i>(Keysets only)</i> Turns background music heard through the keyset speaker on and off. (BGND MUSIC key)
Call Forward All Calls	355	Immediately forwards all calls to another station or to an outside telephone number. (Keysets use the FWD key)
Call Forward If Busy	357	Immediately forwards all calls to another station or to an outside telephone number when the station is in use. (The keyset FWD key may be reprogrammed with this feature code.)
Call Forward If No Answer	356	Forwards all calls to another station or to an outside telephone number if not answered before the forward no answer timer expires. (The keyset FWD key may be reprogrammed with this feature code.)
Call Forward If No Answer or Busy	358	Forwards all calls to another station or to an outside telephone number if not answered before the forward no answer timer expires, or immediately if the station is in use. (The keyset FWD key may be reprogrammed with this feature code.)
Cancel Any Call Forward	359	Cancels any call forward request. (Keysets use the FWD key)
Call Splitting	337	<i>(Single-line sets only)</i> Allows the single-line station user to return to calls on individual hold, in the order they were placed on hold.
Cancel Misc. Operations	395	This single feature code cancels do-not-disturb, hunt group remove, page remove, call forwarding, disable handsfree, background music, and queue requests for the station.
Conference	5	Connects three parties in a conference. A conference consists of a station and two other parties which can be outside callers or stations. (Keysets use the CNF key)
Data	340	<i>(Keysets with Data Port Module only)</i> Allows operation of a data device attached to a keyset. (DATA key)
Default Volumes	394	<i>(Inter-Tel/DVK Keysets only)</i> Sets the volume levels on the Inter-Tel/DVK keyset to the defined default values. <i>These keysets are not presently available.</i>

FEATURE NAME	CODE	DEFINITION
Directories:		
System Directory	307	<i>(Display Keysets only)</i> Allows display keyset users to search for system intercom numbers and user names. The number can then be dialed, if desired.
C.O. Directory	308	<i>(Display Keysets only)</i> Allows display keyset users to search for system speed-dial numbers and names. The number can then be dialed, if desired.
Display Date and Time	300	<i>(Display Keysets only)</i> Displays the system date and time, user name, and intercom number during a call or when other displays are shown.
Do-Not-Disturb	370	Blocks all incoming intercom calls, transferred calls, and pages to the station. The cancel code returns the station to normal operation. The on/off code can be used to turn the feature on or off. <i>(Keysets use the DND key)</i>
Cancel Do-Not-Disturb	371	
Do-Not-Disturb On/Off	372	
Feature Key Default	325	Keysets and SLIs have user-programmable feature keys that can be programmed to access feature codes. The keys can be returned to the defined default values or they can be programmed individually. Display keyset users can view feature key assignments.
Feature Key Programming	327	
Feature Key Display	326	
Handsfree Disable	310	<i>(Keysets only)</i> Disables/enables the keyset's handsfree intercom answering. Incoming intercom calls ring as private calls if handsfree answering is disabled.
Handsfree Enable	311	
Headset Enable	315	<i>(Keysets only)</i> The enable code signals the system that a headset has been connected to the keyset. The disable code returns the keyset to normal operation.
Headset Disable	316	
Hold:		
Individual Hold	336	Places a call on hold so that it can be directly accessed only at that station or accessed through a reverse transfer from any other station. (HOLD key)
System Hold	335	<i>(Keysets only)</i> Places an outside call on system hold. It can be picked up directly at any station that has allowed answer, ring in, or outgoing access to the line. (Cannot be used on intercom calls. If used on conference calls, the system places the parties on individual hold. Cannot be used on out-of-range lines.)

FEATURE NAME	CODE	DEFINITION
Hookflash	330	Sends a timed hookflash over the C.O. line while on an outside call. Some keysets have FLASH keys programmed with this code. SLI FLASH keys do not generate a hookflash over C.O. lines; SLI users must also enter the code to send this type of hookflash.
Hunt Group Remove Hunt Group Replace	322 323	Removes the station from the hunt group or places it in again. Does not affect non-hunt group calls.
Leave Message	365	Leaves a message at a called station or the called station's message center. Depending on how the message was left, the called station user can pick up the message from his/her message center or from the station that left the message. (Keysets use the MSG key)
Cancel Message	366	Allows the user to cancel a message that was left at another station.
Cancel Current Message	379	Cancels a message that is waiting at the station without requiring the user to respond to it. (Keysets use the asterisk key.)
Microphone Mute On/Off	314	<i>(Keysets only)</i> Turns the microphone on or off during a call. If off (muted), the station user can hear the other party, but the party cannot hear the station user. (MUTE key)
Monitor Data Port	341	<i>(Keysets with Data Port Module only)</i> Allows monitoring of a data call through a 24-line keyset's handset. (Requires a Data Port Module and a modem-equipped data device.)
Optional Account Code	390	Allows the station user to enter an optional account code for SMDR during an outside call.
Page	7	When followed by a paging zone code, it allows announcements to be made through keyset speakers, talkback speakers, and/or external paging speakers. (Keysets use the PAGE key)
Page Remove Page Replace	332 333	<i>(Keysets only)</i> Halts pages through the keyset speaker or allows them to be received again.
Queue Request Cancel Queue Request	6 376	Requests an automatic callback when a busy line or station becomes available. The cancel code terminates a queue request. (Keysets use the QUE key)

FEATURE NAME	CODE	DEFINITION
Redialing:		
Redial	380	Redials the last outside telephone number dialed or saved at the station (up to 32 digits). Also used to save numbers at keysets programmed for last number saved. (REDIAL key)
Program Redial Mode — Last Number Dialed	320	<i>(Keysets only)</i> Programs the keyset redial mode to store either the last outside telephone number dialed or the last outside telephone number saved.
Program Redial Mode — Last Number Saved	321	
Reminder Message	305	<i>(Keysets only)</i> Sets or cancels a reminder message that signals the station at a specific time.
Cancel Reminder Message	306	
Reverse Transfer (Call Pick-Up)	4	Picks up a call ringing or holding at another station. Also used for the group call pick-up feature to pick up calls that are ringing at a hunt group pilot number or hunt group station.
Ring Intercom Always	367	Programs the station to always place private (non-handsfree) intercom calls. The cancel code allows the station to again place handsfree calls to keysets.
Cancel Ring Intercom Always	368	
Select Ring Tone	328	<i>(GMX and Inter-Tel/DVK Keysets only)</i> Selects the type of ringing alert tone that will be heard from the keyset. (GX keysets change ring tone by setting DIP switches.)
Speakerphone On/Off	312	<i>(Keysets only)</i> Turns the keyset speakerphone on or off for on-hook dialing, conversation, and monitoring. Also used for turning the headset on and off when a headset is enabled. (SPKR key)
Station Monitoring	396	<i>(Keysets only)</i> Allows a designated hunt group supervisor to monitor the outside calls of anyone in the associated hunt group.
Station Speed Dial	382	Dials/programs one of the 10 station speed-dial telephone numbers when followed by a location code (0-9). (Keysets use the SPD/BLF keys and SLIs use the STN SPD key)
Program Station Speed Dial	383	
System Speed Dial	381	Dials one of the 100 system speed-dial telephone numbers when followed by a location code (00-99). Also used for reviewing system speed-dial numbers at stations and for programming at the designated keyset. (Keysets use the SYS SPD key)

FEATURE NAME	CODE	DEFINITION
Transfer CO Call	345	Transfers an outside call to another station or to an outside telephone number. (Keysets use the XFR key)
Transfer Intercom Call	346	Transfers an intercom call to another station or to an outside telephone number.
Transfer CO/IC to Hold	347	Transfers a call to another station and places it on individual hold so that it does not ring or send call waiting signals while holding. (Keysets may use XFR and HOLD keys on outside calls)

E. ATTENDANT FEATURE CODES

2.7 The following feature codes may be used only at designated attendant stations. Non-attendant station users hear reorder tones if they attempt to use these feature codes.

FEATURE NAME	CODE	DEFINITION
Clear System Alarm	019	Cancels a system alarm display.
Night Ring On/Off	010*	Places system in night mode or cancels night mode. While in night mode, the night ring-in and allowed-answer assignments are used. Placing the system in night mode also activates the night transfer relays.
Program Stations for Night Ring	011*	Reprograms the database night lists for ring in and allowed answer for each station.
Program System Speed Dial	020*	Programs system speed-dial numbers when followed by location codes (00-99). (Also accessed by the SYS SPD key and/or feature code 381. This code can also be used by the system speed-dial programming station, even if it is not an attendant station.)

Remote Feature Cancel:

Group Do-Not-Disturb Cancel	012	Cancels do-not-disturb and/or call forwarding for all stations or individual stations that are served by that attendant.
Group Call Forward Cancel	013	
Group DND/FWD Cancel	014	
Individual Do-Not-Disturb Cancel	015	
Individual Call Forward Cancel	016	
Individual DND/FWD Cancel	017	
Set Time of Day	021*	Programs system time, date, and day of week.
Talkback Speaker Music On/Off	018*	Turns background music on or off to the talkback speaker(s).

*Primary attendant only.

G. INTERCOM NUMBERS

2.8 Intercom numbers are recognized as feature codes by the system. When the system is initialized, the intercom numbers are assigned as follows:

Attendant	0
Stations	100-219
Talkback speakers	221-225
Hunt groups	231-245
300-baud modem	260

3. SYSTEM ORGANIZATION

3.1 The GMX-152D System is designed to allow organization of the stations into groups. The following system features divide the system into manageable units for easier call processing and record keeping.

A. FLEXIBLE ATTENDANT ARRANGEMENTS

3.2 Attendants provide the following services for the stations they serve:

- Accessed by dialing 0
- Central operators for incoming calls (if programmed for ring in)
- Message centers (if programmed)
- Recall stations for unanswered calls
- Able to cancel do-not-disturb and/or call forwarding for the stations they serve
- Receive and clear displayed system alarms (unless the system has been programmed to send them only to the primary attendant)
- Transfer calls to the modem.

3.3 In addition to the capabilities listed above, one attendant can be designated as the primary attendant who can:

- Place the system in night mode or day mode
- Set the system time of day, date, and day of week
- Program all system speed-dial numbers, unless this ability is assigned to another keyset.
- Turn background music on or off for the talkback speakers
- Program stations' allowed-answer and ring-in assignments for night mode
- Receive unsupervised C.O. recalls

3.4 All attendant stations should be equipped with display keysets to show system alarms and recall sources. If desired, each attendant's keyset can also be used with a DSS/BLF Unit for one-key intercom access to all stations.

No-Attendant Operation

3.5 The system will function without an attendant, but attendant features such as night mode, attendant recall, dial-zero access, and system/station programming cannot be used. A display keyset station must be programmed as the system alarm station to receive system alarm messages and unsupervised C.O. recalls. C.O. lines are programmed to ring in at any or all stations.

One-Attendant Operation

3.6 One attendant (generally designated as the primary attendant) has control of all the attendant features listed in paragraphs 3.2 and 3.3. All lines (except private lines) are usually programmed to ring in at this attendant's station.

Multiple-Attendant Operation

3.7 The system can be assigned as many attendants as needed (up to 120). C.O. lines are usually programmed to ring at any or all attendant stations. One attendant can be designated as the primary attendant. With this arrangement, the primary attendant can serve as the only system alarm station, or every attendant can receive alarm messages.

B. AUTOMATED ATTENDANT

3.8 The automated attendant is a programmable feature that can be used to provide some of the services normally handled by an attendant. It allows an outside party to dial into the system and automatically access (or be transferred to) an automated attendant station, which is generally a playback device with a prerecorded message. After hearing the message, the caller is disconnected from the automated attendant and hears intercom dial tone. The caller may then directly dial a station intercom number or hunt group pilot number. (Refer to page 4-14 for information on allowing the caller to dial during the recorded message.)

3.9 Single-line circuits can be designated as automated attendant stations in database programming and can be assigned direct ring in for specific C.O. lines. The number of automated attendant stations is limited to the number of available single-line circuits. Keyset circuits and voice mail stations cannot be programmed as automated attendant stations. Since the

automated attendant feature requires DTMF decoding circuits, a Modem-III or -IV board must be installed.

NOTE: Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-152D System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone.

Automated Attendant Applications

3.10 There are a number of different uses for this feature. For example, direct ring-in calls to a busy attendant could be forwarded to an automated attendant (using one of the forwarding features). Another option is to have calls ring in directly to an automated attendant when the system is in day and/or night mode. Or, a group of automated attendants could be assigned to one hunt group. In this situation, a call would ring in or be transferred to the hunt group pilot number where it would circulate until an available automated attendant answers the call.

3.11 Another possibility is to assign an automated attendant as an announcement or overflow station in an existing hunt group. Unlike standard announcement or overflow stations, the caller hears intercom dial tone after being disconnected and can dial another intercom number, rather than being returned to the hunt group. (Refer to page 4-14 for information on allowing the caller to dial during the recorded message.)

Designated Recall Station

3.12 Automated attendant stations can be assigned *designated recall stations* that will receive recalls instead of an attendant.

Automated Attendant Call Processing

3.13 When a station receives a call that has been routed through the automated attendant, the call rings as a direct ring-in call. The outside caller hears ringing until the call is answered or the caller hangs

up. If the called station is forwarded, the call follows the programmed forward. If the called station is busy or does not answer, the call camps on. It is then transferred to the automated attendant's designated recall station after the appropriate transfer timer expires. (If the designated recall station does not answer the call, it is disconnected after the abandoned recall timer expires. If the automated attendant does not have a designated recall station, the call transfers to the called party's attendant after the appropriate transfer timer expires.)

3.14 When a hunt group pilot number receives a call that has been routed through the automated attendant, the call rings as a direct ring in call and circulates according to how the hunt group is programmed (i.e., linear or distributed). Refer to page 4-15 for more information on hunt group calls.

3.15 The caller cannot access C.O. lines or any other feature through the automated attendant station. An attempt to do so automatically transfers the call to the automated attendant's attendant.

NOTE: If the automated attendant does not have an assigned attendant, calls normally routed to the automated attendant's attendant will instead go to the primary attendant or designated system alarm station.

3.16 To avoid possible camp-on tone interruptions during calls, it is recommended that camp-on tones be disallowed for the automated attendant.

3.17 An intercom call to the automated attendant's intercom number will not be routed to other intercom or pilot numbers. The intercom caller will hear the message and will be returned to intercom dial tone when the automated attendant disconnects, but cannot use digit translation.

Playback Devices As Automated Attendants

3.18 Playback devices are generally used at the automated attendant station(s). When an outside call rings in or is transferred to an automated attendant, the playback device plays a message (giving dialing instructions) and then disconnects from the call. The caller hears intercom dial tone. If using a DTMF telephone, the caller can dial a station intercom number or hunt group pilot number to access the desired station or hunt group, or dial 0 for the automated attendant's attendant. If an invalid number is dialed or the

DTMF decoders are busy, the call is immediately transferred to the automated attendant's attendant. If using a rotary telephone or unsure of the intercom number, the caller can wait on the line for the automated attendant's attendant to be called after the SL dial initiation timer expires.

3.19 Playback devices are described on page 2-15 in SPECIFICATIONS. C.O. line ring-in programming is described on page 5-30 in PROGRAMMING. C.O. lines should not be programmed to ring in to multiple playback devices. Use the call forwarding or hunt group feature if multiple playback devices are to be used.

Dialing During Recording

3.20 A database option allows the programmer to determine if the system will accept a caller's DTMF tones (dialed intercom or hunt group pilot numbers) while the automated attendant is giving dialing instructions (rather than having to wait for intercom dial tone after the automated attendant hangs up). If the option is enabled, callers who know the intercom or pilot number station they wish to call can dial the number any time after the automated attendant answers the call.

NOTE: This feature requires the Modem-IV (MOD-IV) board. The reliability of allowing callers to dial during the instructions may be affected by the voice characteristics of the person giving the instructions, the quality of the playback device, the C.O. line noise levels, the DTMF tone levels, etc. If frequent problems occur, this option should be disabled.

Automated Attendant Do-Not-Disturb Breakthrough

3.21 Direct ring-in calls are not blocked by do-not-disturb; they ring at the called station. However, the database contains an option that allows or disallows automated attendant (and DISA) calls to break through do-not-disturb on a station-by-station basis. If do-not-disturb breakthrough is disallowed, calls through the automated attendant to a station in do-

not-disturb are immediately sent to the automated attendant's designated recall station (or, if one does not exist, the called party's attendant). If do-not-disturb breakthrough is allowed, an unanswered call is transferred to the automated attendant's designated recall station after the appropriate transfer timer expires.

Digit Translation

3.22 As described on the previous pages, the automated attendant feature allows outside callers to access the system and directly dial intercom numbers or hunt group pilot numbers. To simplify this process and to help prevent the system from having problems recognizing digits (due to C.O. line noise levels, DTMF tone levels, etc.) or to restrict callers to specific intercom numbers, a feature called digit translation may be used. Digit translation allows callers to dial a single digit to access a designated intercom number or hunt group pilot number. Up to ten digit translation storage locations (0-9) are available in database programming (refer to PROGRAMMING, page 5-41).

3.23 To use digit translation, the programmer enters an intercom number or hunt group pilot number in the desired translation location (0-9). A caller accessing the system through the automated attendant can then dial the single-digit location number to reach the designated intercom number or hunt group pilot number. For example, if the pilot number for a customer support group was entered in translation location number 3, the automated attendant's message might say: "Dial 3 for customer support." This is easier than dialing a three-digit number, leaves less room for user error, and helps to prevent the system from making digit recognition errors.

3.24 To allow callers to dial zero for the attendant or dial station intercom numbers, it is recommended that translation location numbers 0, 1, and 2 be left blank. For example, if location 1 is assigned pilot number 231, any automated attendant caller attempting to dial a station intercom number that begins with 1 will instead be transferred to 231.

C. TENANT GROUPS AND DEPARTMENTS

3.25 Tenant service allows the customized distribution of C.O. lines among multiple users sharing a common Key Service Unit (KSU). Assigning groups of stations to different tenant groups can be useful for comparing the number and estimated cost of calls that each tenant group makes and receives. See SMDA, page 4-89, for details.

3.26 This form of partitioning is ideal in instances where several small businesses or departments within a larger company wish to operate as separate identities for such purposes as account billing or budgeting.

3.27 Five tenant groups can be established in the system, with up to 10 departments each. Each station must be assigned to one (and only one) tenant group and department. When the system is initialized, all stations are in tenant group 1 and department 1.

3.28 Up to 24 lines can be assigned to line keys. Line key arrangement is programmed on a tenant-by-tenant basis. (For example, line circuit 1.1 can be assigned to line key 1 in one tenant group, and line key 24 in another.) If there are more than 24 equipped lines, the "overflow" lines that cannot be assigned to line keys are automatically assigned to the OVER key for all tenant groups.

3.29 Traffic (communication) between tenant groups can be allowed or denied in database programming. If cross-tenant conversations are denied, a station (including the attendant) can only call other stations within its tenant group and calls cannot be transferred or forwarded between tenant groups. Therefore, if cross-tenant traffic is denied, each tenant group should be assigned its own attendant.

D. HUNT GROUPS

3.30 The hunt group feature permits calls to be placed to a group of stations and to be automatically transferred to an available station within the group. Stations in these groups are accessed by dialing a special intercom number called a pilot number (initialized as 231-245). Individual stations within hunt groups can also be accessed using their assigned intercom numbers.

3.31 Up to 15 hunt groups can be programmed in the database. Hunt groups 1 and 2 can have up to 60

stations, while hunt groups 3 through 15 can have up to 20 stations each.

Hunt Group Call Distribution

3.32 When an intercom or outside call is transferred or rings in to the pilot number, it circulates through the hunt group in either linear or distributed order until answered, as described below.

- **Linear order:** Incoming calls always start circulating by ringing at the first station on the list stored in the database. If that station is busy, or if there is no answer before the no answer advance timer expires, the call goes to the next station on the list. When the system reaches the end of the list, it returns to the beginning of the list.
- **Distributed order:** To even out the call load, distributed order shifts the starting point of each call. When a station user receives a call, the next station on the list receives the next incoming call. If a station is busy, or if there is no answer before the no answer advance timer expires, the call goes to the next station on the list. When the system reaches the end of the list, it returns to the beginning of the list.

3.33 The order in which hunt group stations receive circulating, incoming calls (intercom, transferred, direct ring-in, and DISA calls) is determined by a list stored in the database. A station can appear in a single list more than once and it can appear in multiple hunt group lists, if desired.

Hunt Group Call Processing

3.34 Hunt group stations receive the following indications when a call is ringing in:

- If an outside call is ringing, the designated station in a linear or distributed hunt group, the associated line key will flash to indicate a ringing call until the call is answered.
- If all stations are busy, an intercom or outside call will camp on and cause the system to send camp-on tones and display messages to all stations in the hunt group. If an outside call is ringing, all of the hunt group stations will have the associated line key flashing to indicate a ringing call. As soon as one station is available, the camp-on tone and message end, and the available station receives in-

tercom or C.O. ringing (the line key stops flashing at all other stations). Camped-on calls follow the recall route as described on page 4-17.

- If every station is in do-not-disturb, has hunt group remove enabled, or is forwarded, an incoming call will flash on the associated line key until the call is answered or the caller hangs up.
- If an out-of-range line rings in or is transferred to a busy hunt group, all stations in the group receive a call waiting message and a camp-on tone. The line key flashes at those stations with an associated line key. At keyset stations with the OVER key enabled, the OVER key does not flash until the user ends the current call. Then the key flashes at that station. If a user presses the OVER key before hanging up (before the OVER key starts flashing), reorder tones are heard.

3.35 A C.O. line can be programmed to ring in directly to one or more intercom numbers or to a single pilot number in day and/or night mode. If assigned to a pilot number, ring in for the line cannot be assigned to any other pilot or intercom number.

3.36 Stations within the hunt group can receive direct C.O. ring-in, intercom, forwarded, or transferred calls to their individual intercom numbers without affecting other stations in the hunt group.

3.37 Hunt group programming affects the call forwarding feature in several ways:

- If a station is in call forward mode, the station will not receive hunt group calls.
- If an announcement station or overflow station has call forwarding enabled, hunt group calls will not follow the forward, but will remain at the station.
- Hunt group members should not be assigned secretarial intercepts; such an assignment would have the effect of permanently removing them from the hunt group.

3.38 If cross-tenant traffic is denied, hunt group stations not in the same tenant group as an intercom caller do not receive the incoming intercom call.

3.39 If an outside call rings in or is transferred to a pilot number that does not have hunt group station assignments, the call is sent to the primary attendant

(or the system alarm station if there is no primary attendant). If a station user attempts to transfer an intercom call to an invalid pilot number, the call is placed on transfer hold; the intercom call can be reaccessed by pressing the IC key, so that the transfer can be attempted again using a valid number.

3.40 When a DISA call or a call routed through the automated attendant rings at a hunt group member's station, it is displayed as a direct ring-in call.

Announcement And Overflow Stations

3.41 Two types of special stations can be programmed to help calls circulate through the hunt group more efficiently: hunt group announcement stations and hunt group overflow stations.

3.42 Announcement and overflow stations are not included in the hunt group list; they are individual stations that receive unanswered calls when all of the hunt group stations are unavailable. Announcement and overflow stations can be assigned to separate stations or they can be the same station. Also, each of the hunt groups can have the same announcement and overflow stations or they can be assigned different stations.

3.43 Announcement Stations: When a C.O. call rings in directly to a hunt group (not transferred), it circulates in linear or distributed order until it is answered or the announcement timer expires. If the timer expires, the unanswered call is sent to the designated announcement station (outside of the hunt group). An announcement station can be a playback device that answers the call, plays a message, and then disconnects from the call to transfer it back to the hunt group. Or, the announcement station can be a station where a user greets the caller and, if desired, may return the call to the hunt group using the call transfer feature. If the announcement station is an automated attendant, the caller hears dial tone after the message and can dial another intercom number, rather than being returned to the hunt group. Each direct ring-in call will transfer to the announcement station(s) only once.

3.44 Overflow Stations: When a C.O. call is transferred or recalling to a hunt group, it circulates in linear or distributed order until it is answered or the overflow timer expires. If unanswered when the timer expires, the call is sent to an overflow station. The overflow station can be another hunt group, a station not

in the group, or a playback device. If it is a playback device, the programmer can determine the number of times (up to 25) that the call will be allowed to transfer back to the hunt group and then return to the overflow station. (After the determined number of returns, the call becomes a recall.) If the overflow station is another hunt group or a station, the call can only be sent to the overflow once, unless the user transfers it back using call transfer. If the overflow station is an automated attendant, the caller hears dial tone after the message and can dial another intercom number, rather than being returned to the hunt group.

Unanswered Hunt Group Calls

3.45 The path that an unanswered hunt group call follows is determined by the configuration of the hunt group, as outlined in the following paragraphs. Note that intercom calls (direct or transferred) will not transfer to the announcement or overflow stations, and transferred intercom calls will not recall.

• Direct ring-in outside calls:

- *With a playback device announcement station.* If a direct ring-in call remains unanswered when the hunt group announcement timer expires, the call is sent to an announcement station playback device. After the message is played and the playback device disconnects from the call, the call is automatically transferred back to the hunt group, unless the announcement station is an automated attendant. (In distributed hunt groups, the call begins circulating at the station that appears on the list after the last station that rang before the call was sent to the announcement station. In linear hunt groups, it begins circulating at the first station on the list.) If the call remains unanswered, it then transfers to the overflow station (refer to the transferred call recall information below) or, if there is no overflow station, it recalls the primary attendant or system alarm station.
- *With a non-playback announcement station.* When an unanswered direct ring-in call is sent to a non-playback announcement station (after the hunt group announcement timer expires), the call remains at the announcement station until it is answered or the caller hangs up. After the announcement station user answers, the call is processed as a normal C.O.

call. If desired, the call can be manually transferred back to the hunt group using the call transfer feature.

- *Without an announcement station.* A direct ring-in call rings at or circulates through the hunt group until answered or the caller hangs up; it is not sent to the overflow station, nor does it recall the primary attendant or system alarm station.

• Transferred outside calls or calls recalling the hunt group:

- *With a playback device overflow station.* If a transferred C.O. call remains unanswered when the hunt group overflow timer expires, the call is sent to an overflow station playback device. After the message is played and the playback device disconnects from the call, it is automatically transferred back to the hunt group the programmed number of times, unless the overflow station is an automated attendant. (In distributed hunt groups, the call begins circulating at the station that appears on the list after the last station that rang before the call was sent to the overflow station. In linear hunt groups, it begins circulating at the first station on the list.) If the call remains unanswered after returning to the overflow station for the last time, the call returns to the hunt group until the overflow timer expires, and then recalls the original transferring station.

NOTE: If the transfer came from a playback device announcement station, the call recalls the primary attendant or system alarm station.

- *With a non-playback overflow station.* When an unanswered transferred C.O. call is sent to a non-playback overflow station, the call remains at the overflow station until it is answered or until the recall timer expires; it then recalls the transferring station. If the call still remains unanswered, it recalls the transferring station's attendant.

NOTE: If the transfer came from a playback device announcement station, the call recalls the primary attendant or system alarm station.

- *Without an overflow station.* An unanswered call circulates until the hunt group overflow timer expires and then returns to the original

transferring station. If the call still remains unanswered, it recalls the transferring station's attendant.

• **To avoid the recall timers:**

- A hunt group can be assigned as its own overflow station. The call will circulate through the hunt group until it is answered or the caller hangs up.

Hunt Group Remove/Replace And Do-Not-Disturb

3.46 Hunt group members can temporarily halt hunt group calls to their station by entering the hunt group remove feature code as described below. Also, the do-not-disturb feature can be used to block all incoming hunt group calls to a station. Announcement stations and overflow stations cannot block hunt group calls using the do-not-disturb or hunt group remove features.

3.47 When the hunt group remove feature is enabled, the user will not hear ringing or receive the camp-on message display for calls to the hunt group. The line key flashes only if all other hunt group members are unavailable (busy, in do-not-disturb, with calls forwarded, or with hunt group remove enabled). The station continues to receive calls placed to its intercom number. Hunt group overflow and announcement stations cannot block hunt group calls.

3.48 TO REMOVE OR REPLACE THE STATION'S HUNT GROUP CALLS:

- (1) **Keyset:** While on or off hook, press SPCL.
Single-Line Set: Lift the handset.
- (2) Enter the hunt group remove feature code (322) to halt hunt group calls or enter the hunt group replace feature code (323) to return the station to its hunt group(s).
- (3) *If off hook, hang up.*

Station Call Monitoring

3.49 This feature allows hunt group supervisors to monitor the outside calls of anyone in a specified station hunt group. It can be useful in training or in evaluating the performance of hunt group members.

NOTE: As a courtesy, hunt group members should be notified in advance that their calls may be monitored. (Note that call monitoring may be illegal in some locations. It is the end user's responsibility to ensure that use of this feature is in compliance with local laws.)

3.50 In database programming, each hunt group can have one keyset user assigned as the hunt group supervisor. This can be any keyset user, even if the station is not a member of the hunt group. If the supervisor is a member of the hunt group, the hunt group remove/replace feature can be used at any time without affecting the station monitor ability. If desired, one keyset can be assigned as the supervisor of multiple hunt groups.

3.51 To monitor a hunt group member's call, the supervisor enters the station call monitoring feature code and dials the desired intercom number. The supervisor is connected to the ongoing call and can hear both parties, but cannot be heard by either one. If using a display keyset, the top line of the supervisor's display shows the hunt group member's intercom number (or user name) and line number (or line identification). The bottom line of the supervisor's display shows the hunt group member's call cost information (just as it is on the hunt group member's display). If the monitored call is terminated, transferred, or placed on hold by the hunt group member, the monitor function is terminated.

3.52 In the associated hunt group, the supervisor may monitor any active CO-to-intercom call (both hunting and non-hunting), including incoming, outgoing, and DISA-to-intercom calls. Conference calls and calls that do not involve hunt group members cannot be monitored.

3.53 If the supervisor attempts to monitor a station that is already being monitored or one that is not on an active CO-to-intercom call, the system sends reorder tones and allows the supervisor to dial another intercom number. If the supervisor attempts to monitor a station that is not in the hunt group or an idle station in the hunt group, the system sends reorder tones and cancels the monitor feature.

3.54 TO MONITOR A HUNT GROUP CALL (DESIGNATED SUPERVISOR ONLY):

(1) **EITHER**, while on hook, press SPCL and enter the station call monitoring feature code (396). You hear a confirmation tone and the SPKR key lights.

OR, while off hook, enter the station call monitoring feature code (396). You hear a confirmation tone.

(2) Dial the intercom number (or press the lit speed-dial or DSS/BLF key) of the station to be monitored. You are automatically connected to the call and the display shows the intercom identification, line identification,

and the monitored station's call cost information. The MUTE key lights.

(3) **EITHER**, monitor another hunt group member's call by pressing SPCL, entering the station call monitoring feature code (396), and dialing the intercom number (or pressing another speed-dial or DSS/BLF key).

OR, terminate the monitor feature. *If off hook*, hang up. *If on hook*, press the SPKR key.

OR, place or receive a call by pressing the IC key or a line key (or the ANS key).

OR, access another feature by pressing the SPCL key and entering the desired feature code.

4. C.O. LINE FEATURES

4.1 The GMX-152D System can contain up to 32 C.O. lines. This section explains the C.O. line functions and programmable features.

NOTE: While this system is designed to be reasonably secure against C.O. line misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. If the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the GMX-152D System and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, when a call is forwarded or transferred to the public network, or when DISA is used for placing outgoing calls.

A. DUAL-TONE MULTI-FREQUENCY (DTMF) OR DIAL-PULSE SIGNALLING

4.2 C.O. lines can be designated for DTMF or dial-pulse signalling through database programming (see PROGRAMMING, page 5-30). If dial-pulse signalling is desired, individual circuits on the COU boards must be converted using the Rotary Conversion Kit (part no. 828.1032). Each kit converts two lines. Refer to page 3-47 in INSTALLATION.

4.3 A digital code is generated by the keysets and decoded by the COU board to be sent as either a DTMF or a dial-pulse signal depending on the line designation. Single-line sets generate their own DTMF tones when dialing. Therefore single-line sets should use only DTMF lines, unless speed-dialing, redialing, or using LCR.

B. OUTGOING-ACCESS, ALLOWED-ANSWER, AND RING-IN ASSIGNMENTS

4.4 Each C.O. line has programmed lists of stations for outgoing-access, allowed-answer, and ring-in assignments:

- **Outgoing-access** assignment for a particular line permits the station user to place calls using that line.

- **Allowed-answer** assignment for a particular line permits the user to answer incoming calls on that line. Although the call can be answered, it does not ring at the user's station. On keysets, the line key flashes to indicate an incoming call.
- **Ring-in** assignment for a particular line permits the station user to receive direct ring-in calls on that line. The station rings and, on keysets, the line key flashes. Allowed answer for the line is automatically assigned to a station with ring in. If ring in is assigned to a hunt group pilot number, it cannot be granted to any other intercom or pilot number.

4.5 When keyset stations have at least one of these three assignments, the associated line keys show the status of their lines.

4.6 Stations that do not appear on any of the C.O. line lists cannot place or directly receive outside calls; they are limited to intercom calls, conferences originated by other stations, transferred calls, and retrieving calls on system hold.

4.7 A private line can be established by programming outgoing-access, ring-in, and allowed-answer assignments for the line to only one station.

4.8 Up to three external signalling devices can be connected to the system to signal incoming C.O. calls. They can be assigned ring in on a line-by-line basis. Signal devices cannot be assigned to lines that are designated for DISA or that ring in to hunt group pilot numbers.

C. DAY AND NIGHT MODES

4.9 There are separate lists in the database for allowed-answer and ring-in assignments for day and night modes. While the system is in day mode, calls ring in to stations or hunt groups on the day lists and can also be answered by stations on the allowed-answer day list. When the primary attendant places the system in night mode, the system uses the night lists.

4.10 The database night mode lists for allowed answer and ring in can be reprogrammed from the primary attendant's keyset for any of the C.O. lines and stations. (Hunt group ring-in cannot be assigned by the primary attendant.) Refer to page 4-86.

4.11 There is no attendant recall during night mode. A call will recall the station that transferred it or put it on hold and will ring there until the recall and abandoned recall timers expire; then the system will disconnect the call.

4.12 Placing the system in night mode also activates the night transfer relay on the MOD-III or MOD-IV board. The relay can be used to turn on and off electrical devices such as lights or an alarm system.

D. CALL PRIVACY

4.13 Call privacy restricts speech channel access to one station at a time. When a C.O. line or intercom channel is selected, no other station user can gain access to the line or channel. However, access to, and control of, a line or channel can be passed to another station using the conference or transfer features.

E. C.O. LINE RESTRICTION AND STATION TOLL RESTRICTION

4.14 C.O. lines and stations can be toll restricted using several methods. Lines can be "subject to toll restriction" or "unrestricted." They can also be identified to allow equal access dialing and/or to absorb digits. Stations can be toll restricted using a combination of eight station class of service (SCOS) restrictions and/or they can be restricted from accessing specific lines. Each of the C.O. line and station restrictions is described separately in the following paragraphs.

Line Restriction

4.15 C.O. line outgoing-access permission is programmed on a station-by-station basis. In addition, each C.O. line can also be designated as "subject to toll restriction" or "unrestricted" in database programming. (All lines are subject to toll restriction when the system is initialized.) When a station user selects a line that is designated as subject to toll restriction, the system checks the database for that station's SCOS. When an unrestricted C.O. line is chosen, the station's SCOS is not checked nor is dialing required to hold the line.

4.16 Lines are often programmed as unrestricted to allow station users to have access to reduced-cost

long distance carriers, or to use ringdown lines, dictaphones, voice mail systems, and other auxiliary equipment. When the installer is programming unrestricted lines, one of four call cost factors can be selected to designate calls as free, local, 10-digit toll, or operator/ international. The selected call cost is then used for all calls that are placed using that line.

Line Exemption From LCR Only

4.17 The line may be designated as "exempt from least-cost routing (LCR) only." (LCR is described in detail on page 4-24.) This allows users with SCOS 6 (LCR Only) to directly access specified C.O. lines by pressing the appropriate line keys (or the ANS key) or by entering the appropriate line access feature code. This feature is required if C.O. lines are connected to auxiliary equipment, such as voice mail, dictation, or ring-down equipment. When such lines are designated as exempt from LCR Only, stations with SCOS 6 and allowed access can use the special facilities.

4.18 Designating a line as exempt from LCR Only also allows LCR-Only stations to use the call forward to the public network feature. To do this, the line(s) must be assigned to a line group so that stations can enter a line group access code when programming the call forward number. For call forwarding and line group access purposes, all lines in the line group must be exempt from LCR Only; if not, an attempt to access the line(s) results in reorder tones.

4.19 The default assignment for all C.O. lines is *not* exempt from LCR Only. When a line is not exempt, all stations with SCOS 6 are denied direct access to the line.

Absorbed Digits

4.20 Restricted lines can be programmed to "absorb" or ignore the first digit(s) dialed so that only the remaining digits are checked for toll restriction and call cost purposes. There are two applications for this feature: PBX installations and installations in areas where part of the local office code is absorbed.

4.21 When a GMX-152D System is installed behind a PBX, users must dial special PBX codes to access the C.O. lines. Without absorbed digits, the lines must be unrestricted and the PBX performs the toll restriction and call cost functions. However, with absorbed digits, the GMX-152D System absorbs the

PBX line access codes, checks the remaining digits for toll restriction, and calculates call cost.

4.22 When a number is dialed that does not match one of the absorbed digit strings (up to eight strings, with a maximum of eight digits in each string), it is considered an internal PBX call, toll restriction is passed, and the call is designated as a free call (000) in the SMDR report. When redialing or using call forward, the system automatically inserts a short pause after the PBX access code. (The PBX access code is entered as part of the call forward number.) When speed dialing, the speed-dial number must include the PBX access code and a pause before the telephone number.

4.23 In some rural areas, specific digits (dialed as all or part of the local exchange) are absorbed by the central office, thus reducing the number of digits required to dial local calls. To determine if a central office absorbs digits, contact the telephone company.

4.24 If the system is not programmed to recognize the absorbed digits, two problems may arise. One problem is that a telephone number of less than seven digits that is dialed at toll-restricted stations is not recognized as a valid telephone number and the call is dropped. The other problem is that toll restriction can be defeated by dialing the absorbed digits before dialing a toll number. However, when programmed to recognize a single string of absorbed digits (with up to eight digits in the string), the system checks the remaining digits for toll restriction and processes numbers with less than seven digits as local calls (except 411 calls, which are considered seven-digit toll calls). If the first non-absorbed digit is 1 or 0, SCOS 1, 2, and/or 8 are enforced immediately (see station class of service, beginning with paragraph 4.28). Absorbed digits appear in the SMDR record when dialed if they are not repeatable or suppressed.

4.25 Absorbed-digit designations are programmed on a line-by-line basis. No lines are designated for absorbed digits when the system is initialized. Refer to page 5-30 in PROGRAMMING for more information.

Equal Access

4.26 With equal access, the customer must choose a primary long distance carrier. This is the carrier that

will automatically be accessed when the user dials a long distance telephone number. Customers may also select a secondary carrier or use several secondary carriers. These secondary carriers are accessed by dialing the equal access prefix (10) and a three-digit code assigned to the desired carrier (XXX) before dialing the telephone number. When using a secondary carrier, the telephone number is dialed as usual after the equal access code — including the toll field (1, 0, or 01) and the area code, if needed.

4.27 A restricted C.O. line that does not have equal access designation prevents the system from providing accurate toll restriction and call cost information when 10XXX is dialed on that line. When programmed for equal access, the system ignores the 10XXX and checks the remaining digits for toll restriction. Equal access designation is programmed on a line-by-line basis. All lines are designated for equal access when the system is initialized. To limit access to specific secondary carriers, the stations can be restricted to using LCR only (refer to paragraph 4.17).

Station Class of Service (SCOS)

4.28 SCOS is programmed on a station-by-station basis. A station can be completely unrestricted (SCOS 0) or can have any combination of the following restrictions.

CAUTION

REGARDING EMERGENCY NUMBERS

In areas where the emergency number is 1911, be sure that toll-restricted stations have SCOS 8 (Enable ALD) and that 911 is in the allowed long distance number list. Otherwise, toll-restricted users may not be able to find a station that is permitted to dial "1 + " numbers. Note that 911 is allowed at every station regardless of toll restriction, but 1911 requires this special programming.

4.29 SCOS 1 — Operator restriction: Calls that begin with a 0 are restricted. This also restricts international calls.

NOTE: If this restriction is *not* set, and a user dials 0 as the first digit when placing a call, only SCOS 3 is checked; no other toll restriction is checked.

4.30 SCOS 2 — Toll access restriction: This restricts calls that begin with 1 unless they are on the allowed long distance number list and the station has SCOS 8.

4.31 SCOS 3 — International call restriction: Calls that begin with 01 are restricted.

NOTE: If international calls are allowed (SCOS 1 and SCOS 3 are *not* set) and the user dials 01 as the first digits when placing a call, no other toll restriction is checked.

4.32 SCOS 4 — Eight-digit call restriction: Calls are not permitted if they are over seven digits in length, unless they are in the allowed long distance number list and the station has SCOS 8. Users with this SCOS must dial a valid telephone number before the appropriate interdigit timer expires, otherwise the connection will be dropped and the user will hear reorder tones.

4.33 SCOS 5 — Area/office code restriction: This restriction is divided into three user groups to allow three sets of area/office code restriction tables. This is useful for reducing restrictions for some of the station users while increasing restrictions for others. Each station is assigned to a user group in database programming. Within each user group, area codes can be designated as restricted, allowed, or extended. Restricting an area code prevents users from placing calls to that area code. Allowing an area code also allows all office codes within that area code. Designating an area code as extended allows the programmer to determine which office codes (up to 800) are allowed or restricted within that area code. For each user group, 160 area codes can be marked as allowed or restricted in the database list, and up to four area codes may be marked as extended.

4.34 SCOS 6 — LCR Only: Calls can only be placed using the least-cost routing (LCR) feature when this restriction is assigned. (LCR is described in detail on page 4-24.) The user will hear reorder tones when attempting to place a call using any other method. A re-

stricted user can still access individual lines if the lines are designated as "exempt from LCR Only" (as described on page 4-21), or were transferred, were placed on hold, or are recalling or ringing. Line restriction also determines which lines can be accessed by the station. Because stations with this SCOS can use only LCR, they cannot forward calls to outside telephone numbers (unless they are using a line group containing only lines designated as exempt from LCR Only), nor can they place international (01+) calls.

4.35 SCOS 7 — Alternate carrier number restriction: Calls can not be placed to any of the numbers on the alternate carrier number list if the station is given this restriction. (For example, to restrict 411 at certain stations, enter the number in the alternate carrier list and give the stations SCOS 7.) There can be up to 20 alternate carrier numbers with up to 10 digits each. The numbers should not contain the toll field. An X in a number represents any digit 0-9. A plus (+) in the number restricts any number that begins with the designated sequence (for example, XXX976+ restricts any number that begins with any area code and 976).

NOTE: Allowed long distance numbers override alternate carrier number restrictions. Also, numbers are only restricted if they *exactly* match the number on the alternate carrier list. For this reason, alternate carrier numbers should have a plus (+) added to the end of the number to prevent the user from bypassing toll restriction by dialing extra digits after dialing the restricted number.

4.36 SCOS 8 — Allowed long distance number: Stations with this SCOS are allowed access to numbers in the allowed long distance number list. There can be up to 20 numbers of up to 10 digits each. Calls placed to these numbers are not subject to SCOS restrictions 2 and 4-7. Operator-assisted and international calls (SCOS 1 and 3) are not checked against this list. An X in the number represents any digit 0-9; for example, XXX-555-1212 allows users to dial directory information using any area code. A plus (+) in the number allows any number that begins with the designated sequence (for example, 800+ allows any 800 number to be dialed). The numbers should not include the toll field.

F. LINE GROUP ASSIGNMENTS AND AUTOMATIC LINE ANSWER/SELECT

4.37 For easy access to available C.O. lines, the system can include line groups and auto lines.

- Line group feature codes are used to select a line in one of the programmed line groups. There can be up to eight line groups. MF-rated systems can have up to 32 lines in each line group. For example, all local lines could be in one group, while another group contains WATS lines that are used for long distance calling. Lines can be included in more than one group. KF-rated systems can have one line in each line group. Line group feature codes are necessary when forwarding calls to outside telephone numbers and for single-line sets to use non-LCR lines.
- Auto lines are incoming or outgoing lines that are accessed by entering the automatic line select feature code (89) or by pressing the ANS key. Refer to paragraph 4.39 below. There can be up to 32 auto lines on MF-rated systems. KF-rated systems can have one auto line.

4.38 Automatic Line Answer: If a station is programmed with allowed-answer assignment only, direct ring-in calls can be answered by entering the automatic line answer feature code (350) or pressing the flashing line key.

4.39 Automatic Line Select: For calls that are ringing or holding at the station, the user may enter the automatic line select feature code (89) or press the ANS key. When more than one call is ringing or holding, the following priority list determines which call is answered first:

- Ringing outside calls (ring ins, recalls, callbacks, or transfers) are answered in the order they were received.
- Then calls on individual hold are answered (not calls on system hold, conference hold, or being transferred). Calls are picked up in the order they were placed on hold.
- If no calls are ringing or holding, an available outgoing auto line is selected.

G. LEAST-COST ROUTING (LCR)

NOTE: This feature is available only in the *MF-rated Extended* software package.

4.40 LCR is a money-saving feature that allows the system to be programmed to select the desired route for placing outgoing calls. It can be used for placing outgoing calls or transferring calls to outside telephone numbers, but cannot be used for dialing international (01+) calls or for forwarding calls to outside telephone numbers. Stations can be programmed to only use LCR for placing outgoing calls (refer to page 4-23).

4.41 When LCR is selected, the user dials the number (including the area code, if needed), and the system does the following:

- **Checks the area code and/or office code:** The database contains up to 12 lists of area and office codes called route groups. The system checks the route groups in numerical order (1-12) and selects the first group that contains the area and/or office code that was dialed. (If an area code was not dialed, the system checks the route group for the local area code.)
- **Checks the time of day:** Each route group has three time blocks: day (8:00 AM - 4:59 PM), evening (5:00 PM - 10:59 PM), and night (11:00 PM - 7:59 AM and weekends).
- **Selects a group of lines:** Each time block contains up to eight programmed groups of up to 32 lines each, called facility groups. The groups are ordered so that the least-expensive group of lines is checked and, if available, is selected first. If the least-expensive group is not available, the station camps on until a line is available or the LCR advance timer expires. If the timer expires, the user hears a progress tone and the system checks the next facility group.
NOTE: The system advances only as far as the station's assigned LCR class of service allows.
- **Adds or deletes digits according to the facility group chosen:** Each facility group has a programmed set of dial rules that tell the system what to dial. The system can have up to eight dial rules — five of which are programmable. Each facility group can use 1 to 8 dial rules. For example, if the selected facility group requires that the number

contain 1, but no area code, the dial rules include the 1 and drop the area code.

- **Checks for toll and line restrictions:** Once the number has all of the necessary digits added or deleted, the system checks the SCOS and line restrictions for the station to determine whether the call is allowed. If allowed, the system continues to the next step. If not allowed, the system returns to the third step to select another facility group. If the station is restricted from all of the facility groups in the route group or the number dialed is restricted, the system sends reorder tones and the call is dropped without being dialed.
- **Dials the modified telephone number:** If the number is allowed, the system seizes the selected line, waits for the dial tone wait timer to expire, and then dials. The user hears a single progress tone and outside dial tone.

LCR Class of Service

4.42 In addition, stations are assigned an LCR "class of service" that limits the number of facility groups that the call may advance through when LCR is used. (When facility groups are busy or unavailable, LCR is generally programmed to advance from the least expensive facility group to the more expensive facility groups.) Before assigning an LCR class of service, determinations should be made as to exactly how many facility groups a station user may be allowed to advance should the less expensive facility group lines be busy. Consideration should be given as to how important it is that the call go out immediately, or whether it is more important that the caller wait for a less expensive line to become available.

4.43 An LCR class of service is assigned to all stations, even those not assigned LCR Only (SCOS 6). Each station is assigned the class of service "unlimited" or a number from 0 to 6. (NOTE: This assignment applies to all route groups and all time blocks.) The 0-6 designations indicate the number of facility groups through which the station can advance. Stations with designation 0 will not advance past the first facility group in each route group, stations with 1 may advance once (to the next programmed facility group), and so on. Stations with the unlimited designation may advance through all programmed facility groups in each route group. The default designation for all stations is unlimited. If a station is restricted from the lines in a facility group or if the LCR-modified telephone number is toll restricted due to its station's class of service, the system will immediately proceed to the next facility group and will count this as one advancement.

LCR Toll Call Forced Account Codes

4.44 LCR toll call forced account codes are programmed on a station-by-station basis for stations with SCOS 6 (LCR Only). If required, a forced account code must be entered after LCR has determined that a toll number was dialed. The station user is not given access to the selected outgoing line until the code is entered (refer to page 4-51 for procedures). Up to 120 LCR-Only stations can be assigned LCR toll call forced account codes in the database programming. If the forced account code validation option is set for the station, the LCR toll call forced account code entered by the station user must match any one of the programmed forced account codes before line access is granted. The forced account code appears in the SMDR account code field.

H. DIRECT INWARD SYSTEM ACCESS (DISA)

4.45 DISA is a programmable feature that allows an outside party to dial into the system from an external DTMF telephone and then access the following system resources: intercom numbers for placing calls to stations; line groups or auto lines for placing outgoing calls; hunt group pilot numbers; and the modem for remote system programming or report generation.

4.46 Toll restriction is not checked on DISA calls when an outgoing line is accessed. DISA users cannot use LCR, access individual C.O. lines (lines not in line groups), or make pages.

4.47 Any of the equipped lines can be programmed to receive incoming DISA calls in day and/or night mode. When not in use for DISA, the line can be used by system users for placing outgoing calls (unless the line is designated as "incoming-only"). Stations, hunt groups, or external signalling devices cannot be programmed for ring-in or answer assignments for DISA lines. A modification to the COU board is required for DISA use (refer to INSTALLATION, page 3-47, for details).

NOTE: Due to the natural characteristics of a C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-152D System. This natural degradation in tone volume may adversely affect the reliability of the DISA feature. Other factors which can affect DISA performance are C.O. line noise and the quality and strength of the DTMF tones generated by the off-premises phone itself.

4.48 When a DISA user calls a station intercom number, the call rings as a direct ring-in call. The DISA caller hears music (if enabled) until the call is answered or disconnected, even if the called station is busy or in do-not-disturb. If the called station is forwarded, the call follows the programmed forward.

4.49 When a DISA caller accesses an outside line, the unsupervised CO timer is activated. When the timer expires, the call recalls the attendant. If the attendant does not answer the recall before the recall and abandoned recall timers expire, the call is disconnected.

NOTE: There may be some reduction in voice volume when a DISA caller accesses an outside line.

4.50 When a hunt group pilot number receives a call through DISA, the call rings or circulates according to how the hunt group is programmed (i.e., linear or distributed). The call is displayed as a direct ring-in call. Refer to page 4-15 for more information on hunt group calls.

DISA Do-Not-Disturb Breakthrough

4.51 Under normal circumstances, direct ring-in calls are not blocked by do-not-disturb. However, the database contains an option that allows or disallows do-not-disturb breakthrough on a station-by-station basis. If do-not-disturb breakthrough is disallowed, DISA calls to a station in do-not-disturb are immediately sent to the station's attendant. If the attendant does not answer the call, it is disconnected after the abandoned recall timer expires.

Security Codes

4.52 DISA lines can be assigned four-digit security codes that are required to access intercom numbers and/or the C.O. lines and modem. The installer can program separate codes for each DISA line to be used during day and/or night modes.

NOTE: While DISA is designed to be reasonably secure against misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. The installer and owner of the system should ensure that proper security measures have been taken to prevent outside callers from accessing and misusing outgoing lines for unauthorized calls. Also, if the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the GMX-152D System and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, when a call is forwarded or transferred to the public network, or when DISA is used for placing outgoing calls.

Using DISA

4.53 Incoming DISA calls are not answered unless the necessary resources (a DTMF decoder and a voice channel) are available.

4.54 If you hear a busy signal followed by music, the C.O. line you tried to access is busy. You have camped on and will be connected to the desired line as soon as it is available.

4.55 If you call an intercom number, you will hear music until the appropriate transfer timer expires; then if your call is not answered it recalls the called station's attendant.

4.56 If you entered an invalid feature code, or intercom number, or dialed an invalid number, you hear reorder tones and then three tones (followed by silence). You may try again. If you dial a valid hunt group pilot number that has no members assigned to it, the call automatically rings at the primary attendant station (or the system alarm station) until the appropriate transfer and abandoned recall timers expire. If the attendant does not answer before the abandoned recall timer expires, the call is disconnected. If you enter an invalid security code, you hear reorder tones and the call is disconnected.

4.57 TO USE DISA IF A SECURITY CODE IS NOT REQUIRED:

- (1) From a DTMF telephone, dial the telephone number of the DISA line.
- (2) When the call is answered by the system and you hear three tones, do one of the following:
 - a. *For placing an outside call:* Dial the automatic line select (89) or select line group (81-87 or 9) feature code. You then hear outside dial tone and can place your call.

- b. *For placing an intercom call:* Dial an intercom number or a hunt group pilot number (if calling the attendant, dial the intercom number, not 0). You hear music until the call is answered.

- c. *For remote system programming:* Dial the intercom number assigned to the modem (default is 260). When you hear modem tone, activate the modem according to the manufacturer's instructions.

4.58 TO USE DISA IF A SECURITY CODE IS REQUIRED FOR SYSTEM ACCESS:

- (1) From a DTMF telephone, dial the number of the DISA line.
- (2) When the call is answered by the system and you hear a single progress tone, enter the appropriate (day or night) DISA security code. (If an invalid security code is entered, you hear reorder tones; the call is dropped.)
- (3) When you hear three tones, do one of the following:
 - a. *For placing an outside call:* Dial the automatic line select (89) or select line group (81-87 or 9) feature code. You hear outside dial tone; place your call.
 - b. *For placing an intercom call:* Dial an intercom number or hunt group pilot number. (If calling the attendant, dial the intercom number, not 0.) You hear music until the call is answered.
 - c. *For remote system programming:* Dial the intercom number assigned to the modem (default is 260). When you hear modem tone, activate the modem according to the manufacturer's instructions.

4.59 TO USE DISA IF A SECURITY CODE IS REQUIRED FOR C.O. LINE AND MODEM ACCESS:

- (1) From a DTMF telephone, dial the telephone number of the DISA line.
- (2) When the system answers the call and you hear three tones, do one of the following:
 - a. *For placing an intercom call:* Dial an intercom number or hunt group pilot number (if calling the attendant, dial the intercom number, not 0). You hear music until the call is answered.
 - b. *For placing an outside call:* Dial a C.O. access code (89, 81-87 or 9). When you hear

a single progress tone, enter the appropriate (day or night) DISA security code. You hear outside dial tone when the system recognizes the security code and if the line is available. (If an invalid security code is entered, you hear reorder tones and the call is dropped.)

- c. *For remote system programming:* Dial a modem access code (default is 260). When you hear a single progress tone, enter the appropriate (day or night) DISA security code. You hear outside dial tone when the system recognizes the security code and if the line is available. (If an invalid security code is entered, you hear reorder tones. You then hear dial tone and may try again.)

5. STATION INSTRUMENTS

5.1 To allow system flexibility and cost efficiency, a variety of station instruments can be used on the GMX-152D System. They are:

- GX 24-Line Keysets — display and standard
- GMX 24-Line Keysets — display and standard
- GMX 12-Line Keysets — standard only
- Inter-Tel/DVK 24-Line Keysets — display and standard
- Inter-Tel/DVK 12-Line Keysets — display and standard
- Inter-Tel/DVK 8-Line Keysets — display and standard
- Single-Line Sets — Single-Line Instruments (SLIs) and industry-standard, single-line DTMF sets
- GX Direct Station Selection/Busy Lamp Field (DSS/BLF) Units — single or tandem
- GMX Direct Station Selection/Busy Lamp Field (DSS/BLF) Units — single only
- Inter-Tel/DVK Direct Station Selection/Busy Lamp Field (DSS/BLF) Units — single or tandem

5.2 Station instrument configuration depends on the combination of Station (STN) boards installed in the KSU. There can be any combination of up to 15 STN boards, allowing up to 120 keysets (if all 15 boards are STN-A or -A1) or up to 112 single-line sets (up to 14 of the 15 STN boards can be STN-B or -B2).

5.3 The Inter-Tel/DVK keyset (24-line, 12-line, or 8-line) is a special type of keyset that contains an audio-integrated module which allows the user to adjust volume levels independently for pages, calls, ring tones, etc. *Inter-Tel/DVK keysets are not available at the time of this printing.*

A. KEYSETS

5.4 The 24-line keysets are available in standard or display models. The only physical difference is a liquid crystal display (LCD) on the display keyset. Keyset design features are described in the following paragraphs.

Integrated Speakerphone

5.5 Each GMX and Inter-Tel/DVK keyset has a built-in, integrated speakerphone that allows hands-free operation on outside (C.O.) calls and inside (intercom) calls.

NOTE: On certain handsfree-to-handsfree intercom calls, voice volume levels may cause feedback to occur. If this happens, one station user should pick up the handset.

5.6 All keyset stations allow the user to dial while on hook. In addition, the keyset speaker is used to broadcast pages and may provide background music (provided an external music source is connected to the KSU).

5.7 A programming option can be enabled that disables the speakerphone. This prevents a station from using the speakerphone on outgoing intercom or any outside calls. If enabled, the speakerphone can still be used for receiving handsfree intercom calls, but the user must lift the handset to speak when placing intercom calls and when placing or receiving outside calls. The MUTE key is always lit when the speaker is activated. Call monitoring and on-hook dialing are not affected.

GX Keyset Speakerphone Module or External Desk Speaker

5.8 GX-120 keysets have a built-in speaker and microphone that allow the user to answer intercom calls "handsfree," dial while on hook, monitor calls, and listen to background music. For handsfree conversation on outside calls, GX-120 keysets can be equipped with optional Speakerphone Modules (part no. 828.1077) or with an external desk speaker. Complete information and installation instructions are included with the kit.

5.9 If an external desk speaker is installed, the speaker is connected to the keyset by a mod-to-mod line cord and is turned on and off using the SPKR key. A strap on the bottom of the keyset must also be set to enable the handsfree microphone for outside calls.

Optional Liquid Crystal Display (LCD)

5.10 Standard keysets (except GMX 12-line) can be converted to display keysets by installing LCD Units (refer to REPLACEMENT PARTS for the appropriate part numbers). Installation instructions are on page 3-54 in the INSTALLATION section. The LCD Unit has two 16-character display lines. When the keyset is not in use, the LCD shows the date and the time of day. Other displays include: reminder messages, do-not-disturb messages, numbers dialed, call sources, elapsed time of calls, current call costs, error messages, station status, programming messages, etc. The displayed information is described throughout the instructions in this section of the manual.

5.11 On some GX and GMX keyset models, the LCD contrast can be adjusted by turning the potentiometer located under the telephone number plate on the face of the keysets.

Circuit Number On Power-Up

5.12 To aid in installation and troubleshooting procedures, display keysets show their station identification for five seconds when power is turned on and the keyset line cord is first plugged in. The intercom number and assigned user name appear on the top line of the display, and the circuit number appears on the bottom line. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, or after a system initialization using selection [K] in database programming. After the five-second identification display, the keyset changes to the appropriate display for the current status.

Date And Time Display

5.13 When a display keyset is idle, the date and time are displayed. While on an outside call, in do-not-disturb, or unconditionally forwarded, certain other displays are shown. In these circumstances, use the following procedure to redisplay the date, time, name, and number for five seconds.

5.14 TO DISPLAY THE DATE, TIME, USER NAME, AND INTERCOM NUMBER:

Press the SPCL key and enter the display date and time feature code (300). The date, time, user name, and intercom number are displayed for five seconds.

Selectable Ring Tone

5.15 Keyset users can select the type of ringing alert tone to be heard at their respective keysets. This is useful in open office settings where phones are close together and it is difficult to tell which one is ringing. Eight distinctive ring tones are available.

5.16 In the GX keyset, the ring pitch is changed by setting DIP switches on the bottom of the keyset (refer to page 3-56 in INSTALLATION).

5.17 TO CHANGE GMX OR INTER-TEL/DVK KEYSET RING TONE:

(1) While on hook, press SPCL and enter the select ring tone feature code (328). (Displays SELECT RING TONE.)

(2) EITHER, Enter a number 1-8 for the desired ring tone.

OR, Press the asterisk (*) key or the pound (#) key to scroll through the tones.

OR, Enter 0 or 9 to repeat the previously selected tone.

(3) Lift and replace the handset, or allow the long interdigit timer to expire. The last tone selected will now be heard when the keyset rings.

Volume Controls

5.18 On GX and GMX keysets, speaker volume and ring tone volume are controlled by two thumbwheels on the right-hand side of the keyset.

5.19 On Inter-Tel/DVK keysets, handset and speakerphone volume is controlled by pressing volume control feature keys (UP and DOWN) on the keyset as described on the next page.

5.20 TO CHANGE VOLUMES ON AN INTER-TEL/DVK KEYSSET:

- (1) Press the UP key to raise the volume or press the DOWN key to lower the volume, while performing one of the following. A confirmation tone will alert you when you have reached the highest or lowest possible volume. On display keysets, the display shows the level as it is raised or lowered.
 - a. *To change handset intercom voice volume*, press the desired key while on an off-hook (handset) intercom call.
 - b. *To change handsfree intercom voice volume*, press the desired key while on an on-hook (speakerphone) intercom call.
 - c. *To change handset outside call voice volume*, press the desired key while on an off-hook (handset) outside call.
 - d. *To change handsfree outside call voice volume*, press the desired key while on an on-hook (speakerphone) outside call.
 - e. *To change background music volume*, press the desired key while listening to background music through the keyset speaker.
 - f. *To change alerting tone (ring tone) volume*, press the desired key while the keyset is ringing. **OR**, while on hook, press both keys to hear the currently programmed volume, then press the desired key to adjust it up or down.

NOTE: The selected alert tone is automatically saved.
 - g. *To change handset progress tone volume*, press the desired key while listening to intercom dial tone through the handset.
 - h. *To change speakerphone progress tone volume*, press the desired key while listening to intercom dial tone through the speakerphone.
- (2) **To save the setting:** Press the UP and DOWN keys at the same time. If this step is not performed, the keyset will return to the previous volume level when the call, tone, or music ends (except for the ringing alert tone volume, which is automatically saved at the most current volume level).

5.21 TO RETURN AN INTER-TEL/DVK KEYSSET TO DEFAULT VOLUME LEVELS:

While on or off hook, press the SPCL key and enter the default volume feature code (394).

Optional Loud Ringing Adapter (LRA)

5.22 GMX 24-line keysets or Inter-Tel/DVK keysets with data port modules can have optional LRAs installed. GX keysets can have manufacturer-installed LRAs. The LRA provides dry contacts used in controlling an external ringing device. The LRA is not affected by the ring pitch of the keyset or the ring-r volume control. (Refer to page 3-65 in *INSTALLATION* and page 2-12 in *SPECIFICATIONS* for details.)

Connecting An Optional Headset

5.23 For convenience, a headset can be used at any keyset station. The SPKR key is used to connect and disconnect calls when the headset is attached. Refer to page 2-12 in *SPECIFICATIONS* for hardware requirements.

5.24 TO CONNECT A HEADSET:

- (1) Disconnect the handset by unplugging the coiled handset cord from the base of the keyset. Leave the handset in the cradle.
- (2) Insert the headset plug into the vacant handset jack.
- (3) Press the SPCL key and enter the headset enable feature code (315).

5.25 TO DISCONNECT THE HEADSET:

- (1) Disconnect the headset by unplugging the headset cord from the base of the keyset.
- (2) Plug the coiled handset cord into the base of the keyset.
- (3) While on hook, press the SPCL key and enter the headset disable feature code (316).

C.O. Line Keys

5.26 The line keys provide direct access to up to 24 of the C.O. lines. Each line key is equipped with a light-emitting diode (LED) that indicates the status of the line. Line keys are associated with specific C.O. Line circuit numbers. (The ANS, LCR, and OVER keys are also used to access C.O. lines.)

Automatic Out-Of-Range Line Selection And The OVER Key

5.27 When keysets are used on a system that has more C.O. lines than are present on the keysets, incoming calls on the out-of-range lines may be accessed by pressing the ANS key (or by entering the automatic line selection feature code — 89). Pressing the ANS key answers the call that has been ringing or holding the longest at that keyset. If no call is ringing or holding, the highest-numbered available auto line is selected for an outgoing call.

5.28 In addition to the automatic line selection feature, the database contains a station option that allows one line key to be designated as the automatic “out-of-range” line selection key on a station-by-station basis. This out-of-range line selection key is called the overflow (OVER) key. The location of the OVER key, if any, is determined on a station-by-station basis. GX keysets and GMX 12-line keysets have a fixed-feature OVER key (which may be labelled “POOL”) and therefore do not require this option.

5.29 Although the OVER key works much like the ANS key, the advantage of the OVER key is that it has an LED to indicate the status of ringing or holding calls on the out-of-range lines. Also, when the OVER option is enabled, the keyset user will receive call waiting indications when more than one out-of-range line is ringing or holding. Unlike the ANS key, the OVER key cannot be used to access out-of-range lines for placing outgoing calls.

5.30 When multiple out-of-range lines are ringing or holding, the priority list below determines which call is answered first. When the first call on the list is answered, the second call will camp on and send call waiting signals. Also, the OVER key will flash to indicate the status of the waiting call (ringing or holding).

- Ringing outside calls (ring ins, recalls, callbacks, or transfers) are answered in the order they were received.
- Then calls on individual hold are answered (not calls on system hold, conference hold, or being transferred). Calls are picked up in the order they were placed on hold.

5.31 An exception to the OVER key showing the status of the waiting call occurs when the current call is in the process of being transferred to another station or to the public network. While the call is being transferred, the OVER key will flutter to indicate that the line is in a “transfer hold” condition. The OVER key will flutter until the transfer is either completed or aborted.

NOTE: To complete the transfer of an out-of-range C.O. line, the user must hang up, press another line key, or press the IC key. Pressing the OVER key will abort the transfer and reconnect the current call.

5.32 Out-of-range lines that are ringing in to the system will not flash on the OVER key if the station is programmed with outgoing-access or allowed-answer only. Station users must be assigned ring-in in order for the OVER key to show the status of the line.

5.33 Calls accessed by the OVER key cannot be placed on system hold. Also, out-of-range lines that are placed on system hold by another keyset cannot be accessed using the OVER key.

User-Programmable Speed-Dial Keys with Busy Lamp Field

5.34 The keysets have speed-dial/busy lamp field (SPD/BLF) keys that are used for storing and speed dialing up to 10 intercom and 10 outside telephone numbers. The 8- and 12-line keysets have eight SPD/BLF keys (the other two speed-dial numbers are stored using location codes), and 24-line keysets have 10 SPD/BLF keys. The keys have LEDs that form a busy lamp field to indicate the status of the 10 stations that are accessed using the keys.

Feature Keys

5.35 There are fixed-function and user-programmable feature keys on all of the keysets. These feature keys provide one-key dialing of feature codes. The user-programmable keys can be programmed by the keyset user to access any of the feature codes (except call splitting [337] which is a single-line feature). For feature key locations, refer to the illustrations at the end of the SPECIFICATIONS section. Feature keys of each of the keyset types are described in the following paragraphs.

5.36 The features accessed by the GX 24-line key-set's nine fixed-function keys are shown below. Feature code descriptions start on page 4-5.

KEY	FUNCTION
CNF	Conference (5).
OVER (POOL)	Used for selecting out-of-range lines. (The key may be labelled POOL.)
FWD	Call forward all calls (355).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
MUTE	Microphone mute on/off (314).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.37 The initialized values of the GX 24-line key-set's nine user-programmable keys are as follows.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345); also used for reverse transfer.
LCR	Least-cost routing (80).
AUTO (ANS)	Same as the ANS key. Automatic line selection (89).
REDIAL	Redial (380). When the system is initialized, the mode of the redial feature code is last outside number dialed (320). Users may reprogram the mode to last outside number saved (321).
SYS SPD	System speed dial (381).
QUE	Busy line/station callback (queue) request (6); also used to cancel a queue.
PAGE	Page (7).
BGND MUSIC	Background music on/off (313).

5.38 The features accessed by the GMX 24-line keyset's nine fixed-function keys are shown below.

KEY	FUNCTION
CNF	Conference (5).
FWD	Call forward all calls (355).
DATA	Data (340).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
MUTE	Microphone mute on/off (314).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.39 The initialized values of the GMX 24-line key-set's nine user-programmable keys are as follows.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345); also used for reverse transfer.
ANS	Automatic line selection (89).
FLASH	Hookflash (330).
REDIAL	Redial (380). When the system is initialized, the mode of the redial feature code is last outside number dialed (320). Users may reprogram the mode to last outside number saved (321).
SYS SPD	System speed dial (381).
QUE	Busy line/station callback (queue) request (6); also used to cancel a queue.
PAGE	Page (7).
BGND MUSIC	Background music on/off (313).

5.40 The features accessed by the Inter-Tel/DVK 24-line keyset's nine fixed-function keys are shown below.

KEY	FUNCTION
SPKR	Speakerphone on/off (312).
MUTE	Microphone mute on/off (314).
DATA	Data (340).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
CNF	Conference (5).
FWD	Call forward all calls (355).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.41 The initialized values of the Inter-Tel/DVK 24-line keyset's nine user-programmable keys are as follows.

KEY	FUNCTION
REDIAL	Redial (380). When the system is initialized, the mode of the redial feature code is last outside number dialed (320). Users may reprogram the mode to last outside number saved (321).
SYS SPD	System speed dial (381).
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345); also used for reverse transfer.
PAGE	Page (7).
QUE	Busy line/station callback (queue) request (6); also used to cancel a queue.
BGND MUSIC	Background music on/off (313).
ANS	Automatic line selection (89).
FLASH	Hookflash (330)

5.42 The features accessed by the GMX 12-line keyset's eight fixed-function keys are shown below.

KEY	FUNCTION
CNF	Conference (5).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
OVER	Used for selecting out-of-range lines.
FWD	Call forward all calls (355).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.43 The initialized values of the GMX 12-line keyset's two user-programmable keys are listed below.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345); also used for reverse transfer.

5.44 The features accessed by the Inter-Tel/DVK 8- and 12-line keyset's nine fixed-function keys are shown below.

KEY	FUNCTION
CNF	Conference (5).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
MUTE	Microphone mute on/off (314).
DATA	Data (340).
FWD	Call forward all calls (355).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.45 The initialized values of the Inter-Tel/DVK 8- and 12-line keyset's five user-programmable keys are listed below.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345); also used for reverse transfer.
PAGE	Page (7).
REDIAL	Redial (380). When the system is initialized, the mode of the redial feature code is last outside number dialed (320). Users may reprogram the mode to last outside number saved (321).
QUE	Busy line/station callback (queue) request (6); also used to cancel a queue.

Keyset Light-Emitting Diode (LED) Indications

5.46 The keyset line keys, speed-dial (SPD/BLF) keys, and some of the feature keys contain light-emitting diodes (LEDs). The LED flash rates, shown on the next page, indicate the status of the stations, lines, and features. The rates are shown in interruptions per minute (IPM).

	STEADY 0 IPM	SLOW 30 IPM	MEDIUM 120 IPM	FAST 240 IPM	FLUTTER 60/960 IPM
DATA		Data call is being monitored			Data call is in progress; continuous = data device is off hook
IC			Recalling intercom call is camped on	Intercom call is camped on	Intercom call is on hold
SPKR	Speakerphone is on or ready for use				
CNF		Conference is in progress	Conference is recalling station		Initiator left conference in progress; or conf. party is on conference wait hold
MUTE	Microphone is muted				
FWD	Calls are being forwarded				
MSG			Message is waiting		
DND	Your station is in do-not-disturb				
SPD/BLF	Station is busy or unplugged	Station is in do-not-disturb		Station has a call ringing in	Continuous = station left off hook
CO LINE	Line is in use at another station or unplugged	Line is in use at your station	Line is recalling from hold or transfer	Ring in, call waiting, or busy line callback	Line is on hold
OVER		Out-of-range line is in use at your station	Out-of-range line is recalling from hold or transfer	Ring in, call waiting, or busy line callback	Out-of-range line is on individual hold at your station

B. SINGLE-LINE SETS

5.47 Up to 112 single-line sets can be installed on the system, depending on the STN boards installed in the KSU. There are two types of single-line sets: Single-Line Instruments (SLIs) and industry-standard single-line DTMF sets. Other single-line devices, such as playback devices and voice mail units, can also be installed on single-line STN circuits.

Single-Line Instrument (SLI)

5.48 The SLI has four user-programmable feature keys for one-key dialing of feature codes and a FLASH key that sends a timed hookflash to signal the system before a feature code is entered. The default values of the feature keys are defined in database programming and the keys can be programmed by the user (refer to page 4-39). They can be assigned any of the general feature codes or C.O. line access codes in the list that begins on page 4-5 (except keyset-only and attendant codes). When the system is initialized, the feature codes assigned to the keys are as follows.

KEY	FUNCTION
STN SPD	Station speed dial (382)
REDIAL	Redial (380)
LCR	Least-cost routing (80)
HOLD	Individual hold (336).

Industry-Standard Single-Line DTMF Set (2500 Set)

5.49 Single-line DTMF set users access the features by hookflashing (pressing and releasing the hook-switch quickly) and entering feature codes.

Off-Premises Stations

5.50 Single-line sets can be used as off-premises stations. They are placed in a remote location and are connected to the system through a telephone company OPX line or a customer-provided line. Refer to INSTALLATION, page 3-71 for installation procedures.

5.51 Off-premises station users access the features by hookflashing (pressing and releasing the hook-switch quickly) and entering feature codes.

Voice Mail Units and Playback Devices

5.52 Voice mail units and playback devices require single-line circuits. Refer to page 3-72 in INSTALLATION for playback device information and page 2-19 in SPECIFICATIONS for voice mail unit information.

C. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNITS

5.53 Each DSS/BLF Unit provides one-key access to up to 60 numbers. DSS/BLF Units are programmed to be used with specific keysets, but use separate keyset circuits and are not physically attached to the keysets. For each circuit assigned to a DSS/BLF Unit, one fewer keyset can be installed. Three types of DSS/BLF Units can be used on the GMX-152D System:

- GX and Inter-Tel/DVK DSS/BLF Units can have a single unit or two connected (tandem) units on each keyset circuit.
- GMX DSS/BLF Units *cannot* be connected to make a tandem units. Each unit requires separate cabling and a separate keyset circuit.

5.54 There can be a maximum of five DSS/BLF-equipped keyset stations installed in the system. Each STN-A or -A1 board can support two single units (GX, GMX, or Inter-Tel/DVK) or one tandem unit (GX or Inter-Tel/DVK). The DSS/BLF circuits are then associated with up to five keyset station circuits in the database. Two single units or one tandem unit can be assigned to each of the associated keyset station circuits, but each single unit or tandem unit can be assigned to only one associated keyset.

5.55 The numbers accessed by the DSS/BLF Units are programmed in two system-wide DSS "maps" in the database, then assigned to the DSS/BLF stations individually. (Tandem stations are assigned to map #1 and then internal DIP switches (GX) or straps (Inter-Tel/DVK) are set to indicate which unit uses map #1 and which uses map #2.) The numbers can include station intercom numbers, talkback speaker intercom numbers, hunt group pilot numbers, and the modem access numbers.

5.56 Together, the lamps in the keys create a busy lamp field that indicates the status of each station assigned to the keys. (Hunt groups, talkback speakers and modems do not show status when assigned to DSS/BLF keys.) The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm.

D. TALKBACK SPEAKERS

5.57 Up to five talkback speakers can be connected to the Modem board. They are assigned intercom numbers (initialized to 221-225) and can receive handsfree intercom calls, internal zone pages, and/or background music. Only one talkback speaker zone can be active at a time; additional requests will camp on until the requested talkback speaker zone is available.

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6. USER-PROGRAMMABLE FEATURE KEYS

6.1 The default values for the user-programmable feature keys are assigned on a system-wide basis in the database (see PROGRAMMING, page 5-50). Users can then customize their stations by re-programming the keys to access the desired feature codes, as described below. Default values of the programmable keyset feature keys are shown beginning on page 4-33. These keys can be programmed to access any of the general feature codes (except call splitting — 337, which is a single-line feature code). Default values of the SLI programmable keys are shown on page 4-37. These keys can be programmed to access any of the general feature codes except keyset-only or attendant-only codes.

6.2 TO DISPLAY THE CURRENT FEATURE KEY ENTRIES ON A DISPLAY KEYSSET:

- (1) While on hook, press the SPCL key and enter the feature key display feature code (326). (Display shows DISPLAY FEATURE KEY PROGRAMMING.)
- (2) Press the feature key(s) to be displayed. (Display shows the current feature assigned, as the keys are pressed.)

6.3 TO RETURN THE FEATURE KEYS TO DEFAULTS:

Keyset: While on hook, press the SPCL key and enter the feature key default feature code (325).

Single-Line Set: Lift the handset, enter the feature key default feature code (325), and hang up.

6.4 TO PROGRAM THE FEATURE KEYS:

- (1) **Keyset:** While on hook, press the SPCL key and enter the feature key programming feature code (327). (Display shows NOW PROGRAMMING FEATURE KEY.)

Single-Line Set: Lift the handset and enter the feature key programming feature code (327).

- (2) Press the desired feature key. (Display shows the feature currently assigned to the key.)
- (3) Enter the feature code to be stored under that key. Keyset users hear a single progress tone when the programming is completed; single-line sets return to intercom dial tone. (Display shows the newly programmed feature.) An invalid code causes repeating reorder tones and does not change the feature code assigned to the key. (Display shows ERROR! FEATURE CODE INVALID.)

NOTE: If you do not enter a feature code, the programming mode times out when the long interdigit timer expires and you hear reorder tones; the feature code assigned to the key remains unchanged.

- (4) **Keyset:** Wait for the display to return to date and time, or lift and replace the handset. To program other keys, repeat the procedure.

Single-Line Set: Hang up or program other keys by repeating the procedure.

7. AUTOMATIC CALL ACCESS (KEYSETS ONLY)

7.1 This feature allows a keyset user to determine the way in which incoming calls are answered. Feature codes are entered by the users to select the type of call access. The four variations are as follows:

- The user hears intercom dial tone when the handset is lifted and must press a line key (or the ANS or OVER key) or the IC key to access an incoming call.
- The user can answer ringing intercom calls by simply lifting the handset, but outside calls must be answered by pressing a line key or the ANS or OVER key. (When the system is initialized, all keysets have this type of call access.)
- The user can answer ringing outside calls by lifting the handset, but ringing intercom calls must be answered by pressing the IC key.
- The user can answer any ringing call by lifting the handset. If no call is ringing, the user hears intercom dial tone when the handset is lifted. (This is the way single-line sets work.)

NOTE: In any of the above variations, keyset users may still receive handsfree intercom calls (if enabled).

7.2 The selected options determine how all types of ringing intercom or outside calls (direct calls, transferred calls, recalls, etc.) are answered. If more than one call is ringing at the station, the first call received is the first answered.

7.3 When programmed for automatic C.O. line access, a station user with allowed answer, but without ring in, for a C.O. line must always press a line, ANS, or OVER key (or press SPCL and enter the automatic line answer feature code — 350) to answer a non-ringing call. Transferred ringing calls and recalls can be answered by lifting the handset.

7.4 Camped-on calls cannot be answered by simply lifting the handset or pressing the SPKR key. For example, a station is programmed to automatically answer ringing outside calls, but requires pressing the IC key to answer ringing intercom calls. If a private intercom call rings in and is immediately followed by an outside call ringing in, the display shows the intercom call message and the outside call camps on. The intercom call also camps on when the handset is lifted. The user can then choose between the camped on calls by pressing either the IC key or the line, ANS, or OVER key.

7.5 The automatic call access options can be programmed at keyset stations only. Single-line sets are already designed to automatically answer ringing intercom and outside calls by lifting the handset. This cannot be changed.

7.6 TO PROGRAM OUTSIDE CALL ACCESS:

- (1) While on hook, press the SPCL key.
- (2) Select the option:
 - a. *If you wish to automatically answer ringing outside calls by lifting the handset*, enter the automatic line access feature code (360). You hear a progress tone.
 - b. *If you wish to access outside calls by pressing the line, ANS, or OVER key*, enter the cancel automatic line access feature code (361). You hear a progress tone.

7.7 TO PROGRAM INTERCOM CALL ACCESS:

- (1) While on hook, press the SPCL key.
- (2) Select the option:
 - a. *If you wish to automatically answer ringing intercom calls by lifting the handset*, enter the automatic intercom access feature code (362). You hear a progress tone.
 - b. *If you wish to access ringing intercom calls by pressing the IC key*, enter the cancel automatic intercom access feature code (363). You hear a progress tone.

8. MUSIC-ON-HOLD AND BACKGROUND MUSIC

8.1 The system can be equipped with a customer-provided external music source for calls on hold and calls waiting, as well as for background music on keysets.

8.2 The music-on-hold feature not only makes the wait as pleasant as possible, but it assures the holding party that the call is still connected.

8.3 Music can also be heard on keyset speakers by using the background music feature code. The primary attendant can enable background music for the talkback speakers by entering a feature code (see page 4-86).

8.4 Background music and intercom music-on-hold are interrupted for pages. Music over keyset speakers is also interrupted by calls, programming, and ringing at the station.

8.5 TO TURN KEYSET BACKGROUND MUSIC ON OR OFF:

While on or off hook, press the BGND MUSIC key (or press the SPCL key and enter the background music on/off feature code — 313). *If off hook, hang up.*

8.6 The optional external music source is a customer-provided radio, tape player, or other device connected through a jack on the Input/Output Processor (IOP) board. If an external source is not connected, either a doorbell-like chime (three chimes every 15 seconds) or silence can be selected by setting a strap on the IOP board.

NOTE: In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.

8.7 Throughout the instructions in this section of the manual, the term "music" refers to the selected music-on-hold option: music, chime, or silence.



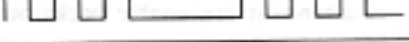

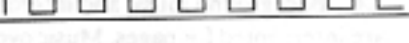
NOTE: If background music to talkback speakers is enabled, the volume of background music at keyset stations is lowered.

9. SIGNALS AND TONES

9.1 There are several distinct signals and tones on the GMX-152D System as shown in the tables below.











A. RING SIGNALS

9.2 The signals and tones generated by the ringer or keyset speaker are as follows.

TYPE OF CALL	SIGNAL	
Outside call	Single long tone every 6 seconds	
Intercom call or off-hook voice announce call	Two short tones and a pause (repeats for private calls)	
Queue callback	Three short tones and a long pause (repeating)	
Recall from transfer or hold	Four short tones and a long pause (repeating)	
Reminder message	Eight short tones	

B. CALL PROCESSING SIGNALS

9.3 The following signals and tones are heard through the handset or keyset speaker.

SIGNAL		ACTION
Intercom dial tone		Handset lifted or SPKR or IC key pressed.
Double tones (called station receives the same signal)		Intercom call — repeats for private call or call to non-handsfree station; one double tone for handsfree call.
Intercom busy signal — slow repeating tones (until camp on)		Called station or selected line is busy.
Four fast tones and a pause (repeating)		Called station is in do-not-disturb.
Reorder tone — fast tones (may be four tones or continuous)		Number or feature code was not accepted, number did not pass toll restriction, or dialing timer expired.
System busy signal — reorder tones followed by music		All resources are busy, station is camped on.
Single progress tone		Feature procedure completed, or something needs to be entered.
Camp-on tone — single tone every 15 seconds (programmable)		Another station has camped on to your station.
Message waiting tone — Six tones followed by intercom dial tone after lifting the handset or hookflashing		A message is waiting at your single-line station.
Consultation hold tones — four fast tones		(Single-line sets only) User just placed a call on consultation hold.

NOTE FOR SINGLE-LINE SET USERS:
When the procedures in this manual tell you to hookflash, quickly press and release the hookswitch. If you press the hookswitch to hang up, hold it down until the SL hookflash maximum timer expires (default value is 0.7 seconds); otherwise, the system recognizes it as a hookflash. If using a Single-Line Instrument (SLI), use the FLASH key to perform a hookflash.

10. INTERCOM CALLS

10.1 The intercom can be used to place station-to-station calls that can be answered handsfree. Or, it can be used to place private (non-handsfree) calls. A station user that reaches a busy station can camp on, request a callback (queue), leave a message, or use the off-hook voice announce feature (if enabled). Other features that apply to both outside and intercom calls, as described later in this section of the manual, include placing calls on hold, call waiting, call transfer, reverse transfer, and call forwarding.

A. PROGRAMMING FOR PRIVATE INTERCOM CALLS

10.2 A station user can place private (non-handsfree) intercom calls by pressing the pound (#) key before dialing the intercom number. Or, the station can be programmed to always send and/or receive private calls using one of the following methods.

Ring Intercom Always

10.3 The user can always place private calls by programming the station with the ring intercom always feature code as described below. While this feature is enabled, the called party hears repeating double tones and must lift the handset (or press the SPKR key or IC key) to answer.

10.4 TO PROGRAM THE STATION TO ALWAYS PLACE PRIVATE INTERCOM CALLS (RING INTERCOM ALWAYS):

Keypad: While on hook, press the SPCL key and enter the ring intercom always feature code (367).

Single-Line Set: Lift the handset. Enter the ring intercom always feature code (367) and hang up.

10.5 TO CANCEL RING INTERCOM ALWAYS:

Keypad: While on hook, press the SPCL key and enter the cancel ring intercom always feature code (368).

Single-Line Set: Lift the handset. Enter the cancel ring intercom always feature code (368) and hang up.

Keypad Handsfree Enable/Disable

10.6 The user can always receive private (non-handsfree) calls by disabling the keypad handsfree answering feature using the disable handsfree feature code. The keypad user hears repeating double tones when receiving an intercom call and must lift the handset (or press the SPKR and/or IC key) to answer while this feature is enabled.

10.7 TO PROGRAM THE STATION TO ALWAYS RECEIVE PRIVATE INTERCOM CALLS (KEYSETS ONLY):

While on hook, press the SPCL key and enter the disable handsfree feature code (310).

10.8 TO RESTORE THE HANDSFREE ANSWERING FEATURE:

While on hook, press the SPCL key and enter the enable handsfree feature code (311).

FEATURES

B. STATION-TO-STATION CALLING

Receiving Intercom Calls

10.9 TO RECEIVE A HANDSFREE INTERCOM CALL ON A KEYSSET:

When you hear a double tone and a call announcement, and the SPKR key is lit, respond handsfree or lift the handset. (Display identifies the source of the call for 10 seconds with INTERCOM CALL FROM XXX.)

10.10 TO RECEIVE A PRIVATE CALL ON A KEYSSET:

When you hear repeating double tones, lift the handset, or press the SPKR or IC key to respond handsfree. (Display identifies the source of the call with INTERCOM CALL FROM XXX.)

10.11 TO RECEIVE AN INTERCOM CALL ON A SINGLE-LINE SET:

When you hear repeating double tones, lift the handset.

10.12 TO RECEIVE A TRANSFERRED-TO-HOLD INTERCOM CALL:

If you hear a page announcing that an intercom call is holding at your station:

Keyset: When the IC key is fluttering, lift the handset and press the IC key. Or, while on hook, press the IC key to speak handsfree. You are connected to the caller.

Single-Line Set: Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

Placing Intercom Calls

NOTE: When placing an intercom call, begin dialing before the dial initiation timer expires. If the timer expires, the system drops the connection and sends repeating reorder tones. This prevents an intercom channel from being tied up accidentally.

10.13 TO PLACE AN INTERCOM CALL:

(1) Keyset:

EITHER, lift the handset.

OR, while on hook, press the SPKR key or the IC key. The SPKR key lights.

Single-Line Set: Lift the handset. (If the DTMF decoders, tone generators, or intercom paths are busy, a single-line set user hears busy signals and then camps on and hears music, if enabled. When all necessary resources are available, the user hears intercom dial tone.)

(2) If you want to place a private (non-handsfree) call to a keyset, press the pound (#) key.

(3) Dial an intercom number. The number can be 0 for the attendant, a station intercom number, or a hunt group pilot number. (Display shows number dialed.) If you dial too slowly, the interdigit timer may expire and you will hear repeating reorder tones.

a. If calling a handsfree keyset station, speak after you hear a double tone.

b. If calling a single-line station, a hunt group, or a keyset with handsfree disabled, you hear repeating double tones until the call is answered.

c. If placing a private call, you hear repeating double tones until the call is answered.

d. If you dial an invalid number, you hear repeating reorder tones.

e. If the called station is busy, you have the following options:

1. Hang up and try later. Or, if dialing handsfree (keysets only), press the SPKR key to disconnect.

2. Do not hang up, your call camps on. When the called station is available, a private call is placed. Refer to paragraph 10.14 for details.

3. Request a busy station callback (queue). This is similar to camping on except that you hang up and wait for the busy station to be available. For more information, refer to paragraph 10.16.

- f. If you hear four fast tones and a pause — repeating, the station is in do-not-disturb. You can use the busy station callback feature.
- g. If the called station is busy, in do-not-disturb, or there is no answer, you can leave a message with the station itself or with the station's message center. For details, refer to page 4-46.
- h. If the called station is an OHVA-equipped keyset (and if all the necessary conditions for OHVA are enabled), you can announce the call using the off-hook voice announce feature. For a complete explanation of this feature, refer to page 4-49.

C. INTERCOM CAMP ON AND BUSY STATION CALLBACK (QUEUE)

Camp On

10.14 When a station user calls a busy station or hunt group, the system sends a busy signal. The caller can wait off hook to camp on (after the camp-on timer expires) and hear music while waiting until the called station is available. The system periodically sends call waiting signals to the busy station(s). Up to 119 stations can camp on to the same intercom number.

10.15 TO CAMP ON TO AN INTERCOM NUMBER:

If you hear a busy signal when calling an intercom number and wish to camp on, do not hang up. You hear music (if enabled) while camped on. When the station is available, a private call is automatically placed and you hear repeating double tones until the call is answered.

Busy Station Callback (Queue)

10.16 When the called station is busy or in do-not-disturb, the caller can request a callback (queue) and hang up until the station is available. This can be done before or after the call camps on. Each station can have only one active queue request at a time.

10.17 Queue callbacks must be answered before the queue callback timer expires. If a callback is not answered, the queue is canceled. If the station is busy when called back, the queue request is placed behind any other waiting queue requests.

10.18 TO QUEUE A STATION:

- (1) **Keyset:** If you hear a busy signal or do-not-disturb signal (four fast tones and a pause, repeating) when calling an intercom number, press the QUE key (or press SPCL and enter the queue request feature code — 6) and hang up.

Single-Line Set: If you hear a busy signal or do-not-disturb signal when calling an intercom number, press the FLASH key (hookflash), enter the queue request feature code (6), and hang up.

- (2) When the queued station is available, you hear three tones and a long pause, repeating. (Display shows XXX IS NOW AVAILABLE.) Lift the handset. A private call is automatically placed to the queued station.

10.19 TO CANCEL A QUEUE REQUEST (BEFORE THE QUEUED STATION BECOMES AVAILABLE):

Keyset: While on hook, press the QUE key (or press the SPCL key and enter the cancel queue request feature code — 376).

Single-Line Set: Lift the handset, enter the cancel queue request feature code (376), and hang up.

11. INTER-STATION MESSAGES

11.1 If a station is busy, there is no answer, or it is in do-not-disturb, intercom callers may leave a message waiting indication. There are two message options:

- **Have the user return your call.** When the station user responds to the message, a call is automatically placed to your station.
- **Leave a message with the station user's message center.** When the station user responds to the message, a call is automatically placed to his or her message center.

11.2 To signal that a message is waiting, a called keyset's MSG key flashes and the display shows the message source. For single-line sets, a system programming option can be enabled that sends message waiting tones when the user lifts the handset or presses the hookswitch. On-premises single-line sets can also be equipped with message waiting lamps if connected to a STN-B2 board that is equipped with a 48VDC power supply.

11.3 Any station can be designated as the message center for any other station or group of stations. However, a station cannot be programmed as its own message center. When the system is initialized, circuit 1.1 (the primary attendant) is the message center for all stations, except itself.

11.4 If the designated message center is a voice mail system, the voice mail system is called after the message (at message center) timer expires. When the voice mail system answers the call, the called station user's "mailbox" is automatically dialed. The caller can then leave a message in the mail box. If a display keyset is called, display shows MESSAGE RECEIVED FROM [Voice Mail].

11.5 Each station user can leave message waiting indications at more than one station, but only one per station. A station can receive up to 119 messages, and there can be a maximum of 255 waiting messages in the system.

11.6 On display keysets, the messages can be viewed in the order they were received and answered as desired.

A. LEAVING MESSAGES

11.7 TO LEAVE A MESSAGE WAITING INDICATION

- (1) When calling a station, if you hear a busy signal, do-not-disturb signal (repeating signal of four fast tones and a pause), or the call is not answered:

Keyset: Press the MSG key.

Single-Line Set: Press the FLASH key (hook-flash) and enter the message feature code (365).

- (2) *To have the called party call you:* Hang up or press a line key or the IC key to disconnect before the message (at message center) timer expires.

To leave the message with the called party's message center: Do not hang up. When the message (at message center) timer expires, a private call is automatically placed to the called party's message center. Leave your message with the message center and hang up. If the message center does not answer the call (that is placed after the timer expires), the message at the called station still processes the message as coming from the message center.

NOTE: If the station you are calling does not have a designated message center or if the station happens to be your message center, you will hear dial tone immediately after pressing the MSG key. The message indication is left at the called station and display keysets will show MESSAGE RECEIVED FROM [your station].

Canceling A Message Waiting Indication That You Left

11.8 Occasionally, you may wish to cancel a message that you left before the station user responds to the message. If the message was left with the station's message center, you cannot cancel it from your station; it can only be canceled from the message center station.

11.9 TO CANCEL A MESSAGE YOU LEFT

- (1) At your station, lift the handset and dial the intercom number (or press the SPD/BLF key) of the station with the message.

- (2) Press the SPCL key (FLASH on single-line sets) and enter the message cancel feature code (366). You hear intercom dial tone (even if a message was not present at the called station).

B. RESPONDING TO MESSAGES

Answering Messages

11.10 TO ANSWER MESSAGES AT A KEYSSET:

- (1) When your MSG key is flashing (display shows MESSAGE RECEIVED FROM XXX), lift the handset and press the MSG key. Depending on how the message was left, an intercom call is placed to either the station that left the message or your message center.

NOTE: If, after pressing the flashing MSG key, the called station does not answer a private call, is busy, or is in do-not-disturb, your message key continues to flash (if you hang up, the display indicates a waiting message). The message waiting indications are canceled only when you are actually connected with the called station.

- (2) *If the MSG key continues to flash, there is another message (display shows the next message). Repeat step 1.*

11.11 TO ANSWER MESSAGES AT A SINGLE-LINE SET:

- (1) When you hear message waiting tones (six tones) after lifting the handset or hookflashing, press the FLASH (hookflash) and enter the message feature code (365). Depending on how the message was left, an intercom call is placed to either the station that left the message or your message center.

NOTE: If the called station does not answer, is busy, or is in do-not-disturb, you may hang up. When the handset is lifted again you will hear message waiting tones. The message waiting

indications are canceled only when you have actually connected with the called station.

- (2) *If you hear message waiting tones after hookflashing or when the handset is lifted again, there is another message waiting. Repeat step 1.*

Canceling A Waiting Message

11.12 TO CANCEL A MESSAGE WITHOUT ANSWERING AT A KEYSSET:

- (1) When the MSG key is flashing (display shows message source), remain on hook and press the asterisk (*) key. Or, press SPCL and enter the cancel current message feature code (379). The message is canceled.
- (2) *If the MSG key continues to flash, there is another message (display shows the next message). Either respond to the message or cancel it.*

11.13 TO CANCEL A MESSAGE WITHOUT ANSWERING AT A SINGLE-LINE SET:

- (1) When you receive message waiting tones, press FLASH (hookflash) and enter the cancel current message feature code (379). The message is canceled.
- (2) *If you hear message waiting tones after hookflashing or when the handset is lifted again, there is another message. Either respond to it or cancel it.*

Viewing Waiting Messages

11.14 TO VIEW RECEIVED MESSAGES AT A DISPLAY KEYSSET:

- (1) When your MSG key is flashing, one or more messages are waiting. While on hook, press the MSG key repeatedly to view waiting messages.
- (2) *If desired, you can answer or cancel a message while it is displayed.*

Alternate Message Source

11.15 An "alternate message source" feature was developed to enable a voice mail system to leave messages through a station that is designated as its alternate message source. When a message is left on the voice mail system for a station user that has an assigned mailbox, the voice mail unit automatically dials the message feature code (365) and then dials the intercom number of the called station. The called station receives message waiting indications. If it is a display keyset, the display shows MESSAGE RECEIVED FROM [alternate message source] rather than from the voice mail circuit. An actual intercom call has not been placed; only the message waiting indications are affected. When the called station user retrieves the message, an intercom call is placed to the alternate message source.

11.16 One possible application for this feature is for routing messages through a COU circuit to allow keysets to use DTMF tones to retrieve messages when the voice mail unit is on a STN-B circuit. (This is not required when the unit is on a STN-B2 circuit.)

11.17 To achieve this function, an unused single-line circuit is programmed as the alternate message source for the voice mail station circuits and is then programmed to automatically forward all calls to a COU circuit that is connected to the voice mail unit. When a user responds to a message from the voice mail unit, the call is automatically forwarded to the COU circuit. This leaves the voice mail single-line circuit available to receive messages while the COU circuit is in use.

12. OFF-HOOK VOICE ANNOUNCE (OHVA)

12.1 Keysets (except GX 24-line and GMX 12-line) can be installed with secondary voice paths and can be enabled to receive off-hook voice announce calls. The off-hook voice announce feature allows an intercom caller (either single-line or keyset) to establish voice contact with the keyset user, even though the user already has a call in progress on the handset (primary voice path). The called keyset user can then talk freely on either connection, using the handset for the original call or the speakerphone for the OHVA intercom call.

12.2 The OHVA feature requires special installation and programming (refer to *INSTALLATION*, page 3-19, and *PROGRAMMING*, page 5-41, for complete details). When the system is initialized, this feature is disabled. Once the OHVA feature is enabled system wide (and the appropriate installation procedures have been performed), each keyset with a secondary voice path can be allowed or disallowed from *placing* and/or *receiving* OHVA calls. Keysets without secondary voice paths and single-line sets can be allowed or disallowed from *placing* OHVA calls.

12.3 For example, you may want to allow all attendants to place, but not receive, OHVA calls, while other stations are allowed to receive, but not place, OHVA calls. Any combination is available through system and station programming.

12.4 OHVA calls cannot be processed if the secondary voice path or the speakerphone of the called keyset is not available. This occurs when the keyset has a different OHVA call in progress, has an active data call in progress, is on an active handsfree intercom or outside call, has handsfree disabled, has a headset enabled, or is in do-not-disturb. Also, OHVA calls are not possible if the caller is placing a forced private intercom call.

12.5 TO PLACE AN OFF-HOOK VOICE ANNOUNCE CALL:

- (1) When an intercom call is placed to a busy OHVA-enabled keyset, do not hang up. You hear busy signals until the camp-on timer and the OHVA screening timer expire. (If you hear music after the camp-on timer expires, condi-

tions for an OHVA call were not met and you are camped-on. See paragraph 10.14.)

- (2) When the OHVA screening timer expires (and if the keyset's secondary voice path is available), you are automatically connected to the called party's speakerphone.

12.6 TO PLACE AN IMMEDIATE OFF-HOOK VOICE ANNOUNCE CALL (KEYSETS EQUIPPED WITH DSS/BLF UNITS ONLY):

NOTE: This method can only be used if the database has been programmed to allow keysets with attached DSS/BLF Units to bypass the camp-on and OHVA screening timers. See page 5-22 in *PROGRAMMING*.

- (1) When an intercom call is placed (using the DSS/BLF key) to a busy OHVA-enabled keyset, do not hang up.
- (2) Press the DSS/BLF key for that keyset again. If the keyset's secondary voice path is available, you are immediately connected and may speak.

12.7 TO RECEIVE AN OFF-HOOK VOICE ANNOUNCE CALL (OHVA-ENABLED KEYSETS ONLY):

- (1) While on a call using the handset, you hear a camp-on tone (display shows CALL ANNOUNCE FROM XXX). Do nothing. When the OHVA screening timer expires, you hear a double tone (display shows INTERCOM CALL FROM XXX). You are connected with the intercom caller via the speakerphone. Your original call remains connected on the handset.
- (2) **To terminate the OHVA call:** Press the lit SPKR key or have the OHVA caller hang up. If you terminate the original call by hanging up the handset, you remain connected to the OHVA call in the handsfree intercom mode.

12.8 TO BLOCK AN OFF-HOOK VOICE ANNOUNCE CALL (OHVA-ENABLED KEYSETS ONLY):

While on a call using the handset, you hear a camp-on tone (display shows CALL ANNOUNCE FROM XXX). To cause the intercom call to camp on, press the SPKR or DND key. The IC key flashes.

FEATURES

13. OUTSIDE CALLS

13.1 When a line is selected for receiving or placing an outside call, a voice channel is seized and cannot be used by any other station (unless the conferencing feature is used). If the desired line is busy, the station user can camp on or request a callback (queue).

13.2 Other features that apply to both outside and intercom calls are discussed later in this section of the manual. They include placing calls on hold, call waiting, call transfer, reverse transfer, conferencing, and call forwarding. Refer to page 4-20 for an explanation of outgoing-access, allowed-answer, and ring-in assignments. Refer to page 4-24 for an explanation of line groups, auto lines, and the use of the automatic line answer and automatic line select feature codes. Refer to page 4-32 for an explanation of using the OVER key to access calls on out-of-range lines.

A. PLACING AND RECEIVING OUTSIDE CALLS

Placing Outside Calls

13.3 TO PLACE AN OUTSIDE CALL:

NOTE: When placing a call, begin dialing before the dial initiation timer expires. If the timer expires, the system drops the line connection and sends repeating reorder tones. This prevents a line from being tied up accidentally. You must have outgoing access to a line to seize it.

- (1) **Keypad:** While on or off hook, select an outgoing line using one of the methods below. The associated line key or the OVER key flashes slowly. If dialing on hook, the SPKR key (and the MUTE key on GX keysets) is lit.

EITHER, press a line key for direct access.

OR, press SPCL and enter the automatic line select feature code (89). Or, if auto lines have been programmed, press the ANS key. If no call is ringing or holding, the system selects the highest-numbered available auto line.

OR, press SPCL and enter a select line group feature code (81-87 or 9). This selects a line in the chosen line group.

OR, refer to the least-cost routing procedure on the next page.

Single-Line Set: Lift the handset and select a line using one of the following methods.

EITHER, enter the automatic line selection feature code (89).

OR, enter a select line group feature code (81-87 or 9).

OR, refer to the least-cost routing procedure on the next page.

- (2) You hear one of the following signals:

- **Outside dial tone:** Go to the next step.
- **Single progress tone:** Enter a forced account code. The display shows ACCT#. You hear a single progress tone and then outside dial tone when the code is accepted.
- **Repeating reorder tones:** You are restricted from the line chosen; choose another line. Or, you are restricted to using LCR only; try again using LCR (refer to the procedure on the next page).
- **Busy signal:** The chosen line is busy. Camp on, use the busy line callback (queue) feature, or select another line.

- (3) Manually dial, speed dial, or redial the desired telephone number. (Display shows the numbers dialed. When the valid call timer expires, the display shows the elapsed time and call cost.) If you hear repeating reorder tones, you dialed a restricted number. If you dial too slowly and the interdigit or line pre-select timer expires, the call may be dropped, and you will hear repeating reorder tones.

If using a keyset with a speakerphone (on hook), you may speak handsfree. Or, lift the handset and speak. The SPKR key goes off. You may transfer back to the speakerphone by pressing the SPKR key and hanging up.

If using a GX keyset without an external speakerphone, lift the handset to speak when the party answers.

- (4) **To terminate the call:** *If on hook, disconnect by pressing the SPKR key. If off hook, hang up.*

13.4 TO PLACE A CALL USING LEAST-COST ROUTING:

- (1) **Keypad:** While on or off hook, enter the least-cost routing feature code (80) or press the LCR key. You hear a single progress tone.

Single-Line Set: Lift the handset and press the LCR key or enter the least-cost routing feature code (80). You hear a single progress tone.

NOTE: If required, enter a forced account code. (Display shows ACCT#.) You hear a progress tone when the code is accepted.

- (2) Dial the telephone number. Use the MUTE key to backspace if you make a mistake. Include the area code, if needed. *If desired*, press the pound (#) or asterisk (*) key after dialing to immediately proceed; otherwise there may be a slight delay. You hear one of the following signals.

NOTE: When dialing 911 or 1911 emergency numbers, always press # or * after dialing so that the call is processed as quickly as possible.

- a. *Single progress tone followed by dial tone and digits being dialed:* Your call is being placed. The associated line key or the OVER key flashes slowly on keysets.
- b. *Single progress tone followed by silence:* Your station is programmed for LCR toll call forced account code. You are required to enter a forced account code when dialing a toll call. (Display shows ACCT#.) Enter a forced account code. You hear a progress tone when the code is accepted.
- c. *Single progress tone followed by busy signals, then music:* All of the lines in the selected route group are busy. Do one of the following:

EITHER, continue to wait off hook. When the system accesses a line, you hear dial tone (and digits being dialed). The associated line key or the OVER key flashes slowly on keysets.

OR, request a busy line callback. The system places your station in a queue for an available line in the selected route group.

When you hear repeating callback signals of three tones and a long pause (and the display shows LINE XX IS NOW AVAILABLE), lift the handset; keypad users must also press the fast flashing line or OVER key (or the ANS key). You hear dial tone and digits being dialed. The associated line key or the OVER key flashes slowly.

- d. *Repeating reorder tones:* You are restricted from the number dialed or the line selected.

Receiving Outside Calls

13.5 TO RECEIVE AN OUTSIDE CALL:

Keypad:

- (1) When one of the following occurs, lift the handset:
 - *You hear repeating long tones and a line key is flashing at the fast rate:* A call is ringing in. (Display shows CALL RINGING IN ON LINE XX.)
 - *You hear an intercom call or page announcing a call and a line key is flashing at the fast rate:* A call has been transferred to your station. (Display shows LINE XX TRANSFER FROM XXX.)
 - *A line key is flashing at the fast rate (there is no ring signal at your station), and you have allowed answer for the line:* You may hear ringing on another keypad. The ANS key cannot be used to answer these calls. Press the fast-flashing line key as described below or enter the automatic line answer feature code [350].
- (2) Press the fast-flashing line or OVER key, or press the ANS key. The line or OVER key flashes slowly during the call.

Single-Line Set:

If you hear a page announcing a transfer and/or repeating long tones, a call is ringing in. Lift the handset; you are connected to the caller.

If you hear a call ringing in on another station and you have allowed answer, lift the handset and enter the automatic line answer feature code (350). You are connected to the lowest-numbered ringing line for which you have allowed answer.

13.6 TO RECEIVE A CALL THAT WAS TRANSFERRED TO HOLD:

If you hear a page announcing that an outside call is holding at your station (a line key is fluttering):

Keyset: Lift the handset and press the fluttering line or OVER key, or press the ANS key. You are connected to the caller.

Single-Line Set: Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

B. KEYSSET ON-HOOK MONITORING

13.7 A keyset user can dial numbers while on hook, monitor the call (listen to a recorded message, wait for the call to be answered, or wait on hold).

13.8 TO USE ON-HOOK MONITOR:

- (1) While on a call, press the SPKR key and hang up. *If you do not want to be heard, press the MUTE key if it is not already lit. You can hear the other party (if the microphone is muted, you cannot be heard). The SPKR key is lit (and the MUTE key is lit if the microphone was muted).*
- (2) **To return to the conversation:** You may lift the handset or speak handsfree. (If the microphone was muted, press the lit MUTE key to speak. The MUTE key goes off. *If using a GX keyset without an external speakerphone, you must lift the handset.*)

C. C.O. LINE CAMP ON AND BUSY LINE CALLBACK (QUEUE)

Camp On

13.9 When a station user attempts to access a busy outgoing line, the system sends a busy signal. The station user can wait off hook to camp on until the line is available.

13.10 TO CAMP ON TO AN OUTGOING LINE:

- (1) When you hear a busy signal after selecting an outgoing line, do not hang up. You camp on and hear music until the line is available.

- (2) When you hear a single progress tone and outside dial tone, dial the desired telephone number. The associated line key (if one exists) flashes slowly.

Busy Line Callback (Queue)

13.11 If you attempt to access a busy outgoing line and hear a busy signal or if you camp on, you can request a callback (queue) and hang up until the system signals your station that the line is available. Each station can wait in only one queue at a time. If a second request is made, the first request is canceled and replaced by the second.

13.12 Queue callbacks must be answered before the queue callback timer expires. If a callback is not answered, the queue is canceled. If the station is busy when the queued line becomes available, the queue request is placed at the end of the queue list for that line and the line is made available to the next queued station.

13.13 TO QUEUE A BUSY OUTGOING LINE:

- (1) **Keyset:** If you hear a busy signal when selecting a line or if you are camped on, press the QUE key (or press the SPCL key and enter the queue request feature code — 6) and hang up.

Single-Line Set: If you hear a busy signal when selecting a line or if you are camped on, press the FLASH key (hookflash) and enter the queue request feature code (6). Then hang up.

- (2) Your station rings (three tones and a long pause, repeating) when the queued line is available. (Display shows LINE XX IS NOW AVAILABLE.)

- (3) **Keyset:** Lift the handset, press the fast-flashing line key or the ANS key, and dial the desired telephone number (unless the number was originally dialed using LCR and it is dialed automatically). The associated line key or the OVER key flashes slowly.

Single-Line Set: Lift the handset and dial the desired number (unless the number was originally dialed using LCR and it is dialed automatically). If all DTMF decoders are busy when your station is called back, the system sends repeating reorder tones instead of dial tone and the queue is canceled.

13.14 TO CANCEL A QUEUE:

Keyset: While on hook, press the QUE key (or press the SPCL key and enter the cancel queue request feature code — 376).

Single-Line Set: Lift the handset, enter the cancel queue request feature code (376), and hang up.

D. ACCOUNT CODES

13.15 There are four types of account codes in the GMX-152D System. All account codes are assigned the same character length (4-8 characters) in database programming. The three types are as follows:

- **Standard account codes** automatically appear in the SMDR report (if programmed) to identify the station that answered or initiated the call. Up to 32 standard account codes can be defined for the system. Stations can then be assigned one of the 32 account codes during station programming.
- **Forced account codes** are programmed on a station-by-station basis. If required, a forced account code must be entered before the station user is given access to a selected outgoing line (refer to paragraph 13.3 for procedures). Up to 120 forced account codes can be assigned in the database programming. If the forced account code validation option is set for the station, the forced account code entered by the station user must match any one of the programmed forced account codes before line access is granted. The forced account code appears in the SMDR account code field.
- **LCR toll call forced account codes** are programmed on a station-by-station basis for stations with SCOS 6 (LCR Only). If required, a forced account code must be entered after LCR has checked area/office code toll restrictions and determined that a toll number was dialed. The station user is not given access to the selected outgoing line until the code is entered (refer to paragraph 13.4 for procedures). Up to 120 LCR-Only stations can be assigned LCR toll call forced account codes in the database programming. If the forced account code validation option is set for

the station, the LCR toll call forced account code entered by the station user must match any one of the programmed forced account codes before line access is granted. The forced account code appears in the SMDR account code field.

- **Optional account codes** are used to identify calls to and from customers for billing purposes. They can be entered at any time during a call (if using LCR, wait for the number to be dialed). These user-defined codes are not pre-programmed, but must be the same length as the standard and forced account codes. If entered, optional account codes are printed in the SMDA and the SMDR report for that call in place of standard or forced codes that may have been used.

13.16 If more than one account code is entered during a call, the last code entered is recorded in the SMDA and SMDR reports. For example, if a standard or forced code is entered whenever the station is used for placing an outgoing call and the user then enters an optional account code, the optional code appears in the reports.

13.17 TO ENTER AN OPTIONAL ACCOUNT CODE WHILE ON AN OUTSIDE CALL:

- (1) **Keyset:** Press the SPCL key and enter the optional account code feature code (390). (Display shows ACCT#.) The outside party does not hear you enter the code.

Single-Line Set: Press the FLASH key and enter the optional account code feature code (390). The call is placed on hold while the account code is being entered.

- (2) Enter the account code using the keypad. Keyset users may press an SPD/BLF key to enter an account code number that has been stored in an outside speed-dial number location. (Display shows numbers.) You hear a single progress tone when the code is accepted. Single-line users are reconnected when the system accepts the account code. (If an account code is entered that has fewer than the programmed number of digits, single-line users will return to the call after the short interdigit timer expires.)

14. PLACING CALLS ON HOLD

14.1 There are several ways to place intercom and outside calls on hold. The party on hold hears music.

- **Individual hold** places the call on hold at only one station. It can then be picked up directly at that station or it can be picked up at another station using the reverse transfer feature.
- **System hold** places the call on hold at all stations. It can then be picked up directly at any keyset station that shows a fluttering line key for the call. Single-line set users cannot place calls on system hold or pick up calls already on system hold. Calls on out-of-range lines cannot be placed on system hold, nor can a call on system hold be picked up by an 8- or 12-line keyset that does not have a line key for the associated line. Intercom calls cannot be placed on system hold. If this feature code is used on conference calls, the callers are placed on individual hold.
- **Consultation hold** allows a single-line set user to pause during a call, use other system features, and then return to the caller by pressing the FLASH key (hookflashing). If a single-line set user attempts to hang up after placing a call on consultation hold, the call immediately recalls the station.
- **Call splitting** allows a station user to place two or more calls on individual hold and then easily split between the calls.
- **Skate-to-hold**, if enabled in the database, allows keyset users to place calls on individual hold when another line key or the IC key is pressed during a call (instead of pressing the HOLD key). The system is initialized to disconnect calls when another key is pressed (skate-to-disconnect).

14.2 If an outside call remains on hold until the hold timer expires, it recalls the station. If it is still unanswered when the recall timer expires, it recalls the station's attendant. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected by the system. If the station

does not have an attendant, or the system is in night mode, the call recalls the station that placed it on hold until the abandoned recall timer expires and the call is disconnected. Intercom calls that are placed on hold do not recall the attendant.

NOTE: Keyset users can avoid the hold timer by muting the microphone during a call instead of placing the call on hold. (If this is done, the caller will not hear music-on-hold and the call will not recall the station.)

A. INDIVIDUAL HOLD

14.3 *TO PLACE AN INTERCOM OR OUTSIDE CALL ON INDIVIDUAL HOLD:*

- (1) While on the call:

Keyset: Press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336). You hear intercom dial tone and the line, OVER, or IC key flutters.

NOTE: If the system is programmed with the skate-to-hold option, pressing another line key or the IC key will place the call on individual hold.

SLI: Press the FLASH key. Then press the HOLD key or enter the individual hold feature code (336). You hear intercom dial tone.

Other Single-Line Set: Hookflash and enter the individual hold feature code (336). You hear intercom dial tone.

- (2) Hang up or place another call.

14.4 *TO RETURN TO THE CALLER ON INDIVIDUAL HOLD:*

Keyset: Lift the handset. Press the fluttering IC key for intercom calls. Or, press the fluttering line or OVER key (or the ANS key) for outside calls.

Single-Line Set: Lift the handset. Then press the HOLD key or enter the individual hold feature code (336).

B. SYSTEM HOLD

NOTE: Intercom calls and calls on out-of-range lines cannot be placed on system hold. If you attempt to do so, you will hear reorder tones. Single-line set users cannot place calls on system hold or pick up calls already on system hold.

14.5 TO PLACE AN OUTSIDE CALL ON SYSTEM HOLD (KEYSETS ONLY):

- (1) While on a call, press the SPCL key and enter the system hold feature code (335). You hear intercom dial tone and the associated line key flutters on all keysets.
- (2) Hang up or place another call.

14.6 TO ACCESS A CALL ON SYSTEM HOLD:

At any keyset that shows a fluttering line key for the call, lift the handset and press the fluttering line key.

C. CONSULTATION HOLD

14.7 TO USE CONSULTATION HOLD (SINGLE-LINE SETS ONLY):

- (1) While on a call, press the FLASH key (hookflash) to place the call on consultation hold. You hear two short tones followed by dial tone.
- (2) You can call another station or enter a feature code. If you attempt to access an outgoing C.O. line, you will hear reorder tones.

NOTE: If you hang up while the call is on consultation hold, the call will immediately recall your station. If you hang up after dialing an intercom number, the call will transfer to that station.

- (3) Return to the caller on hold by pressing the FLASH key (hookflashing).

D. CALL SPLITTING

14.8 KEYSSET CALL SPLITTING:

- (1) When two or more calls are on hold, access the first call on hold by pressing the fluttering line, OVER, or IC key.

- (2) If the system is programmed to place calls on hold when another line key or the IC key is pressed (skate to hold), skip this step. Place the call back on hold by pressing the HOLD key (or pressing the SPCL key and entering the individual hold feature code — 336). You hear intercom dial tone and the key flutters again.
- (3) Access the next call by pressing another fluttering line key or the IC key.

14.9 SINGLE-LINE SET CALL SPLITTING:

- (1) Place one or more calls on hold: For each call, press the FLASH key (hookflash) and press the HOLD key (or enter the individual hold feature code — 336). While on the last call, go to the next step.
- (2) While on the last call, when you are ready to split between calls on hold, press the FLASH key (hookflash) and enter the call splitting feature code (337). That call is placed on hold and you are connected to the first call that was placed on hold in step 1.
- (3) Press the FLASH key (hookflash) every time you wish to be connected to the next holding call. The current call returns to the end of the list.
- (4) Hang up to disconnect the current call and cancel call splitting. You can then place or receive calls or return to any remaining calls on hold by lifting the handset and pressing the HOLD key (or entering the individual hold feature code — 336).

E. HOLD RECALL

14.10 TO ANSWER A HOLD RECALL:

If you hear four tones and a pause — repeating (display shows HOLD RECALL FROM XXX or LINE XX RECALL FROM XXX):

Keyset: Lift the handset. Intercom calls are immediately connected. For outside calls, press the medium-flashing line or OVER key (or the ANS key).

Single-Line Set: Lift the handset. You are connected.

F. MICROPHONE MUTE

14.11 Whether handsfree or using the handset, you can temporarily turn off your microphone while on a call. The call is still connected; you can hear the other party, but they cannot hear you. Since the call is not placed on hold, no timer is activated. The MUTE key is lit when the microphone is muted; the light will go off when you press the MUTE key to re-enable the microphone.

14.12 MUTING THE KEYSER MICROPHONE:

- (1) To temporarily turn off your microphone while on a call, press the MUTE key (or enter the microphone mute on/off feature code — 314). The MUTE key is lit. *If off hook*, do not hang up (unless you press the SPKR key first).
- (2) Press the lit MUTE key to turn the microphone on (or enter the microphone mute on/off feature code — 314). The MUTE key is unlit.

15. CALL WAITING

15.1 While a station is in use, incoming intercom and outside calls camp on until the busy station is available. The busy party hears a single camp-on tone every 15 seconds (unless the camp-on tone timer is changed or camp-on tones have been disabled).

15.2 TO RESPOND TO A WAITING CALL USING A KEYSER:

If, while on a call, you hear a single camp-on tone every 15 seconds and see the IC key or a line key flashing fast, you have a call waiting. (Display shows CALL RINGING IN ON LINE XX or INTERCOM CALL FROM XXX or XXX TRANSFER FROM XXX or XXX RECALL FROM XXX each time you hear the tone.) Do one of the following:

- (1) **EITHER**, end the current call and hang up. A waiting outside call rings as an incoming call; an intercom call rings as a private call. Answer as usual.

OR, place the current call on hold by pressing the HOLD key (or pressing the SPCL key and entering the individual hold feature code — 336). The line, OVER, or IC key flutters (unless an intercom call is camped on, in which case the IC key flashes fast until the camped on call is picked up, then the IC key flutters). Access the waiting call by pressing the flashing line or IC key.

- (2) **To return to the holding call:** Press the fluttering line or IC key.

15.3 TO RESPOND TO A CALL WAITING USING A SINGLE-LINE SET:

When you hear a single camp-on tone every 15 seconds while you are on a call, another call is waiting. Do one of the following:

- (1) **EITHER**, end the current call and hang up: The call rings at your station. Lift the handset.

OR, place the current call on hold: Press the FLASH key (hookflash). Then press the HOLD key or enter the individual hold feature code (336). You are connected with the waiting caller.

- (2) **To return to the first call on hold:**

EITHER, hang up to disconnect from the current call. Return to the holding call by pressing the HOLD key or entering the individual hold feature code (336).

OR, place the current call on hold and connect with the original call: Press the FLASH key (hookflashing). Then press the HOLD key twice, or enter the individual hold feature code (336) twice.

16. CALL TRANSFER

16.1 There are several feature codes for transferring intercom and outside calls to other stations or to outside telephone numbers. The call transfer options are:

- **Transfer C.O. call:** You can transfer outside calls to another station or to an outside telephone number.
- **Transfer intercom call:** Intercom calls can be transferred to another station or to an outside telephone number.
- **Transfer to hold:** Either intercom or outside calls can be transferred to another station and placed on hold using this feature. You cannot transfer calls to hold at hunt groups or voice mail stations.

16.2 In addition, transfer-to-park locations can be set up by the installer. Calls can be transferred to these locations and then reverse transferred by any station user. A transfer-to-park location is an intercom number that is "equipped" during database programming, but the station instrument (and station board, if desired) can be removed once programming is complete. However, if all available station circuits are equipped, you cannot assign a transfer-to-park location.

A. TRANSFER TO AN INTERCOM NUMBER

16.3 TO TRANSFER A CALL TO AN INTERCOM NUMBER:

(1) **Keyset:**

If on an outside call, press the XFR key (or press the SPCL key and enter the transfer C.O. call feature code — 345). You hear intercom dial tone.

If on an intercom call, press the SPCL key and enter the transfer intercom call feature code (346). You hear intercom dial tone.

Single-Line Set: While on a call, press the FLASH key (hookflash). You hear two short tones followed by intercom dial tone.

(2) Dial the desired intercom number or press a SPD/BLF key. The number can be a station

intercom number, a voice mail intercom number, 0 for the attendant, a hunt group pilot number, or a transfer-to-park location number.

- a. **Transfer to voice mail:** *If transferring to the voice mail unit, you hear a single tone and the system waits for you to enter the mailbox number (display shows ENTER VOICE MAILBOX #).*

If you do not enter a mailbox number before you hang up, the caller will be connected to the voice mail unit and must enter the mailbox number after listening to the introductory voice prompts.

If the system is checking for a valid mailbox number and you enter a valid mailbox number, the transfer is completed to voice mail (display shows CALL TRANSFERRED TO VOICE MAIL).

If the system is checking for a valid mailbox number and the number you entered is invalid, you hear reorder tones (display shows INVALID MAILBOX NUMBER ENTERED) and you must enter the correct number (display shows ENTER VOICE MAILBOX #).

If the system is not checking for a valid mailbox number, enter the desired mailbox number and hang up.

- b. **Transfer to a station that is forwarded to voice mail:** The display shows DEST FORWARDED TO VOICE MAIL. Hang up to complete the transfer or return to the caller by pressing the line key (for an outside call) or the XFR key twice (for an intercom call).

- c. **Transfer to a hunt group:** The transfer is completed automatically. Hang up.

- d. **Transfer-to-park:** If transferring to the transfer-to-park location, hang up to complete the transfer, or transfer the call to hold as described in the second part of step 4. Then page the desired party and announce the call. The party must reverse

transfer the call. Note that if the call is not answered, it will recall your station if transferred directly or will recall the called transfer-to-park location's attendant if transferred to hold.

- (3) *If desired*, wait for an answer and announce the call. One of the following occurs:

- a. *If the call is accepted*, go to the next step.
- b. *If the call is refused*, return to the caller:

Keyset: Press the fluttering line key for an outside call; for an intercom call, press the XFR key twice (or press the SPCL key once and enter the transfer intercom call feature code [346] twice).

Single-Line Set: Press the FLASH key (hookflash) twice.

- c. *If the station is busy or there is no answer:*

EITHER, return to the caller as described above.

OR, try another station. Press the XFR key (or press the SPCL key and enter the transfer C.O. feature code — 345, or the transfer intercom feature code — 346) and dial another intercom number.

OR, complete the next step. Then page the party to announce the transfer.

- (4) **EITHER**, hang up, press another line key, or press the IC key to complete the transfer. The call will ring at the station. (Receiving station's display shows XXX TRANSFER FROM XXX or LINE XX TRANSFER FROM XXX.) If the station is busy, the call camps on and sends call waiting signals.

OR, FOR KEYSETS ONLY, press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336) to place the call on hold at the called station. The call will not ring or send call waiting signals until the hold timer expires. It also will not recall your station (see next paragraph).

B. TRANSFER TO HOLD

16.4 A call transferred to hold at a station does not ring or send a display message until after the hold timer expires. Also, calls transferred to hold do not recall the transferring party; they recall the receiving party's attendant if unanswered after the hold and recall timers expire. Besides the procedure listed below, keyset users have an alternative method for transferring calls to hold; refer to the second half of step 4 in the preceding column.

16.5 TO TRANSFER A CALL TO HOLD:

- (1) **Keyset:** While on a call, press the SPCL key and enter the transfer CO/IC to hold feature code (347).

Single-Line Set: While on a call, press the FLASH key (hookflash) and enter the transfer CO/IC to hold feature code (347).

- (2) Dial the desired intercom number.
- (3) *If desired*, wait for an answer and announce the call.
- (4) Hang up to complete the transfer.

16.6 TO PICK UP A CALL THAT WAS TRANSFERRED TO HOLD AT YOUR STATION:

Keyset: When your IC key or a line or OVER key is fluttering, lift the handset and press the fluttering key (or the ANS key for an outside call). You are connected to the caller.

Single-Line Set: Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

C. TRANSFER RECALLS

16.7 If an outside call is transferred to another station and is not answered before the transfer-available or transfer-busy timer expires (and if it was not transferred to hold), the call recalls the transferring station and rings until the recall timer expires. If still unanswered after the recall timer expires, it recalls the transferring party's attendant. If the attendant does not answer a recall before the abandoned recall timer expires, the call is disconnected by the system. If the transferring station has no attendant, the call remains at the transferring station until the recall and abandoned recall timers expire. Transferred intercom calls will not recall the transferring station or the attendant.

16.8 TO ANSWER A TRANSFER RECALL:

Keyset: If you hear four tones and a pause — repeating (display shows XXX RECALL FROM XXX), lift the handset. Press the medium-flashing line or OVER key, or the ANS key.

Single-Line Set: If you hear four tones and a pause — repeating, lift the handset. You are immediately connected.

D. TRANSFER TO AN OUTSIDE NUMBER

16.9 The duration of an outside call that is transferred to outside telephone numbers is limited by the unsupervised C.O. timer. The call recalls the primary attendant or system alarm station when the unsupervised C.O. timer expires. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected by the system.

16.10 TO TRANSFER A CALL TO AN OUTSIDE TELEPHONE NUMBER:

(1) **Keyset:**

While on an outside call, press the XFR key (or press the SPCL key and enter the transfer C.O. call feature code — 345).

While on an intercom call, press the SPCL key and enter the transfer intercom call feature code (346).

Single-Line Set: While on a call, press the FLASH key (hookflash) and enter the transfer C.O. call feature code (345) or the transfer intercom call feature code (346).

- (2) Select an outgoing line, and continue to the next step. *If you hear a busy signal,* select another line or camp on and wait for the line. Or, return to the caller as follows:

Keyset: Press the fluttering line key for an outside call; for an intercom call, press the XFR key twice (or press the SPCL key once and enter the transfer call code [345] twice).

Single-Line Set: Press the FLASH key (hookflash) twice.

- (3) Dial the desired telephone number.
- (4) One of the following occurs:
- If answered,* announce the call. Hang up, press another line key, or press the IC key to complete the transfer. If transferring an outside call, the callers remain connected until the unsupervised C.O. timer expires.
 - If the number is busy or there is no answer,* return to the caller as described in step 2.
 - If you hear repeating reorder tones,* you dialed a restricted telephone number. Return to the caller as described in step 2.

- (5) *If you hear a repeating signal of four tones and a pause immediately after hanging up,* all resources are busy and the transfer did not go through. The party waiting to be transferred is on individual hold at your station and the receiving party recalls your station immediately. (Display shows LINE XX RECALL FROM XXX.) Do the following:

Keyset:

- Lift the handset and press the medium-flashing line or OVER key, or the ANS key to speak to the party waiting to receive the transfer.

- b. EITHER, hang up to attempt the transfer again.

OR, disconnect from that party by pressing the XFR key (or pressing the SPCL key and entering the transfer C.O. call feature code — 345). Then press the fluttering or flashing line or OVER key, or press the XFR key to connect to the party that is waiting to be transferred.

Single-Line Set:

- a. Lift the handset to speak to the party waiting to be transferred.
- b. Hang up to disconnect from the party waiting to be transferred. The recalling call (the party waiting to receive the transfer) rings. Lift the handset again. You are connected with the party that was waiting to receive the transfer.

17. REVERSE TRANSFER AND GROUP CALL PICK-UP

17.1 Calls ringing or recalling at a station, a hunt group, or a transfer-to-park location can be picked up at any other station, using these features. Calls on hold can also be picked up from stations and from transfer-to-park locations.

NOTE: When reverse transferring a direct ring-in call, the line or OVER key will continue to flash at the ringing station until the call is answered. However, when using group call pick-up, the call is accessible only at the reverse transferring station.

Reverse Transfer

17.2 If more than one call is ringing or holding at a station, a priority list determines which call is reverse transferred. Calls are selected in the following order, and if more than one call of the same type is at the station, the calls are picked up in the order they were received:

1. Outside calls
 - a. direct ring-in
 - b. transfer and camped-on
 - c. recall
 - d. call on individual hold
2. Intercom calls
 - a. ringing (ring-in, transfer, or recall)
 - b. holding

Group Call Pick-Up

17.3 A call ringing in to a hunt group or one of its stations can be picked up at any other station. Users can enter the reverse transfer feature code (4) and dial a hunt group's pilot number to pick up a call that is ringing in to the hunt group's pilot number or to any station within that hunt group.

17.4 The following priority list is used for determining which call is picked up. The system follows the hunt group list (always beginning with the first station on the list) to check each station in the hunt group

and then the overflow station for one type of call at a time. If there is more than one call of the same type at the selected station, the call that was received by the station first is picked up. Camped-on calls, holding calls, and queue callbacks cannot be picked up.

1. Ringing outside calls
 - a. direct ring-in
 - b. transfer
 - c. recall
2. Intercom call (ringing, transfer, or recall)

17.5 TO REVERSE TRANSFER A CALL FROM A STATION, HUNT GROUP, OR THE TRANSFER-TO-PARK LOCATION

- (1) Lift the handset and enter the reverse transfer (call pick-up) feature code (4). You hear a progress tone.
- (2) Dial the intercom number of the station where the call is ringing or holding.
- (3) **Keyset:** *If the system is not programmed for direct connection of reverse transferred calls, press the flashing line, OVER, or IC key for a ringing call, or press the fluttering line or IC key for a call on hold. (For outside calls that are ringing or holding, the ANS key may be used instead.)*

Single-Line Set: You are automatically connected to the caller.

17.6 TO REVERSE TRANSFER (PICK UP) A CALL USING THE XFR KEY (KEYSETS ONLY):

- (1) To pick up a call that is ringing or holding at another station, lift the handset and dial the intercom number of the station where the call is ringing or holding.
- (2) Press the XFR key (or press SPCL and enter the transfer C.O. call feature code — 345).
- (3) Press the flashing or fluttering line, OVER, or IC key if the system is not programmed to automatically connect reverse transferred calls. (For outside calls that are ringing or holding, the ANS key may be used instead.)

18. CONFERENCE CALLS

18.1 Station users can establish a three-party conference without operator assistance. A station user can initiate one conference at a time and the system can maintain up to four simultaneous conference calls. In addition to the initiating station, the conference can include any combination of intercom and/or outside calls. The initiating station is considered one of the conferencing parties.

18.2 If a conference is terminated using the hold feature, the remaining parties hear music while they are waiting. The station user must return to the callers one at a time. If the hold timer expires, the calls on hold recall the station that placed them on hold in the order they were placed. If still unanswered after the recall timer expires, they recall the station's attendant.

18.3 While a conference call is in progress, the inside parties cannot dial numbers, enter hookflashes, or use the call transfer features. Also, if an inside party exits the conference, any remaining inside parties may not use the conference or hold features to exit or terminate the conference.

18.4 Station users attempting to join an ongoing conference call by pressing a busy line key will hear busy tones, but may camp on to the line if desired.

A. PLACING A CONFERENCE CALL

18.5 TO PLACE A CONFERENCE CALL:

- (1) **Keyset:** While on a call, press the CNF key. The party is on conference wait hold (hears music) and the CNF key flutters. The line key is lit.

Single-Line Set: While on a call, press the FLASH key (hookflash) and enter the conference feature code (5). The party is on conference wait hold (hears music).

NOTE: If you hear a busy signal followed by music, all conference resources are busy. Do one of the following:

EITHER, wait off hook until you hear intercom dial tone before placing the second call.

OR, return to the call as follows:

Keyset: Press the CNF key.

Single-Line Set: Press FLASH (hookflash) and enter the conference feature code (5).

- (2) Place an intercom or outside call (or access an existing call on hold). If the party is busy or refuses the call, or does not answer, return to the first call as described in the note above.
- (3) **Keyset:** Press the CNF key again. All parties are connected. (Display shows the intercom number or line identification of each party connected in the conference.) The CNF key flashes slowly; line keys are lit.

Single-Line Set: Press the FLASH key (hookflash) and enter the conference feature code (5). All parties are connected.

B. EXITING A CONFERENCE

18.6 There are several options for leaving the conference:

- End the conference by hanging up. The other parties remain connected if one is a station (inside party). The conference circuit is dropped.
- Place both parties on individual hold (refer to paragraph 18.7). The conference is terminated. You must return to the callers one at a time. To re-establish the conference, repeat the procedures in paragraph 18.5.

NOTE: If you attempt to place a conference call on system hold, all parties will be placed on individual hold.

- Keyset users can leave the conference and allow two outside parties to remain connected (refer to paragraph 18.8). You can return to the conference at any time.

18.7 TO PLACE THE OTHER PARTIES ON HOLD:

- (1) **Keyset:** During a conference call, press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336). The conference is terminated; the IC and/or line keys flutter and the CNF key goes off. The parties hear music while waiting.

Single-Line Sets: During a conference call, press the FLASH key (hookflash). The conference is terminated and the parties hear music while waiting.

- (2) Return to the parties one at a time:

Keyset: Access one party by pressing the fluttering line, OVER, or IC key. Then you can place it on hold, disconnect it, or re-establish the conference (following the procedures in paragraph 18.5). Repeat this step to access additional parties.

Single-Line Set: Access one party by pressing the FLASH (hookflash) key and then pressing the HOLD key (or entering the individual hold feature code — 336). Then you can place it on hold, disconnect it, or re-establish the conference (following the procedures in paragraph 18.5). Repeat this step to access the second party on hold.

18.8 TO EXIT THE CONFERENCE AND LEAVE THE OTHER PARTIES CONNECTED (KEYSETS ONLY):

- (1) During the conference, press the CNF key and hang up. The CNF key flutters and the line keys remain lit to indicate the outside calls that remain in the conference. However, if a station remains connected in the conference, the IC key does not light to indicate that a station is involved.

- (2) To return to the conference: Lift the handset and press the CNF key again.

NOTE: If the parties are outside parties the unsupervised conference timer limits the length of the conference. The conference recalls your station when the timer expires. It will not recall the attendant. If not answered before the abandoned timer expires, the call is disconnected.

19. SECRETARIAL INTERCEPT

19.1 Stations can be programmed to have all incoming calls automatically forwarded to a secretarial intercept station (refer to PROGRAMMING, page 5-41). When the station is busy, calls are forwarded immediately. When there is no answer, calls forward after the forward no answer timer expires. Secretarial intercept stations can be assigned their own intercept station to provide back-up when the original secretarial intercept station is busy (as long as the assignments do not cause a call to circulate through a "loop"). Hunt group members should not be assigned secretarial intercepts; such an assignment has the effect of removing them from the hunt group.

19.2 Stations that are programmed to route their calls to a secretarial intercept station do not receive handsfree intercom calls; all calls ring as private calls.

FEATURES

20. CALL FORWARDING

20.1 With call forwarding, a station user can route incoming calls to another station or to an outside telephone number (if allowed by toll and line restrictions). The four forwarding conditions are shown below.

- **Forward all calls:** All incoming calls are immediately forwarded.
- **Forward if no answer:** Incoming calls are forwarded if they are not answered before the forward no answer timer expires.
- **Forward if busy:** Incoming calls are immediately forwarded if the station is busy.
- **Forward if no answer or busy:** Incoming calls are forwarded if the station is busy or if calls are not answered before the forward no answer timer expires.

20.2 If forward all calls is enabled, display keysets show the call forwarding status and destination until the request is canceled. If one of the conditional forwards is enabled (no answer, busy, or no answer/busy), display keysets show the forward status for five seconds and then return to normal. If the station receiving the forward is a display keyset, it shows XXX FORWARD FROM XXX for each forwarded call received.

20.3 Station users can chain forwards from station to station providing the forwards do not form a loop. The conditional forward features (if busy, if no answer, if busy/no answer) may form a loop that the system cannot detect until a call is placed to one of the stations. For example, if two station users forward their calls to each other using the forward if busy feature, the system accepts the requests. However, if a call rings in while both stations are busy, the forwards create an illegal loop. The call camps on to the called station.

20.4 If more than one station has ring in for a C.O. line, direct ring-in calls on that line will forward to intercom numbers, but not outside numbers. The display of the keyset receiving the forwarded call will show it as a direct ring-in call, not as a forwarded call, and the line key flashes to show ring in. The keyset that is being forwarded also shows the call as a direct ring-in call and the line key flashes.

20.5 Calls cannot be forwarded to restricted outside telephone numbers or stations in do-not-disturb. If the station that is programmed to receive the forwarded calls is placed in do-not-disturb after call forwarding is set, intercom callers will see the do-not-disturb display of the receiving station and hear do-not-disturb signals. Direct ring-in calls will follow the forward as described in paragraph 20.4 and override the do-not-disturb mode of the receiving station.

20.6 If a station is in do-not-disturb and call forward modes simultaneously, intercom callers will see the do-not-disturb display set at the forwarded station, but the call is forwarded. Direct ring-in calls will be sent to the receiving station. If both the forwarding and receiving stations are in do-not-disturb, the caller will hear do-not-disturb signal and see the do-not-disturb display of the forwarded station for five seconds, then the do-not-disturb display of the receiving station. Direct ring-in calls will follow the forward as described in paragraph 20.4 and override the do-not-disturb mode of the forwarded and receiving stations.

20.7 If a station in a linear or distributed hunt group is in call forward mode, the station will not receive hunt group calls.

20.8 Call forwarding overrides any secretarial intercept assignment.

20.9 When an outside call is being transferred to a station that is set to forward calls, the intercom call from the transferring party also forwards to allow the transferring party to announce the call.

20.10 When a station that is forwarded to another station receives a message waiting indication, the message indication stays at the called station; the message waiting indication does not appear at the station that is receiving the forwarded calls.

20.11 Queue callbacks and recalls do not forward, except that a recall at the attendant's station will forward to another station.

Forwarding To An Outside Number

20.12 When programming a station for call forward to an outside telephone number, a select line group feature code is programmed before the telephone number. If the station is called while the selected line group is busy, the caller will hear continuous busy sig-

nals and the forward will not go through. The caller cannot camp on or queue and must hang up and try again (keyset users cannot leave a message). If another user transfers a call to a station that is forwarded to an outside number, the transferring party must wait for a line to be seized and the complete number to be dialed before hanging up. Failure to wait for the connection to be completed will result in the call immediately recalling the transferring station.

20.13 A line must be exempt from LCR Only to allow LCR-Only stations to use it for the call forward to the public network feature. To do this, the line(s) must be assigned to a line group so that stations can enter a line group access code when programming the call forward number. For call forwarding and line group access purposes, all lines in the line group must be exempt from LCR Only; if not, an attempt to access the line(s) results in reorder tones.

20.14 The forwarding station's, not the caller's, line and toll restrictions are checked when the call is forwarded to an outside number.

NOTE: While this system is designed to be reasonably secure against C.O. line misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. If the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the GMX-152D System and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, or when it is forwarded or transferred to the public network.

20.15 If using a PBX line to forward to an outside telephone number, a PBX access code is entered after the select line group feature code and before the telephone number. Then, when a call is forwarded, the system automatically pauses for the duration of the pause digit timer before dialing the rest of the number. When other special digits are required, the user can insert a pause (short, medium, or long). And, if the system is programmed to allow hookflashes in speed-dial numbers the user may also enter a hookflash in the number.

20.16 When an outside call is forwarded to an outside number, the unsupervised C.O. timer is activated. The unsupervised call recalls the primary attendant or system alarm station when the timer expires. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected.

Forwarding Calls To An Intercom Or Outside Number

20.17 TO FORWARD CALLS:

(1) Keyset:

EITHER, while on or off hook, press the FWD key to forward calls (except queue callbacks and recalls) according to how the FWD key is programmed. If on hook, the SPKR key is lit. (Display shows PROGRAM FORWARD.)

OR, while on or off hook, press the SPCL key and enter one of the following feature codes. If on hook, the SPKR key is lit. (Display shows PROGRAM FORWARD.)

- Call forward all calls (355)
- Call forward if no answer (356)
- Call forward if busy (357)
- Call forward if no answer or busy (358)

Single-Line Set: Lift the handset and enter one of the feature codes listed above.

(2) **EITHER**, dial the intercom number of the station to receive the calls or 0 for the attendant. (Or, keysets only, press the MSG key to forward calls to the assigned message center.) If you dialed an invalid intercom number, your display shows FORWARD TO INVALID NUMBER and you hear reorder tones.

OR, dial a select line group feature code (81-87 or 9), the PBX access code (if using a PBX line), and the desired outside telephone number. **To include pauses or hookflashes in the number:** Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M).

If you hear repeating reorder tones, you entered an invalid line group feature code or dialed a restricted number and must start over. (Display shows FORWARD TO RESTRICTED LINE.)

NOTE: If a PBX access code was entered, the system automatically pauses for the duration of the pause digit timer before dialing the rest of the number. (Display shows an S to indicate a short pause.)

- (3) **Keyset:** If off hook, hang up. If on hook, press SPKR. You hear a progress tone and the FWD key is lit (display shows FWD [condition] TO XXX). If you attempted to forward calls to a station that is unconditionally forwarded to your station, your display shows SYSTEM DETECTED FORWARD LOOP and you hear reorder tones.

Single-Line Set: Hang up.

20.18 TO CANCEL ANY CALL FORWARD REQUEST:

Keyset: Press the lit FWD key (the key goes off). If on hook, press the lit SPKR key (the key goes off). If off hook, hang up. You hear a progress tone. (Display shows CANCEL ANY CALL FORWARD.)

Single-Line Set: Lift the handset, enter the cancel any call forward feature code (359), and hang up.

Forwarding To the Message Center

20.19 Keyset users have a simple method for forwarding calls to their designated message center. The user presses the FWD key and then the MSG key. Calls forwarded through the keyset are then sent to the keyset's designated message center.

20.20 TO QUICKLY FORWARD CALLS TO YOUR MESSAGE CENTER (KEYSETS ONLY):

While on or off hook, press the FWD key and then the MSG key. (Display shows FWD [condition] TO XXX). If on hook, press the lit SPKR key (the key goes off). If off hook, hang up.

Forwarding To Voice Mail

20.21 If the station is forwarded to the voice mail unit or if the message center is a voice mail system, the keyset user's intercom number (which is usually the mailbox number) is automatically dialed when the voice mail unit answers the forwarded call. In fact, whenever any station (keyset or single-line) is forwarded to a designated voice mail system, the station's intercom number is automatically dialed when the voice mail unit answers the forwarded call.

NOTE: If a C.O. line is assigned direct ring in to multiple stations, and if any of the stations are forwarded to a voice mail system, incoming calls will not be forwarded to the voice mail unit.

21. SPEED DIALING

21.1 Three GMX-152D features provide speed-dialing. They are as follows:

- **System Speed Dialing:** Up to 100, 32-digit system speed-dial numbers can be stored in system memory.
- **Station Speed Dialing:** Single-line set users can store up to 10, 16-digit outside numbers using speed-dial location codes (0-9). Using the speed-dial (SPD/BLF) keys and/or locations, keyset users can store 10 outside telephone numbers (up to 16 digits each) and 10 intercom numbers (up to four digits each).
- **Intercom and Outside (C.O.) System Directory:** The intercom directory enables display keyset users to "look up" intercom numbers and user names. The outside (C.O.) directory enables display keyset users to look for system speed-dial numbers and associated names.

A. SYSTEM SPEED DIALING

21.2 Speed dialing allows station users to dial stored telephone numbers quickly. Up to 100, 32-digit system speed-dial numbers can be stored in system memory. If desired, an identifying name can also be stored with each speed-dial number. (See also the C.O. Directory feature on page 4-72.)

21.3 To keep system speed-dial numbers confidential, a range of locations 10-99 can be programmed as non-display numbers (see PROGRAMMING, page 5-18). Locations 00-09 are always displayed. Non-display numbers can be used by any station user, but can only be displayed on the programming station's keyset. (At keysets, non-display numbers cannot be redialed or saved as station speed-dial numbers.)

NOTE: Non-display numbers will appear in the SMDR report.

21.4 The system speed-dial numbers are stored using location codes (00-99). When dialed, the numbers appear on a display keyset unless they have been programmed as non-display numbers. Display keyset users can also view system speed-dial numbers and names without dialing. When viewing non-display numbers only the name is displayed.

21.5 The system speed-dial numbers and names are protected by the database back-up battery and will not be erased in the event of a power failure.

Programming System Speed-Dial Numbers

21.6 The system speed-dial numbers and names are programmed by the installer or the primary attendant (or system alarm) station. In addition to the primary attendant station, one display keyset can be designated as the system speed-dial programming station, which can program or view all system speed-dial numbers. When the system is initialized, the primary attendant station is the designated system speed-dial programming station.

21.7 The system speed-dial numbers can contain up to 32 digits each and can include hookflashes and/or short, medium, or long pauses for dialing a series of numbers. For example, the speed-dial number can contain an SCC local number, a pause, an access code, and the telephone number. PBX access codes, followed by a pause, may be included in speed-dial numbers. When programming speed-dial numbers, each hookflash and each single, double, or triple pause is considered one digit. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. (Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.) The lengths of the hookflash and the pause are determined by the programmable pause digit and CO hookflash timers.

21.8 To program system speed-dial numbers, use one of the following methods:

- Use the keypad to manually dial the number. If you make a mistake, press the MUTE key to backspace.
- Press the REDIAL key to enter the last number dialed or saved at the station (up to 32 digits).
- Press one of the SPD/BLF keys on the keyset to enter the outside telephone number (up to 16 digits) programmed under that key.

21.9 To program speed-dial names, keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 7776444844 would enter "SMITH." When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 5666 FWD 66337777 would enter "JONES." Refer to the chart below to program speed-dial names. (Note that letters correspond to the letters printed on the keypad keys.)

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	.	-	,	&	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[5
6	M	N	O]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0

NOTE: The character values for key number 1 in the chart are different than those found for custom programming do-not-disturb messages (see page 4-77). This is due to the loss of the pound (#) key and asterisk (*) key character values. Intercom directory, C.O. directory, and system speed-dial programming all use the chart above.

21.10 TO PROGRAM OR CHANGE SYSTEM SPEED-DIAL NUMBERS AND NAMES (PRIMARY ATTENDANT, SYSTEM ALARM STATION, OR DESIGNATED SYSTEM SPEED-DIAL PROGRAMMING KEYS ONLY):

NOTE: If you make a mistake, use the MUTE key to backspace. Or, lift and replace the handset (the name and number in memory remain unchanged); then start over.

- (1) While on hook, press the SYS SPD key (or press SPCL and enter the program system speed-dial feature code — 020). (Display shows PROGRAM SYSTEM SPEED DIAL.)
- (2) Enter the speed-dial location code (00-99). (The MSG key is lit and the display shows the name and number or, if one does not exist, NO OUTSIDE #.)
- (3) EITHER, enter or change the name for the speed-dial number using your keypad. Refer to the chart. If necessary, use the MUTE key to back up and erase existing characters. Press the MSG key (it will go out and the cursor will move to the top line).

OR, if the existing name is correct, or you do not wish to program a name, press the MSG key (it will go out and the cursor will move to the top line). Proceed to the next step.

- (4) Enter or change the number (up to 32 digits) to be stored using the keypad, one of the SPD/BLF keys, or the REDIAL key. If necessary, use the MUTE key to back up and erase existing numbers. (Display shows the number as it is entered.) To include pauses or hookflashes in the number: Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). You may not exceed 32 digits.
- (5) Press any line key to save the number. You hear a single progress tone when the number is accepted. (Display shows PROGRAM SYSTEM SPEED DIAL.)
- (6) EITHER, repeat steps 2 through 5 for each number to be entered or changed.

OR, wait for the display to return to the date and time (after the long interdigit timer expires) or lift and replace the handset.

21.11 TO ERASE SYSTEM SPEED-DIAL NAMES AND/OR NUMBERS (PRIMARY ATTENDANT, SYSTEM ALARM STATION, OR THE DESIGNATED SYSTEM SPEED-DIAL PROGRAMMING KEYS ONLY):

- (1) While on hook, press the SYS SPD key (or press SPCL and enter the program system speed-dial feature code — 020). (Display shows PROGRAM SYSTEM SPEED DIAL.)
- (2) Enter the speed-dial location code (00–99). (The MSG key is lit and the display shows the name and number.)
- (3) *If you wish to erase the name*, press the MUTE key repeatedly until the name is erased. Press any line key. You hear a single progress tone when accepted.
- (4) *If you wish to erase the number*, press the MSG key, then press the unlit MUTE key repeatedly until the number is erased. Press any line key. You hear a single progress tone when accepted.
- (5) EITHER, repeat steps 2 through 4 for each number to be erased.

OR, wait for the display to return to the date and time (after the long interdigit timer expires) or lift and replace the handset.

Dialing System Speed-Dial Numbers

21.12 TO DIAL SYSTEM SPEED-DIAL NUMBERS:

- (1) Lift the handset and select an outgoing line.
- (2) **Keypad:** Press the SYS SPD key (or press SPCL and enter the system speed-dial feature code — 381).
- Single-Line Set:** Press the FLASH key (hook-flash) and enter the system speed-dial feature code (381).

- (3) Enter the location code (00–99) for the desired number. The number is automatically dialed. (Display shows the number dialed unless it is a non-display number.) If you hear reorder tones, your station is restricted from dialing the selected number.

Viewing System Speed-Dial Numbers

21.13 TO VIEW SYSTEM SPEED-DIAL NUMBERS AND NAMES (PRIMARY ATTENDANT, SYSTEM ALARM STATION, OR DESIGNATED SPEED-DIAL PROGRAMMING STATION ONLY):

NOTE: If you make a mistake, lift and replace the handset; then start over.

- (1) While on hook, press the SYS SPD key (or press SPCL and enter the system-speed dial feature code — 381). (Display shows PROGRAM SYSTEM SPEED DIAL.)
- (2) Enter the desired location code (00–99). (The display shows the programmed name and number.)
- (3) Wait for the display to return to the date and time (after the long interdigit timer expires) or lift and replace the handset. Then repeat the procedure for each number to be viewed.

21.14 TO VIEW SYSTEM SPEED-DIAL NUMBERS AND NAMES AT ANY DISPLAY KEYS:

- (1) While on hook, press the SYS SPD key (or press SPCL and enter the system speed-dial feature code — 381). (Display shows REVIEW SYSTEM SPEED DIAL.)
- (2) Enter the desired location code (00–99). (Display shows the programmed name and number. Or, if it is a non-display number, the display shows the name and NON DISPLAY #.)
- (3) Wait for the display to return to the date and time (after the long interdigit timer expires) or lift and replace the handset. Then repeat the procedure for each number to be viewed.

B. STATION SPEED DIALING

21.15 For convenience, each station user can program individual speed-dial numbers. Single-line set users can store up to 10, 16-digit outside numbers using speed-dial location codes (0-9). Using the speed-dial (SPD/BLF) keys and/or location codes, keyset users can store 10 outside telephone numbers (up to 16 digits each) and 10 intercom numbers (up to four digits each; see paragraph 21.17 below). The 8- and 12-line keysets have eight SPD/BLF keys and 24-line keysets have 10 SPD/BLF keys. Together, the lamps in the keyset SPD/BLF keys create a busy lamp field that indicates the status of the stations programmed under the keys. Intercom numbers can be either station intercom numbers or hunt group pilot numbers.

Programming Station Speed-Dial Numbers

21.16 When entering the outside telephone numbers, use one of the following methods:

- Use the keypad to manually dial the number.
- On a keyset, press the REDIAL key to enter the last number (up to the first 16 digits) dialed or saved at the station.
- On a keyset, press the SYS SPD key and enter the system speed-dial location code (00-99) to store one of the system speed-dial numbers in a station speed-dial location. (If the number is over 16 digits, only the first 16 digits are stored.) Non-display system speed-dial numbers cannot be stored in keyset station speed-dial locations.

21.17 A station intercom number can be preceded with a pound (#) to always speed dial private intercom calls to the station. Or, a 4 may be entered before a station intercom number or hunt group pilot number to quickly reverse transfer (pick up) calls from that station or hunt group. If either of these options is used, normal handsfree intercom calls cannot be placed using that station speed-dial location or SPD/BLF key. Also, when an intercom number is preceded by a 4, the SPD/BLF key will not show the station's status.

21.18 Station users can also program pauses into the stored outside telephone numbers. And, if the system-wide programming option is enabled, the numbers can include hookflashes. For example, the number can contain an SCC local number, a pause, and an access code. If the system is installed behind a PBX, speed-dial numbers may contain the PBX access code if it is followed by a pause. When programming speed-dial numbers, each hookflash and each single, double, or triple pause is considered one digit. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. (Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.) The durations of the hookflash and the pause are determined by the programmable pause digit and CO hookflash timers.

21.19 The station speed-dial numbers are stored in the system memory and protected by the database back-up battery. They will not be erased by unplugging the station instrument or by a power failure.

21.20 TO PROGRAM STATION SPEED-DIAL NUMBERS USING KEYSER SPD/BLF KEYS:

NOTE: If you make a mistake, lift and replace the handset; then start over. The number in memory remains unchanged. Or, use the MUTE key to back-space.

- (1) While on hook, press the SPD/BLF key to be programmed. (Display shows PROGRAM STATION SPEED DIAL # and the key number.)
- (2) Dial the intercom number (up to four digits) or telephone number (up to 16 digits) to be stored. (Display shows the number.) **To include pauses in an outside telephone number:** Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). You may not exceed 16 digits. Do not program hookflashes or pauses in intercom numbers, or you will receive reorder tones when trying to dial them.

- (3) EITHER, press the IC key if an intercom number was stored.

OR, press any line key if a telephone number was stored.

You hear a single progress tone when the system has accepted the number. (Display shows both numbers stored under the key.)

- (4) Lift and replace the handset (or wait 5 seconds for the display to return to the date and time). Repeat the steps for each additional number to be stored.

21.21 TO PROGRAM STATION SPEED-DIAL NUMBERS USING SPEED-DIAL LOCATION CODES:

NOTE: If you make a mistake, hang up and start over.

- (1) **Keyset:** While on hook, press SPCL and enter the program station speed-dial feature code (383).

Single-Line Set: Lift the handset and enter the program station speed-dial feature code (383).

- (2) Dial the speed-dial location code (0-9).
- (3) Dial the telephone number (up to 16 digits) to be stored and hang up. **To include pauses or hookflashes in the number:** Press the SPCL or FLASH (hookflash) key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the FLASH (hookflash) key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). Each pause or hookflash counts as one digit. Wait 2 seconds after pressing the FLASH key before pressing it again; the

system only recognizes one FLASH every 2 seconds.

- (4) Repeat the complete procedure for each number to be stored.

21.22 ERASE A STATION SPEED-DIAL NUMBER:

Repeat the programming procedures, but do not dial a number (skip step 3).

Viewing Station Speed-Dial Numbers

21.23 TO VIEW THE STORED NUMBERS (ON A DISPLAY KEYSSET):

- (1) While on hook, press the desired SPD/BLF key twice. (Display shows the currently stored numbers.)
- (2) *If desired*, press other SPD/BLF keys once to view their numbers. (If the date and time displays, the program has timed out; repeat step 1.)

Dialing Station Speed-Dial Numbers

21.24 TO DIAL A STATION SPEED-DIAL NUMBER:

- (1) Lift the handset.
- (2) *If placing an outside call*, select an outgoing line. *If placing an intercom call*, skip this step.
- (3) **Keysets:** Press the SPD/BLF key of the desired number. The number is dialed. (Display shows the number.)

Single-Line Set: Press the FLASH key (hookflash), and then press the STN SPD key or enter the station speed-dial feature code (382). Then dial the location code (0-9). The number is dialed.

22. INTERCOM AND C.O. DIRECTORY (KEYSETS ONLY)

22.1 The intercom directory enables display keyset users to "look up" intercom numbers and user names. The C.O. directory enables display keyset users to look for system speed-dial numbers and associated names. The intercom directory is automatically updated whenever user names and/or intercom number information is reprogrammed. The C.O. directory is updated whenever a system speed-dial number or name is reprogrammed.

22.2 Once the desired intercom number/name or system speed-dial number/name has been selected, the user may automatically dial the number, store the number in a station speed-dial location, select a different number/name, terminate the directory routine, or switch to the other directory. A directory search can be performed when a call is waiting on individual hold, conference hold, or transfer hold at the station, if necessary.

22.3 To use the directory, enter a letter, a string of letters, or a valid intercom number. If searching for a name, the full name need not be entered. The system will find the closest match and show the number and its associated name on the keyset display. Or, use the asterisk (*) or pound (#) keys to scroll backward or forward alphabetically through the stored list of names. (It is not possible to scroll through the intercom numbers.)

22.4 Keypad keys are used to enter the desired letters, numbers, and punctuation. The station user can switch between numeric and alphanumeric modes. (Numeric mode = MSG key unlit; alphanumeric mode = MSG key lit.) In alphanumeric mode, the number of times a key is pressed determines which character is entered. For example, 77776444844 would enter "SMITH." When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 5666 FWD 66337777 would enter "JONES." Refer to the chart below to program messages in alphanumeric mode. The letters correspond to the letters printed on the keypad keys.

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	.	-	,	&	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[5
6	M	N	O]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	-	?	0

NOTE: The character values for key number 1 in the chart are different than those found for custom programming do-not-disturb messages (see page 4-77). This is due to the loss of the pound (#) key and asterisk (*) key character values. Intercom directory, C.O. directory, and system speed-dial programming all use the chart above.

A. INTERCOM DIRECTORY

22.5 TO PERFORM AN INTERCOM DIRECTORY SEARCH:

- (1) While on or off hook, press SPCL and enter the intercom directory feature code (307). The MSG key lights (and the SPKR key lights if on hook) and the display shows INTERCOM NAME: on the top line, while the cursor is located on the bottom line.
- (2) Enter up to seven alpha and/or numeric characters for the intercom number or user name. If searching for a name, the whole name does not have to be entered. You may switch between modes by pressing the MSG key (lit = alphanumeric, unlit = numeric).
 - a. *In numeric mode (MSG key unlit):* Press the keypad keys to enter a valid intercom number. Press the MUTE key to backspace, if necessary.
 - b. *In alphanumeric mode (MSG key lit):* Press the keypad keys to enter the desired characters. Refer to the chart above. Press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

- (3) Press either the pound (#) or asterisk (*) key to signal the system to begin the search. The closest match will be displayed on your keyset. (If you entered an invalid intercom number, you will hear reorder tones. Repeat step 2.)
- (4) *If desired*, press the pound (#) key to scroll forward alphabetically through the directory or press the asterisk (*) key to scroll backward. If this method is used, skip the next step.
- (5) *If desired*, store the selected intercom number in a station speed-dial location by pressing the desired SPD/BLF key. You hear confirmation tone when the number is accepted.
- (6) **EITHER**, automatically dial the intercom number selected by pressing the IC key. (If an intercom call is camped on and the IC key is lit, pressing the IC key accesses the waiting call and terminates the directory feature.)

OR, search for a different intercom number by repeating steps 2 through 3.

OR, terminate the directory routine. *If off hook*, hang up. *If on hook*, press the SPKR key.

OR, switch to the C.O. directory by pressing a non-flashing line key or the ANS key. (C.O. directory instructions are given below.)

NOTE: If a call is ringing in or holding on the selected line, pressing the flashing line or ANS key will answer the call and terminate the directory function.

B. C.O. DIRECTORY

22.6 TO PERFORM A C.O. DIRECTORY SEARCH:

- (1) While on or off hook, press SPCL and enter the C.O. directory feature code (308). The MSG key lights (and the SPKR key lights if on hook) and the display shows OUTSIDE NAME: on the top line, while the cursor is located on the bottom line.
- (2) Enter alphanumeric characters (up to 16) for the speed-dial name. You do not have to enter the whole name. Press the keypad keys to enter the desired characters. Refer to the chart

on the previous page. Press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

- (3) Press either the pound (#) or asterisk (*) key to signal the system to begin searching. The closest match will be displayed on your keyset. If you selected a non-display number, NON DISPLAY # will appear on the top line and the name (if assigned) will appear on the bottom line; the number is not displayed.
- (4) *If desired*, press the pound (#) key to scroll forward alphabetically through the directory or press the asterisk (*) key to scroll backward. If this method is used, skip the next step.
- (5) *If desired*, store the selected system speed-dial number in a station speed-dial location by pressing the desired SPD/BLF key. You hear a confirmation tone when the number is accepted.

NOTE: If the system speed-dial number is longer than 16 digits, only the first 16 digits will be stored in the station speed-dial location. Also, if the number is a non-display number, it cannot be stored.

- (6) **EITHER**, automatically dial the speed-dial number selected by pressing a line key. Lift the handset when the call is answered, if on hook. (If a call is ringing in or holding on the selected line, pressing the flashing line or ANS key will answer the call and terminate the directory function.)

OR, search for a different system speed-dial number by repeating steps 2 through 3.

OR, terminate the directory routine. *If off hook*, hang up. *If on hook*, press the SPKR key.

OR, switch to the intercom directory by pressing the IC key. (Intercom directory instructions are given on page 4-72.)

NOTE: If an intercom call is camped on and the IC key is flashing, pressing the IC key accesses the waiting call and terminates the directory feature.

23. HOUSE PHONE

23.1 This feature provides users with the ability to place a pre-designated intercom or outside call simply by lifting the handset (or pressing the SPKR key) on a designated house phone. There are several applications for this feature, such as:

- **Courtesy paging phone:** Visitors hear pages instructing them to pick up the house phone (such as the "courtesy paging phone" used in airport terminals). When they lift the handset, they are connected to a station user who can give them a message or connect them to a call.
- **Emergency phone:** The house phone can be programmed to automatically place a call to an emergency number (such as 911). This could save time in an emergency.
- **Service phone:** Customers can use the house phone(s) to place orders or receive special services from the lobby. For example, the house phone would automatically dial the intercom number of a service representative (or hunt group number of the service department).
- **Intercom network:** House phones could be placed in specific locations throughout a building (such as examination rooms in a doctor's office) and could be programmed to access a specific station or group of stations (such as a nurses' station).

23.2 Any station may be designated as a house phone in database programming (see PROGRAM-

MING, page 5-41). However, a single-line set is preferred for ease of use. The number dialed by the house phone is determined by the station's speed-dial programming. The outside number programmed in station speed-dial location 1 is automatically dialed during day mode, and the outside number in location 2 is dialed during night mode. This number can be either an intercom number or an outside telephone number. If it is an outside number, it must be preceded with a select line group feature code (and a pause if necessary). Other station information (such as user name, intercom number, SCOS, etc.) for the house phone is programmed as usual.

23.3 If the house phone is a keyset, the intercom or outside telephone number must be programmed in the station's "outside number" speed-dial location, and not the "intercom number" location. If no speed-dial numbers are programmed or if the speed-dial number is erased, the user hears dial tone when the handset is lifted or the SPKR key is pressed and may dial any intercom number or place an outside call.

23.4 Once a station is designated as a house phone, the speed-dial number must be programmed on hook or through the database because lifting the handset causes the number to be dialed.

23.5 Incoming calls take precedence over outgoing calls. If using a single-line set or a keyset programmed for automatic C.O. access (see page 4-40), any ringing call is automatically answered when the handset is lifted or the SPKR key is pressed.

24. REDIALING

24.1 The redial feature stores a telephone number dialed manually or speed dialed at the station (up to 32 digits). If the station user reaches a busy number or is disconnected, or if there is no answer, the number can be redialed easily.

24.2 Only one telephone number can be stored in redial memory at one time. With keysets, this number can be stored in one of two ways, depending on keyset programming.

- **Last number dialed:** The last number manually dialed or speed dialed is automatically stored. It changes every time the user dials a telephone number. The number is redialed using the procedure in paragraph 24.8. This is the default value of the redial feature and the REDIAL key.
- **Last number saved:** The last number dialed is manually stored by the keyset user. Dialing other numbers does not change the number saved. It only changes when a new number is saved, using the procedure in paragraph 24.7. The number is redialed using the procedure in paragraph 24.8. This is programmed with the last number saved feature code.

24.3 There are three feature codes that affect the redial feature. The redial feature code (380) performs the redial function (on keysets and SLIs the code is under the REDIAL key). The program redial mode feature codes (320 and 321) determine the mode of the redial feature code for keysets (last number dialed or last number saved). The SLI REDIAL key mode cannot be changed; it is always last number dialed.

24.4 System speed-dial numbers cannot be redialed at keyset stations if they have been programmed as non-display numbers.

24.5 If the system is installed behind a PBX, the redial feature remembers the PBX access code and automatically inserts a pause after the code when it is redialed.

24.6 TO PROGRAM THE KEYSSET REDIAL MODE:

NOTE: When initialized, the keyset redial mode is programmed for last number redial (320).

- (1) While on hook, press the SPCL key.
- (2) Enter the feature code to program last number dialed (320) or last number saved (321) redial mode.

24.7 TO SAVE A NUMBER ON A KEYSSET PROGRAMMED FOR LAST NUMBER SAVED (321):

NOTE: The saved number is replaced each time you repeat this procedure.

- (1) When you wish to save an outside telephone number, hang up to disconnect the call.
- (2) Remain on hook and press the REDIAL key (or press SPCL and enter the redial feature code — 380).
- (3) **To redial the number:** Use the procedure in the next paragraph.

24.8 TO REDIAL A NUMBER:

- (1) Lift the handset and select an outgoing line.
- (2) **Keyset:** Press the REDIAL key (or press SPCL and enter the redial feature code — 380). The number is dialed and displayed.

SLI: Press the FLASH key and press the REDIAL key or enter the redial feature code (380). The number is dialed.

Single-Line Set: Hookflash and enter the redial feature code (380). The number is dialed.

25. PAGING

25.1 The paging feature allows announcements to be made through keyset internal speakers, talkback speakers, and external paging zones.

25.2 The installer can place keysets and/or talkback speakers in up to six internal paging zones. Up to three external zones can be equipped using the Modem board circuitry. When the system is initialized, all keysets and talkback speakers are assigned to paging zone 1 to provide an all-page zone. Keysets and talkback speakers can be assigned to any, all, or none of the paging zones, as desired.

25.3 Pages are not heard if the keyset has been removed from paging, is in do-not-disturb, is ringing, or is in use. Also, keyset background music and internal music-on-hold are interrupted for pages.

25.4 TO MAKE A PAGE:

- (1) Lift the handset.
- (2) **Keyset:** Press the PAGE key (or enter the page feature code — 7).
Single-Line Set: Enter the page feature code (7).
- (3) Enter the zone code:
Internal zones = 1-6
External zones = 7-9
All external zones = 0

- (4) After the single progress tone, make your page before the paging timer expires. If you hear re-order tones, there are no stations in the selected page zone; all stations in the zone have enabled the page remove feature, are busy, or are in do-not-disturb; the necessary system resources are busy; or the paging system is being used by another station. Users cannot camp on to or queue the paging system.
- (5) Hang up.

26. REMOVE FROM PAGING

26.1 A keyset user can remove the keyset from its assigned page zone(s) or allow it to receive pages again by placing it back in the zone(s) using these feature codes.

26.2 TO HALT OR ENABLE ZONE PAGES:

- (1) While on or off hook, press SPCL.
- (2) Enter the page remove feature code (332) to prevent the keyset from receiving pages or enter the page replace feature code (333) to allow the keyset to receive pages. You hear a progress tone.
- (3) *If off hook, hang up.*

27. DO-NOT-DISTURB

27.1 Placing a station in do-not-disturb halts all pages, incoming intercom calls, camped-on calls, and calls transferred to that station. Queue callbacks, recalls, and direct ring-in calls are not blocked. Another user calling the station while it is in do-not-disturb hears a repeating signal of four fast tones and a pause; the user cannot camp on, but can queue or leave a message at the station.

27.2 Normally, calls to a station through DISA or the automated attendant are not blocked by placing the station in do-not-disturb. If desired, individual stations can be set to prevent these calls from breaking through do-not-disturb (see PROGRAMMING, page 5-41).

27.3 If a station in a hunt group is in do-not-disturb, calls to the user's hunt group do not cause the keyset to ring, but the line or IC key will flash if all other stations in the hunt group are busy, forwarded, have hunt group remove enabled, or are in do-not-disturb. Hunt group announcement stations and overflow stations cannot block hunt group calls by using do-not-disturb.

27.4 When a station is placed in do-not-disturb, the user may select one of 20 system-stored messages (unless do-not-disturb is enabled while the user is on a call, in which case message 1 is automatically selected). The installer can reprogram messages 02-20 with another message, up to 16 characters long. When a station in do-not-disturb is called by a display keyset user, the caller sees the selected message. Initialized messages are programmed as follows:

- | | |
|-----------------------|---------------------|
| 01 - DO-NOT-DISTURB | 11 - OUT OF OFFICE |
| 02 - IN MEETING UNTIL | 12 - OUT UNTIL |
| 03 - IN MEETING | 13 - WITH A CLIENT |
| 04 - ON VACATION 'TIL | 14 - WITH A GUEST |
| 05 - ON VACATION | 15 - WITH A PATIENT |
| 06 - CALL ME AT | 16 - UNAVAILABLE |
| 07 - AT THE DOCTOR | 17 - IN CONFERENCE |
| 08 - ON A TRIP | 18 - AWAY FROM DESK |
| 09 - ON BREAK | 19 - GONE HOME |
| 10 - OUT OF TOWN 'TIL | 20 - OUT TO LUNCH |

27.5 The second line of the message can be customized with a numeric/alphanumeric message of up to 16 characters. The customized message is entered as described in the following paragraphs.

27.6 When programming a customized do-not-disturb message, the station is automatically in numeric mode. The keypad keys are used to enter numbers 0-9, the pound (#) key is used for entering a hyphen (-), and the asterisk (*) key is used for entering a colon (:). For example, 1*00 would enter "1:00" in numeric mode.

27.7 Keyset users can enter alphanumeric mode by pressing the MSG key (the key lights). Keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 33377744432999 would enter "FRIDAY." When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 6 FWD 666 FWD 6632999 would enter "MONDAY." Refer to the chart below to program messages in alphanumeric mode. (Note that letters correspond to the letters printed on the keypad keys.)

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	@	+	&	<	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[5
6	M	N	O]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	-	?	0
*	*	!	\$	(:
#	#	,	.)	-

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27.8 When using either mode, keyset users may use the SPD/BLF keys (digits stored in the outside number location) and/or the REDIAL key to enter stored numbers or messages. Speed-dial numbers can be chained together when entering messages that require more than 16 digits. When programming a message in speed-dial memory, use the SPCL key in place of the FWD key to advance or insert spaces.

27.9 TO ENABLE DO-NOT-DISTURB:

- (1) **Keyset:** While on hook, press the DND key. The DND key lights. (Display shows SELECT DND MESSAGE.)

Single-Line Set: Lift the handset and enter the do-not-disturb feature code (370).

- (2) **EITHER**, select message 01 (DO-NOT-DISTURB):

Keyset: Press the SPKR key or allow the programming mode to time out.

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

OR, select any of the 20 pre-programmed messages by entering the desired number (01-20). (Messages are listed on the previous page.) Keyset users may scroll through the messages by pressing the pound (#) key to go forward or the asterisk (*) key to go backward (the display shows the selected message). If you enter an invalid message number, you will hear reorder tones and may try again.

- (3) **EITHER**, terminate programming.

Keyset: Press the SPKR key, lift and replace the handset, or allow the programming mode to time out.

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

OR, customize the second line of the message using any combination of the following methods:

- a. **Remain in numeric mode:** Press the keypad keys to enter the desired number. Use the pound key (#) for a hyphen (-) and the asterisk key (*) for a colon (:). Keyset users can press the FWD key once to leave a space, or press the MUTE key to backspace.

- b. **Change to alphanumeric mode (keysets only):** Press the MSG key (the key lights), then enter the desired characters. Refer to the chart on the preceding page. Keyset users can press the FWD key once to advance or twice to leave a space, or press the MUTE key to backspace.

- c. **Use speed-dial and/or redial numbers (keysets only):** In either numeric or alphanumeric mode, press one of the SPD/BLF keys, and/or press the REDIAL key to enter the stored characters. You may chain numbers together.

- (4) Terminate programming.

Keyset: Press the SPKR key, lift and replace the handset, or allow the programming mode to time out. (Display shows selected message. Date and time appear on the second line if there is no customized message.)

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

27.10 TO CANCEL DO-NOT-DISTURB:

Keyset: While on hook, press the lit DND key. The key goes off and the display returns to date and time.

Single-Line Set: Lift the handset, enter the cancel do-not-disturb feature code (371), and hang up.

28. CANCEL MISCELLANEOUS OPERATIONS

28.1 A station user can cancel miscellaneous operations (do-not-disturb, disable handsfree, call forward requests, a queue request, page remove, hunt group remove, and background music) all at once by entering a single feature code.

28.2 TO CANCEL MISCELLANEOUS OPERATIONS:

Keyset: While on or off hook, press the SPCL key and enter the cancel miscellaneous operations feature code (395). *If off hook*, hang up.

Single-Line Set: Lift the handset, enter the cancel miscellaneous operations feature code (395), and hang up.

29. HOOKFLASH

29.1 If the system is installed behind a PBX, station users may be required to hookflash to access PBX system resources. Or, a hookflash may be required to access certain telephone company features, such as call waiting. The duration of the hookflash can be changed by reprogramming the C.O. hookflash timer (default value is 600ms).

NOTE: The FLASH key on the SLI does not generate a hookflash over C.O. lines. You must use this procedure.

29.2 TO SEND A TIMED HOOKFLASH WHILE ON AN OUTSIDE LINE:

Keyset: Press the FLASH key. Or, press the SPCL key and enter the hookflash feature code (330).

Single-Line Set: Press the FLASH key (hookflash) and enter the hookflash feature code (330).

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30. REMINDER MESSAGES (KEYSETS ONLY)

30.1 Reminder messages are set, like an alarm clock, to signal a keyset station at a specified time. The user can select the message and time up to 24 hours in advance. Twenty different reminder messages are available. These messages can be re-programmed by the installer.

30.2 At the programmed time, the reminder message signals the station with eight short tones. A display keyset shows the message until it is canceled; a non-display keyset receives tones only. If the station is busy, the user still hears the tones and the message displays for 10 seconds during the call, then the display returns after the user hangs up. (Reminder displays interrupt, but do not affect, programming.) Up to 120 reminder messages can be requested per system.

30.3 Messages can be changed by the installer, if desired. They are limited to 16 characters. The initialized values are:

01 MEETING	11 CALL ENGINEERING
02 STAFF MEETING	12 CALL MARKETING
03 SALES MEETING	13 CALL ACCOUNTING
04 CANCEL MEETING	14 CANCEL DND
05 APPOINTMENT	15 CANCEL CALL FWD
06 PLACE CALL	16 TAKE MEDICATION
07 CALL CLIENT	17 MAKE RESERVATION
08 CALL CUSTOMER	18 REVIEW SCHEDULE
09 CALL HOME	19 LUNCH
10 CALL CORPORATE	20 REMINDER

30.4 TO REQUEST REMINDER MESSAGES:

NOTE: Lift and replace the handset to stop the process without selecting a message.

- (1) While on hook, press the SPCL key.
- (2) Enter the reminder message feature code (305). (Display shows PROGRAM REMINDER MESSAGE.)
- (3) **EITHER**, enter the two-digit message code (01-20). (Display shows selected message.)

OR, view the available messages by pressing the pound (#) key to scroll forward or pressing the asterisk (*) key to scroll backward. Each message displays for the length of the reminder message scroll delay timer before another can be selected.

- (4) While the desired message is displayed, enter the time that you wish to receive the message:
 - a. Enter the hour and minutes (e.g., 900 for 9:00).
 - b. Press the asterisk (*) key for AM or the pound (#) key for PM. You hear a progress tone when it is accepted.

NOTE: If an invalid time is entered, you hear reorder tones and the message request is canceled. (Display shows ERROR! INVALID TIME ENTERED.)

30.5 TO RECEIVE A REMINDER MESSAGE:

At the selected time, you hear eight short tones and the message displays.

- (1) *If your station is idle*, go to the next step.

If you are on a call, the message will display for 10 seconds. After you hang up, the reminder message returns and must be cleared.

If you are programming your keyset, the programming function is interrupted, but not canceled. The message will display for 10 seconds. After programming is completed, the reminder message will return and must be cleared.

- (2) **To clear the message:** Remain on hook and press the asterisk (*) key.

30.6 TO CANCEL ALL OF YOUR REMINDER MESSAGE REQUESTS:

While on hook, press the SPCL key and enter the cancel reminder message feature code (306). You cannot view or cancel individual messages.

31. DATA DEVICE ATTACHMENTS

31.1 A customer-provided, modem-equipped data device (such as a data terminal or a personal computer) may be attached to any GMX 24-line keyset or Inter-Tel/DVK keyset that has an optional Data Port Module installed. The GX 24-line and GMX 12-line keysets cannot have data device attachments.

NOTE: Because incoming calls must be transferred to the data path by pressing the DATA key, auto-answer modems cannot be used to answer data calls to a keyset.

31.2 Data calls can be placed to an intercom or outside number using the keyset or a keyboard attached to the data device. If using a keyboard, the C.O. line or intercom channel is automatically connected to the data device when it comes off hook. If using the keyset to place the call, the keyset user presses the DATA key to connect the C.O. line or intercom channel to the data device. By entering a feature code, data calls may be monitored through the handset without interfering with the data transmission (the microphone is muted).

31.3 If a secondary voice path is installed, data calls are transmitted over the keyset's secondary voice path. This leaves the primary voice path available for normal keyset operation. Receiving off-hook voice announce (OHVA) calls is not possible while a data call is in progress since the secondary voice path is in use. If there is not a secondary voice path, the keyset cannot receive any calls when the data device is in use.

31.4 The modem-equipped data device is connected to the keyset by plugging the data device's line cord (normally intended for connection to a standard C.O. line) into the modular jack on the keyset's optional Data Port Module.

31.5 TO ACCESS A REMOTE DATA DEVICE USING A C.O. LINE:

- (1) **EITHER**, lift the handset.

OR, while on hook, press the SPKR key.
- (2) Select an outside line and dial the telephone number of the data device to be accessed. The

line key flashes and the display shows the call cost and elapsed time of the call.

- (3) When you hear modem tone, press the DATA key. The line key is solidly lit. *If using the speakerphone*, the SPKR key goes off, the DATA key flutters, and the display returns to date and time. *If using the handset*, the DATA key flashes slowly.
- (4) *If using the handset*, hang up. The line key remains lit, the DATA key flutters, and the display returns to date and time.
- (5) Operate the data device according to the manufacturer's instructions.

For keysets with a secondary voice path: If you wish to return the data call to the primary voice path, press the DATA key. The line key remains lit and the call cost and elapsed time are displayed.

For keysets without a secondary voice path: If you wish to disconnect the data call and talk over the handset or speakerphone, press the DATA key.

31.6 TO ACCESS A REMOTE DATA DEVICE USING AN INTERCOM CHANNEL:

- (1) **EITHER**, lift the handset.

OR, while on hook, press the SPKR key.
- (2) Dial the intercom number of the data device to be accessed.
- (3) Notify the receiving party that you wish to connect the data device. When the called party activates the remote data device by pressing the DATA key, you hear modem tone. Or, if the intercom number accesses an auto-answer modem connected to a single-line circuit, you will hear modem tone immediately.

NOTE: If the receiving party wishes to transfer the call to another party, the transfer must be completed before the caller completes the next step.

- (4) Press your DATA key. If using the speakerphone, the SPKR key goes off and the DATA key flutters. If using the handset, the DATA key flashes slowly.
- (5) *If using the handset*, hang up. The DATA key flutters.

- (6) Operate the data device according to the manufacturer's instructions.

31.7 TO ACCESS A REMOTE DATA DEVICE WHILE ON A CALL:

- (1) When you hear modem tone, press the DATA key. (If on an outside call, the line key is solidly lit). If using the speakerphone, the SPKR key goes off and the DATA key flutters (and, if on an outside call, the display returns to date and time). If using the handset, the DATA key flashes slowly.
- (2) *If using the handset*, hang up. (If on an outside call, the line key is solidly lit). The DATA key flutters (and, if on an outside call, the display returns to date and time).
- (3) Operate the data device according to the manufacturer's instructions.

31.8 TO ACCESS A REMOTE DATA DEVICE USING AN ATTACHED MODEM-EQUIPPED DATA DEVICE:

- (1) Following the procedures of your data device's communications software, instruct the device to dial an intercom number or a line access code and a telephone number of the data device to be accessed. The call will be processed as though dialed from the keyset and will be automatically connected when answered. The DATA key is lit until dialing is completed, then it flutters. If the resources are busy, the data device will not camp on, but will receive continuous busy tones.
- (2) Operate the data device according to the manufacturer's instructions.

NOTE: You cannot access system features (other than intercom and line access) by entering feature codes through the data device keyboard.

31.9 TO MONITOR A DATA CALL IN PROGRESS:

- (1) *With a secondary voice path installed:* While a data transmission is active, lift the handset, press SPCL, and enter the data port monitor feature code (341). DATA key flashes slowly. (If connected to an outside line, the line key remains lit and the display shows the call cost and elapsed time of the call.)

Without a secondary voice path installed: While a data transmission is active, lift the handset. DATA key flashes slowly. (If connected to an outside line, the line key remains lit and the display shows the call cost and elapsed time of the call.)

- (2) You may listen to the data call without interfering with the data transmission (the handset microphone is muted). Hang up to discontinue monitoring the data transmission; the data call is still in progress and the DATA key flutters.

31.10 TO TERMINATE THE DATA CONNECTION:

EITHER, using the appropriate commands for the data device, instruct it to disconnect from the call.

OR, while on or off hook:

- a. Press the lit DATA key. The DATA key goes off. *If desired*, speak to the party at the site of the remote data device. This can only be done if the modem at the site of the remote data device can be turned off without dropping the C.O. line.
- b. **To disconnect:** *If off hook*, hang up. *If on hook*, press the SPKR key.

32. ATTENDANT FEATURES

32.1 This section describes the attendant-only features including the functions of the Direct Station Selection/Busy Lamp Field (DSS/BLF) Unit.

32.2 All attendant stations must be equipped with a keyset and should be equipped with a display in order to identify ring-in and recall sources. Also, for increased call-processing capabilities, attendant stations are generally equipped with optional DSS/BLF Units. Single-line sets cannot be used as attendant stations.

32.3 Each DSS/BLF Unit provides one-key access for up to 60 numbers (station intercom numbers, talk-back speaker intercom numbers, and/or hunt group pilot numbers). Together, the lamps in the keys create a busy lamp field that indicates the status of each station assigned to the keys. The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm.

NOTE: Keyset stations do not have to be assigned as attendant stations in order to use a DSS/BLF Unit. However, all keysets with DSS/BLF Units must be identified in database programming (see PROGRAMMING, page 5-61).

A. USING THE DSS/BLF UNIT

32.4 *PLACING AN INTERCOM CALL USING A DSS/BLF UNIT:*

- (1) Lift the handset or press the SPKR key.
- (2) If you wish to place a private call to a keyset, press the pound (#) key.
- (3) Press the desired DSS/BLF key.

If calling a keyset with handsfree answering enabled, you are immediately connected.

If placing a private call, calling a hunt group, calling a single-line set, or calling a keyset with

the handsfree feature disabled, you hear repeating double tones until the call is answered.

- (4) If the system is enabled for immediate DSS/BLF Unit off-hook voice announce, do not hang up when calling a busy OHVA-enabled keyset. Press the DSS/BLF key again. If the keyset's secondary voice path is available, you are immediately connected for an off-hook voice announce call and may speak. (For more information concerning the off-hook voice announce feature, refer to page 4-49.)

32.5 TRANSFERRING CALLS:

- (1) *While on an outside call, press the desired DSS/BLF key (or press the XFR key and dial a station intercom number, a hunt group pilot number, a voice mail intercom number, or a transfer-to-park location number). The call is placed on hold.*

While on an intercom call, press the SPCL key and enter the transfer intercom call feature code (346). Then press the desired DSS/BLF key (or dial a station intercom number, a hunt group pilot number, or a transfer-to-park location number).

- a. **Transfer to voice mail:** *If transferring to a voice mail unit, you hear a single tone and the system waits for you to enter the mailbox number (display shows ENTER VOICE MAILBOX #).*

If you do not enter a mailbox number before you hang up, the caller will be connected to the voice mail unit and must enter the mailbox number after listening to the introductory voice prompts.

If the system is checking for a valid mailbox number and you enter a valid mailbox number, the transfer is completed to voice mail (display shows CALL TRANSFERRED TO VOICE MAIL).

If the system is checking for a valid mailbox number and the number you entered is invalid, you hear reorder tones (display shows INVALID MAILBOX NUMBER ENTERED) and you must enter the correct number.

If the system is not checking for a valid mailbox number, hang up to complete the transfer (display shows CALL TRANSFERRED TO VOICE MAIL).

- b. **Transfer to a station that is forwarded to voice mail:** The display shows DEST FORWARDED TO VOICE MAIL. Hang up to complete the transfer or return to the caller by pressing the line key (for an outside call) or the XFR key twice (for an intercom call).
 - c. **Transfer to a hunt group:** The transfer is completed automatically. Hang up.
 - d. **Transfer-to-park:** If transferring to the transfer-to-park location, hang up to complete the transfer, or transfer the call to hold as described in the second part of step 4. Then page the desired party and announce the call. The party must reverse transfer the call. Note that if the call is not answered, it will recall your station if transferred directly or will recall the called transfer-to-park location's attendant if transferred to hold. (If the transfer-to-park location does not have an attendant, the call stays at the transfer-to-park location until it is answered or the caller hangs up.)
- (2) EITHER, hang up, press another line key, or press the IC key to complete the transfer. If the station you transferred the call to is busy, the call camps on. If the call is not answered before the transfer timer expires, the call returns to the station's attendant and rings until

answered or the abandoned recall timer expires.

OR, wait for an answer and announce the call. One of the following will occur:

- a. *If there is no answer or if the call is refused:*

EITHER, return to the caller by pressing the fluttering line key for outside calls or pressing the XFR key twice for intercom calls.

OR, transfer the call to another station by pressing another DSS/BLF key or pressing the XFR key and dialing an intercom number. (Or, you may transfer to an outside number by pressing the XFR key, selecting a line, and dialing a telephone number.)

- b. *If the call is accepted,* hang up to complete the transfer. The call rings at the station.
- c. *If the called party requests that the call be placed on hold,* press the HOLD key and hang up. If the transferred call is unanswered when the hold timer expires, it will recall the station until the transfer timer expires, and then recall the attendant.

32.6 TO REVERSE TRANSFER (PICK UP) A CALL RINGING OR HOLDING AT ANOTHER STATION:

- (1) Lift the handset or press the SPKR key.
- (2) EITHER, press the DSS/BLF key of the station where the call is ringing or holding and then press the XFR key.

OR, enter the reverse transfer feature code (4) and then press the DSS/BLF key of the station where the call is ringing.
- (3) Press the line or IC key if the system is not programmed to automatically connect reverse transfers. The key is fluttering if the call was on hold or flashing if the call was ringing.

B. ATTENDANT RECALL

32.7 When a call is placed on hold or is transferred from one station to another, certain system timers limit the amount of time the call may remain unattended. After that time, the call recalls the station that transferred it or placed it on hold. If the call remains unanswered at the station until the recall timer expires, it recalls the station's attendant. If the attendant station is busy, the call camps on and the display shows the source of the recall. If the call is not answered before the abandoned recall timer expires, the system disconnects the call.

32.8 If a station user transfers or forwards an outside call to an outside telephone number, the call is limited by the unsupervised C.O. timer. The call recalls the primary attendant or system alarm station when the timer expires and causes the CNF key to flash. (Display shows UNSUPERVISED CO RECALL.) This serves two purposes:

- It allows the attendant to monitor the length of CO-to-CO calls. When the call recalls, the attendant can disconnect it or allow it to continue.
- If the callers hang up before the attendant receives the recall, the system may not have disconnected the lines because a C.O. disconnect was not received from the central office. The attendant must disconnect the call.

32.9 A recall signals the attendant's station with a display message, a recall ring signal (four tones and a pause, repeating), and a medium-flashing line key. If there is no attendant, or if the system is in night mode, the call recalls the station that transferred the call or placed it on hold until the abandoned recall timer expires; then the call is disconnected.

32.10 If the attendant has calls forwarded, recalls from stations follow internal call forward requests. Recalls do not forward to outside telephone numbers, but recall the attendant's station until they are answered or the abandoned recall timer expires. Placing the attendant's station in do-not-disturb does not block recalls or direct ring-in calls.

32.11 TO ANSWER A HOLD OR TRANSFER RECALL FROM AN OUTSIDE CALL:

- (1) When you see a hold or transfer recall display (HOLD RECALL FROM XXX or XXX RECALL FROM XXX) and hear a recall ring signal (four tones and a pause, repeating), lift the handset or press the SPKR key.
- (2) Press the medium-flashing line or OVER key, or press the ANS key. If more than one line is recalling, pressing the ANS key accesses the outside call indicated on the display.

32.12 TO ANSWER A HOLD RECALL FROM AN INTERCOM CALL:

When you see a hold or transfer recall display (HOLD RECALL FROM XXX) and hear a recall ring signal (four tones and a pause, repeating):

EITHER, lift the handset or press the SPKR key, then press the IC key.

OR, for quick handsfree operation, simply press the IC key.

NOTE: If you are busy when the call recalls, it camps on. The IC key flashes at the medium rate, but you do not hear recall ring signals.

32.13 TO ANSWER AN UNSUPERVISED C.O. RECALL:

- (1) When you see the unsupervised C.O. recall display (UNSUPERVISED CO RECALL), hear a recall ring signal (four tones and a pause, repeating), and see the CNF key flashing at the medium rate, lift the handset and press the CNF key to connect with both lines. The CNF key flashes slowly and the display shows CONFERENCE WITH LINE XX LINE XX.
- (2) Check to see if the line is still being used.
- (3) *If the parties are still talking*, press the CNF key again and hang up to return the parties to their conversation. The CNF key flutters. You can enter the conference at any time by pressing the fluttering CNF key. When the unsupervised conference timer expires, the conference recalls your station again.

If the parties have hung up, hang up to disconnect the call.

C. PROGRAMMING STATIONS FOR NIGHT RING

32.14 The primary attendant can use the following procedure to change the database ring-in and allowed-answer night lists for stations. The night list takes effect when the system is placed in night mode. Any line can be assigned to ring in or to be answered on any station. However, you cannot add or delete lines from a station's list; you must reprogram all lines for the station. The primary attendant (or system alarm station) cannot change ring-in assignments for hunt groups.

32.15 To use this procedure, the system must be in the day mode.

32.16 TO PROGRAM STATIONS FOR NIGHT RING:

NOTE: If you make a mistake, lift and replace the handset and start over. An error while pressing keys terminates the program and displays the NIGHT RING LIST UNCHANGED message. Start over.

- (1) While on hook, press the SPCL key.
- (2) Enter the program stations for night ring feature code (011). You hear a single progress tone. (Display shows PROGRAM NIGHT RING FOR EXT #.)
- (3) Enter the intercom number or press the DSS/BLF key of the station to be programmed; do not use a keyset SPD/BLF key. You hear another progress tone. (Display shows ENTER (A)NSWER OR (R)ING-IN.)
- (4) EITHER, press R (the digit 7 key) on the keypad if the calls are to ring in to the station. The station is automatically given allowed answer.

OR, press A (the digit 2 key) on the keypad if the station is to have allowed answer but no ringing for the line(s). When calls ring in to the system, the station user may answer them (the line keys will flash on keysets).

- (5) When the display shows NOW PROGRAMMING XXX, designate the line number(s) by pressing the line keys. (Do not press the OVER key; you cannot assign ring-in or allowed answer for the overflow lines using an attendant's station.) If no line keys are

pressed, the lines previously selected for this station will be erased.

- (6) Press the asterisk (*) key. You hear a single progress tone. (Display momentarily shows NIGHT RING SET FOR XXX.)
- (7) Repeat the procedure for each station to be changed.

D. PLACING THE SYSTEM IN NIGHT OR DAY MODE

32.17 The primary attendant can place the system in night mode. This changes the station allowed-answer and ring-in assignments to the night lists. There is no attendant recall during night mode. Hold and transfer recalls ring at the station that transferred them or placed them on hold. If a recall is not answered before the abandoned recall timer expires, the call is disconnected.

32.18 TO TURN NIGHT MODE ON OR OFF:

While on hook, press the SPCL key and enter the night ring on/off feature code (010). You hear a single progress tone. (If putting the system in night mode, all attendant stations display SYSTEM IS NOW IN NIGHT RING.)

E. TALKBACK SPEAKER BACKGROUND MUSIC

32.19 The primary attendant can turn background music on and/or off for the talkback speakers. Music to speakers is interrupted by pages.

32.20 TO TURN BACKGROUND MUSIC ON OR OFF:

While on hook, press the SPCL key and enter the paging speaker background music feature code (018). You hear a progress tone.

NOTE: If background music to talkback speakers is enabled, the volume of background music at keyset stations may be lowered.

F. SETTING TIME OF DAY AND DATE

32.21 Occasionally, the system time or date needs to be reset (for example, for daylight-saving time). The primary attendant can change the date and time message that appears on all display keysets and in the SMDA and the SMDR reports.

32.22 TO SET THE TIME OF DAY AND DATE:

NOTE: If you make a mistake, lift and replace the handset, then start over. If an invalid date or time is entered, the keyset displays **ERROR! INVALID TME/DTE ENTERED**; you must start over.

- (1) While on hook, press the SPCL key and enter the set time of day feature code (021). (Display shows **SET TIME OF DAY**.)
- (2) Use the keypad keys to enter the time in hours and minutes. Then press the asterisk (*) key for AM or the pound (#) key for PM. For example, enter 900* for 9:00AM or 230# for 2:30PM. (Display shows **SET DATE MM-DD-YYYY**.)
- (3) Use the keypad keys to enter the month, day, and year. For example, press 01011990 for January-01-1990. You may backspace to correct entries by pressing the MUTE key. (When finished, display shows **SET DAY OF WEEK SUN**.)
- (4) Select the day of week by scrolling through the selections. Press the pound (#) key to go forward or the asterisk (*) key to go backward. When the desired day is displayed, press the SPKR key to terminate programming. You hear a progress tone and may check the date and time of day on the display.

G. REMOTE DO-NOT-DISTURB AND CALL FORWARD CANCELING

32.23 An attendant can cancel call forward and/or do-not-disturb for any or all stations that have dial-zero access to that attendant's station.

32.24 TO CANCEL FEATURES:

- (1) While on hook, press the SPCL key.
- (2) Enter one of the following feature codes:
 - Cancel all do-not-disturb requests (012)
 - Cancel all forward requests (013)
 - Cancel all DND/FWD requests (014)
 - Cancel station do-not-disturb request (015)
 - Cancel station forward request (016)
 - Cancel station DND/FWD request (017)
- (3) *If clearing an individual station (using code 015, 016, or 017), dial the intercom number or press the DSS/BLF key after entering the feature code.*

H. SYSTEM ALARM REPORTING

32.25 The system's alarm reporting feature detects equipment failures, determines the impact, and classifies the problem as a major or minor alarm. Minor alarms are indicated on the primary attendant's station display (or the system alarm station's display) and can be programmed to appear on all attendants' keysets. Both major and minor alarms are printed in the SMDR printout. Major alarm messages appear on all display keysets.

32.26 The first four minor alarms indicate problems that can be corrected without calling service personnel. All other minor alarms require attention from service personnel. Refer to page 6-5 in TROUBLESHOOTING for a listing of the possible alarms and their meanings.

32.27 TO RESPOND TO A MINOR SYSTEM ALARM FROM ANY ALARM DISPLAY STATION:

- (1) When a minor alarm indication appears (WARNING! SYSTEM ALARM #XX), write down the alarm number, alarm message, date, and time.
- (2) While on hook, clear the message displayed by pressing the SPCL key and entering the clear system alarm feature code (019).

- (3) If the alarm message is #10 or higher, contact service personnel.

If the alarm message is #01-04, correct the problem:

- a. **#01 STATION OFF-HOOK:** A station remained off hook and inactive until the inactivity alarm timer expired. The SMDR indicates which station is off hook. The station's key on DSS/BLF Units and on other stations' SPD/BLF keypads flutters continuously. Locate the station and replace the handset in the cradle.

NOTE: Calls being transmitted over the secondary voice path are not affected or interrupted by an off-hook alarm condition.

- b. **#02, #03, or #4 PRINTER TIMEOUT:** The indicated printer is not functioning properly. Check that the cable and the power cord are connected and that it has paper and ribbon.

32.28 A major alarm message, WARNING! MAJOR ALARM, appears on all display keysets in the event of a processor board failure. The warning might also appear on a single keyset if the keyset is defective. Major alarms require immediate attention from service personnel.

33. RECORD KEEPING AND MAINTENANCE FEATURES

A. CALL COST ACCOUNTING

33.1 The call cost accounting feature estimates the cost of outgoing and incoming calls, displays it on the keysets, and prints it in the SMDA and/or the SMDR reports. The cost is based on the telephone number dialed, the elapsed time of the call, the day of the week, and the time of day. A table in the database supplies the rates for toll calls and local calls, including evening and weekend rate changes. The equation for calculating call cost is: *Daytime Rate X Evening or Night & Weekend Multiplier X Connect Time.*

33.2 The evening or night/weekend multiplier adjusts the daytime per-minute call cost for evening (5:00 PM to 10:59 PM) and night/weekend (11:00 PM to 7:59 AM and weekends) rates. For example, the evening call cost multiplier is 0.65 if calls are 35% less expensive after 5:00 PM.

NOTE: The GMX-152D System's call cost accounting feature is intended to provide a *cost estimate* that is applied to the various classes of calls. Due to the wide variation in charges among network carriers, the system's call cost calculation cannot be used as a prediction of actual charges. This feature can only be used to *estimate* call cost as a management tool.

33.3 Incoming calls can have a call cost set for accounting or billing purposes. If a line is not subject to toll restriction, calls placed on that line will follow the cost factor set during C.O. line programming. If call cost is set to zero, call cost will not display during the call and the SMDR printout shows \$00.00.

B. STATION MESSAGE DETAIL ACCOUNTING (SMDA)

NOTE: This feature is available only in the *MF- and KF-rated Extended* software packages.

33.4 Station message detail accounting (SMDA) is a system feature that provides management and accounting records for estimating the telephone company's charges. This information can be used to analyze system traffic and employee productivity.

33.5 This data can be recorded on a customer-provided printer or alternate device, such as a magnetic tape or floppy disk. The device is connected

to the RS-232-C port on either the APP or IOP board and the connecting cable can be no longer than 50 feet (15 meters). It can be the same device used for the SMDR report. If so, the SMDR information is buffered (at least 10 calls) while the SMDA report prints.

33.6 Each of the 17 SMDA reports divides incoming and outgoing calls and can be automatically generated daily, weekly, or monthly. They can also be generated on demand through the programming terminal (refer to page 5-98 in PROGRAMMING). Reports can include the information outlined in the following sections.

Account Code Reports

33.7 Call information can be printed for up to 200 account codes. Each time a standard, forced, or optional account code is used, the system opens a "record" for that code. Every time a call is placed that uses that code, the call data is added to the record for that account code. If more than 199 codes are used, the last record (number 200) is used for the overflow record. That is, if 205 different codes are used, call data for the last six will be combined in record 200. For each account code, information includes the total number of calls handled, total and average duration of calls, and the total and average cost of calls.

Summary Reports

33.8 Call information can be selected for the system units listed below. Information includes the total number of calls handled, number of incoming and outgoing calls, total and average duration of incoming and outgoing calls, total and average cost of incoming and outgoing calls, and number of users.

- **System:** SMDA prints call information for the entire system. System reports also include the number of transfers and recalls, average answer time, number of unanswered calls, average ring time (unanswered), and number of equipped lines, incoming lines, outgoing lines, and in/out lines.
- **Tenant groups:** Call information is printed separately for each tenant group.
- **Tenants and departments:** Call information for each tenant group is divided into departments.

Detailed Reports

33.9 These reports can show call information for up to 120 users, listed by system, tenant group, or tenant/department. Separate reports are also available by tenant/department, individual stations, or C.O. lines. The following call information can be requested:

- **System, tenant, or tenant/department by call cost:** Total and average cost of calls for users in the selected group of stations. Station circuit numbers, intercom numbers, and user names are also included.
- **System, tenant, or tenant/department by call duration:** Total and average duration of calls for the selected group of stations. Station circuit numbers, intercom numbers, and user names are also included.
- **System, tenant, or tenant/department by number of calls:** Total number of calls for the selected group of stations. Station circuit numbers, intercom numbers, and user names are also included.
- **Tenant/department listed by station number:** Number of calls, incoming and outgoing call duration, incoming and outgoing call cost, and number of users are listed in numerical order for all stations in each department in each tenant group.

Reports also include station circuit numbers, intercom numbers, and user names.

- **Listed by selected station:** Number of calls, incoming and outgoing call duration, incoming and outgoing call cost, and number of users are listed in numerical order for selected stations. Reports also include station circuit numbers, intercom numbers, and user names.
- **Listed by selected C.O. line:** C.O. line circuit number, line identification, and line type are shown for selected lines. The report also includes number of incoming and outgoing calls, average answer time, number of unanswered calls, and average ring time for unanswered calls as well as total and average duration and cost of incoming and outgoing calls.

33.10 When programming the output, the installer can choose to clear the SMDA information after each report or let it remain in the memory to be accumulated and included in all later reports. This gives the customer the option of having limited or comprehensive SMDA reports.

33.11 The SMDA output reports are printed in the format shown in the following figures. All reports are 80 characters wide. The number of days included in each report is set during programming.

FIGURE 4-1. SMDA ACCOUNT CODE REPORT FORMAT

DETAILED ACCOUNT CODE REPORT 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

Report by Account Code
Reports listed by Account Number

1. Account Code [account code or "Overflow Record"]
Total Number of Calls Handled X,XXX,XXX
Number of Incoming Calls XXX,XXX
Number of Outgoing Calls XXX,XXX
Total Duration of Calls Handled H,HHH:MM:SS
Duration of Incoming Calls HHH:MM:SS
Ave. Duration of Incoming Calls H:MM:SS
Duration of Outgoing Calls HHH:MM:SS
Ave. Duration of Outgoing Calls H:MM:SS
Total Cost of Calls Handled \$X,XXX.XX
Cost of Incoming Calls \$XXX.XX
Ave. Cost of Incoming Calls \$XX.XX
Cost of Outgoing Calls \$XXX.XX
Ave. Cost of Outgoing Calls \$XX.XX

NOTE: When a maximum value has been reached (65,535 account codes, 4,660 hours, and/or \$167,772.15) the value starts over at 0.

FEATURES

FIGURE 4-2. SMDA SUMMARY REPORT FORMAT

STATION MESSAGE DETAIL ACCOUNTING 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

System Summary Report

Total Number of Calls	X,XXX,XXX
Number of Incoming Calls	XXX,XXX
Number of Outgoing Calls	XXX,XXX
Number of Transfers/Recalls	XXX,XXX
Average Answer Time	H:MM:SS
Number of Unanswered Calls	XX,XXX
Average Ring Time -- Unanswered	H:MM:SS
Total Duration of Calls	H,HHH:MM:SS
Duration of Incoming Calls	HHH:MM:SS
Ave. Duration of Incoming Calls	H:MM:SS
Duration of Outgoing Calls	HHH:MM:SS
Ave. Duration of Outgoing Calls	H:MM:SS
Total Cost of Calls	\$X,XXX.XX
Cost of Incoming Calls	\$XXX.XX
Ave. Cost of Incoming Calls	\$XX.XX
Cost of Outgoing Calls	\$XXX.XX
Ave. Cost of Outgoing Calls	\$XX.XX
Number of Users	XXX
Number of Equipped CO Lines	XX
Number of Incoming-Only CO Lines	XX
Number of Outgoing-Only CO Lines	XX
Number of Incoming/Outgoing CO Lines	XX

FIGURE 4-2. SMDA SUMMARY REPORT FORMAT (CONTD)

STATION MESSAGE DETAIL ACCOUNTING 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

Summary Report for Tenant

Tenant 1: [tenant name]

Total Number of Calls Handled	X,XXX,XXX
Number of Incoming Calls	XXX,XXX
Number of Outgoing Calls	XXX,XXX
Total Duration of Calls Handled	H,HHH:MM:SS
Duration of Incoming Calls	HHH:MM:SS
Ave. Duration of Incoming Calls	H:MM:SS
Duration of Outgoing Calls	HHH:MM:SS
Ave. Duration of Outgoing Calls	H:MM:SS
Total Cost of Calls Handled	\$X,XXX.XX
Cost of Incoming Calls	\$XXX.XX
Ave. Cost of Incoming Calls	\$XX.XX
Cost of Outgoing Calls	\$XXX.XX
Ave. Cost of Outgoing Calls	\$XX.XX
Number of Users	XXX

Summary Report for Tenant/Department

Tenant 1: [tenant name]

 Department 1: [department name]

Total Number of Calls Handled	X,XXX,XXX
Number of Incoming Calls	XXX,XXX
Number of Outgoing Calls	XXX,XXX
Total Duration of Calls Handled	H,HHH:MM:SS
Duration of Incoming Calls	HHH:MM:SS
Ave. Duration of Incoming Calls	H:MM:SS
Duration of Outgoing Calls	HHH:MM:SS
Ave. Duration of Outgoing Calls	H:MM:SS
Total Cost of Calls Handled	\$X,XXX.XX
Cost of Incoming Calls	\$XXX.XX
Ave. Cost of Incoming Calls	\$XX.XX
Cost of Outgoing Calls	\$XXX.XX
Ave. Cost of Outgoing Calls	\$XX.XX
Number of Users	XXX

 Department 2: [department name]...

FIGURE 4-3. SMDA DETAILED REPORT FORMAT

STATION MESSAGE DETAIL ACCOUNTING 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

Detailed System Report
or, Detailed Report for Tenant
or, Detailed Report for Tenant/Department

Sorted by Total Cost

1. Station Circuit XX.Y EXXX [user name]
Total Cost of Calls Handled \$X,XXX.XX
Cost of Incoming Calls \$XXX.XX
Ave. Cost of Incoming Calls \$XX.XX
Cost of Outgoing Calls \$XXX.XX
Ave. Cost of Outgoing Calls \$XX.XX

or, Sorted by Total Duration

1. Station Circuit XX.Y EXXX [user name]
Total Duration of Calls Handled H,HHH:MM:SS
Duration of Incoming Calls HHH:MM:SS
Ave. Duration of Incoming Calls H:MM:SS
Duration of Outgoing Calls HHH:MM:SS
Ave. Duration of Outgoing Calls H:MM:SS

or, Sorted by Number of Calls

1. Station Circuit XX.Y EXXX [user name]
Total Number of Calls Handled X,XXX,XXX
Number of Incoming Calls XXX,XXX
Number of Outgoing Calls XXX,XXX

FIGURE 4-3. SMDA DETAILED REPORT FORMAT (CONT'D)

STATION MESSAGE DETAIL ACCOUNTING 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

Detailed Report for Tenant/Department
Listed by Station Number

Tenant 1: [tenant name]
Department 1: [department name]
1. Station Circuit XX.Y EXXX [user name]

Total Number of Calls Handled	X,XXX,XXX
Number of Incoming Calls	XXX,XXX
Number of Outgoing Calls	XXX,XXX
Total Duration of Calls Handled	H,HHH:MM:SS
Duration of Incoming Calls	HHH:MM:SS
Ave. Duration of Incoming Calls	H:MM:SS
Duration of Outgoing Calls	HHH:MM:SS
Ave. Duration of Outgoing Calls	H:MM:SS
Total Cost of Calls Handled	\$X,XXX.XX
Cost of Incoming Calls	\$XXX.XX
Ave. Cost of Incoming Calls	\$XX.XX
Cost of Outgoing Calls	\$XXX.XX
Ave. Cost of Outgoing Calls	\$XX.XX

Detailed Report for Selected Stations
Stations Listed By Circuit Number

1. Station Circuit XX.Y EXXX [user name]

Total Number of Calls Handled	X,XXX,XXX
Number of Incoming Calls	XXX,XXX
Number of Outgoing Calls	XXX,XXX
Total Duration of Calls Handled	H,HHH:MM:SS
Duration of Incoming Calls	HHH:MM:SS
Ave. Duration of Incoming Calls	H:MM:SS
Duration of Outgoing Calls	HHH:MM:SS
Ave. Duration of Outgoing Calls	H:MM:SS
Total Cost of Calls Handled	\$X,XXX.XX
Cost of Incoming Calls	\$XXX.XX
Ave. Cost of Incoming Calls	\$XX.XX
Cost of Outgoing Calls	\$XXX.XX
Ave. Cost of Outgoing Calls	\$XX.XX

FIGURE 4-3. SMDA DETAILED REPORT FORMAT (CONT'D)

STATION MESSAGE DETAIL ACCOUNTING 00:00 MON-01-JAN-1990
DATA COLLECTION PERIOD BEGAN 00:00 MON-01-JAN-1990

Detailed Report for Selected CO Lines
CO Lines Listed by Circuit Number

```

1. CO Circuit X.Y [circuit name]
   Line Type -[in/out] [DISA day/night]
   Total Number of Calls          X,XXX,XXX
   Number of Incoming Calls       XXX,XXX
   Number of Outgoing Calls       XXX,XXX
   Average Answer Time            H:MM:SS
   Number of Unanswered Calls     XX,XXX
   Average Ring Time -- Unanswered H:MM:SS

   Total Duration of Calls        H,HHH:MM:SS
   Duration of Incoming Calls     HHH:MM:SS
   Ave. Duration of Incoming Calls H:MM:SS
   Duration of Outgoing Calls     HHH:MM:SS
   Ave. Duration of Outgoing Calls H:MM:SS

   Total Cost of Calls            $X,XXX.XX
   Cost of Incoming Calls         $XXX.XX
   Ave. Cost of Incoming Calls    $XX.XX
   Cost of Outgoing Calls        $XXX.XX
   Ave. Cost of Outgoing Calls    $XX.XX

```

C. STATION MESSAGE DETAIL RECORDING (SMDR)

33.12 Station message detail recording (SMDR) is a system feature that provides a detailed record of outgoing calls and can include incoming calls. An outgoing call lasting longer than the programmed valid call timer is recorded; however, if the call was transferred to a station or placed on hold, the valid call timer is not checked and the call is recorded. The valid call timer does not affect incoming calls; if the option to record incoming calls is selected in the database, all incoming calls are listed.

33.13 Station call data can be recorded on a customer-provided printer or an alternate device, such as a magnetic tape or floppy disk. This output device is connected to the RS-232-C port on either the APP or IOP board and the connecting cable must be no longer than 50 feet (15 meters). It can be the same device used for SMDA. If so, the SMDR information is buffered (at least 10 calls) while the SMDA report prints.

33.14 Selectable SMDR options can include any combination of the following:

- Incoming calls
- Outgoing non-toll local calls (including "free" calls on unrestricted lines and internal PBX calls)
- Outgoing toll calls (7-digit, 10-digit, operator-assisted, or international calls)
- DISA calls
- Conference calls
- System ring-in messages that show how long calls ring before being answered

33.15 C.O. line noise levels, DTMF tone levels, etc., can affect the reliability of DISA calls to outside telephone numbers. As a result, the central office does not always recognize all of the digits dialed. To help counteract this effect, the programmer can

determine whether digits dialed on DISA-to-CO calls will appear in the SMDR printout.

NOTE: Suppressing outgoing DISA digits enables the system to send DTMF tones to the central office at a higher level.

33.16 The programmer can determine whether absorbed digits and toll field digits appear in the SMDR printout. As an example, assume the following number was dialed: 89 (PBX code) - 10XXX - 1 (toll fields) - 602 (area code) - 961-9000 (seven-digit number). The PBX absorbed digits can be suppressed so that only 10XXX1-602-961-9000 appears. Or, all but the first digit in each toll field can be suppressed to print 89-11-602-961-9000. The PBX digits and the toll fields can all be suppressed to show 11-602-961-9000.

33.17 The programmer can determine which equipped station(s) will be included in the report by listing the desired stations. In addition, there are options that can be selected for listing all DISA calls, conference calls, and/or ring-in diagnostics. If these call types are selected, the record will show the station that is involved in the call, even if the station does not appear on the "stations to be included" list.

33.18 To allow SMDR to give a more accurate representation of elapsed time, an option can be enabled that records the elapsed time of calls in seconds instead of minutes. For calls up to 999 seconds (about 16.67 minutes) long, the ELAPSED TIME field will show S-XXX (XXX represents the number of seconds). For calls lasting longer than 999 seconds, ELAPSED TIME will show HH:MM (hours and minutes rounded up to the nearest minute).

33.19 The SMDR output report is printed in either narrow or wide format, as shown on the following pages. The wide format requires an 80-character output device and the narrow a 64-character device. A page heading (with the day of the week, date, month, year and column headings) is generated at midnight, when the clock cycles from 2359 to 0000 hours (international time).

FIGURE 4-4. SMDR REPORT FORMAT

Wide Format (80-character):

TYP	EXT	USRNAME	LN	DIALED DIGITS	START	ELPST	COST	ACCT CODE
XXX	XXX	AAAAAAA	XX	XX.....XX	HH:MM	HH:MM	\$XX.XX	XXXXXXXX

- TYP** Call type abbreviations for:
- Incoming calls (IN)
 - Outgoing local calls (LOC)
 - Outgoing "free" calls (000)
 - Seven-digit outgoing toll calls (T7)
 - Ten-digit outgoing toll calls (T10)
 - Operator-assisted/international calls (TOI)
 - DISA calls (DSA) and Conference calls (CNF)
 - DISA calls to the modem (MDM)
 - Ring in (blank field)
- EXT** The intercom number (XXX) of the last station to handle the call. For a CO-to-CO call, this field shows the second line involved (LXX). For a ring-in record, it shows the intercom number of the station that answered, or it shows *** if the call was unanswered.
- USRNAME** User's name as programmed. This field is blank if no user name is programmed.
- LN** The C.O. line number used (XX). This is the default C.O. line number given to the line (i.e., C.O. line 1.1 is line 1), regardless of tenant line key programming.
- DIALED DIGITS** Up to 32 digits of the telephone number dialed, including hyphens between the toll field, area code, office code, etc. An asterisk (*) at the end of the dialed digits field indicates that either there was a long enough break in loop current to disconnect the call (the IC-CO disconnect or CO-CO disconnect timer expired), or the outside party hung up before the station user hung up. Some digits may be suppressed (see the previous page for an explanation). "RING" appears for a ring-in record. If the first digit in a 32-digit number is 1, only 31 digits will be printed.
- START** Time the call was placed or answered is shown in 24-hour time (00:00 - 23:59) rounded up to the nearest minute.
- ELPST** Call length from the beginning of the call until disconnect. Elapsed time is rounded up to the nearest minute to show hours and minutes (HH:MM). If the option is enabled, for calls up to 999 seconds (about 16.67 minutes) long, this field will show S = XXX (XXX represents the number of seconds). For ring-in records, S = XXX indicates the ring-in time in seconds.
- COST** Approximate cost of the call (XXX.XX), based on the database information, rounded to the nearest cent.
- ACCT CODE** A standard, forced, or optional account code (4-8 digits). An optional account code overrides installer-programmed standard or forced account codes. The field is blank if no account code was used.

FIGURE 4-4. SMDR REPORT FORMAT (CONT'D)

Narrow Format (64-character):

STN	NUMBER DIALED	DUR	TIME	LN	ACCOUNT
XXX	XX.....XX	XXX	XXXX	XX	XXXXXXXX

STN The intercom number (XXX) of the last station to handle the call. Two lines are printed for CO-to-CO calls, each showing a line number in this field. For ring-in records, this field shows the intercom number of the station that answered the call, or *** if the call was unanswered.

NUMBER DIALED The first 24 digits of the telephone number dialed. An asterisk (*) at the end of the dialed digits column indicates that either there was a long enough break in the loop current to disconnect the call (the IC-CO disconnect or CO-CO disconnect timer expired), or the outside party hung up before the station user hung up. Some digits may be suppressed (see page 4-97 for an explanation). "RING" appears here for ring-in records.

DUR Call length from the end of the valid call timer until disconnect. Elapsed time is shown in minutes, rounded up to the nearest minute, for up to 255 minutes (anything over 255 appears as ***). If the option is enabled, for calls up to 999 seconds (about 16.67 minutes) long, this field will show S = XXX (XXX represents the number of seconds). For a ring-in message, the field shows XX:XX, which indicates the number of minutes and seconds that passed before the call was answered.

TIME Time the call was placed or answered. Time is shown in 24-hour international time (0000 - 2359) rounded up to the nearest minute.

LN The number of the C.O. line used. This is the default C.O. line number given to the line (i.e., C.O. line 1.1 is line 1), regardless of line key programming.

ACCOUNT A standard, forced, or optional account code (4-8 digits). An optional account code overrides installer-programmed standard or forced account codes. The field is blank if no account was used.

FEATURES

D. OPTIONAL CALLMASTER/ACCOUNTING SOFTWARE

33.20 The Inter-Tel CallMaster/Accounting software, when used with the PollCat (Pollable Call Accounting Terminal) call record buffer box, can be used to generate a variety of call record reports. The PollCat unit is connected to an RS-232-C port in place of an SMDA/SMDR output device and to a communications port on a personal computer (PC) containing the CallMaster/Accounting software. The part number for the complete CallMaster/Accounting package (including the PollCat) is 828.1151.

33.21 Call statistics from the telephone system are stored in the PollCat buffer box. This information is then extracted by the CallMaster/Accounting software and sorted to create reports for specific dates, times, users, and/or account codes.

E. SYSTEM ERROR REPORTING

33.22 The system has a self-diagnostic feature that checks for minor and major faults within the central and peripheral equipment. When a failure is detected, the software determines the impact of the problem and classifies it as a major or minor alarm. A major alarm requires immediate attention from service personnel; the system is not operable. A minor alarm can be as simple as a loose printer cable or power cord, or the printer running out of paper or ribbon.

33.23 A minor alarm sends a message to the system attendant(s) programmed to receive alarms and to either the APP or IOP RS-232-C port. Both minor and major alarms are recorded through the RS-232-C ports (if the ports are functional). A fault history report is available on demand to service personnel through the programming terminal (however, minor alarms #1-#4 do not appear in the history report).

33.24 Minor alarm messages print in the format shown below. The message indicates the time the error was detected, the type and number of the alarm, and an explanation of the error.

```
00:00 + + + MINOR ALARM #XX [32-character  
message]  
00:00 * * * [Field Service Diagnostics message]  
00:00 - - - [Engineering Diagnostics message]
```

33.25 User-serviceable minor alarms are:

- **#1 EXT XXX — STATION OFF-HOOK:** A station remained off hook and inactive until the inactivity alarm timer expired. Replace the handset in its cradle at the station indicated.
- **#2 SMDR PRINTER TIMEOUT, #3 ERROR PRINTER TIMEOUT, or #4 SMDA PRINTER TIMEOUT:** The printer possibly has a loose cable or power cord, or it has run out of ribbon or paper.

33.26 All other minor alarms, which require attention from service personnel, field service diagnostics, and engineering diagnostics are explained in TROUBLESHOOTING.

33.27 A major alarm occurs when a problem has caused the processor board to malfunction. The message appears on all display keysets and, if functional, at both RS-232-C ports.

F. POWER FAILURE CAPABILITIES

33.28 Database battery back-up: The Applications Processor (APP) board contains a lithium battery that protects the customer's database memory in the event of a power failure. The back-up battery strap (JMP 1) on the APP board must be placed on pins 1 and 2 to activate the battery. (Refer to page 3-38 in INSTALLATION, and page 2-6 in SPECIFICATIONS.)

33.29 System battery back-up: In the event of a power failure or brownout, the customer-provided batteries are automatically activated and the system remains fully operational for a limited time. Back-up time varies depending on the batteries selected and system configuration. Without battery back-up, calls in progress are dropped when power is removed from the KSU. Refer to SPECIFICATIONS, page 2-17, for more information.

33.30 Power failure transfer: The Input/Output Processor (IOP) board is equipped with a relay that can be used, with optional equipment, to connect single-line sets to C.O. lines in the event of a power or processor board failure. This feature is covered in further detail in SPECIFICATIONS, page 2-7.

PROGRAMMING

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1. INTRODUCTION

1.1 This section of the manual explains how to initialize and program the system. Initializing the system sets the default values for each of the programmable features. These values have been carefully selected to make the programmer's task easier. The system is fully functional when initialized and only requires programming to meet the customer's special needs.

A. INITIALIZED VALUES

1.2 The initialized values of the features are specified in each of the programs outlined throughout this section of the manual. They are also specified on the program planning sheets beginning on page 5-114. A summary of the initialized system values is as follows:

Programming:

- Passwords are not required to access the database programs.
- Menus appear only when you select a new menu.
- The terminal's error bell is turned on to signal the user in the event of a programming error.

Attendant:

- There is one attendant for all stations (circuit 1.1). This station serves as the primary attendant, system alarm station, and message center for all stations. It is also the system speed-dial programming station. The circuit is equipped and configured as a keyset.
- Circuit 1.1 receives ring-in and can answer lines during day and night mode.

Stations:

- Station circuits 1.1-10.8 are *configured* for keysets and 11.1-15.8 are *configured* for single-line sets, but only 1.1 is *equipped* until station instruments are installed and station cables are connected.
- Stations are not toll restricted. All stations are in toll restriction user group number 1. All have unlimited LCR class of service.
- All stations can answer all C.O. lines when the system is in night mode. Users have outgoing access on equipped all lines.

- Intercom numbers are assigned in order from circuit 1.1 (intercom number 100) to circuit 15.8 (intercom number 219).
- All stations are assigned to tenant group 1, department 1.
- All keysets and talkback speakers are in paging zone 1. Page zones 7-9 and 0 are external paging zones.
- Camp-on tones are heard at all stations.
- Message indication tones are not enabled for single-line sets.
- No headsets are equipped.
- No user names are assigned.
- There are no DSS/BLF Unit stations, automated attendants, house phones, voice mail stations, or secretarial intercepts assigned.
- Off-hook voice announce is not enabled.
- All keyset stations have speakerphone capability.
- All stations have C.O. reseize disabled.

C.O. Lines:

- C.O. lines 1.1-6.4 are equipped as DTMF lines and are assigned to the keyset line keys in numerical order, beginning with circuit 1.1 (line key 1) and continuing through circuit 6.4 (line key 24). C.O. line circuits 7.1-8.4 are not equipped.
- No line identifications, auto lines, or DISA lines are assigned. No DISA security codes are assigned.
- Lines 1.1-6.4 are incoming/outgoing lines.
- All lines are subject to toll restriction and LCR. All lines accept equal access dialing. None have absorbed digits.
- No lines are associated with hunt groups or LCR facility groups.

Toll Restriction:

- Office and area codes do not overlap. All area codes and office codes are restricted. No area codes are extended.
- The allowed long distance numbers are 800-XXX-XXXX and 911. There are no alternate carrier numbers.

SMDR and Error Reporting:

- SMDR is active. It is set for the secondary (IOP) port and wide format. Reports include incoming, local, toll, DISA, and conference calls as well as ring-in diagnostics and system faults. All stations are included. No digits are suppressed. Elapsed time is recorded in hours and minutes.
- Error reports are active. They are assigned to the primary (APP) port.

Miscellaneous:

- The system is in the day mode.
- No system or station speed-dial numbers or names are programmed. None of the system speed-dial locations are identified as non-display numbers.
- No hunt groups, hunt group supervisors, or hunt group announcement or overflow stations are assigned.
- No account codes are assigned. Account code default length is four digits.
- The system is programmed to disconnect calls (not place them on hold) when a user presses another line key during a call.
- Cross-tenant intercom traffic is allowed.
- System alarms are sent to all attendants.
- Reverse transfers to keyset stations are not connected immediately; the user must press the flashing line key or IC key.
- Voice mailbox number validation is not enabled.

B. PLAN THE PROGRAMMING SESSION

1.3 Determine the features that have to be programmed to meet the customer's needs by referring to the specific programs and program planning sheets. For example, if the customer wants to use the least-cost routing (LCR) feature, refer to the program on page 5-82 and the planning sheet on page 5-146.

1.4 Generally, there is no need to reprogram the entire database. The programs have been divided to

allow programming of specific information without sorting through other programming areas. Note that some programs allow entering of information for one C.O. line or station while others allow batch loading of information. Select the program that best suits the programming task.

C. SYSTEM SET-UP FOR PROGRAMMING

KSU Set-Up

1.5 There are switches on the front of the Input/Output Processor (IOP) board that set the baud rate for programming. Switches 1 through 3 set the baud rate for the Applications Processor (APP) board; switch 4 sets the baud rate for the IOP board. The settings are (1 = open or away from the board; 0 = closed):

	SWITCH			
	1	2	3	4
IOP Board:				
300 baud	-	-	-	0
1200 baud	-	-	-	1
APP Board:				
300 baud	0	0	1	-
1200 baud	0	1	1	-
4800 baud	1	0	0	-
9600 baud	1	1	0	-

1.6 There are two straps on the APP board. Strap J4 sets Request To Send (pin 4) and strap J5 sets Data Transmit Ready (pin 20) communications between the APP board and the terminal. On each of the straps, connect pins 1 and 2 for the high (true) setting, or connect pins 2 and 3 for the low (false) setting. Check the owner's guide for the terminal to determine the proper setting.

- If the terminal does not supply signal on the line (DTR or RTS), set the associated strap for high.
- If the terminal supplies a signal on either line or requires handshaking, set the associated strap for low. The low setting also detects RS-232-C "cable disconnected" and "out of paper" signals if sent through the associated pin.

The Programming Terminal

1.7 An input/output device is required, such as a printer or CRT terminal with an attached keyboard. The device can be connected to the APP or IOP board for on-site programming or can be used with a modem for remote programming. Refer to SPECIFICATIONS, page 2-17, for programming terminal requirements.

1.8 TO CONNECT THE TERMINAL TO THE APP OR IOP BOARD FOR ON-SITE PROGRAMMING:

- (1) Match the baud rates of the terminal and the board.
- (2) Turn on the terminal and the KSU before connecting the terminal cable to the APP or IOP port to avoid electrical surges when they are interfaced.
- (3) Connect the RS-232-C connector from the terminal to the APP or IOP port.
- (4) To sign on and begin programming, press the RETURN or the ENTER key on the keyboard.
- (5) *If programming the database for the first time, initialize the system (refer to page 5-91 for procedures).*

NOTE: An initialization or reset of the system will drop all calls in progress, including the modem connection.

1.9 TO CONNECT THE TERMINAL FOR REMOTE PROGRAMMING:

- (1) Set the terminal baud rate to 300 baud.

NOTE: For accurate data transmission, use the 300 baud rate setting. Due to characteristics of the modem or the C.O. line connection, there may be difficulty with transmissions at 1200 baud.
- (2) **EITHER**, call an attendant and ask to be transferred to the modem. Specify intercom number 260 for 300 baud rate.

OR, use DISA:

- a. From a DTMF telephone, dial the telephone number of the DISA line and wait for intercom dial tone.
- b. *If you hear a progress tone, enter the DISA security code.*
- c. Dial modem access code 260 (for 300 baud).
- d. *If you hear a progress tone, enter the DISA security code.*
- (3) When you hear the modem tone, activate your programming modem according to the manufacturer's instructions.
- (4) To sign on and begin programming, press the RETURN or ENTER key on the keyboard.
- (5) *If programming the database for the first time, initialize the system (refer to page 5-91 for procedures).*

NOTE: An initialization or reset of the system will drop all calls in progress, including the modem connection.

D. OPERATING THE TERMINAL

Character Case

1.10 The system recognizes both upper- and lower-case characters. Use either case or a combination.

Carriage Return < CR >

1.11 The system begins processing commands after the RETURN or ENTER key has been pressed. This allows the programmer to edit a command before entering it. The instructions in this section use the < CR > symbol to represent the RETURN or ENTER key.

1.12 Default values appear in parentheses () in many of the prompts. If the default value is the desired value, press < CR > to continue to the next prompt.

Editing

1.13 To correct mistakes made while entering information, back up and make corrections using one of the following methods:

- Press the BACKSPACE key to back up and type over the original entry.
- Press the DELETE or RUB OUT key. The characters appear in reverse order on the terminal as they are deleted.

1.14 If the entry becomes unreadable because of the corrections, do one of the following:

- Redisplay the entry without the corrections by pressing the CONTROL and R keys at the same time.
- Delete the entire line without entering it and display a blank line by pressing the ESCAPE key, backslash (\) key, CONTROL and X keys, or CONTROL and U keys. The prompt does not appear on the new line.

Yes or No Responses

1.15 Respond to "Yes or No" questions by entering Y for yes or N for no.

Circuit and Intercom Numbers

1.16 Circuit numbers are expressed as X.Y or XX.Y, with X representing the Station (SIN) or Central Office Unit (COU) board position in the cardfile, and Y representing the circuit on the board. For example, the fourth circuit on the second SIN board is station circuit 2.4. Station circuits range from 1.1 to 15.8; C.O. circuits range from 1.1 to 8.4.

1.17 Stations can also be identified by their intercom (extension) numbers. To use these numbers, enter EXXX (or if the procedures specify, XXX may be entered). The XXX represents the one- to three-digit intercom number assigned to the station.

1.18 When prompts show the current value as a circuit number, enter E to show the associated intercom number. To display circuit numbers when intercom numbers are shown, enter C.

Number Ranges

1.19 Some program prompts request a range of numbers. When the prompt asks for a range, use a

hyphen (-) between two numbers. For example, to indicate a range that includes all numbers from 1.1 to 1.7, enter 1.1-1.7. A single entry, ALL, and NONE are also valid responses to a range prompt.

1.20 If the item entered is too large, too small, or an unexpected value, an error message appears on the terminal.

1.21 A range of intercom numbers is translated into circuit numbers by the system. Therefore, be careful when using intercom numbers in ranges; the first circuit number must be lower than the second. For example, if circuit 1.1 is assigned intercom number 101, and circuit 1.2 is assigned intercom 100, entering E100-E101 would cause an error, because the circuit numbers (1.2-1.1) are not in proper numerical order.

1.22 Do not mix circuit numbers with intercom numbers within ranges. An entry of 1.1-1.7, E100-E111, or E100-111 is allowed, but E100-1.7 is not allowed and causes an error message.

Number Lists

1.23 Some prompts ask for a list of numbers. When creating a list, enter one of the following:

- Single item(s). If more than one item is listed, separate them with commas (1.1, 1.7, 1.2). (They do not have to be in numerical order.)
- Ranges of numbers, using hyphens (1.4-1.7, 1.1-1.2). (The first value in each range must be less than the second value in that range. Ranges do not have to be in order.)
- Any combination of single items and ranges separated by commas (1.8, 1.2-1.5, 1.7, 1.1).
- ALL and NONE can be used in response to a list prompt.

1.24 If one entry in a list is an invalid item, that item is not accepted by the system and an error message is printed. However, other items in the list are sometimes accepted if they are valid; to be certain, the entries should be rechecked.

NOTE: When entering a list, note that the system has an 80-character buffer. You must press <CR> before the buffer is full; the system will not recognize (or echo) any characters entered after the buffer limit is reached.

Signing Off

1.25 When ready to end the programming session, press the CONTROL and C keys or return to the applications program menu and sign off by entering a period (.) and <CR>.

1.26 If any changes were made to C.O. line, station, DSS/BLF, hunt group, tenant group, or LCR assignments, the system prints the following message at the end of the programming session:

WARNING: THE DATABASE HAS BEEN CHANGED IN A MANNER THAT MAY CAUSE FAULTY BEHAVIOR UNLESS THE SYSTEM IS RESET.

PERFORM A SYSTEM RESET (Y)?

1.27 Press <CR> to reset the system to ensure that C.O. line and station information is processed correctly.

NOTE: A system reset drops all calls in progress (including the modem connection if in use) and erases the SMDR and SMDA buffers.

2. MENUS

2.1 Programs are selected through a series of menus. Each menu leads to more specific menus and to the data input prompts. When a menu prompt is displayed, select one of the options shown in the menu:

- Enter the letter (shown in the menu) of the desired program.
- Enter a period (.) to exit the menu and back up to the previous menu. If desired, multiple periods may be entered to back up more than one menu level. (Entering a period at the applications program menu prompt ends the programming session.)
- Enter a question mark (?) to redisplay the menu. (This is useful when the menus are programmed to display only on command. Refer to page 5-105 for more information.)

2.2 The first menu shown after signing on is the *applications program* menu. It introduces the five major programming sections: database programming, SMDR and error programming, SMDA programming, menu displays, and on-line monitor. The applications program menu appears as shown below:

INTER-TEL/GMX-152D KEY TELEPHONE SYSTEM
COPYRIGHT 1984 THROUGH 1990 INTER-TEL, INC.
ALL RIGHTS RESERVED
PART NUMBER [version part number]

APPLICATIONS PROGRAM MENU

- [A] DATABASE PROGRAMMING
- [B] SMDR AND ERROR PROGRAMMING
- [C] SMDA PROGRAMMING
- [D] MENU DISPLAYS
- [E] ON-LINE MONITOR
- EXIT

APPLICATION:

2.3 The database programming menu offers programs for system-wide features as well as the specific C.O. line and station features. It is reached by entering A at the applications program menu prompt (APPLICATION:). The database programming menu appears as follows:

DATABASE PROGRAMMING

- [A] GENERAL SYSTEM DATA
- [B] EXTENSIONS AND FEATURE ACCESS CODES
- [C] CO LINES
- [D] STATION/DSS DATA
- [E] HUNT GROUPS
- [F] TENANTS, ATTENDANTS, AND SECRETARIAL INTERCEPTS
- [G] PAGE ZONES
- [H] TOLL RESTRICTION
- [I] LEAST COST ROUTING
- [J] DATABASE SAVE/RESTORE
- [K] SYSTEM INITIALIZATION AND RESET
- ? DISPLAY MENU
- EXIT

NOTE: Choices J and K appear only when the unrestricted password is used or when no password is required. For more information about passwords, refer to page 5-26.

2.4 The SMDR and error programming menu presents the programs used for assigning the output port for station message detail recording (SMDR) and system error reports, determining what information is included in the reports, and assigning a password. Enter B from the applications program menu to access the SMDR and error programming menu. It appears as shown below:

```
SMDR AND ERROR PROGRAMMING
[A] SMDR OUTPUT
[B] SMDR REPORTS
[C] ERROR OUTPUT
[D] ERROR REPORTS
[E] ON-LINE ERROR REPORTS
[F] SMDR AND ERROR PASSWORD
? DISPLAY MENU
. EXIT
```

2.5 The SMDA programming menu offers the programs used for assigning the output port and report contents for automatic and on-line station message detail accounting (SMDA) printouts. The SMDA password and call cost factors are also programmed from this menu. It is accessed by entering C from the applications program menu. The menu appears as shown below:

```
STATION MESSAGE DETAIL ACCOUNTING (SMDA)
[A] AUTOMATIC SMDA REPORTS
[B] ON-LINE SMDA REPORTS
[C] SMDA PASSWORD
[D] CALL COST FACTORS
? DISPLAY MENU
. EXIT
```

2.6 Selection D (menu displays) from the applications program menu determines how often the programming menus are displayed. Refer to page 5-105 for more information.

2.7 The on-line monitor menu allows trained personnel to view and change system memory control blocks on either the APP board or the IOP board. This program is used by specially-trained programmers for diagnostic purposes. When you enter E from

the applications program menu, the on-line monitor menu appears as shown below:

```
ON-LINE MONITOR
[A] CPU/APP ON-LINE MONITOR
[B] IOP ON-LINE MONITOR
[C] APP ACTIVITY MONITOR
? DISPLAY MENU
. EXIT
```

3. ADVANCED PROGRAMMING TECHNIQUES

3.1 The experienced programmer may wish to move from program to program without using the menus. To directly access programs, enter one of the abbreviated commands listed below.

3.2 All of the abbreviated commands must be preceded by a slash (/) or a double slash (//).

- A single slash before the command signals the terminal to return to the menu prompt for that section (database programming, SMDR and error programming, or SMDA programming) after the program is finished. For example, enter /STN from the C.O. lines menu prompt to access the specific station information program. When the program is finished (or if an abbreviated command was not entered after the slash), the terminal returns to the database programming menu prompt ([]:).
- A double slash before the command signals the system to return to the menu prompt that was being viewed when the command was entered. For example, the programmer may wish to exit the C.O. lines menu in order to change a station's user name and then return to the C.O. lines menu. Enter //STN to access the specific station information program. When finished with the STN program, the terminal returns to the C.O. lines menu prompt ([C]:).

3.3 From the database programming menu prompt (selection [A] from the applications menu), any of these commands can be used:

MENU LEVEL	COMMAND
[A] DATABASE PROGRAMMING	
[A] General System Data	
[AA] Date and Time	DATE
[AB] Timer Values	TIMR
[AC] System Speed Dial	SPDI
[AD] Account Codes	ACCT
[AE] Reminder Messages	MESS
[AF] Miscellaneous System Data	MISC
[AG] DND Messages	DNDM
[AH] Passwords	PASS
[B] Extensions and Feature Access Codes	CODE
[C] CO Lines	
[CA] CO Line Equipment Status	EQU
[CB] CO Line Groups	LGRP
[CC] Specific CO Line Information	LINE
[CD] AUTO and Line Key Assignments	AUTO
[CE] Access, Answer, and Ring In	
[CEA] Assign Common Station Lists to CO Lines	COMM
[CEB] Assign Common Outgoing-Access Lists	ACC
[CEC] Assign Common Allowed-Answer and Ring-in Lists	ANS
[CED] Assign Common Device Ring-in Lists	RING
[D] Station/DSS Data	
[DA] Station Data	
[DAA] Specific Station Information	STN
[DAB] Extension and Username Assignments	NAME
[DAC] Soft Feature Key Default Values	SOFT
[DAD] Copy Station Information	COPY
[DAE] Assign Common SCOS to Stations	CCOS
[DAF] Assign Common CO Line Lists to Stations	SCOM
[DAG] Assign Common Page Zones to Keysets	PCOM
[DAH] Miscellaneous Station Features	SMSC
[DAI] G-Series Keyset Volume Default Values	VOL
[DB] DSS/BLF Data	
[DBA] DSS/BLF Identification	DSS
[DBB] DSS/BLF Key Assignments	DKEY
[DC] Station Report	SREP
[E] Hunt Groups	HUNT
[F] Tenants, Attendants, and Secretarial Intercepts	
[FA] Tenant Group Assignments	TNT
[FB] Attendants	ATT
[FC] Secretarial Intercepts	SEC
[FD] Message Centers	MSG
[FE] Special Purpose Stations	SPCL

MENU LEVEL	COMMAND
[G] Page Zones	PAGE
[H] Toll Restriction	
[HA] SCOS Information	SCOS
[HB] Overlapping Area/Office Codes	OVER
[HC] Area/Office Codes Allowed/Restricted	AREA
[HD] Area/Office Code Reports	AREP
[HIE] Alternate Carriers	ALT
[HIF] Allowed Long Distance	ALD
[I] Least Cost Routing	
[IA] LCR Route Groups	ROUT
[IB] LCR Facility Groups	FAC
[IC] LCR Dial Rules	RULE
[ID] LCR Advance Timer	LCRA
[IE] LCR Data Reports	LREP
[J] Database Save/Restore	SAVE
[K] System Initialization and Reset	INIT

3.4 From the SMDR and error programming menu prompt (selection [B] from the applications menu), the following commands can be used:

MENU LEVEL	COMMAND
[B] SMDR AND ERROR PROGRAMMING	
[A] SMDR Output	OUTR
[B] SMDR Reports	SMDR
[C] Error Output	OUTE
[D] Error Reports	ERR
[E] On-Line Error Reports	OLER
[F] SMDR and Error Password	PASS

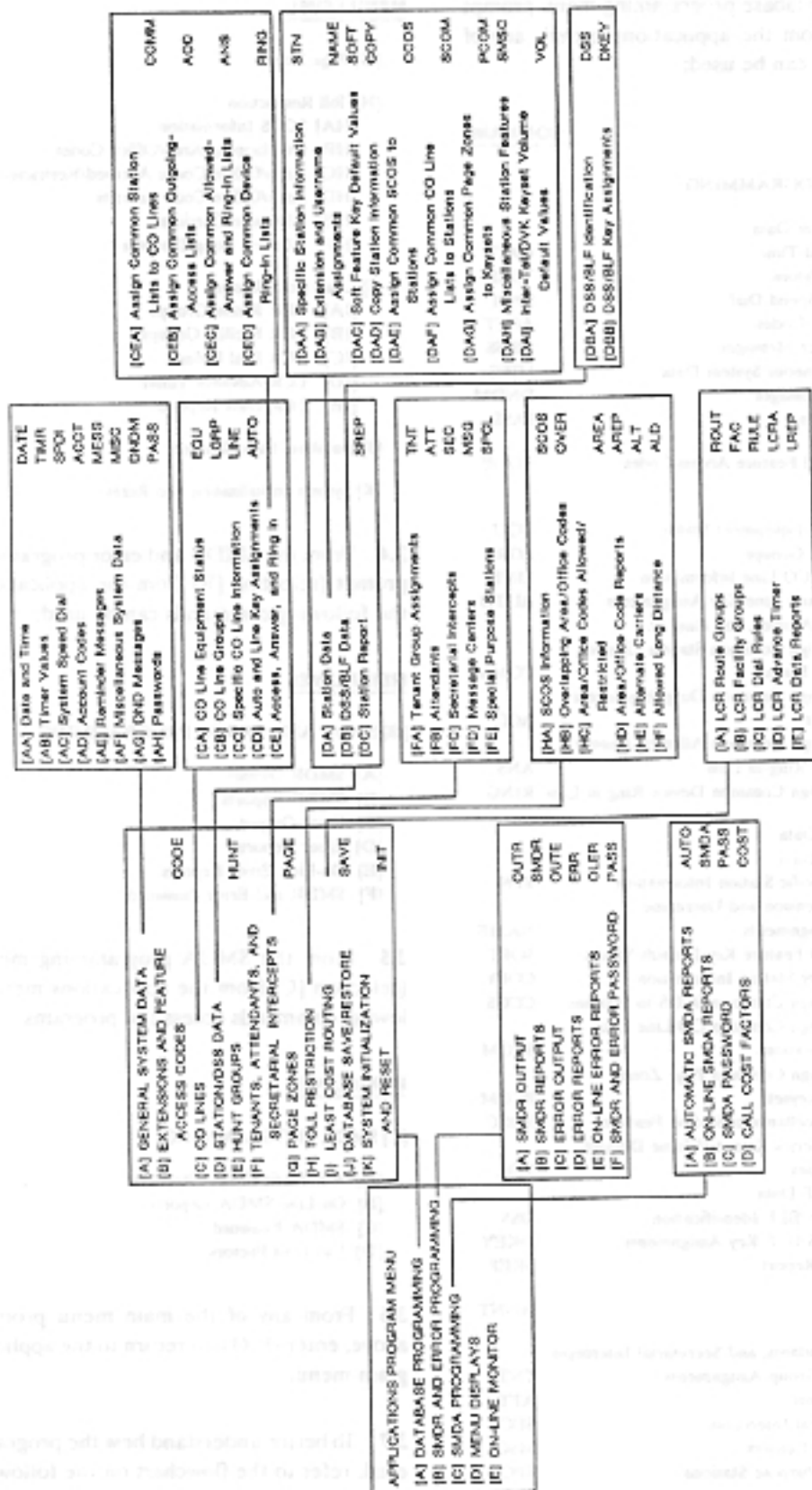
3.5 From the SMDA programming menu prompt (selection [C] from the applications menu), the following commands access the programs:

MENU LEVEL	COMMAND
[C] SMDA PROGRAMMING	
[A] Automatic SMDA Reports	AUTO
[B] On-Line SMDA Reports	SMDA
[C] SMDA Password	PASS
[D] Call Cost Factors	COST

3.6 From any of the main menu prompts shown above, enter /EXIT to return to the applications program menu.

3.7 To better understand how the programs are layered, refer to the flowchart on the following page.

PROGRAMMING



4. [A] GENERAL SYSTEM DATA

4.1 Choose option A from the database programming menu to program general system data. The menu appears as shown below:

- [A] GENERAL SYSTEM DATA
 - [A] DATE AND TIME
 - [B] TIMER VALUES
 - [C] SYSTEM SPEED DIAL
 - [D] ACCOUNT CODES
 - [E] REMINDER MESSAGES
 - [F] MISCELLANEOUS SYSTEM DATA
 - [G] DND MESSAGES
 - [H] PASSWORDS

NOTE: Selection [H] PASSWORDS does not appear unless the unrestricted password was entered or no password is required.

A. [AA] DATE AND TIME (/DATE)

4.2 Enter A from the general system data menu or AA from the database programming menu to set the system date and time. Or, use the abbreviated command /DATE. The first prompt displays the current value of the system date and allows changes to be made. The second prompt is used to change the time. After new information is entered, the terminal redisplay the entry for verification. If it is correct, enter <CR>. If not, enter the correct information.

PROMPT	VALID ENTRY
SYSTEM DATE (THU-26-JAN-1990):	<p>EITHER, enter the current day, date, month, and year as shown in the prompt (day-XX-month-19XX).</p> <p>OR, change only the day, date, month, or year by performing one of the following:</p> <ul style="list-style-type: none"> • Change only the day of the week by entering a three-letter abbreviation (SUN, MON, TUE, WED, THU, FRI, or SAT). • Change only the date by entering a hyphen (-) and then two-digits for the date (01-31). • Change only the month using two hyphens (- -), then a three-letter abbreviation (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC). • Change only the year by entering three hyphens (- - -) and then four digits for the year. • Enter any combination of these entries, separated by a hyphen for each field. Examples: -14-1985 to change date and year or - -JAN-1985 to change month and year.
SYSTEM TIME (XX:XX):	<p>EITHER, enter the hour and the minutes in 24-hour international time (midnight is 00:00; noon is 12:00).</p> <p>OR, change only the hour or minutes using one of the following methods:</p> <ul style="list-style-type: none"> • Enter two digits (00-23) to change the hour. • Change the minutes by entering a colon (:) and then two digits (00-59).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<p><i>This prompt appears only if new information was entered.</i></p> <p>Enter Y to save the changes or N to leave the database unchanged.</p>

PROGRAMMING

B. [AB] TIMER VALUES

4.3 There are programmable timers that control various system functions. In this programming task, the programmer can change any or all of them. To reach this program, enter B from the general system data menu or AB from the database programming menu. Or, use the abbreviated command /TIMR.

4.4 The timers and their initialized values, programmable ranges, and purposes are listed below and on the following pages. The default values have been carefully selected to ensure proper system operation under most circumstances. Determine which timers, if any, need to be changed. If a value is entered that is out of range, the terminal prints an error message. Refer to the program planning sheet in Figure 5-1 on page 5-114.

<u>TIMER</u>	<u>DEFAULT VALUE</u>	<u>RANGE</u>	<u>PURPOSE</u>
CO-CO Disconnect	35/100	2-250	A call is disconnected by the system if it detects loss of loop current (lasting longer than this timer) during CO-to-CO calls.
IC-CO Disconnect	60/100	2-250	A call is disconnected by the system if it detects loss of loop current (lasting longer than this timer) during station-to-CO calls, including calls on hold and modem calls.
DTMF Digit Duration	6/100	5-50	Adjusts the duration of DTMF tones sent by the system.
DTMF Interdigit Pause	6/100	2-60	Adjusts the duration of the pause between DTMF tones sent by the system.
CO Hookflash	60/100	2-250	Adjusts the duration of the timed hookflash that is sent over the C.O. line by the system when the hookflash feature code is used. (Does not affect SLI FLASH keys.)
Dialing Wait After Connect	15/10	10-250	The length of time the system waits for C.O. dial tone before dialing or checking the line for a disconnect.
Dialing Wait After Hookflash	30/10	1-250	Delays dialing after a hookflash to allow the system hardware to recover.
Keypad Hookswitch Debounce	10/10	1-50	After detecting a valid hookswitch toggle, the length of time the system will ignore subsequent hookswitch toggles. Prevents a keypad user from accidentally disconnecting a call if the hookswitch is pressed twice when a call is answered or when the user switches from using the handset to using the speakerphone.
Inter-Ring Silence	60/10	1-250	Indicates the duration of the silence between rings on an incoming C.O. call to determine if the line has stopped ringing prior to being seized. In most areas, C.O. ring pattern is 2 seconds on/4 seconds off. Check with the local telephone company for the ring pattern in your area.

NOTE: This timer must always be set higher than the C.O. ring off time.

TIMER	DEFAULT VALUE	RANGE	PURPOSE
Off-Line After Disconnect	10/10	10-250	The length of time the system waits after disconnect before checking for loop current. Used only after the C.O. line has been disconnected in response to the IC-CO disconnect timer.
Reminder Message Scroll Delay	5/10	0-50	Minimum amount of time a message remains on the display when scrolling through the reminder and do-not-disturb messages.
SL Hookflash Minimum	2/10	1-10	The minimum length of time a single-line set user must press the hookswitch for the system to recognize a hookflash.
SL Hookflash Maximum	7/10	2-20	The maximum amount of time a single-line set user can press the hookswitch before the system disconnects a call.
Camp-On	3 sec.	0-255	Length of time a caller hears busy tone before camping on.
Camp-On Tone	15 sec.	5-255	Length of time between camp-on tones.
CO Re-Seize	3 sec.	1-15	This timer has two functions: (1) It prevents the system from reseizing a C.O. line until the timer expires. This prevents a keyset user from accidentally disconnecting a call when a line key is pressed twice or another line key is bumped while the user is answering or returning to a call. NOTE: A programmable station option can be set to prevent users from reseizing a C.O. line. If selected, the station user cannot reseize a line until it is disconnected by replacing the handset, pressing the SPKR key, or pressing another line key. (2) When a user reseizes a line, this timer is started to determine the length of time the system will hold the line open to allow the central office to drop and reconnect the line.
Data Port Wait	30 sec.	1-255	Length of time the system will wait for the data device to go off hook after pressing the DATA key to transfer an outside or intercom call to the data port.
Dial Tone Wait	2 sec.	1-50	When processing an LCR call, the system waits for this length of time before dialing to allow the central office time to send dial tone.
Dial Initiation — Keyset	15 sec.	5-30	Limits time keyset can remain off hook without dialing before the system sends reorder tones.

PROGRAMMING

TIMER	DEFAULT VALUE	RANGE	PURPOSE
Dial Initiation — Single-Line Set	10 sec.	5-30	Limits time single-line set user can remain off hook without dialing before the system sends reorder tones.
Disconnect Wait After Dialing	20 sec.	2-30	Length of time the system waits after dialing an outside telephone number before checking the line for disconnect.
Forward No Answer	15 sec.	3-255	Length of time a call waits at an unavailable station before being forwarded.
Hold	60 sec.	10-255	Limits time a call remains on hold before recalling the station.
Hunt Group Announcement	18 sec.	10-255	Determines the amount of time a direct ring-in call will remain unanswered before it is sent to the hunt group's announcement station.
Hunt Group Overflow	72 sec.	10-255	Determines the amount of time a transferred outside call will circulate through the hunt group (unanswered) before being sent to the hunt group's overflow station.
Inactivity Alarm	30 sec.	10-255	Limits the time a station can remain off hook and inactive (after first receiving reorder tones) before registering a system alarm.
Interdigit (Long)	15 sec.	2-255	Determines end of dialing. Short timer is used after a valid number has been dialed. Long timer is used until digits form a valid number.
Interdigit (Short)	4 sec.	2-30	
LCR Advance	8 sec.	5-255	Length of time a station remains camped on to a busy facility group before it is moved to the next group.
Line Pre-Select	5 sec.	2-255	To pre-select a line, the keyset user presses a line key while on hook. This limits the time the keyset can hold a line before the user begins dialing.
Message (At Message Center)	5 sec.	1-255	Length of time a caller waits after pressing the MSG key before being connected to the called party's message center.
No Answer Advance	18 sec.	3-255	Determines the amount of time a call will ring at a hunt group station (unanswered) before advancing to the next station in a hunt group.
Off-Hook Voice Announce Screening	5 sec.	0-255	After the camp-on timer expires, length of time before an OHVA call can be completed.
Paging	15 sec.	0-255	Limits duration of page.

TIMER	DEFAULT VALUE	RANGE	PURPOSE
Pause Digit	3 sec.	1-5	Length of timed pauses used in system and station speed-dial telephone numbers and in LCR dial rules.
Queue Callback	15 sec.	10-255	Time allowed for a station to respond to a queue callback before the queue is cancelled.
Recall	60 sec.	10-255	Length of time a hold or transfer recall rings at a station before recalling that station's attendant. If the station receiving the recall has no attendant, the call remains at the station until the abandoned recall timer expires.
Transfer — Available	20 sec.	10-255	Limits time a transferred call rings unanswered at an idle station before it recalls the transferring station.
Transfer — Busy	24 sec.	10-255	Limits time a transferred call waits at a busy station before recalling the transferring station.
Valid Call	15 sec.	0-60	Minimum duration of an outgoing call before it is recorded in SMDR or SMDA. Calls placed on hold or transferred are not subject to this timer.
Abandoned Recall	10 min.	1-255	After a call has recalled to the last possible station, it will recall until this timer expires. If it remains unanswered, the system will disconnect the call.
Unsupervised Conference	5 min.	1-255	Limits time an unsupervised conference call with two or more outside parties remains connected before recalling the station.
Unsupervised CO	15 min.	1-255	Limits duration of CO-to-CO DISA calls or outside calls transferred or forwarded to outside telephone numbers before recalling the primary attendant (or system alarm station).

4.5 If a value is entered that is out of range, the terminal prints an error message. The prompts begin with the timers that are programmed in *hundredths* of a second, as shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
<i>The following timers are programmed in hundredths of a second.</i>	
CO-CO DISCONNECT (35):	2-250
IC-CO DISCONNECT (60):	2-250
DTMF DIGIT DURATION (6):	5-50
DTMF INTERDIGIT PAUSE (6):	2-60
CO HOOKFLASH (60):	2-250
REVIEW SAME TIMERS AGAIN (N)	Y- Return to the CO-CO DISCONNECT prompt. N- Continue to the next prompt.

PROMPT	VALID ENTRY
<i>The following timers are programmed in tenths of seconds.</i>	
DIALING WAIT AFTER CONNECT (15):	10-250
DIALING WAIT AFTER HOOKFLASH (30):	1-250
KEYSET HOOKSWITCH DEBOUNCE (10):	1-50
INTER-RING SILENCE (60):	1-250
OFF-LINE AFTER DISCONNECT (10):	1-250
REMINDER MESSAGE SCROLL DELAY (5):	0-50
SL HOOKFLASH MINIMUM (2):	1-10
SL HOOKFLASH MAXIMUM (7):	2-20
REVIEW SAME TIMERS AGAIN (N)	Y- Return to the DIALING WAIT AFTER CONNECT prompt. N- Continue to the next prompt.
<i>The following timers are programmed in seconds.</i>	
CAMP-ON (3):	0-255
CAMP-ON TONE (15):	5-255
CO RE-SEIZE (3):	1-15
DATA PORT WAIT (30):	1-255
DIAL TONE WAIT (2):	1-50
DIAL INITIATION — KEYSET (15):	5-30
DIAL INITIATION — SL SET (10):	5-30
DISCONNECT WAIT AFTER DIALING (20):	2-30
FORWARD NO ANSWER (15):	3-255
HOLD (60):	10-255
HUNT GROUP ANNOUNCEMENT (18):	10-255
HUNT GROUP OVERFLOW (72):	10-255
INACTIVITY ALARM (30):	10-255
INTERDIGIT (LONG) (15):	2-255
INTERDIGIT (SHORT) (4):	2-30
LCR ADVANCE (8):	5-255
LINE PRE-SELECT (5):	2-255
MESSAGE (AT MESSAGE CENTER) (5):	1-255
NO ANSWER ADVANCE (18):	3-255
OFF-HOOK VOICE ANNOUNCE SCREENING (5):	0-255
PAGING (15):	0-255
PAUSE DIGIT (3):	1-5
QUEUE CALLBACK (15):	10-255
RECALL (60):	10-255

PROMPT	VALID ENTRY
TRANSFER-AVAILABLE (20):	10-255
TRANSFER-BUSY (24):	10-255
VALID CALL (15):	0-60
REVIEW SAME TIMERS AGAIN (N)	Y- Return to the CAMP-ON prompt. N- Continue to the next prompt.
<i>The following timers are programmed in minutes.</i>	
ABANDONED RECALL (10):	1-255
UNSUPERVISED CONFERENCE (5):	1-255
UNSUPERVISED CO (15):	1-255
REVIEW SAME TIMERS AGAIN (N)	Y- Return to the ABANDONED RECALL prompt. N- Exit the program and return to the general system data menu prompt ([A]).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

C. [AC] SYSTEM SPEED DIAL

4.6 To prepare for programming the system speed-dial information, determine the following information. (If desired, use the program planning sheet in Figure 5-2 on page 5-115.)

- **System speed-dial programming station:** Determine the circuit or intercom number of the keyset station that will be used to program the system speed-dial numbers.
- **Display speed-dial numbers:** Determine how many system speed-dial numbers can be viewed on display keysets. (Locations 00-09 are always displayed.) The remaining numbers will be confidential, non-display numbers. Non-display numbers do not appear on display keysets when dialed and cannot be redialed at keyset stations; however, they will appear in the SMDR report.
- **Speed-dial numbers:** List up to 100 system speed-dial numbers and associated names. The names can include up to 16 characters. (These names are used with C.O. Directory feature.) The

numbers can include up to 32 digits and can include timed pauses and/or hookflashes. Timed pauses and/or hookflashes are used when entering a series of numbers, such as access codes, security codes, and telephone numbers, for specialized common carrier (SCC) dialing. To include a pause in the number, enter the letter P for a short pause, PP for a medium pause, or PPP for a long pause. The pause length represented by the P is determined in program [AB] (timer values). If the hookflash option is enabled, enter an F (flash) for a hookflash. Each pause and/or hookflash (P, PP, PPP, or F) is considered one of the 32 digits. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.

4.7 Enter C from the general system data menu or AC from the database programming menu to access the system speed-dial program. Or, use the abbreviated command /SPDI. The prompts appear as shown below; end entries with <CR>.

PROMPT	VALID ENTRY
SYSTEM SPEED DIAL PROGRAMMING STATION (I.I):	Enter the circuit (X.Y) or intercom (EXXX) number of the station that will be used for entering or changing system speed-dial numbers.
DISPLAY ALL SYSTEM SPEED DIAL NUMBERS (Y):	Y- All numbers appear on display keysets when dialed. Advance to the RANGE OF SPEED DIAL NUMBERS prompt. N- Advance to the next prompt.
DISPLAY SYSTEM SPEED DIAL NUMBERS 0 TO (99):	Complete the range of system speed-dial numbers (10-99) as desired. Numbers within the range will be allowed to appear on display keysets when dialed. Any number not included in this range is a non-display number. Numbers 00-09 are always displayed.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
RANGE OF SPEED DIAL NUMBERS TO BE REVIEWED (NONE):	Enter a range of speed-dial location codes (0-99). ALL is a valid entry, but only 20 speed-dial numbers will be viewed before the REVIEW ADDITIONAL prompt appears. Enter NONE to return to the general system data menu prompt ([A]:).

PROMPT	VALID ENTRY
00 (): SPEED DIAL NAME (): ... 99 (): SPEED DIAL NAME ():	As each location code prompt appears, enter the speed-dial number (up to 32 digits including pauses and/or hookflashes). After pressing < CR >, the prompt requests a name. If desired, enter a speed-dial name (up to 16 character). NOTE: To erase an existing number without entering a new number, enter < at the number prompt.
REVIEW SAME SPEED DIAL NUMBERS AGAIN (N)?	Y- Return to the first speed-dial number. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW ADDITIONAL SPEED DIAL NUMBERS (N)?	Y- Return to the RANGE OF SPEED DIAL NUMBERS prompt. N- Return to the general system data menu prompt ([A]). Or, if more than 20 numbers were entered at the RANGE prompt, the system continues to the next 20 speed-dial numbers.

PROGRAMMING

D. [AD] ACCOUNT CODES

4.8 Enter D from the general system data menu or AD from the database programming menu to define up to 32 standard account codes and up to 120 forced account codes. Or, use the abbreviated command /ACCT. (For more information regarding account codes, refer to page 4-53 in FEATURES.) These codes can then be assigned to specific stations in program [D] (station/DSS data).

4.9 To plan the account code programming, determine the length for all account codes (4-8 digits). Then list the standard account codes (numbered 0-31) and the forced account codes (numbered 0-119). The forced account codes in this list are used

for the account code validation features. If forced account codes and/or LCR toll call forced account codes are validated, the code entered by the user must match one of the codes on this forced account code list before the call is allowed. The program planning sheet in Figure 5-3 on page 5-116 may be helpful.

4.10 The terminal first displays the warning shown below. It is followed by the prompts. End each entry with < CR >.

WARNING: CHANGING THE ACCOUNT CODE LENGTH ERASES ALL PREVIOUSLY DEFINED STANDARD AND FORCED ACCOUNT CODES.

PROMPT	VALID ENTRY
ACCOUNT CODE LENGTHS (4):	To leave it unchanged, enter < CR > only. Entering a number (4-8) changes the length of all codes and erases any previously programmed codes.
RANGE OF STANDARD ACCOUNT CODES TO BE REVIEWED (NONE):	Enter a range of standard account codes (0-31) to be programmed or viewed. ALL is a valid entry. Enter NONE to advance to the RANGE OF FORCED ACCOUNT CODES prompt.
0 (): ... 31 ():	As each standard account code number appears, enter the four- to eight-digit code. Or, enter < to erase the current code without entering a new code.
REVIEW SAME STANDARD ACCOUNT CODES AGAIN (N)?	Y- Return to the first standard account code. N- Continue to the next prompt.
REVIEW ADDITIONAL STANDARD ACCOUNT CODES (N)?	Y- Return to the RANGE OF STANDARD ACCOUNT CODES prompt. N- Continue to the next prompt.
RANGE OF FORCED ACCOUNT CODES TO BE REVIEWED (NONE):	Enter a range of forced account code numbers (0-119) to be programmed or viewed. ALL is a valid entry. Enter NONE to return to the general system data menu prompt ([A]).
0 (): ... 119 ():	As each forced account code number appears, enter the four- to eight-digit code. Or, enter < to erase the current code without entering a new code.
REVIEW SAME FORCED ACCOUNT CODES AGAIN (N)?	Y- Return to the first forced account code. N- Continue to the next prompt.
REVIEW ADDITIONAL FORCED ACCOUNT CODES (N)?	Y- Return to the RANGE OF FORCED ACCOUNT CODES prompt. N- Return to the general system data menu prompt ([A]).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

E. [AE] REMINDER MESSAGES

4.11 Select program E from the general system data menu or AE from the database programming menu to define any or all of the 20 reminder message displays. Or, use the abbreviated command /MESS. (For more information regarding reminder messages, refer to page 4-80 in FEATURES.) Refer to the program planning sheet in Figure 5-4 on page 5-117.

PROMPT	VALID ENTRY
MESSAGE 1 (MEETING); MESSAGE 2 (STAFF MEETING); MESSAGE 3 (SALES MEETING); MESSAGE 4 (CANCEL MEETING); MESSAGE 5 (APPOINTMENT); MESSAGE 6 (PLACE CALL); MESSAGE 7 (CALL CLIENT); MESSAGE 8 (CALL CUSTOMER); MESSAGE 9 (CALL HOME); MESSAGE 10 (CALL CORPORATE); MESSAGE 11 (CALL ENGINEERING); MESSAGE 12 (CALL MARKETING); MESSAGE 13 (CALL ACCOUNTING); MESSAGE 14 (CANCEL DND); MESSAGE 15 (CANCEL CALL FWD); MESSAGE 16 (TAKE MEDICATION); MESSAGE 17 (MAKE RESERVATION); MESSAGE 18 (REVIEW SCHEDULE); MESSAGE 19 (LUNCH); MESSAGE 20 (REMINDER);	Enter any 16-character message or < to erase the current message without entering a new one. End each entry with < CR > or just press < CR > to advance to the next line without changing the current message.
REVIEW REMINDER MESSAGES AGAIN (N)	Y- Display the messages again. N- Return to the general system data menu prompt ([A]);.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

E [AF] MISCELLANEOUS SYSTEM DATA

4.12 Various system parameters are set using this programming task. Select F from the general system data menu or AF from the database programming menu. Or, use the abbreviated command /MISC.

4.13 To prepare for this program, determine the following information. If desired, use the program planning sheet in Figure 5-5 on page 5-118.

- **System "skate" type:** Determine whether the system will "skate-to-hold" or "skate-to-disconnect." With skate-to-hold a call is placed on hold when a keyset user presses another line key or the IC key while on a call. Skate-to-disconnect drops the call when another key is pressed. Skate-to-hold will not affect the procedure for reseizing a line.
- **Primary attendant or system alarm station:** Record the circuit or intercom number of the primary attendant station. This attendant serves as the main attendant for the system. The station must first be programmed as an attendant in program [FB] (attendants). If there will not be a primary attendant, select a display keyset station to receive system alarm messages.
- **Broadcasting of alarms:** System alarms can be programmed to display on all attendant stations or only at the primary attendant (or system alarm) station.
- **Cross-tenant traffic:** Determine whether stations that are in different tenant groups will be allowed to place, forward, or transfer intercom calls to one another. Intercom calls placed to a hunt group are routed only to the hunt group stations that are in the same tenant group as the caller. Outside calls that are transferred to the hunt group are routed to all stations in the group. Recalls are not blocked, even if the attendant is not in the hunt groups' tenant group.
- **Reverse transfer:** Reverse-transferred calls can be programmed to be connected to keysets automatically. If not, the user must press the flashing line key or the IC key to be connected. Single-line stations are always automatically connected to reverse-transferred calls.

- **Speed-dial programming hookflash:** Determine whether hookflashes can be entered as part of speed-dial numbers and LCR dial rules.

- **Dialing during automated attendant recording:** Determine whether callers to an automated attendant will be allowed to dial DTMF digits while the automated attendant is giving dialing instructions. If enabled, this option allows callers (who know the intercom number of the person to whom they wish to speak) to dial before the end of the message.

NOTE: The reliability of allowing callers to dial during the instructions may be affected by the voice characteristics of the person giving the instructions, the quality of the playback device, the C.O. line noise levels, the DTMF tone levels, etc. If frequent problems occur, this option should be disabled.

- **Off-hook voice announce:** Determine whether the off-hook voice announce (OHVA) feature will be enabled system-wide, and if so, whether keysets equipped with DSS/BLF Units will have immediate off-hook voice announce capability.
- **Audible message indication for SL sets:** If this option is enabled, single-line set users will hear a signal after lifting the handset or pressing the hookswitch whenever a message is waiting at their stations.
- **Voice mailbox validation:** This feature affects calls transferred to a voice mail unit. If all mailbox numbers match intercom numbers, the option should be enabled to allow the system to check that the mailbox number entered by the transferring party is valid. (If the number entered does not match an intercom number, the user hears a burst of reorder tone and may try again to enter a valid number.) If there are mailbox numbers that do not match an intercom number, this option must be disabled to allow the non-matching numbers to be dialed. In the default state, this is set to not validate numbers.

4.14 The miscellaneous system data prompts are as follows. End each entry with < CR >.

PROMPT	VALID ENTRY
SYSTEM SKATE TYPE H = SKATE-TO-HOLD D = SKATE-TO-DISCONNECT SYSTEM SKATE TYPE (D):	H- A call is placed on hold when the keyset user presses another line key or the IC key. D- The current call is disconnected when another line key or the IC key is pressed.
PRIMARY ATTENDANT STATION (1.1):	If desired, enter the circuit (X.Y) or intercom (EXXX) number of the primary attendant station. Or, enter NONE if there is not a primary attendant.
SYSTEM ALARM STATION (1.1):	<i>This prompt appears only if a primary attendant has not been assigned.</i> Enter the circuit (X.Y) or intercom (EXXX) number of the station to receive system alarm messages.
BROADCAST ALARMS TO ALL ATTENDANTS (Y):	Y- System alarms display on all attendants' keysets. N- Only the primary attendant or system alarm station is notified in the event of a system alarm.
ALLOW CROSS-TENANT IC TRAFFIC (Y):	Y- Members of different tenant groups are allowed to place calls to one another. N- No intercom calls are allowed between tenant groups. A warning displays "Cross Tenant IC Traffic Disabled" before the next prompt appears.
CONNECT REVERSE TRANSFERS IMMEDIATELY (N):	Y- Reverse transfers are automatically connected. N- After reverse transfers, the keyset user must press the flashing line key or the IC key to be connected.
ENABLE SPEED DIAL HOOKFLASH PROGRAMMING (N):	Y- When programming system or station speed-dial numbers from a keyset, pressing the SPCL key once enters a hookflash, twice enters a short pause, and three times enters a medium pause. When programming from a terminal, the programmer can enter F for a hookflash, P for a short pause, PP for a medium pause, and PPP for a long pause. N- When programming system or station speed-dial numbers from a keyset, pressing the SPCL key once enters a short pause, twice enters a medium pause, and three times enters a long pause. When using a terminal, the programmer can enter P for a short pause, PP for a medium pause, and PPP for a long pause.
IGNORE DIALED DIGITS DURING AUTOMATED ATTENDANT'S RECORDING (Y):	Y- The system will ignore digits dialed during the automated attendant's dialing instructions. N- The system will recognize digits dialed during the automated attendant's dialing instructions.
ENABLE SYSTEM-WIDE OFF-HOOK VOICE ANNOUNCE (N):	Y- Enables system-wide OHVA. N- OHVA calls are not allowed. Advance to the AUDIBLE MESSAGE INDICATION FOR SL SETS prompt.

PROMPT	VALID ENTRY
ENABLE IMMEDIATE DSS OFF-HOOK VOICE ANNOUNCE (Y):	<p><i>This prompt appears only if the OHVA feature is enabled.</i></p> <p>Y- Keysets with DSS/BLF Units can make immediate OHVA calls without waiting for the OHVA screening timer to expire.</p> <p>N- Keysets with DSS/BLF Units do not have special priority when making OHVA calls.</p>
AUDIBLE MESSAGE INDICATION FOR SL SETS (N):	<p>Y- The system will send a signal if a message is waiting at a single-line set.</p> <p>N- The system will not send special tones to notify a single-line set user when a message is waiting.</p>
ENABLE VALIDATION OF VOICE MAILBOX ID (N):	<p>Y- When a call is transferred to a voice mail unit, the system checks that the mailbox number entered by the transferring party corresponds to a valid intercom number.</p> <p>N- Mailbox numbers are not validated.</p>
REVIEW MISCELLANEOUS SYSTEM DATA (N)?	<p>Y- Return to the SYSTEM SKATE TYPE prompt.</p> <p>N- Continue to the next prompt.</p>
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?	<p><i>This prompt appears only if new information was entered.</i></p> <p>Enter Y to save the changes or N to leave the database unchanged.</p>

G. [AG] DND MESSAGES

4.15 To reprogram the message selections for the do-not-disturb feature, enter G from the general system data menu or AG from the database programming menu. Or, use the abbreviated command /DNM. The prompts appear as shown below.

PROMPT	VALID ENTRY
MESSAGE 1 (DO-NOT-DISTURB) MESSAGE 2 (IN MEETING UNTIL): MESSAGE 3 (IN MEETING): MESSAGE 4 (ON VACATION 'TIL): MESSAGE 5 (ON VACATION): MESSAGE 6 (CALL ME AT): MESSAGE 7 (AT THE DOCTOR): MESSAGE 8 (ON A TRIP): MESSAGE 9 (ON BREAK): MESSAGE 10 (OUT OF TOWN 'TIL): MESSAGE 11 (OUT OF OFFICE): MESSAGE 12 (OUT UNTIL): MESSAGE 13 (WITH A CLIENT): MESSAGE 14 (WITH A GUEST): MESSAGE 15 (WITH A PATIENT): MESSAGE 16 (UNAVAILABLE): MESSAGE 17 (IN CONFERENCE): MESSAGE 18 (AWAY FROM DESK): MESSAGE 19 (GONE HOME): MESSAGE 20 (OUT TO LUNCH):	<i>Messages 2-20 can be changed to any 16-character message. Message 1 cannot be reprogrammed.</i> Enter any 16-character message or < to erase the current message without entering a new one. End each entry with < CR > or just press < CR > to advance to the next line without changing the current message.
REVIEW DND MESSAGES AGAIN (N)?	Y- Return to message 2. N- Return to the menu prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

H. [AH] PASSWORDS

4.16 The database programming, SMDR and error programming, SMDA programming, and on-line monitor menus each can be assigned passwords that limit access.

4.17 The database programming menu can have up to three passwords; each specifies a different level of access:

- **Inspection level** allows any portion of the database to be viewed, except the save/restore, initialization, or password programs. It does not allow changes to be made in the database.
- **Modification level** allows changes in the database to be made and saved. But, it does not allow access to the save/restore, initialization, or password programs.
- **Unrestricted level** allows the programmer to make changes, save or load information, and to initialize the system.

4.18 If an inspection and/or modification password is assigned, an unrestricted password must also be assigned to ensure adequate security. If an unrestricted password is not assigned, a simple <CR> allows access to the save/restore, initialization, and password programs, thus defeating the purpose of password security.

4.19 The SMDR and error programming, SMDA programming, and on-line monitor each have one password (unrestricted level).

4.20 If a password is required for entry to a programming area, the terminal prompts you to enter a password. If an invalid password is entered, the system returns to the applications menu prompt and prints an error message. For security, the passwords do not appear on the terminal when typed.

4.21 A password can be up to eight characters long. To allow immediate access to every program, no passwords are set during initialization. If desired, record the passwords on the program planning sheet in Figure 5-6 on page 5-119.

NOTE: If a password is created and later designated as *not required*, it remains in the system memory. If it is later designated as *required* and a new password is not created, the original password is assigned.

4.22 To establish, change, or remove passwords, select H from the general system data menu or AH from the database programming menu. Or, use the abbreviated command /PASS. The prompts for the database programming menu password appear first. End each entry with <CR>.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR DATABASE PROGRAMMING (N):	N- Advance to the SMDR password prompts. Y- Continue to the next prompt.
CHANGE INSPECTION PASSWORD (N)?	N- Advance to the CHANGE MODIFICATION PASSWORD prompt. Y- Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
CHANGE MODIFICATION PASSWORD (N)?	N- Advance to the CHANGE UNRESTRICTED PASSWORD prompt. Y- Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
CHANGE UNRESTRICTED PASSWORD (N)?	N- Advance to the SMDR password prompts. Y- Continue to the next prompt.

PROMPT	VALID ENTRY
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REQUIRE A PASSWORD FOR SMDR AND ERROR (N):	N- Advance to the REQUIRE A PASSWORD FOR SMDA prompt. Y- Continue to the next prompt.
CHANGE SMDR AND ERROR PASSWORD (N)?	N- Advance to the REQUIRE A PASSWORD FOR SMDA prompt. Y- Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REQUIRE A PASSWORD FOR SMDA (N):	N- Advance to the REQUIRE A PASSWORD FOR ON-LINE MONITOR prompt. Y- Continue to the next prompt.
CHANGE SMDA PASSWORD (N)?	N- Advance to the REQUIRE A PASSWORD FOR ON-LINE MONITOR prompt. Y- Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REQUIRE A PASSWORD FOR ON-LINE MONITOR (N):	N- Return to the general system data menu prompt ([A]). Y- Continue to the next prompt.
CHANGE ON-LINE MONITOR PASSWORD (N)?	N- Return to the general system data menu prompt ([A]). Y- Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

5. [B] EXTENSIONS (INTERCOM NUMBERS) AND FEATURE ACCESS CODES

5.1 To reprogram intercom numbers or feature codes, enter B from the database programming menu prompt. Or, use the abbreviated command /CODE. To prepare for programming, make a list of feature codes and intercom numbers and check to be sure they do not overlap. Prompts are shown below only for a few intercom numbers and feature codes. The program planning sheet in Figure 5-7, page 5-120, lists all of the feature codes and their default values.

5.2 The feature codes and intercom numbers are preset to carefully-selected default values. Changing the codes or numbers can cause existing assignments

to be erased. For example, if 300, 305, and 306 are assigned as feature codes and you attempt to assign 30 as another feature code, 30 would not be accepted, because 3 and 0 make up part of existing codes. The terminal prints the error message shown below. If desired, enter Y to save 30 and erase feature codes 300, 305, and 306.

```
*** AMBIGUOUS ASSIGNMENT(S) ***
E300
E305
E306
```

OVERRIDE CONFLICT (N)?

5.3 The prompts begin with intercom number assignments. End each entry with <CR>.

PROMPT	VALID ENTRY
RANGE OF STATIONS TO BE REVIEWED (NONE):	Enter a range of circuit numbers of the stations to be viewed or assigned new intercom numbers. ALL is a valid entry. Enter NONE to advance to the REVIEW TALKBACK SPEAKERS prompt.
KEYSET 1.1 (E100): ... SL SET 15.8 (E219):	Enter an intercom number (XXX or EXXX) to change the number assigned to the circuit.
REVIEW SAME STATIONS AGAIN (N)?	Y- Return to the first station selected. N- Continue to the next prompt.
REVIEW ADDITIONAL STATIONS (N)?	Y- Return to the RANGE OF STATIONS prompt. N- Continue to the next prompt.
REVIEW TALKBACK SPEAKERS (N)?	Y- Continue to the next prompt. N- Advance to the RANGE OF HUNT GROUPS prompt.
TALKBACK SPEAKER 1 (E221): ... TALKBACK SPEAKER 5 (E225):	Enter new intercom numbers for the talkback speakers, if desired. Be careful not to use numbers that are to be used as intercom numbers or feature codes.
REVIEW TALKBACK SPEAKERS AGAIN (N)?	Y- Return to the first TALKBACK SPEAKER prompt. N- Continue to the next prompt.
RANGE OF HUNT GROUPS TO BE REVIEWED (NONE):	Enter a range of hunt group numbers (1-15) to be assigned pilot numbers. ALL is a valid entry. Enter NONE to advance to the REVIEW FEATURES prompt.
HUNT GROUP 1 (E231): ... HUNT GROUP 15 (E245):	Enter new pilot numbers for the hunt groups, if desired. Be careful not to use numbers that are to be used as intercom numbers or feature codes.
REVIEW SAME HUNT GROUPS AGAIN (N)?	Y- Return to the first hunt group in the selected range. N- Continue to the next prompt.

PROMPT	VALID ENTRY
REVIEW ADDITIONAL HUNT GROUPS (N)?	Y- Return to the RANGE OF HUNT GROUPS prompt. N- Continue to the next prompt.
REVIEW FEATURES (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW MODEMS prompt.
CO LINE ACCESS: LEAST COST ROUTING (E80): ... FEATURE; SET TIME OF DAY (E021):	Enter a new 1-3 digit code for each feature or NONE if the feature will not be used. Be careful not to use numbers that are to be used as intercom numbers.
REVIEW FEATURES AGAIN (N)?	Y- Return to the CO LINE ACCESS prompt. N- Continue to the next prompt.
REVIEW MODEMS (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW EXTENSION ASSIGNMENTS AGAIN prompt.
MODEM 300 (E260):	Enter the intercom number to be used for accessing the 300-baud modem. Be careful not to use numbers that are to be used as intercom numbers or feature codes.
MODEM 1200 (E270):	Enter the intercom number to be used for accessing the 1200-baud modem. Be careful not to use numbers that are to be used as intercom numbers or feature codes.
REVIEW MODEMS AGAIN (N)?	Y- Return to the MODEM 300 prompt. N- Continue to the next prompt.
REVIEW EXTENSION ASSIGNMENTS AGAIN (N)?	Y- Return to the RANGE OF STATIONS TO BE REVIEWED prompt. N- Exit to the database programming menu prompt ([]):
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

6. [C] C.O. LINES

6.1 The programs reached through menu [C] C.O. Lines (selection C from the database programming menu) establish equipped C.O. lines, C.O. line groups, least-cost routing (LCR) facility groups, outgoing-access lists, allowed-answer lists, and ring-in lists.

6.2 The menu appears as shown below:

[C] CO LINES

- [A] CO LINE EQUIPMENT STATUS
- [B] CO LINE GROUPS
- [C] SPECIFIC CO LINE INFORMATION
- [D] AUTO AND LINE KEY ASSIGNMENTS
- [E] ACCESS, ANSWER, AND RING-IN

6.3 Certain types of C.O. information can be entered in more than one program. For example, lists of stations with outgoing-access, allowed-answer, and ring-in can be assigned individually to each C.O. line (using program [CC] Specific C.O. Line Information) or they can be assigned to a group of C.O. lines (using program [CE] Access, Answer, And Ring-In). The exact method and order of programming used depends on the customer's specific needs and the programmer's preference.

6.4 Before using these programs, look through all of the information on pages 5-30 to 5-38. Then, using the program planning sheet in Figure 5-8, which begins on page 5-122, make lists of the following information.

- Circuit numbers of equipped C.O. lines.
- Line identifications of up to seven characters.
- Circuit numbers of lines to be used for DISA during the day and night modes, and security codes (1-4 digits), if desired.
- Circuit numbers of incoming-only and/or outgoing-only C.O. lines.

- Circuit numbers of lines that require dial-pulse signalling.
- Circuit numbers of lines that will be subject to toll restriction, lines exempt from LCR Only, lines that will be programmed to absorb digits for PBX or local lines (and their absorbed digit strings), and lines that will be used for equal access dialing.
- Call cost type for unrestricted lines.
- Circuit numbers of lines assigned to the auto group.
- Line group and facility group numbers.
- Hunt group ring-in assignments.
- Outgoing-access, allowed-answer, and ring-in assignments for stations.
- Signal device ring-in assignments.
- Line key numbers of each C.O. line circuit (for each of the five tenant groups), and overflow lines.

A. [CA] C.O. LINE EQUIPMENT STATUS

6.5 Select option A from the C.O. lines menu or CA from the database programming menu to batch load information for several C.O. lines. Or, use the abbreviated command /EQU. The program planning sheet is in Figure 5-8, which begins on page 5-122.

6.6 After each list of circuit numbers is entered, the terminal redisplay the entry. Press <CR> if the information is correct. If not, enter new information.

6.7 When a list is displayed, items can be added to it by entering a plus (+) before the information. For example, the list reads 1.1-1.3, 2.1. To add 1.4 and 2.2-2.4, enter + 1.4, 2.2-2.4. To subtract items from the list, enter a minus (-) before the numbers. Do not add and subtract items in the same entry.

PROMPT	VALID ENTRY
LIST OF EQUIPPED CO LINES (1.1-6.4):	Enter circuit numbers of the equipped C.O. lines. NONE is a valid entry. If you enter ALL, lines 7.1-8.4 are OVER lines.
LIST OF DAY DISA CO LINES (NONE):	Enter circuit numbers of lines to be used for DISA access while the system is in day mode or NONE if DISA will not be used during day mode.

PROMPT	VALID ENTRY
LIST OF NIGHT DISA CO LINES (NONE):	Enter circuit numbers of lines to be used for DISA access while the system is in night mode or NONE if DISA will not be used during night mode.
LIST OF INCOMING-ONLY CO LINES (NONE):	Enter circuit numbers of lines to be used for incoming calls only or NONE if the lines are not incoming-only. Changing this list also changes the outgoing-access list in [DAA].
LIST OF OUTGOING-ONLY CO LINES (NONE):	Enter circuit numbers of lines to be used for outgoing calls only. Do not include DISA lines. Changing this list also changes the allowed-answer list in [DAA].
LIST OF PULSE-DIALING CO LINES (NONE):	Enter circuit numbers of lines that have been converted for dial-pulse signalling or NONE if all lines are DTMF.
LIST OF CO LINES SUBJECT TO TOLL RESTRICT (ALL):	Enter circuit numbers of lines that will be subject to toll restriction. Station class of service (SCOS) is checked only if the line is restricted. Enter ALL to restrict all lines.
LIST OF CO LINES EXEMPT FROM LCR ONLY (NONE):	Enter circuit numbers of lines that can be accessed directly by stations with SCOS 6 (LCR Only) and allowed access.
REVIEW CO LINE STATUS AGAIN (N)?	Y- Return to LIST OF EQUIPPED CO LINES prompt. N- Return to the C.O. lines menu prompt ([C]).
<i>The following prompts appear only if a line is changed from unequipped to equipped status. They show the available auto key assignments. A newly equipped line must be assigned to a line key. In KF-rated systems, there can be only one auto line.</i>	
LINE KEY ASSIGNMENT FOR CO LINE X.Y TENANT GROUP X LINE KEY NUMBER(S) AVAILABLE (): <i>OR</i> NO LINE KEYS AVAILABLE! OVERFLOW CO LINE ASSUMED!	<i>If a line key is available, enter the desired line key number from the list shown, or press RETURN to select the lowest available line key. If a line key is not available, the line is automatically made an overflow line. This prompt repeats for each of the tenant groups.</i> NOTE: Only 24 lines can be assigned to line keys and distributed among the tenant groups. That is, if lines 1.1-6.4 are assigned to line keys in any of the tenant groups, all other tenant groups are also limited to having any combination of lines 1.1-6.4 under their line keys. In this example, lines 7.1-8.4 cannot be assigned to line keys in any tenant group and will be assigned to the "overflow" (OVER) key in all of the tenant groups.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

B. [CB] C.O. LINE GROUPS

6.8 A line group is accessed for placing outgoing calls by entering one of the select line group feature codes at a station. To define the eight line groups, select B from the C.O. lines menu or CB from the database programming menu. Or, use the abbreviated command /LGRP. Prepare to use this program by making a list of C.O. line circuit numbers for each line group. The program planning sheet is in Figure 5-8, which begins on page 5-122. A line can be in more than one line group or in none.

6.9 When a list of C.O. lines is entered, the terminal redisplay the entry for verification. If the list is correct, press <CR>. If any items are incorrect, enter the correct information.

6.10 When a list is displayed, items can be added by entering a plus (+) before the information. For example, the list reads 1.1-1.3, 2.1. To add 1.4 and 2.2-2.4, enter + 1.4, 2.2-2.4. Subtract items from the list by entering a minus (-) before the numbers. Do not add and subtract items in the same entry. The prompts appear as follows. End each entry with <CR>.

PROMPT	VALID ENTRY
RANGE OF LINE GROUPS TO BE REVIEWED (ALL):	Enter a range of line group numbers (1-8) to be programmed. Enter NONE to return to the C.O. Lines menu prompt ([C]:) or ALL to view all line groups.
LINE GROUP X. LIST OF CO LINES (NONE):	Enter circuit number(s) of line(s) to be assigned to the line group. This prompt repeats for each of the line groups in the selected range. ALL is a valid entry. NOTE: In the KF-rated version of the GMX-152D System, enter only one line per line group. If you try to enter more than one, you will receive an error message.
REVIEW SAME LINE GROUPS AGAIN (N)?	Y- Return to the first line group. N- Continue to the next prompt.
REVIEW ADDITIONAL LINE GROUPS (N)?	Y- Return to the RANGE OF LINE GROUPS prompt. N- Return to the C.O. lines menu prompt ([C]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

C. [CC] SPECIFIC C.O. LINE INFORMATION

6.11 To assign C.O. line features on a line-by-line basis, enter C from the C.O. lines menu or CC from the database programming menu. Or, use the abbreviated command /LINE. Before using this program, determine the following information for each equipped C.O. line circuit. (The program planning sheet is in Figure 5-8, which begins on page 5-122.)

- **C.O. lines equipped:** List all equipped C.O. lines.
- **C.O. line identification:** An identifier of up to seven characters can be programmed for each line.
- **DISA access:** The line can be programmed as a day and/or night DISA line. In addition, each DISA line can be assigned a four-digit security code to limit system access and/or access to the C.O. lines and modem. Separate security codes can be assigned for day and night modes.
- **Dial-pulse signalling:** Determine if the line uses dial-pulse signalling.
- **Toll restriction:** If the line is not subject to toll restriction, the station class of service (SCOS) is not checked when the line is used. For unrestricted lines, determine the call cost rate to be used for calls placed on the line. Restricted lines can be designated as equal access lines and can be programmed to absorb digits for PBX installations and installations in areas where the first digit(s) of the office code is absorbed.

- **LCR Only restriction:** Each line can be exempt from, or subject to, the LCR Only restriction. If exempt from LCR Only, stations with SCOS 6 (LCR Only) and the proper C.O. line access permission can directly access the lines. If subject to LCR Only, stations with SCOS 6 cannot access the line directly, but can access it when using LCR if the line is part of an LCR facility group.

- **Line groups and facility groups:** The C.O. line can be assigned to line groups and/or LCR facility groups.

- **Outgoing access, allowed-answer, and ring-in assignments:** List the stations with outgoing access for placing calls. Prepare lists of stations that have ring-in and/or allowed-answer assignments for day and night modes. List hunt group and signal device ring-in assignments, if used.

6.12 When the prompt asks for a list, the terminal redisplay the entry for verification. Enter < CR > if it is correct. If not, enter the correct information.

6.13 When a list is displayed, items can be added by entering a plus (+) before the information. For example, the list reads 1.1-1.3, 2.1. To add 1.4 and 2.2-2.4, enter + 1.4, 2.2-2.4. To subtract items from the list, enter a minus (-) as the first character. Do not attempt to add and subtract items in a single entry.

6.14 The first prompts determine whether the line is equipped, and they program the DISA assignments and security codes. End each entry with < CR > .

PROMPT	VALID ENTRY
RANGE OF CO LINES TO BE REVIEWED (ALL):	Enter a range of circuit numbers of the C.O. lines to be reviewed or programmed. All and none are valid entries.
CO LINE X.Y EQUIPPED (Y):	Y- A C.O. line is connected to this circuit. N- Circuit is unequipped. Advance to the REVIEW SAME CO LINE AGAIN prompt.
CO LINE ID ():	If desired, enter a name for the C.O. line up to seven characters long (i.e., WATS or LOCAL) or enter < to erase the current name. (If no entry is made, LINE XX appears on keyset displays and in SMDA reports.) NOTE: Programming names for all lines may cause the system to process calls more slowly than usual.
DAY DISA LINE (N):	Y- This line is used for DISA access during day mode. Continue to the next prompt. N- It is not available for DISA use during day mode. Advance to the NIGHT DISA prompts.

PROMPT	VALID ENTRY
SECURITY CODE OPTION N = NONE REQUIRED C = CO AND MODEM ONLY I = IC, CO, AND MODEM SECURITY CODE OPTION (N):	N- No DISA security code is required. Advance to the NIGHT DISA prompt. C- A security code will be required to access the C.O. lines and the modem when using DISA. I- A security code is required to access any system resource. NOTE: Changing the security code option erases previously programmed security code.
SECURITY CODE ():	<i>This prompt appears if C or I is entered above.</i> Enter the four-digit day DISA security code, if desired. If a new security code is not entered, the security code option returns to N (NONE REQUIRED).
NIGHT DISA LINE (N):	Y- This line is used for DISA access during night mode. Continue to the next prompt. N- It is not available for DISA during night mode. Advance to the INCOMING-ONLY LINE prompt.
SECURITY CODE OPTION N = NONE REQUIRED C = CO AND MODEM ONLY I = IC, CO, AND MODEM SECURITY CODE OPTION (N):	N- No DISA codes are required. Advance to the INCOMING-ONLY LINE prompt. C- A security code will be required to access the C.O. lines and the modem when using DISA. I- A security code is required to access any system resource. NOTE: Changing the security code option erases previously programmed security code.
SECURITY CODE ():	Enter the four-digit night DISA security code, if desired. If a new code is not entered, the security code option returns to N (NONE REQUIRED).
INCOMING-ONLY LINE (N) OUTGOING-ONLY LINE (N)	<i>These are assigned in program [CA] (C.O. line equipment status); they are shown here for reference only.</i>
PULSE-DIALING LINE (N):	Y- The line has been converted for dial-pulse signaling (see INSTALLATION, page 3-47). N- This is a DTMF line.
SUBJECT TO TOLL RESTRICT (Y):	Y- SCOS is checked when this line is used. Advance to the next prompt. N- Toll restriction is not checked when this line is used. Advance to the CALL COST TYPE prompt.
EQUAL ACCESS (Y):	Y- Users will be allowed to dial 10XXX to reach long distance carriers using this C.O. line. N- This line will not be used for equal access dialing.
DOES THIS LINE ABSORB DIGITS (N):	Y- This is a PBX or local C.O. line that requires digits to be absorbed in order to provide toll restriction. Advance to the next prompt. N- Advance to the LINE GROUPS prompt.

PROMPT	VALID ENTRY
<p>REASON FOR ABSORBING DIGITS P = PBX LINE L = LOCAL CO LINE REASON FOR ABSORBING DIGITS (P):</p>	<p>P- The system is installed behind a PBX. L- The system is installed in an area where the central office absorbs the first digit(s).</p>
<p>ABSORBED DIGIT STRINGS 1. (... 8. ()</p>	<p>Enter the digit string(s) to be used on this line, up to eight digits. You may use X in the number to represent any digit 0-9. For example, 8X allows 80-89. If you chose L above, only one string prompt appears.</p>
<p>REVIEW ABSORBED DIGIT STRINGS AGAIN (N)?</p>	<p>Y- Return to the ABSORBED DIGIT STRINGS prompt. N- Advance to the next prompt.</p>
<p>ARE THE ABSORBED DIGITS REPEATABLE (N):</p>	<p><i>This prompt does not appear for PBX lines.</i> Y- The digit string is absorbed when it is dialed more than once. Advance to the LINE GROUPS prompt. N- The digit string is processed as part of the telephone number if dialed a second time. Advance to the LINE GROUPS prompt.</p>
<p>CALL COST TYPE F = FREE (000) L = LOCAL (LOC) T = TEN-DIGIT TOLL (T10) O = OPERATOR/INTERNATIONAL (TOI) CALL COST TYPE (F):</p>	<p><i>This prompt appears only for lines that are not subject to toll restriction.</i> F- The call cost will be 000. L- Local call cost calculations will be used for this line. T- 10-digit call cost calculations will be used. O- Operator/international rates will be used.</p>
<p>EXEMPT FROM LCR ONLY (N):</p>	<p>Y- This line can be accessed directly by stations with SCOS 6 (LCR Only) and allowed access. N- This line cannot be accessed directly by stations with SCOS 6 (LCR Only).</p>
<p>AUTO LINE (N)</p>	<p><i>This is assigned in program [CD] (auto, and line key assignments); it is shown here for reference only.</i></p>
<p>LINE GROUPS (NONE):</p>	<p><i>For MF-rated systems:</i> Enter line group numbers (1-8) that are to include this line or NONE if it is not in a line group. ALL is a valid entry. <i>For KF-rated systems:</i> This prompt is shown for reference only. Line groups are programmed in [CB] (C.O. line groups).</p>
<p>LCR FACILITY GROUPS (NONE):</p>	<p><i>For MF-rated systems:</i> Enter the numbers of the LCR facility groups (1-8) that contain this line or NONE if it is not in a facility group. <i>For KF-rated systems:</i> This prompt is not used; it is shown for reference only.</p>
<p>HUNT GROUP RING-IN EXTENSION DAY MODE (NONE) : NIGHT MODE (NONE) :</p>	<p><i>This prompt does not appear for DISA lines or outgoing-only lines.</i> If the line rings in to a hunt group, enter the pilot number of the hunt group or the hunt group number (1-15) for day mode and/or night mode. NOTE: Lines that ring in to a hunt group cannot be assigned to ring in to any other hunt group or to a station.</p>

PROMPT	VALID ENTRY
LIST OF STATIONS WITH OUTGOING-ACCESS (ALL):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations with access to this line for placing outside calls in day or night mode. NONE is a valid entry..
STATIONS WITH ALLOWED-ANSWER DAY LIST (1.1) : NIGHT LIST (ALL) :	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that can answer these lines during day or night mode (keyset line keys flash, but there is no ring-in). Single-line sets can use the automatic line answer feature code (350) if given allowed answer. ALL or NONE are valid entries. This data cannot be modified for outgoing-only, DISA, or hunt group ring-in lines using this program.
STATIONS WITH RING-IN DAY LIST (1.1) : NIGHT LIST (1.1) :	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that have ring-in for this line during day or night mode (stations receive ring signals; keysets have flashing line keys). ALL is a valid entry. These stations have allowed-answer assignment. This data cannot be modified for outgoing-only, DISA, or hunt group ring-in lines using this program.
SIGNAL DEVICE RING-IN DAY LIST (NONE) : NIGHT LIST (ALL) :	Enter device numbers (1-3) that have ring-in for this line during day or night mode. ALL is a valid entry.
REVIEW SAME CO LINE AGAIN (N)?	Y- Return to the EQUIPPED prompt for this line. N- Continue to the next prompt.
LINE KEY ASSIGNMENT FOR CO LINE X,Y	<i>These prompts appear only if a line is changed from un-equipped to equipped status.</i> They show the available line key assignments. A newly equipped line must be assigned to a line key (unless line keys are not available, in which case the line is assigned to the OVER key).
TENANT GROUP X LINE KEY NUMBER(S) AVAILABLE (X):	Enter the desired line key number from the list shown, or < CR > to select the lowest available line key. This prompt repeats for each of the five tenant groups.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW ADDITIONAL CO LINES (N)?	Y- Return to the RANGE OF CO LINES prompt. N- Return to the C.O. Lines menu prompt ([C]:).

D. [CD] AUTO AND LINE KEY ASSIGNMENTS

6.15 This program designates which lines are in the auto line selection group and assigns the C.O. lines to line keys for each tenant group. To reach this program, enter D from the C.O. lines menu or CD from the database programming menu. Or, use the abbreviated command /AUTO. (The program planning sheet is in Figure 5-8, which begins on page 5-122 .)

6.16 When the prompt asks for a list, the terminal redisplayes the entries for verification. Enter < CR > if the list is correct. If not, enter the correct information.

6.17 When a list is displayed, items can be added by entering a plus (+) before the information. For example, the list reads 1.1-1.3, 2.1. To add 1.4 and 2.2-2.4, enter + 1.4, 2.2-2.4. To subtract items from the list, enter a minus (-) before the numbers. Do not add and subtract items in the same entry.

PROMPT	VALID ENTRY
LIST OF AUTO LINES (NONE):	<i>For MF-rated systems:</i> Enter up to 32 line circuit numbers or ALL. <i>For KF-rated systems:</i> Enter a circuit number for the auto line. If you attempt to enter more than one circuit number, you will receive an error message.
RANGE OF TENANT GROUPS TO BE REVIEWED (NONE):	Enter a range of tenant group numbers (1-5). ALL is a valid entry. Enter NONE to return to the C.O. lines menu prompt ([C]:).
TENANT GROUP X. LINE KEY 1 (1.1): ... LINE KEY 24 (6.4):	Enter the circuit number of the line that appears under each key.
REVIEW TENANT GROUP AGAIN (N)?	Y- Return to the TENANT GROUP X prompt. N- Continue to the next prompt.
REVIEW ADDITIONAL TENANT GROUPS (N)?	Y- Return to the RANGE OF TENANT GROUPS prompt. N- Return to the C.O. lines menu prompt ([C]:).
CO LINE(S) X.Y WILL BE OVERFLOW LINES IF NOT ASSIGNED A LINE KEY IN EACH TENANT GROUP UNEQUIP THE CO LINE(S) (N):	<i>All equipped lines must be assigned to a line key in each of the five tenant groups. If they are not, this message appears.</i> Y- The indicated lines will be unequipped. Return to the C.O. lines menu prompt ([C]:). N- Return to the LIST OF AUTO LINES prompt; then review the tenant groups and reassign the line to a line key.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

PROGRAMMING

E. [CE] ACCESS, ANSWER, AND RING-IN

6.18 Outgoing-access, allowed-answer, and ring-in lists for the C.O. lines are assigned in the programs accessed through this menu. Enter E from the C.O. lines menu or CE from the database programming menu to access the following menu:

[CE] ACCESS, ANSWER, AND RING IN

- [A] ASSIGN COMMON STATION LISTS TO CO LINES
- [B] ASSIGN COMMON OUTGOING-ACCESS LISTS
- [C] ASSIGN COMMON ALLOWED-ANSWER AND RING-IN LISTS
- [D] ASSIGN COMMON DEVICE RING-IN LISTS

6.19 In all of the programs accessed through this menu, the prompts ask for a list of C.O. line circuit numbers. When a list is entered, the terminal redisplay the entry for verification. Enter <CR> if the list is correct. If not, enter the correct information.

6.20 Items can be added to or subtracted from lists by entering a plus (+) or minus (-) before the information. For example, the list reads 1.1-1.5, 1.8. To add 1.6-1.7 and 2.1, enter +1.6-1.7, 2.1. To subtract 1.3-1.4, enter -1.3-1.4. Do not add and subtract items in the same entry.

NOTE: These programs cannot be used for reviewing current assignments. The prompts show NONE until new information is entered, even if assignments have been made for those lines.

6.21 To prepare to use these programs, list the circuit numbers of the stations that have the same C.O. line outgoing-access, allowed-answer, and/or ring-in assignments. Information is entered either using the list of common C.O. lines or using the lists of common stations. (The program planning sheet is in Figure 5-8, which begins on page 5-122.)

CAUTION

These programs are total replacement programs. If the prompts are not answered carefully, previously entered data from other programs or programming sessions may be overwritten.

[CEA] Assign Common Station Lists to CO Lines

6.22 Select A from the access, answer, and ring-in menu, EA from the C.O. lines menu, or CEA from the database programming menu to reach this program. Or, use the abbreviated command /COMM. It is used to batch load lists of stations for outgoing-access, allowed-answer, and ring-in assignments for the same C.O. lines. (The program planning sheet is in Figure 5-8, which begins on page 5-122.)

6.23 The prompts appear in the order shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON ACCESS, ANSWER, AND RING-IN LISTS (NONE):	Enter circuit numbers of lines that have the same access, answer, and/or ring-in station lists. ALL is a valid entry. Enter NONE to return to the access, answer, and ring-in menu prompt ([CE]:).
LIST OF STATIONS WITH OUTGOING-ACCESS (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that can access these lines for placing outgoing calls. ALL is a valid entry.
STATIONS WITH ALLOWED-ANSWER DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that can answer these lines during day/night mode. ALL is a valid entry.
STATIONS WITH RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that have ring-in during day/night mode. ALL is a valid entry.
SIGNAL DEVICE RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter numbers of the signal devices (1-3) that have ring-in during day/night mode. ALL is a valid entry.

PROMPT	VALID ENTRY
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF CO LINES prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF CO LINES prompt. N- Return to the access, answer, and ring-in menu prompt ([CE]:).

[CEB] Assign Common Outgoing-Access Lists

6.24 To reach this program, enter B from the access, answer, and ring-in menu, EB from the C.O. lines menu, or enter CEB from the database programming menu. Or, use the abbreviated command /ACC. It is used to batch load lists of stations with outgoing access for the same lines. (The program planning sheet is in Figure 5-8, which begins on page 5-122.)

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON OUTGOING-ACCESS LISTS (NONE):	Enter circuit numbers of lines that have the same outgoing access lists. Enter NONE to return to the menu prompt ([CE]:). ALL is a valid entry.
LIST OF STATIONS WITH OUTGOING-ACCESS (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can access these lines for placing outgoing calls. ALL is a valid entry.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF CO LINES prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF CO LINES prompt. N- Return to the access, answer, and ring-in menu prompt ([CE]:).

[CEC] Assign Common Allowed-Answer and Ring-in Lists

6.25 This program assigns lists of stations that are allowed to answer and/or have ring in for groups of C.O. lines. It can be reached by entering C from the access, answer, and ring-in menu, EC from the C.O. lines menu, or CEC from the database programming menu. Or, use the abbreviated command /ANS.

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON ALLOWED-ANSWER AND RING-IN LISTS (NONE):	Enter circuit numbers of lines that can be answered or ring in at the same stations. ALL and NONE are valid entries.
STATIONS WITH ALLOWED-ANSWER DAY LIST (NONE); NIGHT LIST (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that can answer these lines during day/night mode. ALL is a valid entry. (Keysets have flashing line keys only. Single-line set users can answer using the automatic line answer feature code [350].)
STATIONS WITH RING-IN DAY LIST (NONE); NIGHT LIST (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations that have ring-in for these lines during day/night mode. ALL is a valid entry. (Keysets have flashing line keys and ring-in. Single-line sets ring.)
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF CO LINES prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF CO LINES prompt. N- Return to the access, answer, and ring-in menu prompt ([CE]).

[CED] Assign Common Device Ring-in Lists

6.26 This program is used for designating C.O. lines that ring in on the same signal devices. Up to three signal devices can be connected to the Modem IV (MOD-IV) board for external ringing. The program is accessed by entering D from the access, answer, and ring-in menu, ED from the C.O. lines menu, or CED from the database programming menu. Or, use the abbreviated command /RING.

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON DEVICE RING-IN LISTS (NONE):	Enter circuit numbers of lines that are assigned to the same signal device(s). ALL is a valid entry. Enter NONE to return to the C.O. line menu prompt ([C]).
SIGNAL DEVICE RING-IN DAY LIST (NONE); NIGHT LIST (NONE):	Enter numbers for signal devices (1-3) that have ring-in for these lines during day or night mode. ALL is a valid entry.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF CO LINES prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF CO LINES prompt. N- Return to the access, answer, and ring-in menu prompt ([CE]).

7. [D] STATION/DSS DATA

7.1 Selecting D from the database programming menu allows the programmer to review and set the features for each station. The station/DSS data menu appears as shown below:

```
[D] STATION/DSS DATA
```

```
  [A] STATION DATA
  [B] DSS/BLP DATA
  [C] STATION REPORT
```

7.2 In all of the programs accessed through this menu, the prompts ask for lists. When a list is entered, the terminal redisplay the entry for verification. Enter <CR> if the list is correct. If it is not correct, enter the correct information.

7.3 Items can be added to or subtracted from lists by entering a plus (+) or minus (-) before the information. For example, the list reads 1.1-1.5, 1.8. To add 1.6-1.7 and 2.1, enter +1.6-1.7, 2.1. To subtract 1.3-1.4, enter -1.3-1.4. Do not add and subtract items in the same entry.

7.4 Certain types of station information can be entered in more than one program. For example, station class of service (SCOS) can assigned individually to each station (using program [DAA] Specific Station Information) or it can be assigned to a group of stations (using program [DAF] Assign Common SCOS To Stations). The exact method and order of programming used depends on the customer's specific needs and the programmer's preference.

7.5 Before using the programs outlined in this section, look through *all* of the information on pages 5-41 to 5-60. Then, using the program planning sheet in Figure 5-9, which begins on page 5-126, make lists of the necessary information.

A. [DA] STATION DATA

7.6 The station data program menu is reached by entering A from the station/DSS data menu or DA from the database programming menu. The menu appears as shown below:

```
[DA] STATION DATA
```

```
  [A] SPECIFIC STATION INFORMATION
  [B] EXTENSION AND USERNAME ASSIGNMENTS
  [C] SOFT FEATURE KEY DEFAULT VALUES
  [D] COPY STATION INFORMATION
  [E] ASSIGN COMMON SCOS TO STATIONS
  [F] ASSIGN COMMON CO LINE LISTS TO STATIONS
  [G] ASSIGN COMMON PAGE ZONES TO KEYSETS
  [H] MISCELLANEOUS STATION FEATURES
  [I] G-SERIES KEYSER VOLUME DEFAULT VALUES
```

7.7 The programs that are accessed through this menu are used to enter specific information about individual stations or groups of stations. To prepare to use these programs, determine the following information for each station. (The program planning sheet in Figure 5-9, which begins on page 5-126, may be helpful. Refer to the FEATURES section for more information regarding the station features.)

- **Circuit number:** Circuit numbers are assigned to stations according to the position of the STN board in the KSU. For example, the first circuit on the second STN board is 2.1. Keysets are assigned the circuit numbers associated with the STN-A boards in the KSU. Single-line sets, voice mail units, automated attendants, and playback devices use STN-B or -B2 circuit numbers.
- **Intercom number:** When the system is initialized, intercom numbers are assigned to the circuits in numerical order ranging from circuit 1.1/intercom number 100 to circuit number 15.8/intercom number 219. The intercom number list in Figure 5-7, page 5-120, may be helpful.
- **User's name:** Names can be up to seven characters long. The assigned name will appear on the display of a keyset receiving an intercom call from the station. Names are also used for the intercom directory feature.

- **Tenant group and department numbers:** Tenant group numbers range from 1-5. Each tenant can have department numbers ranging from 1-10. Tenant groups and departments are given names in program [FA] (tenant group assignments).
- **Station class of service (SCOS):** Refer to FEATURES, page 4-22, for a full explanation of the SCOS designations. For more toll restriction programming information, refer to page 5-74 for program [H] (toll restriction).
- **LCR station class of service:** Determine the number of facility group advances that can be accessed by the station. LCR designation can be unlimited or designated as 0-6. (0 = access to first facility group only, 1 = access to first two, etc.)
- **Secretarial intercept station:** Determine the circuit number of the station that will receive calls when the station (being assigned a secretarial intercept) is busy or there is no answer.
- **Attendant station:** Determine the circuit number of the station that serves as the attendant for this station.
- **Message center:** Stations can be assigned a message center that will receive messages after the message (at message center) timer expires.
- **Alternate message source:** An "alternate message source" feature was developed to enable a station to leave messages through another station or a hunt group that is designated as its alternate message source. Only single-line circuits can be given alternate message sources. Refer to page 4-48 in FEATURES for further information.
- **Camp-on tones:** You may choose to disable the camp-on tones (that signal a call waiting) for any station.
- **Voice mail port:** If using the optional Voice Mail system, the STN-B2 circuit connected to the system must be designated as a voice mail port. This designation allows the voice mail facility to leave message waiting indications at station locations.
- **Overflow line key (OVER):** For each station, determine which line key on each keyset will be designated as the OVER key. The OVER key will show the status of the out-of-range lines and may be used to access incoming calls on these lines. Note that if the OVER key is not assigned to the highest numbered line key, all higher numbered lines will also be assigned to the OVER key. For example, if line key 9 is the OVER key on a 12-line keyset, line keys 10, 11, and 12 will no longer function and the lines will be accessed using the OVER key.
- **Speakerphone:** Determine which speakerphone-equipped keysets will be permitted to place hands-free intercom and outside calls.
- **Secondary voice path:** Determine which keysets are installed with a secondary voice path for data transmission and/or off-hook voice announce. Refer to FEATURES, pages 4-49 and 4-81, and INSTALLATION, page 3-19, for more information.
- **Off-hook voice announce (OHVA) options:** If OHVA is enabled in [AF] (misc. system data), keysets with secondary voice paths can be enabled to place and/or receive OHVA calls. Keysets without a secondary voice path and single-line sets can be enabled to place OHVA calls.
- **Automated attendant and designated recall station:** Single-line stations can be designated as automated attendants that answer incoming C.O. calls, play a recorded message (or give information), and disconnect to allow the caller to dial an intercom number or hunt group pilot number. If desired, the automated attendant can be assigned a designated recall station. Refer to page 4-12 in FEATURES for more information.

NOTE: Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-152D System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone itself.

- **Digit translation:** As described above, the automated attendant allows callers to dial intercom numbers or hunt group pilot numbers. To simplify this process and prevent the system from having digit recognition problems, digit translation may be used to allow callers to dial a single digit to access a designated intercom number or hunt group pilot number. Ten-digit translation storage locations (0-9) are available.
- **House phone:** The station can be designated as a house phone that automatically dials a predetermined number when the handset is lifted. The day and night house phone numbers are programmed using the house phone station speed-dial locations.
- **C.O. reseize:** Determine which stations will be allowed to reseize a C.O. line without first disconnecting the call by hanging up or pressing another line key.
- **Automated attendant and DISA do-not-disturb breakthrough:** Determine whether calls through DISA and the automated attendant will be allowed to ring at the station if it is in do-not-disturb. If disallowed, such calls will immediately transfer to the appropriate recall destination.
- **C.O. line lists:** Make lists of the C.O. lines that the station can access for outgoing calls. Also list lines that do not ring at the station but can be answered (keyset line keys flash) and lines that ring in at the station.
- **Account code type:** The station can be assigned a standard account code, forced account code, LCR toll call forced account code, or none. If it is a standard code, indicate the code index (0-31). Refer to FEATURES, page 4-53, for more information. If it is a forced account code or LCR toll call forced account code, indicate whether it should be validated against the list of forced account codes.
- **Hunt group number:** The station can be assigned to one or more hunt groups. Refer to page 4-15 in FEATURES for more information regarding hunt groups.

- **Page zones:** If the station is a keyset, list its page zone(s) (1-6), if any.
- **DSS/BLF associated:** If DSS/BLF Unit(s) will be used with the station indicate the unit(s) circuit number(s).

[DAA] Specific Station Information

7.8 To define the characteristics of each station individually, enter A from the station data menu, AA from the station/DSS data menu, or DAA from the database programming menu. Or, use the abbreviated command /STN. This program may also be used for reviewing the features after they have been programmed.

7.9 Once the features included in this program have been assigned to one station, they can be copied to other stations using program [DAD] (copy station information). DSS/BLF Units are not included in this program.

7.10 When changing STN boards from one type to another in the KSU, the database must be changed to equip the new stations. To change circuit designations:

- (1) Unequip all affected circuits. *DO NOT* perform a reset until step 2 is completed.
- (2) Turn OFF the AC power to the KSU, install the new STN board(s), install the station instruments, and connect the station cables. When the the AC power is turned back ON, the database automatically equips and configures the circuits according to the type of board that is installed.

7.11 If a circuit remained equipped before the change, an error message indicates "DEVICE CHANGE FAILED: XX.X (circuit number) DEVICE REMAINS XXX (device type)" to show the incorrect circuit(s). Station features remain the same after the change except page zone assignments are erased and user-programmable features are returned to default status. Station speed-dial numbers are not erased.

7.12 The prompts for this program appear as follows. End each entry with < CR > .

PROMPT	VALID ENTRY
RANGE OF STATIONS TO BE REVIEWED (ALL)?	Enter a range of circuit (X.Y) or interroom (EXXX) numbers of the stations to be programmed. Enter NONE to return to the station/DSS data menu prompt ([D]:) or ALL to view all stations.
KEYSET X.Y (ATTENDANT) or or SL SET X.Y	NOTE: (ATTENDANT) or (PRIMARY ATTENDANT) appears only if the station was previously designated as an attendant. A playback device appears as an SL SET circuit.
EQUIPPED (N):	Y- Continue to the next prompt. N- Go to the REVIEW STATION AGAIN prompt.
EXTENSION (EXXX)	<i>This is assigned in program [B] (extensions and feature codes) or [DAB] (extensions and usernames). It appears here for reference only.</i>
USERNAME ():	Enter < to erase the existing name or enter a name with up to seven characters.
TENANT GROUP NAME " "	<i>This is assigned in program [FA] (tenant group assignment). It is shown here for reference only.</i>
TENANT GROUP NUMBER (1):	Enter a tenant group number (1-5). This can be changed without changing the department number.
DEPARTMENT NAME " "	<i>This is assigned in program [FA] (tenant group assignment). It is shown here for reference only.</i>
DEPARTMENT NUMBER (1):	Enter a department number (1-10). This can be changed without changing the tenant number.
SCOS (0) REVIEW SCOS STATUS (N):	N- No changes are required. Go to the SECRETARIAL INTERCEPT prompt. Y- Continue to the next prompt. The following prompts assign SCOS.
(0) UNRESTRICTED (Y):	Y- This station is not toll-restricted. Advance to the SECRETARIAL INTERCEPT prompt. N- Continue to the next prompt.
RESTRICTED (1) OPERATOR ACCESS (N):	Y- Restricts calls that begin with zero. N- Calls that begin with zero are not restricted.
(2) TOLL ACCESS (N):	Y- Restricts toll calls (calls that begin with 1). N- Toll calls are not restricted.
(3) INTERNATIONAL (N):	Y- International calls, which begin with 01, are restricted. N- International calls are not restricted.
(4) EIGHT DIGIT (N):	Y- Numbers with eight digits or more are restricted. N- Numbers over eight digits are not restricted.
(5) AREA/OFFICE CODE (N):	Y- Local and long distance calls are limited to the allowed area/office codes list. N- Area/office code list is not checked when a call is placed.
(6) LCR ONLY (N):	Y- Calls can only be placed using the LCR feature. N- Outgoing calls are not limited to LCR.

PROMPT	VALID ENTRY
(7) ALTERNATE CARRIER (N):	Y- Station cannot dial the numbers in the alternate carrier list. N- The alternate carrier number list is not checked when a call is placed.
(8) ENABLE ALD (N):	Y- Calls are permitted to the allowed long distance numbers. N- The allowed long distance number list is not checked when a call is placed.
USER GROUP NUMBER (1):	<i>This prompt appears only if you answered Y to the AREA/ OFFICE CODE prompt.</i> Select the user group (1-3) for this station.
LCR CLASS OF SERVICE UNLIMITED LCR ADVANCES (Y):	Y- The station can advance through all available facility groups in each route group. N- Advance to the next prompt.
NUMBER OF LCR ADVANCES (0):	Enter a number (0-6). An entry of 0 allows the station to use only the first facility group in each route group, a 1 allows one facility group advance, and so on.
SECRETARIAL INTERCEPT (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the station (in the same tenant group if cross-tenant traffic is denied) that will receive calls when this station is busy or does not answer. Or enter NONE if secretarial intercept is not used.
ATTENDANT (1.1):	<i>This prompt does not appear when programming an attendant's station.</i> Enter the circuit (X.Y) or intercom (EXXX) number of a programmed attendant station that will be this station's attendant (it must be the same tenant group if cross-tenant traffic is denied). Enter NONE if an attendant is not used.
MESSAGE CENTER (1.1):	Enter the circuit (X.Y) or intercom (EXXX) number of the station that will receive messages that are left for this keyset. NONE is a valid entry.
ALTERNATE MESSAGE SOURCE (NONE):	<i>This prompt appears for single-line circuits only.</i> Enter the circuit (X.Y) or intercom (EXXX) number of the station that will serve as the alternate message source for this circuit.
DISALLOW CAMP-ON TONES (N):	Y- The user will <i>not</i> hear camp-on tones when there is a call waiting. N- The user will hear camp-on tones.
VOICE MAIL PORT (N):	<i>This prompt appears for single-line circuits only.</i> Y- This circuit is used as a voice mail port. N- This circuit is not used as a voice mail port.
OVERFLOW LINE KEY NUMBER (NONE):	<i>This prompt appears for keysets only.</i> Enter the number of the line key (1-24) that will be used as the OVER key on this keyset. The OVER key is used for accessing out-of-range lines.

PROMPT	VALID ENTRY
ENABLE SPEAKERPHONE (Y):	<i>This prompt appears for keysets only.</i> Y- This station is allowed to use the handsfree answering feature. N- Handsfree answering is not allowed at this station.
SECONDARY VOICE PATH KEYSET (N):	<i>This prompt appears for keysets only.</i> Y- This is a keyset that has a secondary voice path installed. N- This keyset does not have a secondary voice path installed.
OFF-HOOK VOICE ANNOUNCE TRANSMIT ENABLED (Y):	<i>This prompt appears only if the system OHVA feature is enabled in program [AF] (miscellaneous system data).</i> Y- This station can be used for placing OHVA calls to a keysets with secondary voice path. N- This station cannot place OHVA calls.
OFF-HOOK VOICE ANNOUNCE RECEIVE ENABLED (N):	<i>This prompt appears only if you answered yes to SECONDARY VOICE PATH KEYSET prompt and the system OHVA feature is enabled.</i> Y- The keyset can receive OHVA calls when its secondary voice path is available. N- The keyset cannot receive OHVA calls.
AUTOMATED ATTENDANT (N):	<i>This prompt appears for single-line circuits only. It will not appear for voice mail stations.</i> Y- This station is used as an automated attendant. N- This station is not used as an automated attendant. Advance to the HOUSE PHONE prompt.
RECALL DESTINATION (NONE):	<i>This prompt appears only if Y was selected at the previous prompt.</i> Enter the circuit (X.Y) or intercom (EXXX) number of the station that will receive recalls from stations that are called through the automated attendant.
REVIEW DIGIT TRANSLATION (N):	<i>This prompt appears only if Y was selected at the AUTOMATED ATTENDANT prompt.</i> Y- Continue to the next prompt. N- Advance to the HOUSE PHONE prompt.
1 (): 2 (): 3 (): ... 9 (): 0 ():	Enter station intercom numbers or hunt group pilot numbers in the desired digit translation locations. Enter < if you wish to erase the existing number. NOTE: To allow callers to dial zero for the attendant or to dial station intercom numbers (which begin with 1), do not use digit translation locations 1 and 0.
HOUSE PHONE (N):	Y- This station is used as a house phone. Advance to the next prompt. N- This station is not used as a house phone. Advance to the next prompt.

PROMPT	VALID ENTRY
CO RESEIZE ENABLED (N):	<i>This prompt appears for keysets only.</i> Y- This keyset user may reseize the C.O. line by pressing the lit line key. N- This keyset user must disconnect from the line before accessing it again.
ALLOW AUTOMATED ATTENDANT/DISA DND BREAKTHROUGH (Y):	Y- Calls to this station through DISA or the automated attendant will ring in if the station is in do-not-disturb. N- Calls to this station through DISA or the automated attendant will not ring in if the station is in do-not-disturb.
REVIEW CO LINE LISTS (N):	N- Advance to the ACCOUNT CODE TYPE prompt. Y- Continue to the next prompt.
LIST OF CO LINES THAT CAN BE ACCESSED FOR OUTGOING CALLS (1.1-6.4):	Enter circuit numbers of lines that can be used for placing outgoing calls. Do not include incoming-only lines. NONE is a valid entry.
LIST OF CO LINES THAT CAN BE ANSWERED DAY LIST (NONE): NIGHT LIST (1.1-6.4):	Enter circuit numbers of lines that can be answered at this station during day/night mode. ALL is a valid entry. Do not include outgoing-only lines.
LIST OF CO LINES THAT RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit numbers of lines that ring in on this station during day/night mode. ALL is a valid entry. These stations automatically have allowed-answer assignments. Do not include outgoing-only lines.
ACCOUNT CODE TYPE S = STANDARD (AUTOMATIC) F = FORCED (REQUIRED) T = LCR TOLL N = NONE ACCOUNT CODE TYPE (N):	S- An account code is entered in the SMDR automatically when this station is used to place a C.O. call. F- Station user is forced to enter an account code before placing an outside call. T- Station user must enter a forced account code when placing a toll call while using LCR. N- Account code does not appear in SMDR unless an optional account code is entered.
ACCOUNT CODE INDEX (0):	<i>This prompt appears only if S was entered above.</i> Enter an account code index (0-31).
VALIDATE ACCOUNT CODE (Y):	<i>This prompt appears only if F or T was entered above.</i> Y- When a forced account code is entered, it must match a programmed account code to be accepted. N- Any number with the correct amount of digits will be accepted as the forced account code.
HUNT GROUPS (NONE)	<i>This is assigned in program [E] (hunt groups). It is shown here for reference only.</i>
PAGE ZONES (1):	<i>This prompt appears for keysets only.</i> List the page zones (1-6) in which the keyset is located.

PROMPT	VALID ENTRY
DSS/BLF ASSOCIATED (NONE)	<i>This prompt appears for keysets only and if the station has been programmed to be used with a DSS/BLF Unit ([DBA] DSS/BLF identification). It is shown here for reference only.</i>
REVIEW STATION AGAIN (N)?	Y- Return to EQUIPPED prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW ADDITIONAL STATIONS (N)?	Y- Return to the RANGE OF STATIONS prompt. N- Return to the station data menu prompt ([DA]).

[DAB] Extension (Intercom Number) and Username Assignments

7.13 To use this program, enter B from the station data menu, AB from the station/DSS data menu, or enter DAB from the database programming menu. Or, use the abbreviated command /NAME. This program is used for assigning user names and intercom numbers for individual stations. Refer to paragraph 5.2 on page 5-28 for information on ambiguous intercom number assignments. The prompts appear as shown below. End each entry with < CR > .

PROMPT	VALID ENTRY
LIST OF STATIONS TO BE REVIEWED (NONE):	Enter a list of up to eight circuit (X.Y) numbers of the stations to be programmed or reviewed.
KEYSET X.Y (EXXX): or SL SET X.Y (EXXX):	Enter an intercom number (EXXX). Playback devices appear as an SL SET.
USERNAME ():	Enter < to erase the existing name or enter a name with up to seven letters.
REVIEW SAME STATIONS AGAIN (N)?	Y- Return to the KEYSET or SL SET prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW ADDITIONAL EXTENSIONS AND USERNAMES (N)?	Y- Return to the LIST prompt. N- Return to the station data menu prompt ([DA]:).

[DAC] Soft Feature Key Default Values

7.14 Enter C from the station data menu, AC from the station/DSS data menu, or DAC from the database programming menu to set the default value of the user-programmable SLI and keyset feature keys. Or, use the abbreviated command /SOFT. The programmer can then reset all stations to the new default values, or leave them unchanged so that default values will be set only when the station users enter the

feature key default feature code (325). Refer to Figure 5-9, which begins on page 5-126, for a program planning sheet.

7.15 The current feature name and feature code are shown in the prompt for each key. Whenever a new code is entered, the name and feature code are redisplayed for verification. If the entry is correct, press <CR>; if not, enter a new feature code.

PROMPT	VALID ENTRY
REVIEW SL SOFT FEATURE KEYS (N):	Y- Continue to the next prompt. N- Advance to the REVIEW GX 24-LINE KEYSOFT FEATURE KEYS prompt.
SL SET SOFT FEATURE KEYS KEY A "FEATURE: STATION SPEED DIAL" FEATURE CODE (E382) : KEY B "FEATURE: REDIAL": FEATURE CODE (E380): KEY C "CO LINE ACCESS: LEAST COST ROUTING": FEATURE CODE (E80) : KEY D "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : KEY E "FEATURE: SYSTEM SPEED DIAL" FEATURE CODE (E381) : KEY F "FEATURE: PROGRAM STATION SPEED DIAL" FEATURE CODE (E383) : KEY G "FEATURE: QUEUE REQUEST" FEATURE CODE (E6) : KEY H "FEATURE: CONFERENCE" FEATURE CODE (E5) : KEY I "FEATURE: LEAVE MESSAGE" FEATURE CODE (E365) :	Enter any feature code except keyset-only or attendant-only codes. Keys are listed as they appear on the SLI. Key A is the top feature key and Key D is the bottom feature key. <i>Keys E through I are not currently used.</i>
LIST OF SL SETS TO UPDATE (NONE):	Enter the list of single-line stations to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes. NOTE: Any single-line station not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW SL FEATURES AGAIN (N)?	Y- Return to the KEY A prompt. N- Continue to the next prompt.

PROMPT	VALID ENTRY
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW GX 24-LINE KEYSOFT FEATURE KEYS (N):	Y- Continue to the next prompt. N- Advance to the REVIEW GMX 24-LINE KEYSOFT FEATURE KEYS prompt.
GX 24-LINE KEYSOFT FEATURE KEYS KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : KEY B "FEATURE: TRANSFER CO CALL": FEATURE CODE (E345) : KEY C "CO LINE ACCESS: LEAST COST ROUTING": FEATURE CODE (E80) : KEY D "CO LINE ACCESS: AUTOMATIC LINE SELECTION" FEATURE CODE (E89) : KEY E "FEATURE: REDIAL": FEATURE CODE (E380) : KEY F "FEATURE: SYSTEM SPEED DIAL": FEATURE CODE (E381) : KEY G "FEATURE: QUEUE REQUEST": FEATURE CODE (E6) : KEY H "FEATURE: PAGE" FEATURE CODE (E7) : KEY I "FEATURE: BACKGROUND MUSIC ON/OFF" FEATURE CODE (E313) :	Enter any feature code except call splitting (337).
LIST OF GX 24-LINE KEYSOFTS TO UPDATE (NONE):	Enter the list of GX 24-line keysets to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes. NOTE: Any GX 24-line keysets not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW GX 24-LINE KEYSOFT FEATURES AGAIN (N)?	Y- Return to the keyset KEY A prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

PROMPT	VALID ENTRY
REVIEW GMX 24-LINE KEYSOFT FEATURE KEYS (N):	Y- Continue to the next prompt to program the GMX 24-line keyset keys. N- Advance to the REVIEW GMX 12-LINE KEYSOFT FEATURE KEYS prompt.
GMX 24-LINE KEYSOFT FEATURE KEYS KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : KEY B "FEATURE: TRANSFER CO CALL": FEATURE CODE (E345) : KEY C "CO LINE ACCESS: AUTOMATIC LINE SELECTION": FEATURE CODE (E89) : KEY D "FEATURE: HOOKFLASH" FEATURE CODE (E330) : KEY E "FEATURE: REDIAL": FEATURE CODE (E380) : KEY F "FEATURE: SYSTEM SPEED DIAL": FEATURE CODE (E381) : KEY G "FEATURE: QUEUE REQUEST": FEATURE CODE (E6) : KEY H "FEATURE: PAGE" FEATURE CODE (E7) : KEY I "FEATURE: BACKGROUND MUSIC ON/OFF" FEATURE CODE (E313) :	Enter any feature code except call splitting (337).
LIST OF GMX 24-LINE KEYSOFTS TO UPDATE (NONE):	Enter the list of GMX 24-line keysets to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes. NOTE: Any GMX 24-line keysets not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW GMX 24-LINE KEYSOFT FEATURES AGAIN (N)?	Y- Return to the keyset KEY A prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW GMX 12-LINE KEYSOFT FEATURE KEYS (N):	Y- Continue to the next prompt to program the GMX 12-line keyset keys. N- Advance to the REVIEW INTER-TEL/DVK 24-LINE KEYSOFT FEATURE KEYS prompt.

PROMPT	VALID ENTRY
<p>GMX 12-LINE KEYS KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) :</p> <p>KEY B "FEATURE: TRANSFER CO CALL": FEATURE CODE (E345) :</p>	<p>Enter any feature code except call splitting (337).</p>
<p>LIST OF GMX 12-LINE KEYS TO UPDATE (NONE):</p>	<p>Enter the list of GMX 12-line keys to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes.</p> <p>NOTE: Any GMX 12-line keys not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).</p>
<p>REVIEW GMX 12-LINE KEYS FEATURES AGAIN (N)?</p>	<p>Y- Return to the keyset KEY A prompt. N- Continue to the next prompt.</p>
<p>PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)</p>	<p><i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.</p>
<p>REVIEW INTER-TEL/DVK 24-LINE KEYS SOFT FEATURE KEYS (N):</p>	<p><i>These keysets are not presently available.</i> Y- Continue to the next prompt. N- Advance to REVIEW INTER-TEL/DVK 8/12-LINE KEYS SOFT FEATURE KEYS prompt.</p>
<p>INTER-TEL/DVK 24-LINE KEYS KEY A "FEATURE: REDIAL" FEATURE CODE (E380) :</p> <p>KEY B "FEATURE: SYSTEM SPEED DIAL": FEATURE CODE (E381) :</p> <p>KEY C "FEATURE: INDIVIDUAL HOLD": FEATURE CODE (E336) :</p> <p>KEY D "FEATURE: TRANSFER CO CALL" FEATURE CODE (E345) :</p> <p>KEY E "FEATURE: PAGE": FEATURE CODE (E7) :</p> <p>KEY F "FEATURE: QUEUE REQUEST": FEATURE CODE (E6) :</p> <p>KEY G "FEATURE: BACKGROUND MUSIC ON/OFF": FEATURE CODE (E313) :</p> <p>KEY H "CO LINE ACCESS: AUTOMATIC LINE SELECTION" FEATURE CODE (E89) :</p> <p>KEY I "FEATURE: HOOKFLASH" FEATURE CODE (E330) :</p>	<p>Enter any feature code except call splitting (337).</p>

PROMPT	VALID ENTRY
LIST OF INTER-TEL/DVK 24-LINE KEYSETS TO UPDATE (NONE):	Enter the list of Inter-Tel/DVK 24-line keysets to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes. NOTE: Any Inter-Tel/DVK 24-line keysets not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW INTER-TEL/DVK 24-LINE KEYSSET FEATURES AGAIN (N)?	Y- Return to the keyset KEY A prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW INTER-TEL/DVK 8/12-LINE KEYSSET SOFT FEATURE KEYS (N):	<i>These keysets are not presently available.</i> Y- Continue to the next prompt. N- Advance to the REVIEW SOFT KEY DEFAULTS AGAIN prompt.
INTER-TEL/DVK 8/12-LINE KEYSSET SOFT FEATURE KEYS KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336): KEY B "FEATURE: TRANSFER CO CALL": FEATURE CODE (E345): KEY C "FEATURE: PAGE": FEATURE CODE (E7): KEY D "FEATURE: QUEUE REQUEST" FEATURE CODE (E6): KEY E "FEATURE: REDIAL": FEATURE CODE (E380):	Enter any feature code except call splitting (337).
LIST OF INTER-TEL/DVK 8/12-LINE KEYSETS TO UPDATE (NONE):	Enter the list of Inter-Tel/DVK 8/12-line keysets to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered yes. NOTE: Any Inter-Tel/DVK 8- or 12-line keysets not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW INTER-TEL/DVK 8/12-LINE KEYSSET FEATURES AGAIN (N)?	Y- Return to the keyset KEY A prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW SOFT KEY DEFAULTS AGAIN (N)?	Y- Return to the SL Set KEY A prompt. N- Return to the station data menu prompt ([DA]);).

[DAD] Copy Station Information

7.16 Station information can be copied to several stations using this program. (Usernames, extension numbers, hunt groups, and DSS/BLF assignments are not copied.) Copying station features to an existing station replaces that station's current features.

7.17 To reach this program, enter D from the station data menu, AD from the station/DSS data menu, or DAD from the database programming menu. Or, use the abbreviated command /COPY. A program planning sheet is located in Figure 5-9, which begins on page 5-126.

PROMPT	VALID ENTRY
STATION TO BE COPIED (NONE):	Enter the circuit number (X.Y) or intercom number (EXXX) of the station that has the information to be copied. Enter NONE to return to the station data menu prompt ([DA]:).
REVIEW STATION INFORMATION (N)?	N- Continue to the LIST OF STATIONS TO COPY prompt. Y- Review station parameters to be copied.
KEYSET XX.Y or SL SET XX.Y EQUIPPED (Y): TENANT GROUP NAME " " TENANT GROUP NUMBER (1): DEPARTMENT NAME " " DEPARTMENT NUMBER (1): ... PAGE ZONES (1):	Valid responses are the same as in program [DAA] (specific station information) on page 5-43.
REVIEW STATION COPY AGAIN (N)?	Y- Review the station features again. N- Continue to the next prompt.
LIST OF STATIONS TO COPY INFORMATION TO (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations to receive the information. Enter NONE to stop the procedure without copying information.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
COPY ADDITIONAL STATIONS (N)?	Y- Return to the STATION TO BE COPIED prompt. N- Return to the station data menu prompt ([DA]:).

[DAE] Assign Common SCOS to Stations

7.18 Station class of service (SCOS) is assigned to multiple stations using this program. It is accessed by entering E from the station data menu, AE from the station/DSS data menu, or DAE from the database programming menu. Or, use the abbreviated command /CCOS.

7.19 This program cannot be used to review the current assignments. The prompts show default values until new SCOS information is entered for the list of stations. The prompts appear as shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
LIST OF STATIONS WITH COMMON SCOS (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations with the same SCOS. Enter NONE to return to the station data menu prompt ([DA]).
(0) UNRESTRICTED (Y):	Y- Advance to the USER GROUP NUMBER prompt. N- Continue to the next prompt.
RESTRICTED (1) OPERATOR ACCESS (N): (2) TOLL ACCESS (N): (3) INTERNATIONAL (N): (4) EIGHT DIGIT (N): (5) AREA/OFFICE CODE (N): (6) LCR ONLY (N): (7) ALTERNATE CARRIER (N): (8) ENABLE ALD (N):	Respond with Y or N as in program [DAA] (specific station information), page 5-53.
USER GROUP NUMBER (1):	<i>This prompt appears only when the prompt for SCOS 5 is answered Y.</i> Enter the area/office code user group number.
LCR CLASS-OF-SERVICE UNLIMITED LCR ADVANCES (Y):	Y- The station can advance through all available facility groups in each route group. Advance to the REVIEW ASSIGNMENTS AGAIN prompt. N- Advance to the next prompt.
NUMBER OF LCR ADVANCES (0):	Enter a number (0-6). An entry of 0 allows the station to use only the first facility group in each route group, a 1 allows an advance to the next programmed facility group, and so on.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF STATIONS prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF STATIONS prompt. N- Return to the station data menu prompt ([DA]).

[DAF] Assign Common CO Line Lists to Stations

7.20 Enter F from the station data menu, AF from the station/DSS data menu, or DAF from the database programming menu to batch load C.O. line information to multiple stations. Or, use the abbreviated command /SCOM. A program planning sheet is located in Figure 5-9, which begins on page 5-126.

7.21 This program cannot be used to review the current assignments. The prompts show default values until new C.O. information is entered for the list of stations. Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct, press < CR >. If not, enter the correct information. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF STATIONS WITH COMMON CO LINE LISTS (NONE):	Enter circuit (X,Y) or intercom (EXXX) numbers of stations with allowed-answer, ring-in, and outgoing-access assignments for the same C.O. lines. Enter NONE to return to the station data menu prompt ([DA]). ALL is a valid entry.
LIST OF CO LINES THAT CAN BE ACCESSED FOR OUTGOING CALLS (NONE): LIST OF CO LINES THAT CAN BE ANSWERED DAY LIST (NONE): NIGHT LIST (NONE): LIST OF CO LINES THAT RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter a list of C.O. line circuit numbers (X, Y) for each prompt. ALL or NONE are valid entries.
REVIEW ASSIGNMENT (N)?	Y- Return to the LIST OF STATIONS prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF STATIONS prompt. N- Return to the station data menu prompt ([DA]).

[DAG] Assign Common Page Zones to Keysets

7.22 Select option G from the station data menu, AG from the station/DSS data menu, or DAG from the database programming menu to assign the same page zone list to multiple stations. Or, use the abbreviated command /PCOM.

7.23 This program cannot be used to review the current assignments. The prompts show default values until new page zones are programmed for the list of

stations. Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct, press < CR >. If not, enter the correct information.

7.24 The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF KEYSETS WITH COMMON PAGE ZONES (NONE):	Enter a list of circuit (X.Y) or intercom (EXXX) numbers of keysets in the same page zone(s). Enter NONE to return to the station data menu prompt ([DA]:). (If you attempt to enter the number of a single-line set, a warning message displays that says, "Station Is Configured as SL Set.")
LIST OF PAGE ZONES TO BE ASSIGNED (NONE):	Enter page zone number(s) 1-6 for the keysets.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF KEYSETS prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF KEYSETS prompt. N- Return to the station data menu prompt ([DA]:).

[DAH] Miscellaneous Station Features

7.25 Select option H from the station data menu, AH from the station/DSS data menu, or DAH from the database programming menu to assign miscellaneous station features to multiple stations. Or, use the abbreviated command /SMSC. (A program planning sheet is located in Figure 5-9, which begins on page 5-126.)

7.26 Whenever the prompt asks for a list, entries

redisplay for verification after they are entered. If the information is correct, press <CR>. If not, enter the correct information. The prompts appear as shown below. End each entry with <CR>.

7.27 Items can be added to or subtracted from lists by entering a plus (+) or minus (-) before the information. For example, the list reads 1.1-1.3, 1.6. To add 1.4-1.5 and 2.1, enter +1.4-1.5, 2.1. To subtract 1.2-1.3, enter -1.2-1.3. Do not attempt to add and subtract items in the same entry.

PROMPT	VALID ENTRY
LIST OF STATIONS WITH: HANDSFREE ENABLED (1.1): REDIAL MODE — LAST NUMBER DIALED (1.1): AUTOMATIC ANSWER ON CO CALLS (NONE): AUTOMATIC ANSWER ON IC CALLS (1.1): RING INTERCOM ALWAYS ENABLED (NONE): CO RESEIZE ENABLED (NONE): DISA/AUTOMATED ATTENDANT DND OVERRIDE ENABLED (NONE): SECONDARY VOICE PATH KEYSETS (NONE):	The current lists are displayed. For each prompt, enter a list of station circuit (X.Y) or intercom (EXXX) numbers of stations with each of the indicated features.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF STATIONS WITH HANDSFREE ENABLED prompt. N- Return to the station data menu prompt ([DA]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

[DAI] Inter-Tel/DVK Keypad Volume Default Values

7.28 These keysets are not currently available. When they are available, this program will be used to set the default volume settings on the Inter-Tel/DVK keypad. Select option 1 from the station data menu, AI from the station/DSS data menu, or DAI from the database programming menu to assign the Inter-Tel/DVK keypad volume default settings. Or, use the abbreviated command /VOL. The prompts appear as shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
<i>Set the default value of each of the volume levels. With 1 as the most quiet, the ranges are as follows:</i>	
HANDSET IC VOICE LEVEL (4)	1-13
SPEAKERPHONE IC VOICE LEVEL(3)	1-16
HANDSET CO VOICE LEVEL (5)	1-13
SPEAKERPHONE CO VOICE LEVEL (5)	1-16
BACKGROUND MUSIC LEVEL (2)	1-16
ALERTING TONE LEVEL (4)	1-13
HANDSET PROGRESS TONE LEVEL (5); SPEAKERPHONE PROGRESS TONE LEVEL (3):	1-13
REVIEW DEFAULT VOLUME LEVELS AGAIN (N)?	Y- Return to the HANDSET IC VOICE LEVEL prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
ASSIGN DEFAULT VOLUME LEVELS TO ALL KEYSETS (N)?	Y- Resets volumes on all Inter-Tel/DVK keysets in the system to the new default values that were set in the previous prompts as soon as the PERFORM SYS- TEM UPDATE prompt is answered. N- Inter-Tel/DVK keypad volumes remain un- changed, but will be set to the new default values if the station user enters the default volumes feature code (394).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

B. [DB] DSS/BLF DATA

7.29 Information related to DSS/BLF Units is entered using the programs in this menu. Enter B from the station/DSS data menu or DB from the database programming menu. The DSS/BLF data menu appears as shown below:

[DB] DSS/BLF DATA

- [A] DSS/BLF IDENTIFICATION
- [B] DSS/BLF KEY ASSIGNMENTS

NOTE: Up to two single units or one tandem unit can be assigned to each STN-A or -A1 board. There can be up to five DSS/BLF-equipped stations per system.

[DBA] DSS/BLF Identification

7.30 Select option A from the DSS/BLF data menu, BA from the station/DSS data menu, or DBA from the database programming menu to review and change DSS/BLF Unit assignments. Or, use the abbreviated command /DSS. (A program planning sheet is located in Figure 5-10 on page 5-133.) To equip a DSS/BLF circuit, first unequip a keyset circuit in program [DAA] (specific station information). The prompts appear as shown below. End all entries with < CR > .

PROMPT	VALID ENTRY
DSS/BLF CIRCUIT X.Y ASSOCIATED KEYSSET X.Y DSS/BLF 1 ASSIGNED TO FIRST MAP EQUIPPED (Y):	<i>This prompt appears only if a DSS/BLF Unit has previously been assigned to a keyset.</i> Enter N if you wish to unequip the DSS/BLF station or < CR > to continue to the next prompt.
EQUIP ADDITIONAL DSS/BLF CIRCUITS (N):	Y- Continue to the next prompt. N- Advance to REVIEW DSS/BLF IDENTIFICATION AGAIN prompt.
DSS/BLF CIRCUIT ():	Enter a circuit number, that was programmed as unequipped in program [DAA] (specific station information), page 5-53, for the DSS/BLF Unit (or tandem).
ASSOCIATED KEYSSET (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the keyset used with this DSS/BLF Unit (or tandem).
ASSIGN DSS/BLF MAP F = FIRST MAP S = SECOND MAP ASSIGN DSS/BLF MAP (F):	<i>These prompts appear only if an associated keyset was assigned above.</i> F- Assigns the first DSS key map to the DSS/BLF Unit. (Assign this map to tandem pairs of DSS/BLF Units.) S- Assigns the second DSS key map to the DSS/BLF Unit. (Use this map only for single units that will use map 2.)
DSS/BLF CIRCUIT ():	To program another DSS/BLF Unit, enter a circuit number and return to the ASSOCIATED KEYSSET prompt. Or, just press < CR > to advance to the REVIEW prompt. NOTE: Only two DSS/BLF Units (or one tandem pair) should be assigned to each STN-A board.
REVIEW DSS/BLF IDENTIFICATION AGAIN (N)?	Y- Return to the DSS/BLF CIRCUIT or EQUIP ADDITIONAL DSS/BLF CIRCUITS prompt. N- Return to the DSS/BLF data menu prompt ([DB]).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

[DBB] DSS/BLF Key Assignments

7.31 Select option B from the DSS/BLF data menu, BB from the station/DSS data menu, or DBB from the database programming menu to assign or review system-wide DSS/BLF Unit key assignments. Or use the abbreviated command /DKEY. Because DSS/BLF Units can be used as single or tandem units (two connected), the assignments are made separately for DSS 1 and DSS 2. (A program planning sheet is located in Figure 5-10 on page 5-133.)

7.32 The following numbers can appear under the DSS/BLF keys (the initialized values are shown in parentheses).

- Station intercom numbers (E100-E219)
- Talkback speaker numbers (T1-T5 or E221-E225)
- Hunt group numbers (H1-H15 or E231-E245)
- Modem access numbers for each baud rate (M300/M1200 or E260/E270)

7.33 The prompts appear in the order shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
REVIEW FIRST DSS/BLF (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW SECOND DSS/BLF prompt.
DSS/BLF 1 COLUMN 1 ROW 1 (1.1); DSS/BLF 1 COLUMN 1 ROW 2 (1.2); ... DSS/BLF 1 COLUMN 6 ROW 10 (8.4);	Enter the desired numbers or NONE. Enter E to display the intercom number of the station, if desired.
REVIEW FIRST DSS/BLF KEY ASSIGNMENTS AGAIN (N)?	Y- Return to COLUMN 1 ROW 1. N- Continue to the next prompt.
REVIEW SECOND DSS/BLF (N)?	Y- Continue to the next prompt. N- Advance to REVIEW ADDITIONAL KEY ASSIGNMENTS prompt.
DSS/BLF 2 COLUMN 1 ROW 1 (8.5); DSS/BLF 2 COLUMN 1 ROW 2 (8.6); ... DSS/BLF 2 COLUMN 6 ROW 10 (15.8);	Enter the desired numbers or NONE. Enter E to display the intercom number of the station, if desired.
REVIEW SECOND DSS/BLF KEY ASSIGNMENTS AGAIN (N)?	Y- Return to COLUMN 1 ROW 1 of the second DSS/BLF. N- Continue to the next prompt.
REVIEW ADDITIONAL KEY ASSIGNMENTS (N)?	Y- Return to the REVIEW FIRST DSS/BLF prompt. N- Return to the DSS/BLF data menu prompt ([DB]);
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.

C. [DC] STATION REPORT

7.34 This program is used to generate a report for any range of stations in the system. The information includes the station's circuit number, intercom (extension) number, user name, type of equipment, attendant's circuit number, secretarial intercept station, tenant group and department numbers, and related DSS/BLF Unit circuit number.

7.35 An unequipped station shows the circuit number only. A DSS/BLF Unit shows the circuit number and related keyset station. Attendants have an asterisk in place of the attendant station number.

7.36 To reach this program, enter C from the station/DSS data menu or DC from the database programming menu. Or, use the abbreviated command /SREP. The prompts for this program are shown below. End each entry with <CR>.

PROMPT	VALID ENTRY																																																
STATION REPORT OUTPUT PORT P = PRIMARY M = MODEM S = SECONDARY STATION REPORT OUTPUT PORT (P):	Choose the output port that the terminal will be attached to: Select P for the APP port, M if using a modem, or S for the IOP port.																																																
BREAK AFTER EACH CIRCUIT CARD (N)?	Y- The station report pauses after each circuit board and prints CONTINUE (Y). N- All circuit boards are grouped together in the report without breaks.																																																
RANGE OF STATIONS TO BE REPORTED (ALL):	Enter the range of circuit (X.Y) or intercom (EXXX) numbers of the stations to appear in the report. Enter NONE to return to the station/DSS data menu prompt ([D]); or ALL to have all stations included in the report.																																																
<p><i>The terminal or printer attached to the selected output port displays the information in the format shown below. If the information scrolls across the terminal screen too quickly, press CONTROL S to stop the output and then press CONTROL Q to begin again.</i></p> <table border="1"> <thead> <tr> <th colspan="2">STATION REPORT</th> <th colspan="2">FR1-27-JAN-1990</th> <th colspan="2">HI:MM</th> <th colspan="2"></th> </tr> <tr> <th>STA</th> <th>EXT</th> <th>USERNAME</th> <th>EQ</th> <th>ATT</th> <th>SEC</th> <th>TNT/DPT</th> <th>REL STA</th> </tr> </thead> <tbody> <tr> <td>1.1</td> <td>E100</td> <td>AL</td> <td>KEY +</td> <td>*</td> <td></td> <td>1 1</td> <td>1.2</td> </tr> <tr> <td>1.2</td> <td></td> <td></td> <td>DSS</td> <td></td> <td></td> <td></td> <td>1.1</td> </tr> <tr> <td>---</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11.8</td> <td>E187</td> <td>BETTY</td> <td>SL</td> <td>1.1</td> <td>1.1</td> <td>1 2</td> <td></td> </tr> </tbody> </table> <p>NOTE: The plus (+) after the KEY abbreviation indicates that a headset is enabled on that station. The asterisk (*) in the ATT column indicates that the station is an attendant.</p>		STATION REPORT		FR1-27-JAN-1990		HI:MM				STA	EXT	USERNAME	EQ	ATT	SEC	TNT/DPT	REL STA	1.1	E100	AL	KEY +	*		1 1	1.2	1.2			DSS				1.1	---								11.8	E187	BETTY	SL	1.1	1.1	1 2	
STATION REPORT		FR1-27-JAN-1990		HI:MM																																													
STA	EXT	USERNAME	EQ	ATT	SEC	TNT/DPT	REL STA																																										
1.1	E100	AL	KEY +	*		1 1	1.2																																										
1.2			DSS				1.1																																										

11.8	E187	BETTY	SL	1.1	1.1	1 2																																											
CONTINUE (Y):	<i>If a break between circuit boards was programmed, this prompt appears after information for each board is printed.</i> Y- Continue the report. N- Continue to the next prompt.																																																
REVIEW SAME STATION REPORTS AGAIN (N)?	Y- The terminal prints the report again, from the beginning. N- Continue to the next prompt.																																																
REVIEW ADDITIONAL STATION REPORTS (N)?	Y- Return to the STATION REPORT OUTPUT PORT prompt. N- Return to the station/DSS data menu prompt ([D]).																																																

PROGRAMMING

8. [E] HUNT GROUPS

8.1 Select E or enter /HUNT from the database programming menu to assign stations for up to 15 hunt groups. Before using the program, prepare a list of the hunt groups and the stations to be included in them. Depending on the option selected, the stations receive calls in the order in which they appear on the programmed list. If desired, a station can appear more than once in a hunt group list. A station can be in more than one hunt group. Refer to Figure 5-11, page 5-135, for a program planning sheet that lists hunt groups.

8.2 This program also determines whether the calls are sent to the stations in linear or distributed order. Linear order means that the call is sent to the first station on the list and moves down the list until it reaches an available station. With distributed order, the call is sent to the station that appears on the list after the last station to receive a call.

8.3 Because linear and distributed lists must be entered in a specific order, the entire list should be re-entered to make changes. Stations cannot be subtracted from the list. However, stations may be added to the list (+ X.Y), but they will be placed at the end of the list. After each list is entered, the terminal redis-

plays the entry for verification. If the list is correct press < CR >. If not, enter the correct information.

8.4 In addition, a hunt group can have an overflow station and/or an announcement station. When a call rings in directly to the hunt group and is not answered before the hunt group announcement timer expires, the call automatically transfers to the announcement station, if one is programmed. When a call is transferred to the hunt group and is not answered before the hunt group overflow timer expires, the call automatically transfers to the overflow station, if one is programmed. Record the overflow and announcement stations' circuit or intercom numbers on the program planning sheet in Figure 5-11 on page 5-135. Do not include these stations in the hunt group distribution list. Also, if the overflow station is a playback device, record the number of times (count) a call will be allowed to return to the playback device before recalling. Refer to FEATURES, page 4-16, for a full explanation of overflow and announcement stations.

8.5 Each hunt group can have one keyset assigned as a hunt group supervisor. The assigned supervisor has the option of using the station monitor feature code to monitor an active outside call of any station in the hunt group. Refer to page 4-18 in FEATURES for more information.

PROMPT	VALID ENTRY
RANGE OF HUNT GROUPS TO BE REVIEWED (NONE):	Enter a range of hunt group numbers (1-15) to be reviewed or programmed. ALL is a valid entry. Enter NONE to return to the database programming menu prompt ([]):
HUNT GROUP X— PILOT EXTENSION EXXX	<i>The current assignment is shown for reference only. Pilot numbers are assigned in program [B] (extensions and feature access codes).</i>
ORDERED LIST OF STATIONS ():	Enter circuit (X.Y) or intercom (EXXX) numbers of stations in the hunt group in the order they will be accessed.
HUNTING METHOD L = LINEAR HUNTING D = DISTRIBUTED HUNTING HUNTING METHOD (L):	L- Calls ring in at the first available station on the list. D- Calls ring in at the next station on the list after the last station to answer a call.
HUNT GROUP ANNOUNCEMENT STATION (NONE):	Enter a circuit (X.Y) or intercom number (EXXX). If you enter NONE, advance to the OVERFLOW prompt.

PROMPT	VALID ENTRY
IS THE ANNOUNCEMENT STATION A PLAYBACK DEVICE (N):	Y- Whether the station is equipped with a playback device or a station instrument, calls will return to the hunt group whenever this station answers and then disconnects. N- It is equipped with a station instrument that operates as a regular station.
OVERFLOW (NONE):	Enter the circuit (X.Y) or intercom number (EXXX) for a station. Or, enter a pilot number (EXXX) or hunt group number (H1-H15) for a hunt group. If you enter NONE, advance to the REVIEW SAME HUNT GROUP prompt.
IS THE OVERFLOW A PLAYBACK DEVICE (N):	<i>This prompt does not appear if the overflow station is another hunt group.</i> Y- Whether the overflow station is equipped with a playback device or a station instrument, calls will return to the hunt group whenever this station answers and then disconnects. N- It is equipped with a station instrument that operates as a regular station.
OVERFLOW COUNT (0):	<i>This prompt appears if you answered Y to the previous prompt.</i> Enter the number of times (0-25) calls will be allowed to return to the playback device before recalling.
HUNT GROUP SUPERVISOR (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the keyset station that can monitor calls in this hunt group. Or, enter NONE to continue.
REVIEW SAME HUNT GROUP AGAIN (N)?	Y- Return to the HUNT GROUP X prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	<i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.
REVIEW ADDITIONAL HUNT GROUPS (N)?	Y- Return to the RANGE OF HUNT GROUPS prompt. N- Return to the database programming menu prompt ([]).

9. [F] TENANTS, ATTENDANTS, AND SECRETARIAL INTERCEPTS

9.1 To define tenant groups, departments, attendants, secretarial intercepts, message centers, and special purpose stations, select F from the database programming menu. The following menu appears:

- ```
[F] TENANTS, ATTENDANT, AND SECRETARIAL
 INTERCEPTS
 [A] TENANT GROUP ASSIGNMENTS
 [B] ATTENDANTS
 [C] SECRETARIAL INTERCEPTS
 [D] MESSAGE CENTERS
 [E] SPECIAL PURPOSE STATIONS
```

### A. [FA] TENANT GROUP ASSIGNMENTS

9.2 Select A from the menu shown above or FA from the database programming menu to program tenant groups. Or, use the abbreviated command

/TNT. There can be up to five tenant groups with up to 10 departments each. When the system is initialized, all stations are in tenant group 1 and department 1.

9.3 To prepare to use this program, make a list of the stations to be assigned to each of the five tenant groups. Within each tenant group, make lists of stations to assign to each of the 10 departments. All stations must be assigned to a tenant group and a department. If desired, give each tenant group and department a name (up to 20 characters for tenant groups; up to 12 characters for departments). Refer to the program planning sheet in Figure 5-12, page 5-136, if desired.

9.4 Whenever the prompt asks for a list, the entries redisplay for verification. If the information is correct, press < CR >. If not, enter the correct information.

| PROMPT                                        | VALID ENTRY                                                                                                                                                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF TENANT GROUPS TO BE REVIEWED (NONE): | Enter a range of tenant group numbers (1-5) to be programmed. ALL is a valid entry. Enter NONE to return to the tenants, attendants, and secretarial intercepts menu prompt ([F]). |
| TENANT GROUP NAME ( ):                        | Enter tenant group name of up to 20 characters.                                                                                                                                    |
| LIST OF STATIONS (ALL):                       | Enter circuit (X.Y) or intercom (EXXX) numbers of stations in the tenant group.                                                                                                    |
| REVIEW DEPARTMENTS (N)?                       | Y- Continue to the next prompt.<br>N- Advance to the REVIEW SAME TENANT GROUP AGAIN prompt.                                                                                        |
| RANGE OF DEPARTMENTS TO BE REVIEWED (ALL):    | Enter a range of department numbers (1-10). Enter NONE to advance to the REVIEW SAME TENANT GROUP AGAIN prompt.                                                                    |
| DEPARTMENT X NAME ( ):                        | Enter department name of up to 12 characters.                                                                                                                                      |
| LIST OF STATIONS (ALL):                       | Enter circuit (X.Y) or intercom (EXXX) numbers of stations in the department.                                                                                                      |
| REVIEW SAME DEPARTMENTS AGAIN (N)?            | Y- Return to the first department selected.<br>N- Continue to the next prompt.                                                                                                     |
| REVIEW ADDITIONAL DEPARTMENTS (N)?            | Y- Return to the RANGE OF DEPARTMENTS prompt.<br>N- Continue to the next prompt or tenant group.                                                                                   |
| REVIEW SAME TENANT GROUP AGAIN (N)?           | Y- Return to the TENANT GROUP X prompt.<br>N- Continue to the next prompt or tenant group.                                                                                         |

| PROMPT                                                                                                                                                            | VALID ENTRY                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REVIEW ADDITIONAL TENANT GROUPS (N)?                                                                                                                              | Y- Return to the RANGE OF TENANT GROUPS prompt.<br>N- Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]).                                                                                                                                                     |
| ***ALL STATIONS MUST BE ASSIGNED***<br>LIST OF STATIONS NOT ASSIGNED TO A TENANT GROUP (X.Y-X.Y)<br>or<br>LIST OF STATIONS NOT ASSIGNED TO A DEPARTMENT (X.Y-X.Y) | <i>This message appears if any stations in the system were not assigned to a tenant group and/or department.</i><br>The terminal returns to the REVIEW ADDITIONAL TENANT GROUPS or the TENANT GROUP X prompt. Make sure all stations are assigned to both a tenant group and a department. |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                                                                                        | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                       |

## B. [FB] ATTENDANTS

9.5 To program the attendant stations, enter B from the tenants, attendants, and secretarial intercepts menu or enter FB from the database programming menu. Or, use the abbreviated command /ATT.

9.6 To prepare to use this program, make a list of the attendant stations. Then list the stations each attendant serves. If desired, indicate a primary attendant that receives unanswered recalls. If a station is assigned to more than one attendant, only the last assignment is valid. (When making the list, refer to

the program planning sheet in Figure 5-12 on page 5-138.)

9.7 When the system is initialized, station 1.1 is the primary attendant that serves all other stations. No secondary attendants are initialized. The primary attendant assignment cannot be deleted until it has been redefined in program [AF] (misc. system data).

9.8 Whenever the prompt asks for a list, entries re-display for verification after they are entered. If the information is correct, press <CR>. If not, enter the correct information. The prompts appear as shown below. End each entry with <CR>.

| PROMPT                                                               | VALID ENTRY                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF ATTENDANTS TO BE REVIEWED (ALL):                            | Enter a range of station circuit numbers that contains attendants. Enter NONE to advance to the MAKE ADDITIONAL ATTENDANTS prompt.                                                                                                                                                                                               |
| ATTENDANT STATION X.Y                                                | <i>This prompt appears only for previously programmed attendant stations.</i>                                                                                                                                                                                                                                                    |
| LIST OF STATIONS SERVED ( ):                                         | Enter circuit (X.Y) or intercom (EXXX) numbers of stations served by this attendant. Or, enter NONE to delete the attendant station.                                                                                                                                                                                             |
| *** NO STATIONS SERVED ***<br>KEEP THIS KEYSSET AS AN ATTENDANT (Y): | <i>This message appears if an attendant station (other than the primary attendant) is deleted.</i><br>Enter Y to keep the station as an attendant or N to make the station a keyset. The primary attendant cannot be deleted until another station is assigned as the new primary attendant in program [AF] (misc. system data). |
| REVIEW SAME ATTENDANT AGAIN (N)?                                     | Y- Return to the ATTENDANT STATION prompt.<br>N- Continue to the next prompt.                                                                                                                                                                                                                                                    |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                           | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                                                             |
| MAKE ADDITIONAL ATTENDANTS (N)?                                      | Y- Continue to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL ATTENDANTS prompt.                                                                                                                                                                                                                                        |
| ATTENDANT STATION (NONE):                                            | Enter the circuit (X.Y) or intercom (EXXX) number of the attendant. This should be a display keyset station.                                                                                                                                                                                                                     |
| LIST OF STATIONS SERVED (NONE):                                      | Enter circuit (X.Y) or intercom (EXXX) numbers of stations served by this attendant.                                                                                                                                                                                                                                             |
| REVIEW SAME ATTENDANT AGAIN (N)?                                     | Y- Return to the ATTENDANT STATION prompt.<br>N- Continue to the next attendant or the next prompt.                                                                                                                                                                                                                              |

| PROMPT                                     | VALID ENTRY                                                                                                                          |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |
| MAKE ADDITIONAL ATTENDANTS (N)?            | Y- Continue to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL ATTENDANTS prompt.                                            |
| REVIEW ADDITIONAL ATTENDANTS (N)?          | Y- Return to the RANGE OF ATTENDANTS prompt.<br>N- Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]).  |

### C. [FC] SECRETARIAL INTERCEPTS

9.9 This program is used to assign secretarial intercept stations that receive calls when the stations they serve are busy or do not answer. Enter C from the tenants, attendants, and secretarial intercepts menu or FC from the database programming menu. Or, use the abbreviated command /SEC.

9.10 Before programming, make a list of the secre-

tarial intercept stations (circuit or intercom numbers) and the stations they serve. (Refer to the program planning sheet in Figure 5-12, on page 5-138, when making the list.)

9.11 When a list is entered, the terminal redisplay it for verification. If the list is correct, enter <CR>. If not, enter the correct information. The prompts appear in the order shown below. End each entry with <CR>.

| PROMPT                                                         | VALID ENTRY                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF SECRETARIAL INTERCEPTS TO BE REVIEWED (ALL):          | Enter a range of station circuit or intercom numbers that contains secretarial intercept stations. Enter NONE to advance to the MAKE ADDITIONAL SECRETARIAL INTERCEPTS prompt.                                                                                                   |
| SECRETARIAL INTERCEPT STATION X.Y LIST OF STATIONS SERVED ( ): | <i>This prompt appears for secretarial intercept stations that were programmed previously.</i> Enter a new list of circuit (X.Y) or intercom (EXXX) numbers to change the stations served by this secretarial intercept. Enter NONE to delete the secretarial intercept station. |
| REVIEW SAME SECRETARIAL INTERCEPT AGAIN (N)?                   | Y- Return to the SECRETARIAL INTERCEPT STATION prompt.<br>N- Continue to the next prompt.                                                                                                                                                                                        |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                     | <i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                |
| MAKE ADDITIONAL SECRETARIAL INTERCEPTS (N)?                    | Y- Continue to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL SECRETARIAL INTERCEPTS prompt.                                                                                                                                                                            |
| SECRETARIAL INTERCEPT STATION (NONE):                          | Enter the circuit (X.Y) or intercom (EXXX) number of the secretarial intercept station.                                                                                                                                                                                          |
| LIST OF STATIONS SERVED (NONE):                                | Enter the circuit (X.Y) or intercom (EXXX) numbers of stations served by this secretarial intercept station. ALL is a valid entry.                                                                                                                                               |
| REVIEW SAME SECRETARIAL INTERCEPT AGAIN (N)?                   | Y- Return to the SECRETARIAL INTERCEPT STATION prompt.<br>N- Continue to the next secretarial intercept or next prompt.                                                                                                                                                          |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                     | <i>This prompt appears only if new information was entered.</i> Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                |
| MAKE ADDITIONAL SECRETARIAL INTERCEPTS (N)?                    | Y- Continue to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL SECRETARIAL INTERCEPTS prompt.                                                                                                                                                                            |
| REVIEW ADDITIONAL SECRETARIAL INTERCEPTS (N)?                  | Y- Return to the RANGE OF SECRETARIAL INTERCEPTS prompt.<br>N- Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]).                                                                                                                                  |



D. [FD] MESSAGE CENTERS

9.12 This program is used to assign message centers to keysets and single-line sets. Station users can then leave messages at a station or the station's assigned message centers. Refer to FEATURES, page 4-46, for details. Enter D from the tenants, attendants, and secretarial intercepts menu or FD from the database programming menu. Or, use the abbreviated command /MSG.

9.13 Before programming, make a list of the message center stations (circuit or intercom numbers) and the stations they serve. (Refer to the program planning sheet in Figure 5-12 on page 5-139, when making the list.)

9.14 When a list is entered, the terminal redisplay it for verification. If the list is correct, enter < CR >. If not, enter the correct information. The prompts appear in the order shown below. End each entry with < CR >.

| PROMPT                                                     | VALID ENTRY                                                                                                                                      |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF MESSAGE CENTERS TO BE REVIEWED (ALL):             | Enter a range of station circuit (X.Y) or intercom (EXXX) numbers that includes a message center.                                                |
| MESSAGE CENTER STATION X.Y<br>LIST OF STATIONS SERVED ( ): | If desired, change the stations served by entering a list of circuit (X.Y) or intercom (EXXX) numbers. Entering NONE deletes the message center. |
| REVIEW SAME MESSAGE CENTER AGAIN (N)?                      | Y- Return to the MESSAGE CENTER STATION X.Y prompt.<br>N- Advance to the next prompt.                                                            |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                 | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.             |
| MAKE ADDITIONAL MESSAGE CENTERS (N)?                       | Y- Advance to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL MESSAGE CENTERS prompt.                                                    |
| REVIEW SAME MESSAGE CENTER AGAIN (N)?                      | Y- Return to the MESSAGE CENTER STATION X.Y prompt.<br>N- Advance to the next prompt.                                                            |
| MESSAGE CENTER STATION (NONE):                             | Enter the circuit (X.Y) or intercom (EXXX) number of the message center station.                                                                 |
| LIST OF STATIONS SERVED (NONE):                            | Enter a list of circuit (X.Y) or intercom (EXXX) numbers of keysets that will be served by the message center station.                           |
| REVIEW SAME MESSAGE CENTER AGAIN (N)?                      | Y- Return to the MESSAGE CENTER STATION X.Y prompt.<br>N- Advance to the next prompt.                                                            |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                 | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.             |
| MAKE ADDITIONAL MESSAGE CENTERS (N)?                       | Y- Return to the MESSAGE CENTER STATION (NONE) prompt.<br>N- Advance to the next prompt.                                                         |
| REVIEW ADDITIONAL MESSAGE CENTERS (N)?                     | Y- Return to the RANGE OF STATIONS prompt.<br>N- Exit to the tenants, attendant, and secretarial intercepts menu prompt ([E]).                   |

E. [FE] SPECIAL PURPOSE STATIONS

9.15 This program is used to quickly assign automated attendants, house phones, and voice mail ports in one program. Enter E from the tenants, attendants, and secretarial intercepts menu or FE from the database programming menu. Or, use the abbreviated command /SPCL.

9.16 Before programming, make a list (circuit or intercom numbers) of special purpose stations to be assigned. (Refer to the program planning sheet in Figure 5-12 on page 5-139.)

9.17 When a list is entered, the terminal redisplay it for verification. If the list is correct, enter <CR>. If not, enter the correct information. The prompts appear as shown below.

| PROMPT                                     | VALID ENTRY                                                                                                                                |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| LIST OF AUTOMATED ATTENDANTS (NONE):       | Enter the single-line circuit (X.Y) or intercom (EXXX) numbers of the automated attendant stations.                                        |
| LIST OF HOUSE PHONES (NONE):               | Enter the circuit (X.Y) or intercom (EXXX) numbers of the house phone stations. ALL or NONE are valid entries.                             |
| LIST OF VOICE MAIL PORTS (NONE):           | Enter the single-line circuit (X.Y) or intercom (EXXX) numbers of the voice mail ports.                                                    |
| REVIEW ASSIGNMENTS AGAIN (N)?              | Y- Return to the LIST OF AUTOMATED ATTENDANTS prompt.<br>N- Exit to the tenants, attendant, and secretarial intercepts menu prompt ([E]:). |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.       |

## 10. [G] PAGE ZONES

**10.1** To define the internal page zones, select G or enter /PAGE from the database programming menu. To prepare to use this program, make a list of the keysets and talkback speakers that are included in up to six paging zones. Keysets and talkback speakers can be in more than one page zone. (Refer to the program planning sheet in Figure 5-13, page 5-140, when making the list.)

**10.2** To create an all-page zone, assign all keysets and talkback speakers to one zone. When the system is initialized, all keysets and talkback speakers are assigned to page zone 1.

**10.3** When a list is entered, it is redisplayed for verification. If the list is correct, enter <CR>. If not, enter the correct information. The prompts appear in the order shown below. End each entry with <CR>.

| PROMPT                                     | VALID ENTRY                                                                                                                          |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF PAGE ZONES TO BE REVIEWED (ALL):  | Enter a range of page zone numbers (1-6). Enter NONE to return to the database programming menu prompt ([ ]).                        |
| PAGE ZONE X<br>LIST OF KEYSETS ( ):        | Enter circuit (X,Y) or intercom (EXXX) numbers of keysets in this page zone.                                                         |
| LIST OF TALKBACK SPEAKERS ( ):             | Enter talkback speaker numbers (1-5) for this page zone.                                                                             |
| REVIEW SAME PAGE ZONES AGAIN (N)?          | Y- Return to the first selected page zone.<br>N- Continue to the next prompt.                                                        |
| REVIEW ADDITIONAL PAGE ZONES (N)?          | Y- Return to the RANGE OF PAGE ZONES prompt.<br>N- Return to the database programming menu prompt ([ ]).                             |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |

## 11. [H] TOLL RESTRICTION

11.1 Select H from the database programming menu to access the toll restriction menu. It appears as shown below:

### [H] TOLL RESTRICTION

- [A] SCOS INFORMATION
- [B] OVERLAPPING AREA/OFFICE CODES
- [C] AREA/OFFICE CODES ALLOWED/RESTRICTED
- [D] AREA/OFFICE CODE REPORTS
- [E] ALTERNATE CARRIERS
- [F] ALLOWED LONG DISTANCE

11.2 To plan the toll restriction information before programming, make lists of the following items. (Refer to Figure 5-14, page 5-141, for a program planning sheet. Also, refer to FEATURES, page 4-22, for more information about toll restrictions.)

- **Station class of service (SCOS) designations:** List all unrestricted stations and those that are affected by each of the following restrictions:
  - Operator access
  - Toll call access
  - International call access
  - Eight-digit call access
  - Area/office code restriction
  - LCR only restriction
  - Alternate carrier access
  - Allowed long distance number access

- **LCR class of service:** List stations that will be allowed unlimited advances through the LCR facility groups and those stations that will be limited by LCR classes of service 0-6.
- **Area/office codes:** There can be up to three user groups that each have separate lists of allowed, restricted, and extended area codes. For the extended area codes (up to four) in each group, make lists of allowed and restricted office codes.
- **Alternate carrier numbers:** List up to 20 local access numbers (up to 10 digits each, do not include the toll field) for alternate carriers that will not be accessible from restricted stations.
- **Allowed long distance numbers:** List up to 20 long distance numbers (up to 10 digits each, do not include the toll field) that are not subject to toll restriction.

### A. [HA] SCOS INFORMATION

11.3 Select A from the toll restriction menu or HA from the database programming menu to batch load the SCOS information. Or, use the abbreviated command /SCOS. SCOS restrictions can be set for individual stations using program [DAA] (specific station information). The prompts appear as shown below. End each entry with <CR>.

| PROMPT                                                                                                                                                                                                                                                                                                                                                                                                                                                      | VALID ENTRY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (0) LIST OF UNRESTRICTED STATIONS (ALL):<br>RESTRICTED<br>(1) OPERATOR ACCESS<br>LIST OF STATIONS (NONE):<br>(2) TOLL ACCESS<br>LIST OF STATIONS (NONE):<br>(3) INTERNATIONAL<br>LIST OF STATIONS (NONE):<br>(4) EIGHT DIGIT<br>LIST OF STATIONS (NONE):<br>(5) AREA/OFFICE CODE<br>LIST OF STATIONS (NONE):<br>(6) LCR ONLY<br>LIST OF STATIONS (NONE):<br>(7) ALTERNATE CARRIER<br>LIST OF STATIONS (NONE):<br>(8) ENABLE ALD<br>LIST OF STATIONS (NONE): | Respond to each prompt with circuit (X,Y) or intercom (EXXX) numbers of stations to be added to the lists. After any changes are made, the list is re-displayed for verification. Press <CR> if the list is correct or enter new information.<br><br>NOTE: Stations cannot be directly deleted in the LIST OF UNRESTRICTED STATIONS prompt. Stations are removed from unrestricted status only by giving them restrictions in the remaining prompts. Stations may have multiple restrictions assigned to them. To return a station to unrestricted status, add it back in the first prompt. |

| PROMPT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | VALID ENTRY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LIST OF STATIONS IN USER GROUP 1 (ALL):<br>LIST OF STATIONS IN USER GROUP 2 (NONE):<br>LIST OF STATIONS IN USER GROUP 3 (NONE):<br>LIST OF STATIONS WITH UNLIMITED LCR ADVANCES (ALL):<br>LIST OF STATIONS WITH 0 LCR ADVANCES (NONE):<br>LIST OF STATIONS WITH 1 LCR ADVANCE (NONE):<br>LIST OF STATIONS WITH 2 LCR ADVANCES (NONE):<br>LIST OF STATIONS WITH 3 LCR ADVANCES (NONE):<br>LIST OF STATIONS WITH 4 LCR ADVANCES (NONE):<br>LIST OF STATIONS WITH 5 LCR ADVANCES (NONE):<br>LIST OF STATIONS WITH 6 LCR ADVANCES (NONE): | Respond to each prompt with circuit (X.Y) or intercom (EXXX) numbers of stations to be added to the lists. After any changes are made, the list is redisplayed for verification. Press < CR > if the list is correct or enter new information.<br><br><b>NOTE:</b> Stations cannot be directly deleted in these prompts. Stations are removed from one prompt by adding them to one of the other prompts within the group or LCR advance. Stations may be assigned only one designation within each group or LCR advance. |
| REVIEW SCOS DATA AGAIN (N)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Y- Return to the LIST OF UNRESTRICTED STATIONS prompt.<br>N- Returns to the toll restriction menu prompt ([H]).                                                                                                                                                                                                                                                                                                                                                                                                           |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                                                                                                                                                                                                                                                      |

**B. [HB] OVERLAPPING AREA/OFFICE CODES**

11.4 This program is used to designate whether the system is being programmed in an area where some of the area codes and office codes overlap. For example, 901 is an area code in Tennessee and is an office code in the 818 area code in the Los Angeles area. This program is reached by selecting B from the toll restriction menu or HB from the database programming menu. Or, use the abbreviated command /OVER.

| PROMPT                                     | VALID ENTRY                                                                                                                                               |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| DO OFFICE AND AREA CODES OVERLAP (N):      | N- Return to the toll restriction menu prompt ([H]).<br>Y- The system is in an area where some of the office codes use the same digits as the area codes. |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                      |

C. [HC] AREA/OFFICE CODES  
ALLOWED/RESTRICTED

11.5 This program is used to specify the area codes and office codes to which calls are allowed or restricted for those users assigned with SCOS 5 (allowed area/office codes). It is reached by entering C from the toll restriction menu or HC from the database programming menu. Or, use the abbreviated command /AREA. Refer to Figure 5-14, page 5-143, for a program planning sheet.

11.6 The allowed/restricted area codes are programmed for three separate user groups to allow flexibility in toll restriction. During SCOS programming, the stations are assigned to one of the user groups.

11.7 Flexibility is further enhanced by the use of extended area codes. Up to four area codes in each user group can be assigned an extended table of allowed/restricted office codes. With this feature, the customer can determine the office codes that can be called within an area code. For example, the local area code can be given an extended table to allow non-toll calls and restrict toll calls within the area code.

11.8 User group programming also affects call cost designation for the SMDR feature. When a seven-digit number is dialed from a station without SCOS 5, the system checks the office code against the area/office code tables for that station's user group. If the office code is allowed, the call is recorded as a local call (LOC). If the area/office code that was dialed is restricted, the call is recorded as a seven-digit toll call (T7).

11.9 When the lists of area or office codes are entered, the terminal redisplay the entry for verification. If the list is correct, press <CR>. If not, enter the correct information. An error message (\*\* IN-VALID AREA/OFFICE CODE SPECIFICATION \*\*) appears if an invalid area code is entered. In the North American Numbering Plan, area codes take the form NPA and office codes take the form NXX where:

N = Digits 2-9 P = Digits 0 or 1 A = Digits 0-9

11.10 The area/office code prompts appear as shown below. End each entry with <CR>.

| PROMPT                                                                                                                                           | VALID ENTRY                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| LOCAL AREA CODE ( ):                                                                                                                             | Enter the three-digit area code of the system's location. (An error message appears if it is not entered or if an invalid code is entered.) |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                                                                       | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.        |
| RANGE OF USER GROUPS TO BE REVIEWED (NONE)?                                                                                                      | Select the user group(s) you wish to program (1-3, ALL, or NONE).                                                                           |
| USER GROUP X                                                                                                                                     | Y- Continue to the next prompt.<br>N- Advance to the REVIEW AREA CODES INDIVIDUALLY prompt.                                                 |
| INITIALIZE ALL AREA CODES TO SAME ALLOWED/RESTRICTED STATUS (N)?                                                                                 |                                                                                                                                             |
| INITIAL ALLOWED/RESTRICTED STATUS OF ALL AREA CODES<br>A = ALLOWED<br>R = RESTRICTED<br>INITIAL ALLOWED/RESTRICTED STATUS OF ALL AREA CODES (A): | A- All area codes are allowed until they are reprogrammed.<br>R- All codes are restricted until they are reprogrammed.                      |
| LIST OF AREA CODES TO BE RESTRICTED (or ALLOWED) (NONE):                                                                                         | List of exceptions to the value assigned above. ALL is a valid entry. This prompt does not show the current status of the area codes.       |
| AREA CODES THAT HAVE EXTENDED OFFICE CODE TABLES (NONE)                                                                                          | <i>This prompt is shown for reference only. Extended area codes are programmed below</i>                                                    |

| PROMPT                                                                                                                                                                | VALID ENTRY                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| REVIEW AREA CODES INDIVIDUALLY (N)?                                                                                                                                   | Y- Continue to the next prompt.<br>N- Advance to the LIST OF ADDITIONAL AREA CODES prompt.                                              |
| RANGE OF AREA CODES TO BE REVIEWED (NONE) :                                                                                                                           | Enter a range of area codes to be reviewed or programmed. Enter NONE to advance to the LIST OF ADDITIONAL AREA CODES prompt.            |
| XXX (R) :                                                                                                                                                             | A- The area code is allowed.<br>R- The area code is restricted.<br>E- The area code has an extended office code table.                  |
| <i>The following prompts appear when E is entered after an area code prompt.<br/>When these prompts have been answered, the list of individual prompts continues.</i> |                                                                                                                                         |
| OFFICE CODES FOR AREA CODE XXX<br>INITIALIZE ALL OFFICE CODES TO SAME ALLOWED/RESTRICTED STATUS (N)?                                                                  | Y- Continue to the next prompt.<br>N- Advance to the REVIEW OFFICE CODES INDIVIDUALLY prompt.                                           |
| INITIAL ALLOWED/RESTRICTED STATUS OF ALL OFFICE CODES<br>A - ALLOWED<br>R - RESTRICTED<br>INITIAL ALLOWED/RESTRICTED STATUS OF ALL OFFICE CODES (A):                  | A- All office codes are allowed until they are reprogrammed.<br>R- All office codes are restricted until they are reprogrammed.         |
| LIST OF OFFICE CODES TO BE RESTRICTED (or ALLOWED) (NONE):                                                                                                            | List of exceptions to the value assigned above.                                                                                         |
| REVIEW OFFICE CODES INDIVIDUALLY (N)?                                                                                                                                 | Y- Continue to the next prompt.<br>N- Advance to the LIST OF ADDITIONAL OFFICE CODES prompt.                                            |
| RANGE OF OFFICE CODES TO BE REVIEWED (NONE) :                                                                                                                         | Enter a range of office codes to be reviewed or programmed. Enter NONE to advance to the LIST OF ADDITIONAL OFFICE CODES prompt.        |
| XXX (R) :                                                                                                                                                             | A- The office code is allowed.<br>R- The office code is restricted.                                                                     |
| REVIEW SAME OFFICE CODES AGAIN (N)?                                                                                                                                   | Y- Return to the first office code selected.<br>N- Continue to the next prompt.                                                         |
| LIST OF ADDITIONAL OFFICE CODES TO BE RESTRICTED ( );<br>LIST OF ADDITIONAL OFFICE CODES TO BE ALLOWED ( ):                                                           | List of exceptions to the value assigned above. ALL is a valid entry. This prompt does not show the current status of the office codes. |
| REVIEW ADDITIONAL OFFICE CODES (N)?                                                                                                                                   | Y- Return to the RANGE OF OFFICE CODES prompt.<br>N- Continue to the next prompt.                                                       |
| CONTINUING WITH THE REVIEW OF AREA CODES                                                                                                                              | The program continues to the next area code.                                                                                            |
| <i>After all area codes have been reviewed, the prompts continue as follows:</i>                                                                                      |                                                                                                                                         |
| REVIEW SAME AREA CODES AGAIN (N)?                                                                                                                                     | Y- Return to the first area code selected.<br>N- Continue to the next prompt.                                                           |

PROGRAMMING

| PROMPT                                                                                                  | VALID ENTRY                                                                                                                          |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| LIST OF ADDITIONAL AREA CODES TO BE RESTRICTED ( ):<br>LIST OF ADDITIONAL AREA CODES TO BE ALLOWED ( ): | List of exceptions to the assigned value. ALL is a valid entry. These prompt does not show the current status of the office codes.   |
| REVIEW ADDITIONAL AREA CODES (N)?                                                                       | Y- Return to the RANGE OF AREA CODES prompt.<br>N- Continue to the next prompt.                                                      |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                              | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |
| REVIEW SAME USER GROUPS AGAIN (N)?                                                                      | Y- Return to the USER GROUP X prompt.<br>N- Continue to the next prompt.                                                             |
| REVIEW ADDITIONAL USER GROUPS (N)?                                                                      | Y- Return to the RANGE OF USER GROUPS prompt.<br>N- Return to the toll restriction menu prompt ([H]).                                |



D. [HD] AREA/OFFICE CODE REPORTS

11.11 Select D from the toll restriction menu or HD from the database programming menu to print summary reports of area code and office code assignments. Or, use the abbreviated command /AREP. The prompts appear as shown below, end each entry with < CR >.

| PROMPT                                                                                                                                                                                                                                              | VALID ENTRY                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| REPORT OUTPUT PORT<br>P - PRIMARY<br>M - MODEM<br>S - SECONDARY<br>REPORT OUTPUT PORT (P):                                                                                                                                                          | Select the port that is connected to the printer. The APP is the primary port; the IOP is the secondary port. |
| <i>A date/time header appears:</i>                                                                                                                                                                                                                  |                                                                                                               |
| AREA/OFFICE CODE TABLE REPORT                                                                                                                                                                                                                       | FRI-27-JAN-1990 12:00                                                                                         |
| RANGE OF USER GROUPS TO BE REVIEWED (NONE):                                                                                                                                                                                                         | Select the user group(s) to be included in the report (1-3, ALL, or NONE).                                    |
| <i>The report appears in the following format. Office code tables appear only if there are extended area codes.</i>                                                                                                                                 |                                                                                                               |
| USER GROUP X<br><br>LIST OF ALLOWED AREA CODES ( )<br>LIST OF RESTRICTED AREA CODES ( )<br>LIST OF EXTENDED AREA CODES ( )<br><br>OFFICE CODE TABLE FOR AREA<br>CODE XXX<br>LIST OF ALLOWED OFFICE CODES ( )<br>LIST OF RESTRICTED OFFICE CODES ( ) |                                                                                                               |
| REVIEW ADDITIONAL USER GROUPS (N)?                                                                                                                                                                                                                  | Y- Return to the RANGE OF USER GROUPS prompt.<br>N- Return to the toll restriction menu prompt ([H]).         |

E. [HE] ALTERNATE CARRIERS

11.12 To program the alternate carrier local access numbers that *cannot* be dialed from stations with SCOS 7 (alternate carrier), enter E from the toll restriction menu or HE from the database programming menu. Or, use the abbreviated command /ALT. Refer to Figure 5-14, page 5-144, for a program planning sheet.

11.13 The alternate carrier access numbers are the telephone numbers that a station user dials to access specialized common carriers. The numbers can have up to 10 digits each including the following:

- An X to indicate any digit 0-9.

- A plus (+) *at the end* of any number to indicate that any digits dialed after the indicated digits are also restricted. For example, 976+ restricts any number beginning with 976.

**NOTE:** Alternate carrier numbers are only restricted if they *exactly match* the number on the alternate carrier list. For this reason, all alternate carrier numbers should have a plus (+) added to the end of the number to prevent users from bypassing toll restriction by dialing extra digits after dialing the restricted number. Allowed long distance numbers override alternate carrier numbers.

11.14 The prompts appear in the order shown below. End each entry with < CR >.

| PROMPT                                      | VALID ENTRY                                                                                                                          |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1 ( ):<br>...<br>20 ( ):                    | Enter up to 10 digits per number or < to erase the current number. Do not include the toll field (1 or 10XXX).                       |
| REVIEW ALTERNATE CARRIER NUMBERS AGAIN (N)? | Y- Return to number 1.<br>N- Return to the toll restriction menu prompt ([H]);                                                       |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)  | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |

**E. [HF] ALLOWED LONG DISTANCE**

**11.15** This program defines the allowed long distance numbers for SCOS 8 (enable ALD). It is reached by entering F from the toll restriction menu or HF from the database programming menu. Or, use the abbreviated command /ALD. Refer to Figure 5-14, page 5-145, for a program planning sheet.

**11.16** The allowed long distance numbers can have up to 10 digits each including the following:

- An X to indicate any digit 0-9. For example, XXX5551212 allows the user to dial directory assistance for any area code.
- A plus (+) at the end of any number to indicate that any digits can be dialed after the indicated digits are dialed. For example, 800+ allows any number beginning with 800.

**NOTE:** Even if 0+ numbers are included in the allowed long distance number list, they cannot be dialed by a station with SCOS 1. If the station *does not* have SCOS 1, the allowed long distance number list is not checked when a 0+ number is dialed.

**11.17** The prompts below show the initialized values of the allowed long distance numbers. End each entry with <CR>.

**CAUTION REGARDING  
EMERGENCY NUMBERS:**

In areas where the emergency number is 1911, be sure that toll-restricted stations have SCOS 8 (Enable ALD) and that 911 is in the allowed long distance number list. Otherwise, users will have to take extra time to find a station that is permitted to dial "1+" numbers. Note that 911 is allowed at all stations regardless of SCOS, but 1911 requires special programming.

| PROMPT                                          | VALID ENTRY                                                                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1 (800XXXXXXX):<br>2 (911):<br>...<br>20 ( ):   | Enter up to 10 digits including X or +, if desired. Do not include the toll field (1 or 10XXX).                                      |
| REVIEW ALLOWED LONG DISTANCE NUMBERS AGAIN (N)? | Y- Return to number 1.<br>N- Return to the toll restriction menu prompt ([H]).                                                       |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)      | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |

## 12. [I] LEAST-COST ROUTING

**NOTE:** These programs cannot be accessed in KF-rated systems or in MF-rated, basic-software systems.

**12.1** The least-cost routing menu is used to enter data for the route groups, facility groups, dial rules, and the LCR advance timer. Enter I from the database programming menu to view the following menu:

### [I] LEAST COST ROUTING

- [A] LCR ROUTE GROUPS
- [B] LCR FACILITY GROUPS
- [C] LCR DIAL RULES
- [D] LCR ADVANCE TIMER
- [E] LCR DATA REPORTS

**12.2** To prepare to program LCR, refer to page 4-24 in FEATURES. Then, gather the necessary information to determine the following (refer to Figure 5-15, page 5-146, for a program planning sheet):

- **Facility groups:** Determine the types of lines available and assign them to up to eight facility groups. For example, place all local lines in one group, in-state WATS lines in another, out-of-state WATS lines in a third group, etc. Each facility group can contain up to 32 lines.
- **Area codes and office codes to be accessed by LCR:** Customers may wish to use LCR for all outgoing calls, all long distance calls, or calls to specific cities. List the area codes to which the customer wishes to place calls using LCR. Also list office codes within the area codes for more specific LCR use.
- **Route groups:** Group the area codes and office codes that have common access. For example, non-toll local area and office codes can be in one group, while toll codes are in another. A route group for "800+" calls could also be programmed.

**NOTE:** Route group 1 is normally used for non-toll, local calls.

- **Rank the facility groups within the route groups:** Each route group is divided into day, evening, and night/weekend time blocks. Rank the facility

groups, from most-economical to least-economical, for each time block. For example, a direct-dial line may be the least-economical line during the day, but at night it may be the most-economical line. A facility group can appear in more than one route group.

- **Dial rules needed:** If the lines in the facility groups require special digits (for example, SCC access codes) up to five dial rules can be programmed. There are three permanently programmed rules in the database, they are:

- *Echo toll field:* When LCR is selected, the station user dials the number as if a direct dial line was being used, including the area code if necessary. If LCR selects a line that requires a 1, its facility group must have this dial rule programmed to tell the system to echo (send) the 1.

**NOTE:** It may be desirable to program dial rule number four to add a 1, even though dial rule number one can be used to echo the toll field. This allows users to dial without knowing whether the 1 is required. If 1 is needed, the dial rules tell the system to add it. Users only have to remember to dial the area code when placing a call outside the local area code. If dial rule number four is programmed as described, do not include dial rule number one.

- *Echo area code:* The system includes the area code in the number if this dial rule is programmed for the facility group. If this dial rule is not programmed, the system drops the area code from the dialed number.
- *Echo local address:* All facility groups must have this dial rule. It tells the system to send the seven-digit telephone number that the user has dialed.

- **Assign the dial rules to the facility groups:** List the dial rules for the facility groups in the order they are to be used (for example, dial rule 1 — add the 1, then dial rule 2 — echo the area code, then dial rule 3 — echo the seven digits dialed; you will enter "1, 2, 3").

**A. [IA] LCR ROUTE GROUPS**

**12.3** This program identifies the area codes and office codes associated with each of the route groups. It is reached by entering A from the least-cost routing menu or IA from the database programming menu. Or, use the abbreviated command /ROUT. Refer to the program planning sheet, in Figure 5-15, page 5-146, for lists of area codes, office codes, and facility groups for each route group.

**12.4** The program includes two steps for entering

area codes and office codes.

- (1) In the first step, all area/office codes can be included or excluded from a route group.
- (2) Then, a list of exceptions is entered. Or, area/office codes are viewed individually and designated as included or excluded in the route group.

**12.5** When a list of area or office codes is entered, the terminal redisplay the entry for verification. If the list is correct, enter < CR >. If not, enter the correct information.

| PROMPT                                                                                                                                  | VALID ENTRY                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOCAL AREA CODE ( ):                                                                                                                    | Enter the three-digit area code of the system's location. (An error message appears if it is not entered or an invalid code is entered.)                                     |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?                                                                                             | Y- To update the database.<br>N- To exit to the least-cost routing menu prompt ([I]).                                                                                        |
| RANGE OF ROUTE GROUPS TO BE REVIEWED (ALL):                                                                                             | Enter a range of route group numbers (1-12) to be programmed or reviewed. Enter NONE to return to the least-cost routing menu prompt ([I]).                                  |
| NOTE: 911,1-411, AND CALLS TO THE OPERATOR (DIAL 0) ARE ALL ROUTED THROUGH THIS GROUP.<br>— NORMALLY USED FOR LOCAL CALLS—              | <i>This note appears only for route group 1, which is usually reserved for calls within the local area code.</i>                                                             |
| ROUTE GROUP X.<br><br>INITIALIZE ALL AREA CODES TO SAME INCLUDE/EXCLUDE STATUS (N)?                                                     | Y- All area codes are initialized to the same value. Continue to the next prompt.<br>N- Advance to the REVIEW AREA CODES INDIVIDUALLY prompt.                                |
| INITIAL INCLUDE/EXCLUDE STATUS OF ALL AREA CODES<br>I - INCLUDE<br>E - EXCLUDE<br>INITIAL INCLUDE/EXCLUDE STATUS OF ALL AREA CODES (E): | I- All area codes are included in this route group.<br>E- All area codes are excluded.                                                                                       |
| LIST OF AREA CODES TO BE INCLUDED (or EXCLUDED) (NONE):                                                                                 | Enter exceptions to the initialized list of codes.                                                                                                                           |
| REVIEW AREA CODES INDIVIDUALLY (N)?                                                                                                     | Y- Determine the included/excluded status of each code individually. Continue to the next prompt.<br>N- Continue to the LIST OF ADDITIONAL AREA CODES TO BE INCLUDED prompt. |
| RANGE OF AREA CODES TO BE REVIEWED (ALL):                                                                                               | Enter a range of three-digit area codes.                                                                                                                                     |
| XXX (E):                                                                                                                                | I- The area code is included in this route group.<br>E- The area code is excluded from this route group.                                                                     |

| PROMPT                                                                                                                                      | VALID ENTRY                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| REVIEW SAME AREA CODES AGAIN (N)?                                                                                                           | Y- Return to the first area code.<br>N- Continue to the next prompt.                                          |
| REVIEW ADDITIONAL AREA CODES INDIVIDUALLY (N)?                                                                                              | Y- Return to the RANGE OF AREA CODES TO BE REVIEWED prompt.<br>N- Continue to the next prompt.                |
| LIST OF ADDITIONAL AREA CODES TO BE INCLUDED:                                                                                               | Enter exceptions to the initialized list of codes.                                                            |
| LIST OF ADDITIONAL AREA CODES TO BE EXCLUDED:                                                                                               | Enter exceptions to the initialized list of codes.                                                            |
| REVIEW ADDITIONAL AREA CODES (N)?                                                                                                           | Y- Return to the RANGE OF AREA CODES TO BE REVIEWED prompt.<br>N- Continue to the next prompt.                |
| INITIALIZE ALL OFFICE CODES TO SAME INCLUDE/EXCLUDE STATUS (N)?                                                                             | Y- Continue to the next prompt.<br>N- Advance to the REVIEW OFFICE CODES INDIVIDUALLY prompt.                 |
| INITIAL INCLUDE/EXCLUDE STATUS OF ALL OFFICE CODES<br>I = INCLUDE<br>E = EXCLUDE<br>INITIAL INCLUDE/EXCLUDE STATUS OF ALL OFFICE CODES (E): | I- All office codes are included in this route group.<br>E- All office codes are excluded.                    |
| LIST OF OFFICE CODES TO BE INCLUDED (or EXCLUDED) (NONE):                                                                                   | Enter exceptions to the initialized code list.                                                                |
| REVIEW OFFICE CODES INDIVIDUALLY (N)?                                                                                                       | Y- Continue to the next prompt.<br>N- Advance to LIST OF ADDITIONAL OFFICE CODES prompts.                     |
| RANGE OF OFFICE CODES TO BE REVIEWED (ALL):                                                                                                 | Enter a range of three-digit office codes. Enter NONE to return to the least-cost routing menu prompt ([I]);. |
| XXX (E) :                                                                                                                                   | I- The office code is included in this route group.<br>E- The office code is excluded.                        |
| REVIEW SAME OFFICE CODES AGAIN (N)?                                                                                                         | Y- Return to the first office code.<br>N- Continue to the next prompt.                                        |
| REVIEW ADDITIONAL OFFICE CODES INDIVIDUALLY (N)?                                                                                            | Y- Return to the RANGE OF OFFICE CODES TO BE REVIEWED prompt.<br>N- Continue to the next prompt.              |
| LIST OF ADDITIONAL OFFICE CODES TO BE INCLUDED:                                                                                             | Enter exceptions to the initialized code list.                                                                |
| LIST OF ADDITIONAL OFFICE CODES TO BE EXCLUDED:                                                                                             | Enter exceptions to the initialized code list.                                                                |
| REVIEW ADDITIONAL OFFICE CODES (N)?                                                                                                         | Y- Return to the RANGE OF OFFICE CODES TO BE REVIEWED prompt.<br>N- Continue to the next prompt.              |

| PROMPT                                                                                    | VALID ENTRY                                                                                                                          |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| REVIEW FACILITY GROUPS IN TIME BLOCKS (N)?                                                | Y- Continue to the next prompt.<br>N- Advance to the REVIEW ADDITIONAL ROUTE GROUPS prompt.                                          |
| ORDERED LISTS OF FACILITY GROUPS<br>DAY LIST ( ):<br>EVENING LIST ( ):<br>NIGHT LIST ( ): | Enter lists of facility groups (1-8) in order (most economical first) to be used for each time block.                                |
| REVIEW FACILITY GROUPS IN TIME BLOCKS AGAIN (N)?                                          | Y- Return to the ORDERED LISTS OF FACILITY GROUPS prompt.<br>N- Continue to the next prompt.                                         |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |
| REVIEW ADDITIONAL ROUTE GROUPS (N)?                                                       | Y- Return to the RANGE OF ROUTE GROUPS prompt.<br>N- Return to the least-cost routing menu prompt ([I]).                             |

**B. [IB] LCR FACILITY GROUPS**

**12.6** To define the eight LCR facility groups, select B from the least-cost routing menu or IB from the database programming menu. Or, use the abbreviated command /FAC.

**12.7** To use this program, refer to the list of lines and dial rules for each of the facility groups (Figure 5-15, page 5-147). Each group can contain 0-32 lines.

A line can appear in more than one facility group, but not all lines need to be assigned. When the list is entered, it redisplay for verification; enter < CR > if it is correct. If not, enter the correct information. The prompts appear in the order shown below. End each entry with < CR >.

| PROMPT                                          | VALID ENTRY                                                                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| RANGE OF FACILITY GROUPS TO BE REVIEWED (ALL) : | Enter a range of facility group numbers (1-8). Enter NONE to return to the least-cost routing menu prompt ([I]).                     |
| FACILITY GROUP X.<br>LIST OF CO LINES (NONE):   | Enter circuit numbers (X.Y) of the C.O. lines included in this facility group.                                                       |
| REVIEW SAME FACILITY GROUPS AGAIN (N)?          | Y- Return to the first facility group selected.<br>N- Continue to the next prompt.                                                   |
| REVIEW ADDITIONAL FACILITY GROUPS (N)?          | Y- Return to the RANGE OF FACILITY GROUPS prompt.<br>N- Return to the least-cost routing menu prompt ([I]).                          |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)      | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |



C. [IC] LCR DIAL RULES

12.8 The system dials the number according to the dial rules assigned to the facility group. If the dial rules do not tell the system to echo digits that are dialed (rules 1-3), they are deleted. To program the digits that are added to the dialed number when the facility group is selected (rules 4-8), select C from the least-cost routing menu or IC from the database programming menu. Or, use the abbreviated command /RULE. The first three rules are preset; rules 4-8 are programmable.

12.9 The dial rules can contain up to 16 digits including 0-9, #, \*, and timed pauses and/or hookflashes. To program pauses, enter P for a short pause, PP

for a medium pause, and PPP for a long pause. The length of the pause (P) is determined by the programmable pause timer. And, if hookflash programming is enabled (in miscellaneous system data [AF]), enter an F for a hookflash. The length of the hookflash is determined by the programmable CO hookflash timer. Each pause or hookflash (P, PP, PPP, or F) is considered one digit. The prompts appear as shown below. End each entry with <CR>. The program planning sheet is in Figure 5-15 on page 5-147.

NOTE: When dialing an LCR number, the system only sends out up to 48 digits. For this reason, the complete LCR number (including the telephone number and any assigned dial rules) should be kept under 48 digits.

| PROMPT                                                                                                                | VALID ENTRY                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADD RULE 1. ECHO TOLL FIELD<br>ADD RULE 2. ECHO AREA CODE<br>ADD RULE 3. ECHO LOCAL ADDRESS<br>(LAST 7 DIGITS DIALED) | <i>The first three dial rules are shown for reference only. They cannot be changed.</i>                                                                                                                                                                                                       |
| ADD RULE 4 ( ):<br>...<br>ADD RULE 8 ( ):                                                                             | Enter up to 16 digits. Include pauses (P, PP, or PPP), if necessary.                                                                                                                                                                                                                          |
| REVIEW DIAL RULES AGAIN (N)?                                                                                          | Y- Return to ADD RULE 4.<br>N- Continue to the next prompt.                                                                                                                                                                                                                                   |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                                                         | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                          |
| RANGE OF FACILITY GROUPS TO BE<br>REVIEWED (ALL):                                                                     | Enter a range of facility group numbers (1-8). Enter NONE to return to the least-cost routing menu prompt ([I]).                                                                                                                                                                              |
| FACILITY GROUP 1.<br>DIALING RULES ( ):                                                                               | Enter a list of dial rules (1-8) that are used with this facility group in the exact order that the number should be dialed (i.e., toll field, area code, seven-digit number). The entry redisplay for verification. Enter <CR> if it is correct or enter new information if it is incorrect. |
| REVIEW SAME FACILITY GROUPS AGAIN<br>(N)?                                                                             | Y- Return to the first facility group selected.<br>N- Continue to the next prompt.                                                                                                                                                                                                            |
| REVIEW ADDITIONAL FACILITY GROUPS<br>(N)?                                                                             | Y- Return to the RANGE OF FACILITY GROUPS prompt.<br>N- Return to the least-cost routing menu prompt ([I]).                                                                                                                                                                                   |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                                                         | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                          |

**D. [ID] LCR ADVANCE TIMER**

**12.10** If the lines in a facility group are busy when a station user attempts to place a call with LCR, the user camps on and the system sends busy signals followed by music. This program is used to set the value of the LCR advance timer, which determines how long the system camps on to a facility group before moving to the next group. Enter D from the least-cost routing menu or ID from the database programming menu. Or, use the abbreviated command /LCRA. This timer can also be programmed with the other timers in [AB] (timer values.)

| PROMPT                                     | VALID ENTRY                                                                                                                          |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| LCR ADVANCE TIMER (8):                     | Enter a value within the valid range (5-255 seconds).                                                                                |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |

**E. [IE] LCR DATA REPORTS**

**12.11** To aid programming and record keeping, use this program to produce a report that shows the LCR assignments for the route groups and facility groups. Enter E from the least-cost routing menu or enter IE from the database programming menu. Or, use the abbreviated command /LREP. The prompts appear as shown below. End each entry with <CR>.

| PROMPT                                                                                                                                                                                                                                                        | VALID ENTRY                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| REPORT OUTPUT PORT<br>P = PRIMARY<br>M = MODEM<br>S = SECONDARY<br>REPORT OUTPUT PORT (P):                                                                                                                                                                    | Select the port that is connected to the printer. The APP is the primary port; the IOP is the secondary port. |
| LCR REPORT FRI-27-JAN-1990 12:00                                                                                                                                                                                                                              | <i>The report header prints the current date and time.</i>                                                    |
| RANGE OF ROUTE GROUPS TO BE REVIEWED (NONE):                                                                                                                                                                                                                  | Select the route group(s) to be included in the report (1-12, ALL, or NONE).                                  |
| ROUTE GROUP X<br>LIST OF INCLUDED AREA CODES ( )<br>LIST OF EXCLUDED AREA CODES ( )<br><br>LIST OF INCLUDED OFFICE CODES ( )<br>LIST OF EXCLUDED OFFICE CODES ( )<br><br>FACILITY GROUPS IN TIME BLOCKS<br>DAY LIST ( )<br>EVENING LIST ( )<br>NIGHT LIST ( ) | <i>The report for the selected route group(s) is generated.</i>                                               |
| REVIEW ADDITIONAL ROUTE GROUPS (N)?                                                                                                                                                                                                                           | Y- Return to the RANGE OF ROUTE GROUPS prompt.<br>N- Continue to the next prompt.                             |
| RANGE OF FACILITY GROUPS TO BE REVIEWED (NONE):                                                                                                                                                                                                               | Select the facility group(s) to be included in the report (1-8, ALL, or NONE).                                |
| FACILITY GROUP X<br>LIST OF CO LINES ( )<br>DIALING RULES ( )                                                                                                                                                                                                 | <i>The report for the selected facility group(s) is generated.</i>                                            |
| REVIEW ADDITIONAL FACILITY GROUPS (N)?                                                                                                                                                                                                                        | Y- Return to the RANGE OF FACILITY GROUPS prompt.<br>N- Return to the LCR menu prompt ([I]).                  |

### 13. [J] DATABASE SAVE/RESTORE

13.1 This program allows an unrestricted programmer to save and/or load the database using an external storage device such as a personal computer. (Refer to SPECIFICATIONS, page 2-17, for information concerning the external storage device.)

Enter J or /SAVE from the database programming menu. The prompts appear as shown below.

**NOTE:** To store the entire system database, 140K bytes of memory are required.

| PROMPT                                                                                              | VALID ENTRY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SELECT DEVICE PORT:<br>P - PRIMARY<br>M - MODEM<br>S - SECONDARY<br>DEVICE PORT (P/S/M)?            | P- APP board port.<br>M- Modem connection.<br>S- IOP board port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DELAY VALUE (DEFAULT - 10 SECONDS):                                                                 | <i>This prompt appears only if the selected port is currently connected to another device.</i><br>Set the delay to a value between 1 and 255 seconds to allow time to prepare the terminal to send or receive the information. Make sure that the baud rates of the selected port and the storage device are the same.                                                                                                                                                                                                                                                                              |
| *** REQUESTED OUTPUT PORT IS BUSY<br>***                                                            | This message appears only if the selected port is busy (for example, SMDR is printing).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| WAIT FOR THE PORT TO BE AVAILABLE (Y):                                                              | Y- The terminal pauses until the port is no longer in use (for example, the SMDR stops printing).<br>N- Return to the SELECT DEVICE PORT prompt and choose another port.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ECHO ENABLE (N)?                                                                                    | Y- The data appears in Motorola-S format on the terminal.<br>N- The data is not displayed.<br><b>NOTE:</b> Some devices do not operate properly when echo is enabled. Unless otherwise instructed, it is recommended that echo not be enabled.                                                                                                                                                                                                                                                                                                                                                      |
| SELECT DEVICE HANDLER:<br>D - CPU/DISK DEVICE<br>T - TECHTRAN DATACASSETTE<br>DEVICE HANDLER (D/T)? | Select the type of storage device that will send or receive the data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SELECT FILE TRANSFER PROTOCOL:<br>Y - ENABLE<br>N - DISABLE<br>ACK/NAK (DEFAULT - DISABLE)?         | <i>If CPU/DISK DEVICE was selected, this prompt appears and allows you to determine the transfer protocol.</i><br>The ACK/NAK file transfer protocol provides a method of validating each line of the database as it is transferred from one device to the other. As each line is transferred, the value that was received is compared with the value that was sent. If the two values match, the ACK character is transmitted to the sending device and the next line is sent. If the values do not match, the NAK character is transmitted to the sending device and the same line is sent again. |
| SELECT SAVE/RESTORE OPERATION:<br>S - SAVE<br>R - RESTORE<br>OPERATION (R/S)?                       | S- Information is sent from the system to the storage device.<br>R- Information is transferred from the storage device to the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

13.2 The terminal then prints one of the following sets of instructions for beginning the save/restore function:

- *If a delay time is set:*

THE DELAY OPERATION IS NOW IN EFFECT. PROCEED WITH ANY RE-CABLING (ETC.) AS NECESSARY. THE SPECIFIED OPERATION WILL START WHEN THE DELAY TIMER EXPIRES.

- *If another port is selected and a delay time is not set:*

ESTABLISH ANY NECESSARY COMMUNICATION WITH THE HOST/DEVICE, THEN TYPE CONTROL-P WHEN READY TO PROCEED.

13.3 When the selected operation is completed, the following message appears:

\*\*\* REQUESTED DATABASE OPERATION HAS SUCCESSFULLY COMPLETED \*\*\*

13.4 *If using the restore function*, the PERFORM A SYSTEM RESET (Y) message is printed when the programmer attempts to exit the system after the database has been loaded. Enter Y to reset the system.

## 14. [K] SYSTEM INITIALIZATION AND RESET

14.1 This program allows an unrestricted programmer to reset the database or return it to the default configuration. It is used when the system is first installed or when the APP board has been replaced. To access this program, enter K or /INIT from the database programming menu. The prompts are preceded with this warning:

**WARNING: THIS TASK WILL END THE PROGRAMMING SESSION AND TERMINATE ALL CALLS IN PROGRESS AS PART OF THE INITIALIZATION PROCESS.**

| PROMPT                                                                                                                          | VALID ENTRY                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYSTEM INITIALIZATION OPTION<br>I= INITIALIZE TO SYSTEM DEFAULT<br>VALUES<br>R= RESET ONLY<br>SYSTEM INITIALIZATION OPTION (R): | I- Initializing the database returns all system information to default values. Advance to the next prompt.<br>R- A reset of the system does not change the database, but drops all calls in progress and erases the SMDR buffer. Advance to the PERFORM UPDATE TO SYSTEM prompt. |
| PRESERVE SELECTED DATA (N):                                                                                                     | N- All data is returned to the default values. Advance to the PERFORM UPDATE TO SYSTEM prompt.<br>Y- Continue to the next prompt to select the data to be saved.                                                                                                                 |
| <i>For the following PRESERVE prompts, enter Y to save the information or N to return to default values:</i>                    |                                                                                                                                                                                                                                                                                  |
| PRESERVE SYSTEM TIMERS (N):                                                                                                     | All system timers.                                                                                                                                                                                                                                                               |
| PRESERVE SYSTEM SPEED DIAL (N):                                                                                                 | All system speed-dial numbers and non-display designations.<br><b>NOTE:</b> Does not preserve the system speed-dial programming station assignment.                                                                                                                              |
| PRESERVE ACCOUNT CODES (N):                                                                                                     | All standard and forced account codes.                                                                                                                                                                                                                                           |
| PRESERVE EXTENSION AND FEATURE CODE ASSIGNMENTS (N):                                                                            | All intercom numbers and feature codes.                                                                                                                                                                                                                                          |
| PRESERVE STATION INFORMATION (N):                                                                                               | User names, station speed-dial numbers, programmable feature keys, station SMDA data, SCOS, secretarial intercept, attendants, call forward requests, and account codes.                                                                                                         |
| PRESERVE TOLL-RESTRICT TABLES (N):                                                                                              | Overlapping area/office code designation, allowed/restricted area and office codes, alternate carrier numbers, and allowed long distance numbers.                                                                                                                                |
| PRESERVE LEAST COST ROUTING TABLES (N):                                                                                         | All route groups, facility groups, and dial rules.                                                                                                                                                                                                                               |
| PRESERVE REPORT PROGRAMMING (N):                                                                                                | SMDA automatic reports, SMDR reports, call cost information, tenant and department names, and error reports.                                                                                                                                                                     |
| REVIEW SELECTED DATA AGAIN (N)?                                                                                                 | Y- Return to the PRESERVE SYSTEM TIMERS prompt.<br>N- Continue to the next prompt.                                                                                                                                                                                               |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?                                                                                     | Y- Complete the selected function.<br>N- Return to the database programming menu prompt ([ ]) without affecting the system.                                                                                                                                                      |

## 15. SMDR AND ERROR PROGRAMMING

15.1 To program the station message detail recording (SMDR) and error message output, select B from the applications program menu. This program sets the parameters for the SMDR and error output. For a program planning sheet, see Figure 5-16 on page 5-148.

15.2 If a password is required for access to the SMDR and error programming menu, the PASSWORD prompt is displayed. If an incorrect password is entered, the terminal returns to the applications program menu.

15.3 The SMDR produces a record of calls and their cost as well as system error messages. Report format

and error messages are discussed in the FEATURES section, starting on page 4-97. The menu appears as shown below:

### SMDR AND ERROR PROGRAMMING

- [A] SMDR OUTPUT
- [B] SMDR REPORTS
- [C] ERROR OUTPUT
- [D] ERROR REPORTS
- [E] ON-LINE ERROR REPORTS
- [F] SMDR AND ERROR PASSWORD
- ? DISPLAY MENU
- . EXIT

#### A. [A] SMDR OUTPUT

15.4 To select the output port for the SMDR, enter A or /OUTR from the SMDR and error programming menu. The prompts appear as shown below. End each entry with < CR > .

| PROMPT                                                                                  | VALID ENTRY                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SMDR OUTPUT ACTIVE (Y):                                                                 | Y- Activate the SMDR output.<br>N- Halt the SMDR output.<br><b>NOTE:</b> Halting the SMDR output places the information (at least 10 calls) in a buffer that is printed when the SMDR resumes operation. |
| SMDR OUTPUT PORT<br>P = PRIMARY<br>M = MODEM<br>S = SECONDARY<br>SMDR OUTPUT PORT (S) : | <i>This prompt appears only if the SMDR is activated.</i><br>P- APP board port.<br>M- Modem connection.<br>S- IOP board port.                                                                            |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                           | <i>This prompt appears only if the SMDR was halted or new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                              |

**B. [B] SMDR REPORTS**

15.5 To determine the information that is included in the SMDR report, enter B or /SMDR from the SMDR and error programming menu. To program the SMDR report contents, enter Y or N to any or all of the following options. End all entries with <CR>.

| PROMPT                                                    | VALID ENTRY                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RECORD ALL INCOMING CALLS (Y):                            | Records all incoming calls.                                                                                                                                                                                                                                                                                                              |
| RECORD ALL LOCAL CALLS (Y):                               | Records all local, non-toll calls that are longer than the valid call timer.                                                                                                                                                                                                                                                             |
| RECORD ALL TOLL CALLS (Y):                                | Records all toll calls that are longer than the valid call timer. Toll calls include calls that begin with 1 or 0, are longer than seven digits, or contain a restricted area or office code.                                                                                                                                            |
| RECORD ALL DISA CALLS (Y):                                | All calls made using DISA are recorded.                                                                                                                                                                                                                                                                                                  |
| RECORD ALL CONFERENCE CALLS (Y):                          | All conference calls that involve an outgoing line are recorded.                                                                                                                                                                                                                                                                         |
| RECORD ALL RING-IN DIAGNOSTICS (Y):                       | A ring-in message is recorded for every incoming call (whether answered or unanswered) to indicate how long it rang.                                                                                                                                                                                                                     |
| RECORD ALL ELAPSED TIME IN SECONDS IF LESS THAN 999 (N):  | Y- Calls up to 999 seconds (about 16.67 minutes) will appear in the ELAPSED TIME field as S = XXX with XXX representing the number of seconds). After 999 seconds, the time appears in hours and minutes, rounded up to the nearest minute.<br>N- Elapsed time will always appear in hours and minutes rounded up to the nearest minute. |
| SUPPRESS ALL ABSORBED DIGITS (N):                         | Y- Absorbed digits (on local or PBX lines) will not appear in the report.<br>N- Absorbed digits appear in the report.<br>NOTE: If absorbed digits are repeatable on a local line, the absorbed digits will not appear in the SMDR report.                                                                                                |
| SUPPRESS ALL BUT THE FIRST TOLL DIGIT (N):                | Y- Only the first digit of the toll field(s) will appear in the number dialed field (i.e., if 10XXX-1-... was dialed, only 11 would appear).<br>N- The entire toll field will appear in the report.                                                                                                                                      |
| SMDR LIST OF STATIONS (ALL):                              | Enter the extension (EXXX) or circuit (X.X) number(s) of the station(s) that will appear in the report. ALL and NONE are valid entries.                                                                                                                                                                                                  |
| SMDR FORMAT<br>W = WIDE<br>N = NARROW<br>SMDR FORMAT (W): | W- Selects the 80-character report format.<br>N- Selects the 64-character report format.                                                                                                                                                                                                                                                 |
| REVIEW SMDR AGAIN (N)?                                    | Y- Return to the RECORD ALL INCOMING CALLS prompt.<br>N- Continue to next prompt.                                                                                                                                                                                                                                                        |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                                                                                                     |

PROGRAMMING

### C. [C] ERROR OUTPUT

15.6 Enter C or /OUTE from the SMDR and error programming menu to activate or halt error message output. The programmer can halt the error output so that messages are only printed when service personnel request them. Or, the programmer can choose to have continuous output for a complete record of all errors. At least 20 error messages are held in a buffer. These messages are printed as soon as the output is activated again.

15.7 If the error message output is activated, select the port. If error messages are sent to the SMDR port, the message appears within the report and call information is buffered while the message prints. Or, the messages can be sent to another port to keep the error information separate from the SMDR information.

| PROMPT                                                                                   | VALID ENTRY                                                                                                                          |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| ERROR MESSAGE OUTPUT ACTIVE (Y):                                                         | Y- Activate the error message output.<br>N- Halt the error message output.                                                           |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                            | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |
| ERROR OUTPUT PORT<br>P = PRIMARY<br>M = MODEM<br>S = SECONDARY<br>ERROR OUTPUT PORT (P): | P- APP board port.<br>M- Modem connection.<br>S- IOP board port.                                                                     |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                            | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |



**D. [D] ERROR REPORTS**

**15.8** This program determines the types of error messages to be included in the error report. It can be reached by entering D or /ERR from the SMDR and error programming menu. For a program planning sheet, refer to Figure 5-16 on page 5-148.

**NOTE:** It is recommended that you do not enable the "user detected user errors" report unless requested to do so by Inter-Tel service personnel.

**15.9** The prompts are as follows. Enter Y to include the information or N to exclude it.

| PROMPT                                        | VALID ENTRY                                                                                                                                      |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| REPORT ALL USER DETECTED USER ERRORS (N):     | An error message is recorded when the software on the APP board detects an inconsistent or illogical condition in the dynamic database.          |
| REPORT ALL SYSTEM DETECTED USER ERRORS (N):   | An error message is recorded when the operating system on the APP board detects an error in the non-operating system software on the same board. |
| REPORT ALL SYSTEM DETECTED SYSTEM ERRORS (N): | An error message is recorded if the operating system detects an inconsistency or error condition in its own data structures.                     |
| REVIEW ERROR MESSAGES AGAIN (N)?              | Y- Return to the REPORT ALL USER DETECTED USER ERRORS prompt.<br>N- Continue to the next prompt.                                                 |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)    | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.             |

**E. [E] ON-LINE ERROR REPORTS**

**15.10** A report containing logged system error messages can be requested at any time using this program. Refer to the previous page for an explanation of the

types of messages. To reach this program, enter E or /OLER from the SMDR and error programming menu. Select the output port in the first prompt and start the output in the second prompt:

| PROMPT                                                                                                 | VALID ENTRY                                                                                                                          |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| ERROR REPORT OUTPUT PORT<br>P = PRIMARY<br>M = MODEM<br>S = SECONDARY<br>ERROR REPORT OUTPUT PORT (P): | P- APP board port.<br>M- Modem connection.<br>S- IOP board port.                                                                     |
| BEGIN ERROR REPORT (Y)?                                                                                | Y- Error report prints in format shown below.<br>N- Advance to the REVIEW SAME ERROR REPORT prompt without printing the report.      |
| Day-XX-Month-19XX HH:MM [Error Message]                                                                | The report includes the date and time of the error and the error code/message.                                                       |
| REVIEW SAME ERROR REPORTS AGAIN (N)?                                                                   | Y- Return to the ERROR REPORT OUTPUT PORT prompt.<br>N- Continue to the next prompt.                                                 |
| CLEAR THE ERROR MESSAGE QUEUE NOW (N):                                                                 | Y- Clear the error report data.<br>N- Save the messages in the system memory.                                                        |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                             | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged. |

**E. [F] SMDR AND ERROR PASSWORD**

15.11 This program gives the option of requiring a password for access to the SMDR and error programming menu. To access this program, enter F or /PASS from the SMDR and error programming menu. This password can also be programmed using the [AH] (passwords) program.

**NOTE:** If a password is created and later designated as *not required*, it remains in the system memory. If it

is later designated as *required* and a new password is not created, the original password is reassigned. Also, if a password is required through this program, one should also be assigned to database programming so that the password cannot be changed in program [AH].

15.12 The prompts appear as shown below. End all entries with < CR >.

| PROMPT                                      | VALID ENTRY                                                                                                                                                                                                                                                   |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REQUIRE A PASSWORD FOR SMDR AND ERROR (N) : | Y- Continue to the next prompt.<br>N- Return to the SMDR and error programming menu prompt ([ ]).                                                                                                                                                             |
| CHANGE SMDR AND ERROR PASSWORD (N)?         | Y- Continue to the next prompt.<br>N- Advance to the PERFORM UPDATE TO SYSTEM DATABASE prompt.                                                                                                                                                                |
| ENTER NEW PASSWORD :                        | Enter the password (up to eight characters).                                                                                                                                                                                                                  |
| ENTER NEW PASSWORD AGAIN :                  | Enter the same characters. If they do not match the first entry, an error message appears; return to the ENTER NEW PASSWORD prompt. (The passwords must be typed twice because they do not appear on the screen and cannot be verified before being entered.) |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)  | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                          |

## 16. SMDA PROGRAMMING

16.1 The SMDA feature produces a record of call costs in a format similar to a telephone bill. Refer to FEATURES, page 4-89, for details on SMDA report options. To program the SMDA information, select C from the applications program menu. You may wish to use the SMDR/SMDA program planning sheet, Figure 5-17, on page 5-149. The menu appears as shown below:

### STATION MESSAGE DETAIL ACCOUNTING (SMDA)

- [A] AUTOMATIC SMDA REPORTS
- [B] ON-LINE SMDA REPORTS
- [C] SMDA PASSWORD
- [D] CALL COST FACTORS
- ? DISPLAY MENU
- . EXIT

NOTE: In the basic-software packages, only program [D] CALL COST FACTORS can be accessed.

16.2 If a password is required for access to the SMDA program, the PASSWORD: prompt appears. The password can be up to eight characters long. An incorrect password causes the system to return to the applications program menu.

### A. [A] AUTOMATIC SMDA REPORTS

16.3 This program establishes the frequency, format, and output port for the automatic SMDA reports. It is reached by entering A or /AUTO from the SMDA programming menu. The prompts and valid entries are as follows. End each entry with <CR>.

| PROMPT                                                                                  | VALID ENTRY                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENABLE AUTOMATIC SMDA REPORT GENERATION (N):                                            | Y- An SMDA output device is connected to the system.<br>N- No output device is connected for SMDA.                                                                                                                                                                                                                 |
| REPORTING INTERVAL<br>D - DAILY<br>W - WEEKLY<br>M - MONTHLY<br>REPORTING INTERVAL (D): | D- Reports print daily. Go to the TIME OF DAY prompt.<br>W- Reports print weekly. Go to the DAY OF WEEK prompt.<br>M- Reports print monthly. Continue to the next prompt.                                                                                                                                          |
| DAY OF MONTH (1):                                                                       | If monthly, select the day of the month on which reports are to be generated. Advance to the TIME OF DAY prompt.<br><b>NOTE:</b> If the date does not occur within the month (e.g., 30 is not in February), the report is not generated. For end-of-the-month reports, select 00:00 on the first day of the month. |
| DAY OF WEEK (SUN):                                                                      | If weekly, enter a three-letter abbreviation for the day of the week that reports are to be generated (SUN, MON, TUE, WED, THU, FRI, SAT).                                                                                                                                                                         |
| TIME-OF-DAY FOR AUTOMATIC REPORTS (00:00):                                              | Select the time of day that reports are generated. Input hours and minutes in 24-hour international time.                                                                                                                                                                                                          |
| SMDA OUTPUT PORT<br>P - PRIMARY<br>M - MODEM<br>S - SECONDARY<br>SMDA OUTPUT PORT (S):  | P- APP board port.<br>M- Modem connection.<br>S- IOP board port.                                                                                                                                                                                                                                                   |
| REVIEW SMDA REPORT FORMAT (N) ?                                                         | Y- Continue to the next prompt.<br>N- Advance to the STATION/CO LINE DATA WAS LAST CLEARED prompt.                                                                                                                                                                                                                 |

| PROMPT                                                                                                                                                                                                                             | VALID ENTRY                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GENERATE ACCOUNT CODE REPORTS (N):                                                                                                                                                                                                 | Y- Reports are generated for up to 199 account code records, with one "overflow" record. (See FEATURES, page 4-89, for an explanation of account code reports.)<br>N- Advance to the GENERATE SUMMARY REPORTS prompt.           |
| CLEAR ACCOUNT CODE DATA FOLLOWING REPORT (N):                                                                                                                                                                                      | Y- Each report includes only the information accumulated since the previous report.<br>N- Each report is cumulative.                                                                                                            |
| GENERATE SUMMARY REPORTS (Y):                                                                                                                                                                                                      | Y- Summary reports are generated. Continue to the next prompt.<br>N- Advance to the GENERATE SELECTED STATION prompt.                                                                                                           |
| SYSTEM-WIDE REPORT (Y):<br>TENANT REPORT (Y):<br>TENANT/DEPARTMENT REPORT (Y):                                                                                                                                                     | Select the group(s) to be included in the summary report.                                                                                                                                                                       |
| GENERATE SELECTED STATION/CO LINE REPORTS (N):                                                                                                                                                                                     | Y- Reports are generated for individual stations or C.O. lines. Advance to the next prompt.<br>N- Advance to the GENERATE DETAILED REPORTS prompt.                                                                              |
| STATION REPORT BY EXTENSION/<br>CIRCUIT NUMBER (N):                                                                                                                                                                                | Y- Reports will be generated for individual stations.<br>N- Advance to the CO LINE REPORT prompt.                                                                                                                               |
| LIST OF STATIONS (NONE):                                                                                                                                                                                                           | Indicate the station(s) to be included. Use circuit (X.Y) or intercom (EXXX) numbers. ALL or NONE are valid entries. If NONE is entered, a message states that "No Report Will Be Generated."                                   |
| CO LINE REPORT BY CIRCUIT<br>NUMBER (N):                                                                                                                                                                                           | Y- Reports include C.O. lines. Advance to the next prompt.<br>N- Advance to the GENERATE DETAILED REPORTS prompt.                                                                                                               |
| LIST OF CO LINES (NONE):                                                                                                                                                                                                           | Indicate the C.O. line(s) to be included. Use circuit numbers (X.X). ALL or NONE are valid entries. If NONE is entered, a message states that "No Report Will Be Generated."                                                    |
| GENERATE DETAILED REPORTS (N):                                                                                                                                                                                                     | Y- Detailed reports are generated. Continue to the next prompt.<br>N- If any changes were made in previous prompts, advance to the REVIEW REPORT FORMAT AGAIN prompt. If not, advance to the CLEAR STATION/CO LINE DATA prompt. |
| REPORT OF ALL USERS IN TENANT/DEPT.<br>GROUPS (BY CIRCUIT #) (N):<br>REPORT OF TOP USERS IN THE SYSTEM<br>(N):<br>REPORT OF TOP USERS IN EACH<br>TENANT GROUP (N):<br>REPORT OF TOP USERS IN EACH<br>TENANT/ DEPARTMENT GROUP (N): | Select the group(s) to be included in the detailed report.                                                                                                                                                                      |

| PROMPT                                                                                                                                      | VALID ENTRY                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOP USERS RANKED BY TOTAL COST (N):<br>TOP USERS RANKED BY TOTAL<br>DURATION (N):<br>TOP USERS RANKED BY TOTAL NUMBER<br>OF CALLS (N):      | Select the ranking criteria for the detailed report. Users can be ranked by call cost, call duration, or number of calls.                                                                                   |
| REVIEW RANKING CHOICES AGAIN (N)?                                                                                                           | This prompt appears if you do not select the criteria in the prompt above. Answer Y to try again, or N to continue.                                                                                         |
| TOP 'N' USERS [1-120] PER REPORT (120):                                                                                                     | Select the number of users that are ranked for each system, tenant, or department report (for example, enter 10 to print the top 10 users in each report ranking).                                          |
| CLEAR STATION/CO LINE DATA<br>FOLLOWING REPORT (N):                                                                                         | Y- The next report will include only the information accumulated after this report is printed.<br>N- Each report will include information accumulated since the data was last cleared.                      |
| REVIEW REPORT FORMAT AGAIN (N)?                                                                                                             | Y- Return to the GENERATE ACCOUNT CODE REPORTS prompt.<br>N- Continue to the next prompt.                                                                                                                   |
| STATION/CO LINE DATA WAS LAST<br>CLEARED Day-XX-Month-19XX HH:MM<br>(e.g. FRI-27-JAN-1990 12:00) CLEAR THE<br>STATION/CO LINE DATA NOW (N): | Y- All stored cumulative station data is cleared.<br>N- Later reports will include data from previous printouts.<br>NOTE: Answer Y when the system is first installed to set the date for the first report. |
| ACCOUNT CODE DATA WAS LAST<br>CLEARED Day-XX-Month-19XX HH:MM<br>(e.g. FRI-27-JAN-1990 12:00) CLEAR THE<br>ACCOUNT CODE DATA NOW (N):       | Y- All stored account code data is cleared.<br>N- Later reports will include data from previous printouts.<br>NOTE: Answer Y when the system is first installed to set the date for the first report.       |
| PERFORM UPDATE TO SYSTEM<br>DATABASE (Y OR N)                                                                                               | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                        |

**B. [B] ON-LINE SMDA REPORTS**

16.4 This program generates an on-line SMDA report. It is reached by entering B or /SMDA from the SMDA programming menu. The format settings temporarily change the SMDA output without affecting the automatic SMDA reports. The prompts appear as shown below. End each entry with < CR >.

| PROMPT                                                                                 | VALID ENTRY                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SMDA OUTPUT PORT<br>P = PRIMARY<br>M = MODEM<br>S = SECONDARY<br>SMDA OUTPUT PORT (S): | Select the output port. The primary port is on the APP board. The secondary port is on the IOP board.                                                                                                             |
| REVIEW SMDA REPORT FORMAT (N) ?                                                        | Y- Continue to the next prompt.<br>N- Advance to the BEGIN SMDA REPORTING prompt.                                                                                                                                 |
| GENERATE ACCOUNT CODE REPORTS (N):                                                     | Y- Reports are generated for up to 199 account code records, with one "overflow" record. (See FEATURES, page , for an explanation of account code reports.)<br>N- Advance to the GENERATE SUMMARY REPORTS prompt. |
| CLEAR ACCOUNT CODE DATA FOLLOWING REPORT (N):                                          | Y- Each report includes only the information accumulated since the previous report.<br>N- Each report is cumulative.                                                                                              |
| GENERATE SUMMARY REPORTS (Y):                                                          | Y- Summary reports are generated. Continue to the next prompt.<br>N- Advance to the GENERATE SELECTED STATION prompt.                                                                                             |
| SYSTEM-WIDE REPORT (Y) :<br>TENANT REPORT (Y) :<br>TENANT/DEPARTMENT REPORT (Y) :      | Select the groups to be included in the summary reports.                                                                                                                                                          |
| GENERATE SELECTED STATION/ CO LINE REPORTS (N):                                        | Y- Reports are generated for individual stations or C.O. lines.<br>N- Advance to the GENERATE DETAILED REPORTS prompt.                                                                                            |
| STATION REPORT BY EXTENSION/ CIRCUIT NUMBER (N):                                       | Y- Reports will be generated for individual stations.<br>N- Advance to the CO LINE REPORT prompt.                                                                                                                 |
| LIST OF STATIONS (NONE):                                                               | Indicate the station(s) to be included. Use circuit numbers (X.X).                                                                                                                                                |
| CO LINE REPORT BY CIRCUIT NUMBER (N):                                                  | Y- Reports include C.O. lines.<br>N- Advance to the GENERATE DETAILED REPORTS prompt.                                                                                                                             |
| LIST OF CO LINES (NONE):                                                               | Indicate the C.O. line(s) to be included. Use circuit numbers (X.X).                                                                                                                                              |

PROGRAMMING

| PROMPT                                                                                                                                                                                                                    | VALID ENTRY                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GENERATE DETAILED REPORTS (N):                                                                                                                                                                                            | Y- Detailed reports are generated. Continue to the next prompt.<br>N- If any changes were made in previous prompts, advance to the REVIEW REPORT FORMAT AGAIN prompt. If not, advance to the CLEAR STATION/CO LINE DATA prompt.    |
| REPORT OF ALL USERS IN TENANT/<br>DEPT. GROUPS (BY CIRCUIT #) (N):<br>REPORT OF TOP USERS IN THE SYSTEM (N):<br>REPORT OF TOP USERS IN EACH TENANT GROUP (N):<br>REPORT OF TOP USERS IN EACH TENANT/DEPARTMENT GROUP (N): | Select the group(s) to be included in the detailed report.                                                                                                                                                                         |
| TOP USERS RANKED BY TOTAL COST (N):<br>TOP USERS RANKED BY TOTAL DURATION (N):<br>TOP USERS RANKED BY TOTAL NUMBER OF CALLS (N):                                                                                          | Select the ranking criteria for the detailed report. Users can be ranked by call cost, call duration, or number of calls. <i>If you do not select the criteria, you will receive an error message and the prompts will repeat.</i> |
| TOP 'N' USERS [1-120] PER REPORT (120):                                                                                                                                                                                   | Select the number of users that are ranked for each system, tenant, or department report (for example, enter 10 to print the top 10 users in each report ranking).                                                                 |
| REVIEW RANKING CHOICES AGAIN (N)?                                                                                                                                                                                         | <i>This prompt appears only if you did not select a ranking option or enter the number of users above.</i><br>Y- Return to the TOP USERS RANKED BY TOTAL COST prompt.<br>N- Continue to the next prompt.                           |
| CLEAR STATION/CO LINE DATA FOLLOWING REPORT (N):                                                                                                                                                                          | Y- The next report will include only the information accumulated after this report is printed.<br>N- Each report will include information accumulated since the data was last cleared.                                             |
| REVIEW REPORT FORMAT AGAIN (N)?                                                                                                                                                                                           | Y- Return to the GENERATE ACCOUNT CODE REPORTS prompt.<br>N- Continue to the next prompt.                                                                                                                                          |
| BEGIN SMDA REPORTING (Y):                                                                                                                                                                                                 | Y- Ensure that the output port is ready. Then enter <CR>.<br>N- Return to the SMDA programming menu prompt ([ ]):                                                                                                                  |
| GENERATE ANOTHER REPORT (N):                                                                                                                                                                                              | Y- Return to the SMDA OUTPUT PORT prompt.<br>N- Return to the SMDA programming menu prompt ([ ]):                                                                                                                                  |



**C. [C] SMDA PASSWORD**

**16.5** This program gives the option of requiring a password to access the SMDA programming menu. It is accessed by entering C or /PASS from the SMDA programming menu. This password can also be programmed using the [AH] (passwords) program.

**NOTE:** If a password is created and later designated as *not required*, it remains in the system memory. If it

is later designated as *required* and a *new* password is not created, the original password is reassigned. Also, if a password is required through this program, one should also be assigned to database programming so that the password cannot be changed in program [AH].

**16.6** The prompts appear as shown below. End each entry with < CR >.

| PROMPT                                     | VALID ENTRY                                                                                                                                                                                                                                              |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REQUIRE A PASSWORD FOR SMDA (N):           | Y- Continue to the next prompt.<br>N- Return to the SMDA programming menu prompt (I ).                                                                                                                                                                   |
| CHANGE SMDA PASSWORD (N)?                  | Y- Continue to the next prompt.<br>N- Advance to the PERFORM UPDATE TO SYSTEM DATABASE prompt.                                                                                                                                                           |
| ENTER NEW PASSWORD :                       | Enter the password (up to eight characters).                                                                                                                                                                                                             |
| ENTER NEW PASSWORD AGAIN :                 | Enter the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt. (The passwords must be typed twice because they do not appear on the screen and cannot be verified before being entered.) |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.                                                                                                                     |

**D. [D] CALL COST FACTORS**

16.7 This program establishes the variables used in calculating the call cost portion of the SMDA report and SMDR reports. Call cost information is also shown on display keysets. To access the program, enter D or /COST from the SMDA programming menu. For a program planning sheet, refer to Figure 5-17, on page 5-150.

**NOTE:** The system's call cost accounting feature is intended to provide a cost estimate that is applied to the various classes of calls. Due to the wide variation in charges among network carriers, the system's call cost calculation cannot be used as prediction of actual charges. This feature can only be used as a management tool to estimate call cost.

16.8 Before using this program, determine the daytime rates (in dollars per minute) for the following types of calls. Use several telephone bills from

months with typical usage to calculate the average cost per minute of each type of call. Record the charges in dollars and cents from 00.00 to 99.99. You may need to adjust the calculations later to more accurately estimate actual call costs. (Refer to page 4-89 in FEATURES for more information.)

- Local calls
- Seven-digit toll calls
- Ten-digit toll calls
- Operator-assisted and international calls
- Incoming calls

16.9 Then, determine the discount rates for night/ weekend and evening calls. Record these as decimal factors. For example, an evening discount rate of 35% would have a factor of 0.65. The allowed range is between 0.00 and 1.99. The prompts appear as shown below. End each entry with <CR>.

| PROMPT                                                                                                                                                                                      | VALID ENTRY                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| LOCAL AREA CODE ( )                                                                                                                                                                         | Enter the three-digit area code. An error message appears if you enter an invalid area code or no area code.                          |
| DAYTIME RATES IN DOLLARS PER MINUTE<br><br>LOCAL CALL (0.05) ;<br>7-DIGIT TOLL CALL (0.20) ;<br>10-DIGIT TOLL CALL (0.50) ;<br>OPERATOR/INTERNATIONAL CALL (1.00);<br>INCOMING CALL (0.00); | Enter the per-minute cost in dollars and cents for calls placed during the day. The range is 0.00 to 99.99.                           |
| MULTIPLICATIVE FACTORS<br><br>EVENING (0.65);<br>NIGHT AND WEEKEND (0.40);                                                                                                                  | Enter the number that, when multiplied by the above rates, produces the evening and night rates for calls. The range is 0.00 to 1.99. |
| REVIEW CALL COST AGAIN (N)?                                                                                                                                                                 | Y- Return to the LOCAL AREA CODE prompt.<br>N- Return to the SMDA programming menu prompt ([ ]).                                      |
| PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)                                                                                                                                                  | <i>This prompt appears only if new information was entered.</i><br>Enter Y to save the changes or N to leave the database unchanged.  |

## 17. MENU DISPLAYS

17.1 For convenience, the programmer can set the system to display menus as desired (always, at change of menu, or on request). To determine when the current menu is displayed, select D from the applications program menu. The prompts appear as shown below. End each entry with < CR > .

| PROMPT                                                                                                    | VALID ENTRY                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DISPLAY CURRENT MENU<br>A = ALWAYS<br>C = CHANGE OF MENU<br>R = REQUEST ONLY<br>DISPLAY CURRENT MENU (C): | A- The current menu displays whenever a menu prompt appears.<br>C- The current menu displays only when an item in a new menu is selected.<br>R- The menu appears only when the display request question mark (?) is entered. |
| RING BELL ON PROGRAMMING ERROR<br>MESSAGES (Y):                                                           | Y- While programming, all error messages are accompanied by a bell.<br>N- Error messages appear without ringing bell.                                                                                                        |

## 18. ON-LINE MONITOR

18.1 The on-line monitor program is used to display and change the system memory. Because it requires a knowledge of hexadecimal and binary mathematics, it is intended only for use by an advanced installer or engineer for "debugging" and maintaining the system. *This program is not intended for untrained personnel.*

18.2 The on-line monitor menu is accessed by entering E from the applications program menu prompt. It includes the following:

### ON-LINE MONITOR

- [A] CPU/APP ON-LINE MONITOR
- [B] IOP ON-LINE MONITOR
- [C] APP ACTIVITY MONITOR
- ? DISPLAY MENU
- . EXIT

[MONITOR]:

### A. [A] CPU/APP ON-LINE MONITOR AND [B] IOP ON-LINE MONITOR

18.3 Both of the on-line monitor programs (choices A and B) follow the same format as described in the following paragraphs. When program [A] is first selected, the following warning appears:

**WARNING: THE ON-LINE MONITOR SHOULD BE USED ONLY BY TRAINED PERSONNEL. CHANGING VALUES COULD RESULT IN A MAJOR SYSTEM FAILURE.**

18.4 A summary of the commands available can be viewed using the HELP directory. The help directory is displayed any time the programmer enters either a question mark (?) or HELP in response to one of the command level prompts (APP > or IOP >).

18.5 The help directory shows the following commands:

| ON-LINE MONITOR HELP FACILITY |                               |      |                              |
|-------------------------------|-------------------------------|------|------------------------------|
| C                             | CHANGE MEMORY < B, W, L >     | NS   | FIND NEXT MATCHING STRING    |
| C+                            | ADD TO MEMORY START ADDRESS   | PE   | PEEK INTO MEMORY < B, W, L > |
| ERRH                          | TOGGLE ERROR HALT BIT         | PO   | POKE INTO MEMORY < B, W, L > |
| ERRP                          | TOGGLE ERROR PRINT BIT        | QUIT | EXIT THE ROUTINE             |
| EXIT                          | EXIT THE ROUTINE              | SDOF | DISABLE SYSTEM DIAGNOSTICS   |
| EXT                           | CONVERT EXTENSION TO TYPE/NUM | SDON | ENABLE SYSTEM DIAGNOSTICS    |
| F                             | FIND MEMORY < B, W, L >       | SEND | SEND A MESSAGE TO THE IOP    |
| FIFO                          | TOGGLE CPU/APP MESSAGE ENABLE | STR  | FIND STRING IN MEMORY        |
| FRZ                           | FREEZE IOP POLLING            | UDOF | DISABLE USER DIAGNOSTICS     |
| HELP                          | PRINT HELP DIRECTORY          | UDON | ENABLE USER DIAGNOSTICS      |
| I                             | INITIALIZE MEMORY < B, W, L > | UFRZ | UN-FREEZE IOP POLLING        |
| M                             | MEMORY DUMP < B, W, L >       | *    | MULTIPLY WITH ACCUMULATOR    |
| MSG                           | TOGGLE IOP MESSAGE ENABLE     | +    | ADDITION WITH ACCUMULATOR    |
| MV                            | MOVE MEMORY BLOCK < B, W, L > | .    | EXIT THE ROUTINE             |
| M+                            | ADD TO MEMORY START ADDRESS   | ?    | PRINT HELP DIRECTORY         |

18.6 After the help menu has been displayed, the terminal sends the message TYPE A PERIOD TO TERMINATE HELP, ANY OTHER TO CONTINUE. If you continue, the following menu appears.

| FORMATTED CONTROL BLOCKS |                           |      |                         |
|--------------------------|---------------------------|------|-------------------------|
| COCB                     | PRINT DYNAMIC CO-CCB      | KCBS | PRINT STATIC KEYSSET CB |
| DCBD                     | PRINT DYNAMIC DSS CB      | LCBD | PRINT DYNAMIC CO-LCB    |
| DCBS                     | PRINT STATIC DSS CB       | LCBS | PRINT STATIC CO-LCB     |
| DDBF                     | PRINT DIALED DIGIT BUFFER | SCBD | PRINT DYNAMIC SL-CB     |
| ICCB                     | PRINT DYNAMIC IC-CCB      | SCBS | PRINT STATIC SL-CB      |
| KCBD                     | PRINT DYNAMIC KEYSSET CB  |      |                         |

18.7 The terminal then sends the message TYPE A PERIOD TO TERMINATE HELP, ANY OTHER TO CONTINUE. If you continue, the following menus appear.

| RESOURCE MANAGER ROUTINES |                              |      |                             |
|---------------------------|------------------------------|------|-----------------------------|
| CCB                       | CALL CONTROL BLOCK BIT LIST  | DTMF | DTMF BIT LIST & MAP         |
| CNF                       | CONFERENCE CIRCUIT BIT LIST  | ICO  | IC CALL CONTROL BLOCK QUEUE |
| COQ                       | CO CALL CONTROL BLOCK QUEUE  | SPQ  | SMDR WAIT QUEUE             |
| DB                        | DIALED-DIGIT BUFFER BIT LIST | TS   | TIMESLOT BIT LIST           |
| DBQ                       | DIALED-DIGIT BUFFER QUEUE    | TSQ  | TIMESLOT QUEUE              |
| DIAG                      | TOGGLE CP DIAGNOSTICS BIT    |      |                             |

| ADDITIONAL ROUTINES |                             |      |                           |
|---------------------|-----------------------------|------|---------------------------|
| BELL                | RING BELL ON ERROR MESSAGES | CPMH | CP MESSAGE HISTORY QUEUE  |
| CPFR                | FREEZE CP MESSAGE QUEUE     | CPUF | UNFREEZE CP MESSAGE QUEUE |
| RHST                | DUMP RESET HISTORY          | CPF? | CP MESSAGE QUEUE FROZEN?  |
| CPDS                | CP HIST FROM CURRENT MSG    | CPDH | DUMP CP MESSAGE HISTORY   |
| CODS                | CO HIST FROM CURRENT MSG    | CODH | DUMP CO MESSAGE HISTORY   |
| AUX                 | DUMP X AUX INFO RECORDS     | AUXD | DUMP AUXILIARY HISTORY    |
| PORT                | ACTIVE PORT IDENTIFICATION  | UDDG | UP/DOWN DIAG TOGGLE       |

18.8 To exit the on-line monitor program and return to the [MONITOR]: prompt, enter EXIT, QUIT, or a period (.) at any command level prompt.

18.9 The first group of commands shown in the HELP menu are used to find, change, and initialize the system memory blocks, as described in the following paragraphs.

#### Find Memory

18.10 The find (F) function allows the user to locate all instances of a specified KEY (ANDed with the optional mask) in a given range of memory. The command is used in the following format:

F[B/W/L] START STOP KEY [MASK]

18.11 The following parameters can be specified:

- The memory range can be specified as start and stop address, or as a start address followed by the number of locations to be searched.
- The number of locations to be searched depend on the mode (byte, word, or longword).
- The substring must start on a word boundary.
- Values taken from memory are ANDed with the mask value before they are compared to the input value for the KEY. When only the first three parameters are input, the default value of the mask is \$FFFFFFF, specifying an exact match between the memory values and the KEY.

18.12 For example, the command FL C000 30 FE00 locates the next \$30 (hex) longwords beginning at location \$C000 for the longword value \$0000FE00.

18.13 When a match is found, the entire line (or lines) containing the matched substring is displayed and the memory repeat address is set to the base of the line. When multiple locations match the input KEY, the entire line is printed and the system continues to display matching information until a full page has been displayed on the screen. The system then waits for either a period (.) to terminate the find command, or any other character to continue searching until the range has been exhausted or another full page has been displayed (in which case the system waits again).

#### Find String in Memory

18.14 The find string (STR) command allows the programmer to search through an area of memory for the given literal string. The command uses the following format:

STR START STOP LITERAL string

18.15 Three parameters are required for the STR command:

- The starting address of the search.
- Either the stop address or the range of words that are to be searched.
- The final parameter that specifies the literal string to find. The string and the memory are converted to upper case letters before the comparisons are made.

18.16 If a match is not found, a message is displayed. Or, when a match is found, the lines that contain the substring are displayed and the memory repeat mode is enabled for the next line. When the command prompt displays, either inspect the memory that follows the string by pressing the carriage return <CR> key, or search for another instance of the string by typing NS on a line by itself. The search is picked up from the point where it left off and searches the remainder of the requested range.

#### Memory Dump

18.17 The memory dump (M) command allows the programmer to display an area of memory in one of three formats. Word format (default value) is displayed when an M or MW is followed by the optional start and stop parameters. Byte format is requested by entering MB. Longword format is used when ML is entered.

18.18 The memory dump (M) command uses the following format:

M[B/W/L] [[START] [STOP]]

**18.19** The START and STOP addresses follow the format command to determine the beginning and end of the selected memory block. For example:

- **ML C000, 4** or **ML C000 4** — A new start address is specified for the start parameter, followed by the number (interpreted as a hexadecimal value) of memory longwords to display.
- **ML ,4** — Use the current value for the memory start address and display the next 4 longwords of memory. When no starting address is specified, the current value of the memory dump START variable is used. (To add to the start address for the memory dump processor, use the M+ command.)
- **M** — Sixteen lines of word-formatted memory are displayed using the current value for START as the start address.

**NOTE:** Either a comma (,) or space can be used to separate the parameters.

**18.20** The memory dump pauses between pages. Enter one of the following characters:

- An "at" sign (@) — The current value for the memory START variable is set to the base address of the top of the current page. This allows the programmer to read a large area of memory and mark an area for the default start address to begin the next use of the memory dump command.
- A comma (,) — The current screen of data is re-displayed. This allows the programmer to observe data as it is changed by some other task.
- A period (.) — The memory dump command is terminated. The memory START variable is unaffected.
- A circumflex (^) or asterisk (\*) — The previous screen of data is displayed. This allows the programmer to back up. The back-up can extend beyond the memory START address.
- Any other character — The next screen of data is displayed. Pages of memory are displayed until this mode is terminated with either a period (.) or @, or the end of the range is reached.

**18.21** After an area of memory is displayed, successive lines of memory can be viewed by pressing the carriage return <CR> in response to the command prompt (either APP> or IOP>).

### Change Memory

**18.22** The change memory (C) command allows the programmer to change a byte, word, or longword in either IOP or APP memory. The command is entered in the following format:

C[B/W/L] [START]

**18.23** The start address for the change command is optional; one of the following can be used: Use word format (default value) by entering C or CW (with or without a starting address), specify byte format by entering CB, or select longword format using CL.

**18.24** To terminate the change mode, enter one of the following characters followed by a carriage return <CR>.

- An "at" sign (@) — The start address can be changed at any time by simply entering a new start address when the change command is entered or by using the @ terminator while in change mode. When the @ terminator is used, the change mode START parameter is set to the address currently displayed on the terminal.
- A comma (,) — The same line is re-displayed on the terminal.
- A period (.) — Return to the command prompt for the on-line monitor.
- A circumflex (^) or asterisk (\*) — The previous line of memory is displayed at the terminal.
- A <CR> — Continue to the next line of memory.

### Add To Memory Start Address

**18.25** The M+ and C+ commands add an offset to the current memory or change start address to determine the starting address of a field within a data structure. (They do not change the current start address.) They are used in the following format:

M+ ADDEND or C+ ADDEND

**18.26** Once the field address has been computed, full lines of memory can be viewed by pressing the carriage return <CR> key.

**18.27** Depending on whether the M+ or C+ is used, after the computed address is displayed (RESULT = XXXXXX) the system is put into memory display mode or change mode (auto repeat is enabled).

### Initialize Memory

18.28 The initialize memory (I) command allows the programmer to initialize a range of memory bytes, words, or longwords to any desired value. The command uses the following format:

I[B/W/L] START STOP KEY.

18.29 The parameters for the initialize command are similar to the find command in that the range is given by a start and stop address or a start address followed by the amount of memory to initialize.

18.30 For example, the command I 15000 A 11 causes the 10 words starting at location \$15000 to be initialized to 0011.

### Move Memory Block

18.31 The move memory (MV) command allows the programmer to move a block of memory to another location. Enter the command in the following format:

MV[B/W/L] START STOP DESTINATION

18.32 The same parameters used for the find command are needed to move the blocks. When MV is used without a size qualifier, the default value is word. To specify byte, word, or longword, use MVB, MVW, or MVL, respectively.

18.33 No provision is made for overlapping buffers. Therefore, depending on the degree of overlap and the direction of the move, the resulting buffer may not be what was expected.

### Toggle Error Halt/Error Print Bits

18.34 The ERRH/ERRP commands are used to turn on and off the call processing error display. When the ERRP bit is set and a call processing error occurs, the error messages are posted for the call processing error print task.

### Enable/Disable System Diagnostics

18.35 The SDON/SDOF commands are used to enable and disable the reporting of system diagnostic

messages to the primary port. SDOF disables error messages and SDON enables error messages.

### Enable/Disable User Diagnostics

18.36 The UDON/UDOF commands are used to enable and disable the printout of user diagnostic messages to the primary port. UDOF disables error messages and UDON enables error messages.

### Toggle APP/CPU Message Enable Bit

18.37 The FIFO command toggles the APP message enable bit. When this bit is set (1), all message packets that are sent to the IOP (from the APP) are displayed at the primary port. When this bit is cleared, the message packets are not displayed.

### Toggle IOP Message Enable Bit

18.38 The MSG command is used to toggle the IOP message enable bit. When this bit is set, messages that are sent through the FIFO from the IOP to the APP are displayed at the primary port. When the message bit is cleared, no message is displayed.

### Send A Message To The IOP

18.39 Entering the SEND command allows the programmer to send messages (entered from the keyboard) to the IOP. After each message is sent to the IOP, the IOP message processor prompts the user for another message. This mode can be terminated by entering a period (.) in response to the prompt IOP MESSAGE:.

#### CAUTION

Message validity is NOT verified before being sent to the IOP. It is therefore the responsibility of the user to send proper messages.

### Freeze IOP Polling

18.40 The FRZ/UFRZ commands are used to enable and disable the IOP keyset polling. The FRZ command causes the IOP to stop polling the keysets for data. In this mode, the rest of the system continues to function as normal. The UFRZ command re-enables the IOP polling function so that the entire system functions normally.



### Multiply With Accumulator

18.41 The multiply command (\*) uses the following format:

\* [P1], P2

18.42 It requires up to two parameters. The first parameter represents the accumulator value and is optional for this command. If missing, the multiplicand is the value for the accumulator. For example, \*,12 is interpreted correctly as 12 times the accumulator value. However, \* 12 is interpreted as 12 times the constant value.

18.43 All inputs are interpreted as hexadecimal values. The unary operators + and - are allowed.

### Addition With Accumulator

18.44 The add command (+) requires uses the following format:

+ [P1], P2

18.45 It requires up to two parameters. The first parameter represents the primary addend and is optional for this command. If missing, the primary addend is taken from the accumulator for the add instruction. This allows results to accumulate over several additions. The second parameter specifies the secondary addend and is also optional. If the secondary addend is omitted, the constant value is used in its place.

**NOTE:** When the primary addend is missing, the user must precede the second parameter with a comma or it is taken as a new value for the accumulator. For example, +,12 is interpreted correctly as the accumulator plus 12. However, + 12 is interpreted as 12 plus the constant value.

18.46 All inputs are interpreted as hexadecimal values. The unary operators + and - are allowed.

### Memory Read/Write Commands

18.47 The PE/PO commands allow the programmer to inspect or change a byte, word, or longword in either APP or IOP memory. They use the following format:

PE [B/W/L] [START] or PO [B/W/L] [START]

18.48 The start address for the peek and poke commands are optional and default to the last start address specified for the command. The default size of the commands is word. Choose one of the following, if desired: Enter POB or PEB for byte, enter POW or PEW for word, or enter POL or PEL for longword.

18.49 The terminators are the same for the memory change (M) command.

### Convert Extension Number to Type and Logical Number

18.50 The EXT command allows the programmer to enter the extension (intercom) number of a station. The terminal then displays the type of station instrument and the hex value of the control block associated with the extension number. Enter the command in the following format:

EXT EXXX (extension number)

### Formatted Control Blocks

18.51 The formatted control block commands can be used to display the blocks of system data. The control blocks are displayed with the data on the right half of the screen and a brief description on the left half of the screen. The fields are separated by a colon.

18.52 The base address of the control block is output as a 32-bit hexadecimal value on the first line of the display. The remaining fields of the control block are output using hexadecimal, binary, ASCII, or DTMF binary-coded decimal (DTMF BCD) values.

18.53 The hexadecimal values begin with a dollar sign (\$) and can be represented as byte, word, 3-byte, or longword fields. Individual fields that contain more than one value are separated by blank spaces and as many fields as possible are put on the same line. A new line for the same field starts with a colon in the middle of the page or screen.

18.54 All binary fields are broken into byte quantities and begin with a percent sign (%). As many values as will fit in the right half of the page/screen are output with blank spaces inserted to separate the fields.

18.55 ASCII fields are displayed without spaces. As many characters as will fit on a line are output before a new line is started.

18.56 DTMF BCD values are represented according to the table shown in the box below. These values are printed as a single field with no intervening spaces.

**Resource Manager Routines**

18.57 The commands listed under resource manager routines in the HELP menu are used to specify the

resource list to be inspected. After the source is specified, the programmer can view and/or change (using the change memory command) the contents of the resource displayed.

**CAUTION**

The resource manager routines can change values that can cause a major system failure.

| DTMF BCD      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Display Value | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | # | * | S | M | L |

S — short pause  
 M — medium pause  
 L — long pause

**B. [C] APP ACTIVITY MONITOR**

**18.58** This program is intended for use by trained engineers to monitor the activity of the APP. The APP activity monitor produces a graph that shows the amount of useful work being performed by the APP. Useful work includes executing call processing code, applications code, or operating system code. It does not include searching for information or waiting for a backlogged IOP. The graph appears in the form of a three-column bar chart as shown below:

```
BUSY FIFO :
xxx% xxx% :***** . . *****
xxx% xxx% :***** . . ***
xxx% xxx% :***** . . *****
```

**18.59** The first column (BUSY) indicates the total percentage of time that the APP was busy during the time the graph was being generated. For example, if a new graph is generated every 3 seconds and the percentage is 50%, the APP was busy for 1.5 seconds (.5 x 3).

**18.60** The second column (FIFO) indicates the percentage of time the FIFO was waiting for the APP-to-IOP hardware communication. It shows the amount of time the APP spent waiting for the IOP to catch up (this is wasted time because the APP is not performing useful work while waiting). Under normal operating conditions this percentage should be zero. If it is not, subtract this number from the BUSY percentage to determine the actual useful system busy time.

**18.61** The third column is a graphic representation of the first two columns. An asterisk (\*) appears for

every two percent of busy time and a hyphen (-) for every two percent of FIFO time.

**18.62** As an example, the graph below shows 56% BUSY time and 22% FIFO time, which is represented in the graph as 34% actual useful system busy time (17 asterisks = 34%; 11 hyphens = 22%):

```
BUSY FIFO :
56% 22% :*****-----
```

**18.63** To reach the program, enter C from the on-line monitor menu. The first prompt is WINDOW SIZE (31). The window size is the amount of time it takes for the APP activity to be measured and each graph to be produced. The current window size is 1/31 of a second and produces one graph every second. (A window size of 61 would produce a graph every two seconds.) The window size can be any value between 1 and 65,535. However, it is not recommended to use a window size of less than 1/31 second.

**18.64** The next prompt selects an output port:

```
OUTPUT PORT
P = PRIMARY
M = MODEM
S = SECONDARY
OUTPUT PORT (P):
```

**18.65** Enter P for the APP port, M for the modem connection, or S for the IOP port.

**18.66** The terminal automatically begins printing the graph. To terminate the output at any time, press any key on the terminal to return to the on-line monitor menu prompt ([ ]).

FIGURE 5-1. SYSTEM TIMER PROGRAM PLANNING SHEET

[AB] TIMER VALUES (TIMR): List new values if different than default values.

|                                                     | RANGE  | DEFAULT | NEW VALUE |
|-----------------------------------------------------|--------|---------|-----------|
| <b>Timers programmed in hundredths of a second:</b> |        |         |           |
| CO-CO DISCONNECT                                    | 2-250  | 35      | _____     |
| IC-CO DISCONNECT                                    | 2-250  | 60      | _____     |
| DTMF DIGIT DURATION                                 | 5-50   | 6       | _____     |
| DTMF INTERDIGIT PAUSE                               | 2-60   | 6       | _____     |
| CO HOOKFLASH                                        | 2-250  | 60      | _____     |
| <b>Timers programmed in tenths of seconds:</b>      |        |         |           |
| DIALING WAIT AFTER CONNECT                          | 10-250 | 15      | _____     |
| DIALING WAIT AFTER HOOKFLASH                        | 1-250  | 30      | _____     |
| KEYSET HOOKSWITCH DEBOUNCE                          | 1-50   | 10      | _____     |
| INTER-RING SILENCE                                  | 1-250  | 60      | _____     |
| OFF-LINE AFTER DISCONNECT                           | 10-250 | 10      | _____     |
| REMINDER MESSAGE SCROLL DELAY                       | 0-50   | 5       | _____     |
| SL HOOKFLASH MINIMUM                                | 1-10   | 2       | _____     |
| SL HOOKFLASH MAXIMUM                                | 2-20   | 7       | _____     |
| <b>Timers programmed in seconds:</b>                |        |         |           |
| CAMP-ON                                             | 0-255  | 3       | _____     |
| CAMP-ON TONE                                        | 5-255  | 15      | _____     |
| CO RE-SEIZE                                         | 1-15   | 3       | _____     |
| DATA PORT WAIT                                      | 1-255  | 30      | _____     |
| DIAL TONE WAIT                                      | 1-50   | 2       | _____     |
| DIAL INITIATION - KEYSET                            | 5-30   | 15      | _____     |
| DIAL INITIATION - SL SET                            | 5-30   | 10      | _____     |
| DISCONNECT WAIT AFTER DIALING                       | 2-30   | 20      | _____     |
| FORWARD NO ANSWER                                   | 3-255  | 15      | _____     |
| HOLD                                                | 10-255 | 60      | _____     |
| HUNT GROUP ANNOUNCEMENT                             | 10-255 | 18      | _____     |
| HUNT GROUP OVERFLOW                                 | 10-255 | 72      | _____     |
| INACTIVITY ALARM                                    | 10-255 | 30      | _____     |
| INTERDIGIT (LONG)                                   | 2-255  | 15      | _____     |
| INTERDIGIT (SHORT)                                  | 2-30   | 4       | _____     |
| LCR ADVANCE                                         | 5-255  | 8       | _____     |
| LINE PRE-SELECT                                     | 2-255  | 5       | _____     |
| MESSAGE (AT MESSAGE CENTER)                         | 1-255  | 5       | _____     |
| NO ANSWER ADVANCE                                   | 3-255  | 18      | _____     |
| OFF-HOOK VOICE ANNOUNCE SCREENING                   | 0-255  | 5       | _____     |
| PAGING                                              | 0-255  | 15      | _____     |
| PAUSE DIGIT                                         | 1-5    | 3       | _____     |
| QUEUE CALLBACK                                      | 10-255 | 15      | _____     |
| RECALL                                              | 10-255 | 60      | _____     |
| TRANSFER-AVAILABLE                                  | 10-255 | 20      | _____     |
| TRANSFER-BUSY                                       | 10-255 | 24      | _____     |
| VALID CALL                                          | 0-60   | 15      | _____     |
| <b>Timers programmed in minutes:</b>                |        |         |           |
| ABANDONED RECALL                                    | 1-255  | 10      | _____     |
| UNSUPERVISED CONFERENCE                             | 1-255  | 5       | _____     |
| UNSUPERVISED CO                                     | 1-255  | 15      | _____     |

FIGURE 5-2. SPEED-DIAL PROGRAM PLANNING SHEET

[AC] SYSTEM SPEED-DIAL (SPDI):

System speed-dial programming station (intercom or circuit number): \_\_\_\_\_

Display system speed-dial numbers 0 to \_\_\_\_\_ (99)

SPEED-DIAL NUMBER :

|    |       |    |       |    |       |
|----|-------|----|-------|----|-------|
| 00 | _____ | 34 | _____ | 68 | _____ |
| 01 | _____ | 35 | _____ | 69 | _____ |
| 02 | _____ | 36 | _____ | 70 | _____ |
| 03 | _____ | 37 | _____ | 71 | _____ |
| 04 | _____ | 38 | _____ | 72 | _____ |
| 05 | _____ | 39 | _____ | 73 | _____ |
| 06 | _____ | 40 | _____ | 74 | _____ |
| 07 | _____ | 41 | _____ | 75 | _____ |
| 08 | _____ | 42 | _____ | 76 | _____ |
| 09 | _____ | 43 | _____ | 77 | _____ |
| 10 | _____ | 44 | _____ | 78 | _____ |
| 11 | _____ | 45 | _____ | 79 | _____ |
| 12 | _____ | 46 | _____ | 80 | _____ |
| 13 | _____ | 47 | _____ | 81 | _____ |
| 14 | _____ | 48 | _____ | 82 | _____ |
| 15 | _____ | 49 | _____ | 83 | _____ |
| 16 | _____ | 50 | _____ | 84 | _____ |
| 17 | _____ | 51 | _____ | 85 | _____ |
| 18 | _____ | 52 | _____ | 86 | _____ |
| 19 | _____ | 53 | _____ | 87 | _____ |
| 20 | _____ | 54 | _____ | 88 | _____ |
| 21 | _____ | 55 | _____ | 89 | _____ |
| 22 | _____ | 56 | _____ | 90 | _____ |
| 23 | _____ | 57 | _____ | 91 | _____ |
| 24 | _____ | 58 | _____ | 92 | _____ |
| 25 | _____ | 59 | _____ | 93 | _____ |
| 26 | _____ | 60 | _____ | 94 | _____ |
| 27 | _____ | 61 | _____ | 95 | _____ |
| 28 | _____ | 62 | _____ | 96 | _____ |
| 29 | _____ | 63 | _____ | 97 | _____ |
| 30 | _____ | 64 | _____ | 98 | _____ |
| 31 | _____ | 65 | _____ | 99 | _____ |
| 32 | _____ | 66 | _____ |    |       |
| 33 | _____ | 67 | _____ |    |       |

FIGURE 5-3. ACCOUNT CODE PROGRAM PLANNING SHEET

[AD] ACCOUNT CODES (ACCT):

Length of all account codes is (4-8) digits. \_\_\_\_\_

STANDARD ACCOUNT CODES:

|         |          |          |          |          |
|---------|----------|----------|----------|----------|
| 0 _____ | 7 _____  | 14 _____ | 21 _____ | 28 _____ |
| 1 _____ | 8 _____  | 15 _____ | 22 _____ | 29 _____ |
| 2 _____ | 9 _____  | 16 _____ | 23 _____ | 30 _____ |
| 3 _____ | 10 _____ | 17 _____ | 24 _____ | 31 _____ |
| 4 _____ | 11 _____ | 18 _____ | 25 _____ |          |
| 5 _____ | 12 _____ | 19 _____ | 26 _____ |          |
| 6 _____ | 13 _____ | 20 _____ | 27 _____ |          |

FORCED ACCOUNT CODES:

|          |          |          |          |           |
|----------|----------|----------|----------|-----------|
| 0 _____  | 24 _____ | 48 _____ | 72 _____ | 96 _____  |
| 1 _____  | 25 _____ | 49 _____ | 73 _____ | 97 _____  |
| 2 _____  | 26 _____ | 50 _____ | 74 _____ | 98 _____  |
| 3 _____  | 27 _____ | 51 _____ | 75 _____ | 99 _____  |
| 4 _____  | 28 _____ | 52 _____ | 76 _____ | 100 _____ |
| 5 _____  | 29 _____ | 53 _____ | 77 _____ | 101 _____ |
| 6 _____  | 30 _____ | 54 _____ | 78 _____ | 102 _____ |
| 7 _____  | 31 _____ | 55 _____ | 79 _____ | 103 _____ |
| 8 _____  | 32 _____ | 56 _____ | 80 _____ | 104 _____ |
| 9 _____  | 33 _____ | 57 _____ | 81 _____ | 105 _____ |
| 10 _____ | 34 _____ | 58 _____ | 82 _____ | 106 _____ |
| 11 _____ | 35 _____ | 59 _____ | 83 _____ | 107 _____ |
| 12 _____ | 36 _____ | 60 _____ | 84 _____ | 108 _____ |
| 13 _____ | 37 _____ | 61 _____ | 85 _____ | 109 _____ |
| 14 _____ | 38 _____ | 62 _____ | 86 _____ | 110 _____ |
| 15 _____ | 39 _____ | 63 _____ | 87 _____ | 111 _____ |
| 16 _____ | 40 _____ | 64 _____ | 88 _____ | 112 _____ |
| 17 _____ | 41 _____ | 65 _____ | 89 _____ | 113 _____ |
| 18 _____ | 42 _____ | 66 _____ | 90 _____ | 114 _____ |
| 19 _____ | 43 _____ | 67 _____ | 91 _____ | 115 _____ |
| 20 _____ | 44 _____ | 68 _____ | 92 _____ | 116 _____ |
| 21 _____ | 45 _____ | 69 _____ | 93 _____ | 117 _____ |
| 22 _____ | 46 _____ | 70 _____ | 94 _____ | 118 _____ |
| 23 _____ | 47 _____ | 71 _____ | 95 _____ | 119 _____ |

**FIGURE 5-4. REMINDER MESSAGE PROGRAM PLANNING SHEET**

[AE] REMINDER MESSAGES (MESS):

| DEFAULT VALUE                  | NEW MESSAGE |
|--------------------------------|-------------|
| MESSAGE 1 (MEETING):           | _____       |
| MESSAGE 2 (STAFF MEETING):     | _____       |
| MESSAGE 3 (SALES MEETING):     | _____       |
| MESSAGE 4 (CANCEL MEETING):    | _____       |
| MESSAGE 5 (APPOINTMENT):       | _____       |
| MESSAGE 6 (PLACE CALL):        | _____       |
| MESSAGE 7 (CALL CLIENT):       | _____       |
| MESSAGE 8 (CALL CUSTOMER):     | _____       |
| MESSAGE 9 (CALL HOME):         | _____       |
| MESSAGE 10 (CALL CORPORATE):   | _____       |
| MESSAGE 11 (CALL ENGINEERING): | _____       |
| MESSAGE 12 (CALL MARKETING):   | _____       |
| MESSAGE 13 (CALL ACCOUNTING):  | _____       |
| MESSAGE 14 (CANCEL DND):       | _____       |
| MESSAGE 15 (CANCEL CALL FWD):  | _____       |
| MESSAGE 16 (TAKE MEDICATION):  | _____       |
| MESSAGE 17 (MAKE RESERVATION)  | _____       |
| MESSAGE 18 (REVIEW SCHEDULE):  | _____       |
| MESSAGE 19 (LUNCH):            | _____       |
| MESSAGE 20 (REMINDER):         | _____       |

PROGRAMMING

**FIGURE 5-5. MISC. SYSTEM DATA PROGRAM PLANNING SHEET**

**[AF] Misc. System Data (MISC):**

System Skate Type: \_\_\_\_\_ Disconnect or Hold

Primary Attendant/System Alarm Station  
(intercom or circuit number) \_\_\_\_\_

Broadcast Alarms to: \_\_\_\_\_ All Attendants or  
Primary Att./System Alarm

Allow Cross-Tenant IC Traffic: Y or N

Connect Reverse Transfers Immediately: Y or N

Speed-dial Programming Hookflash: Y or N

Ignore Dialing During Auto. Att. Announcement: Y or N

Off-Hook Voice Announce: Y or N

Immediate DSS Off-Hook Voice Announce: Y or N

Audible Message Indication for SL Sets: Y or N

Voice Mail Validation: Y or N



FIGURE 5-6. DND MESSAGE AND PASSWORD PROGRAM PLANNING SHEET

[AG] DND MESSAGES (DNDM):

- MESSAGE 1 (DO-NOT-DISTURB) \_\_\_\_\_
- MESSAGE 2 (IN MEETING UNTIL) \_\_\_\_\_
- MESSAGE 3 (IN MEETING) \_\_\_\_\_
- MESSAGE 4 (ON VACATION 'TIL) \_\_\_\_\_
- MESSAGE 5 (ON VACATION) \_\_\_\_\_
- MESSAGE 6 (CALL ME AT) \_\_\_\_\_
- MESSAGE 7 (AT THE DOCTOR) \_\_\_\_\_
- MESSAGE 8 (ON A TRIP) \_\_\_\_\_
- MESSAGE 9 (ON BREAK) \_\_\_\_\_
- MESSAGE 10 (OUT OF TOWN 'TIL) \_\_\_\_\_
- MESSAGE 11 (OUT OF OFFICE) \_\_\_\_\_
- MESSAGE 12 (OUT UNTIL) \_\_\_\_\_
- MESSAGE 13 (WITH A CLIENT) \_\_\_\_\_
- MESSAGE 14 (WITH A GUEST) \_\_\_\_\_
- MESSAGE 15 (WITH A PATIENT) \_\_\_\_\_
- MESSAGE 16 (UNAVAILABLE) \_\_\_\_\_
- MESSAGE 17 (IN CONFERENCE) \_\_\_\_\_
- MESSAGE 18 (AWAY FROM DESK) \_\_\_\_\_
- MESSAGE 19 (GONE HOME) \_\_\_\_\_
- MESSAGE 20 (OUT TO LUNCH) \_\_\_\_\_

[AH] PASSWORDS (PASS):

- Database
- Inspection: \_\_\_\_\_
  - Modification: \_\_\_\_\_
  - Unrestricted: \_\_\_\_\_
- SMDR/Error: \_\_\_\_\_
- SMDA: \_\_\_\_\_
- On-Line Monitor: \_\_\_\_\_

PROGRAMMING

FIGURE 5-7. INTERCOM NUMBER AND FEATURE CODE  
PROGRAM PLANNING SHEET

[B] EXTENSIONS AND FEATURE ACCESS CODES (CODE):

| CIRCUIT   | EXT.  | CIRCUIT   | EXT.  | CIRCUIT    | EXT.  | CIRCUIT    | EXT.  |
|-----------|-------|-----------|-------|------------|-------|------------|-------|
| 1.1 (100) | _____ | 4.8 (131) | _____ | 8.7 (162)  | _____ | 12.6 (193) | _____ |
| 1.2 (101) | _____ | 5.1 (132) | _____ | 8.8 (163)  | _____ | 12.7 (194) | _____ |
| 1.3 (102) | _____ | 5.2 (133) | _____ | 9.1 (164)  | _____ | 12.8 (195) | _____ |
| 1.4 (103) | _____ | 5.3 (134) | _____ | 9.2 (165)  | _____ | 13.1 (196) | _____ |
| 1.5 (104) | _____ | 5.4 (135) | _____ | 9.3 (166)  | _____ | 13.2 (197) | _____ |
| 1.6 (105) | _____ | 5.5 (136) | _____ | 9.4 (167)  | _____ | 13.3 (198) | _____ |
| 1.7 (106) | _____ | 5.6 (137) | _____ | 9.5 (168)  | _____ | 13.4 (199) | _____ |
| 1.8 (107) | _____ | 5.7 (138) | _____ | 9.6 (169)  | _____ | 13.5 (200) | _____ |
| 2.1 (108) | _____ | 5.8 (139) | _____ | 9.7 (170)  | _____ | 13.6 (201) | _____ |
| 2.2 (109) | _____ | 6.1 (140) | _____ | 9.8 (171)  | _____ | 13.7 (202) | _____ |
| 2.3 (110) | _____ | 6.2 (141) | _____ | 10.1 (172) | _____ | 13.8 (203) | _____ |
| 2.4 (111) | _____ | 6.3 (142) | _____ | 10.2 (173) | _____ | 14.1 (204) | _____ |
| 2.5 (112) | _____ | 6.4 (143) | _____ | 10.3 (174) | _____ | 14.2 (205) | _____ |
| 2.6 (113) | _____ | 6.5 (144) | _____ | 10.4 (175) | _____ | 14.3 (206) | _____ |
| 2.7 (114) | _____ | 6.6 (145) | _____ | 10.5 (176) | _____ | 14.4 (207) | _____ |
| 2.8 (115) | _____ | 6.7 (146) | _____ | 10.6 (177) | _____ | 14.5 (208) | _____ |
| 3.1 (116) | _____ | 6.8 (147) | _____ | 10.7 (178) | _____ | 14.6 (209) | _____ |
| 3.2 (117) | _____ | 7.1 (148) | _____ | 10.8 (179) | _____ | 14.7 (210) | _____ |
| 3.3 (118) | _____ | 7.2 (149) | _____ | 11.1 (180) | _____ | 14.8 (211) | _____ |
| 3.4 (119) | _____ | 7.3 (150) | _____ | 11.2 (181) | _____ | 15.1 (212) | _____ |
| 3.5 (120) | _____ | 7.4 (151) | _____ | 11.3 (182) | _____ | 15.2 (213) | _____ |
| 3.6 (121) | _____ | 7.5 (152) | _____ | 11.4 (183) | _____ | 15.3 (214) | _____ |
| 3.7 (122) | _____ | 7.6 (153) | _____ | 11.5 (184) | _____ | 15.4 (215) | _____ |
| 3.8 (123) | _____ | 7.7 (154) | _____ | 11.6 (185) | _____ | 15.5 (216) | _____ |
| 4.1 (124) | _____ | 7.8 (155) | _____ | 11.7 (186) | _____ | 15.6 (217) | _____ |
| 4.2 (125) | _____ | 8.1 (156) | _____ | 11.8 (187) | _____ | 15.7 (218) | _____ |
| 4.3 (126) | _____ | 8.2 (157) | _____ | 12.1 (188) | _____ | 15.8 (219) | _____ |
| 4.4 (127) | _____ | 8.3 (158) | _____ | 12.2 (189) | _____ |            |       |
| 4.5 (128) | _____ | 8.4 (159) | _____ | 12.3 (190) | _____ |            |       |
| 4.6 (129) | _____ | 8.5 (160) | _____ | 12.4 (191) | _____ |            |       |
| 4.7 (130) | _____ | 8.6 (161) | _____ | 12.5 (192) | _____ |            |       |

Talkback Speakers:

|         |       |         |       |
|---------|-------|---------|-------|
| 1 (221) | _____ | 4 (224) | _____ |
| 2 (222) | _____ | 5 (225) | _____ |
| 3 (223) | _____ |         |       |

Hunt Group:

|         |       |          |       |          |       |
|---------|-------|----------|-------|----------|-------|
| 1 (231) | _____ | 6 (236)  | _____ | 11 (241) | _____ |
| 2 (232) | _____ | 7 (237)  | _____ | 12 (242) | _____ |
| 2 (233) | _____ | 8 (238)  | _____ | 13 (243) | _____ |
| 4 (234) | _____ | 9 (239)  | _____ | 14 (244) | _____ |
| 5 (235) | _____ | 10 (240) | _____ | 15 (245) | _____ |

FIGURE 5-7. INTERCOM NUMBER AND FEATURE CODE PROGRAM PLANNING SHEET (CONT'D)

**C.O. LINE ACCESS CODES:**

- \_\_\_ Least Cost Routing (80)
- \_\_\_ Select Line Group 1 (81)
- \_\_\_ Select Line Group 2 (82)
- \_\_\_ Select Line Group 3 (83)
- \_\_\_ Select Line Group 4 (84)
- \_\_\_ Select Line Group 5 (85)
- \_\_\_ Select Line Group 6 (86)
- \_\_\_ Select Line Group 7 (87)
- \_\_\_ Select Line Group 8 (9)
- \_\_\_ Automatic Line Selection (89)

**FEATURE CODES:**

- \_\_\_ Display Date and Time (300)
- \_\_\_ Program Reminder Message (305)
- \_\_\_ Cancel Reminder Message (306)
- \_\_\_ System Directory (307)
- \_\_\_ CO Directory (308)
- \_\_\_ Disable Handsfree (310)
- \_\_\_ Enable Handsfree (311)
- \_\_\_ Speakerphone On/Off (312)
- \_\_\_ Background Music On/Off (313)
- \_\_\_ Microphone Mute On/Off (314)
- \_\_\_ Enable Headset (315)
- \_\_\_ Disable Headset (316)
- \_\_\_ Program Redial Mode—Last Number Dialed (320)
- \_\_\_ Program Redial Mode—Last Number Saved (321)
- \_\_\_ Hunt Group Remove (322)
- \_\_\_ Hunt Group Replace (323)
- \_\_\_ Default Opt. Feat. Keys (325)
- \_\_\_ Display Opt. Feat. Key (326)
- \_\_\_ Program Opt. Feat. Key (327)
- \_\_\_ Select Ring Tone (328)
- \_\_\_ Hookflash (330)
- \_\_\_ Page Remove (332)
- \_\_\_ Page Replace (333)
- \_\_\_ System Hold (335)
- \_\_\_ Individual Hold (336)
- \_\_\_ Call Splitting (337)
- \_\_\_ Data (340)
- \_\_\_ Monitor Data Port (341)
- \_\_\_ Transfer CO Call (345)
- \_\_\_ Transfer Intercom Call (346)
- \_\_\_ Transfer CO/IC to Hold (347)
- \_\_\_ Automatic Line Answer (350)

- \_\_\_ Call Forward All Calls (355)
- \_\_\_ Call Forward If No Answer (356)
- \_\_\_ Call Forward If Busy (357)
- \_\_\_ Call Forward If No Answer or Busy (358)
- \_\_\_ Cancel Any Call Forward (359)
- \_\_\_ Automatic Line Access (360)
- \_\_\_ Cancel Automatic Line Access (361)
- \_\_\_ Automatic IC Access (362)
- \_\_\_ Cancel Automatic Line Access (363)
- \_\_\_ Leave Message (365)
- \_\_\_ Cancel Message (366)
- \_\_\_ Ring Intercom Always (367)
- \_\_\_ Cancel Ring Inter. Always (368)
- \_\_\_ Do-Not-Disturb (370)
- \_\_\_ Cancel Do-Not-Disturb (371)
- \_\_\_ Do Not Disturb Mode On/Off (372)
- \_\_\_ Cancel Queue Request (376)
- \_\_\_ Cancel Current Message (379)
- \_\_\_ Redial (380)
- \_\_\_ System Speed Dial (381)
- \_\_\_ Station Speed Dial (382)
- \_\_\_ Program Station Speed Dial (383)
- \_\_\_ Optional Account Code (390)
- \_\_\_ Default Volumes (394)
- \_\_\_ Cancel Misc. Operations (395)
- \_\_\_ Station Monitoring (396)
- \_\_\_ Reverse Transfer (4)
- \_\_\_ Conference (5)
- \_\_\_ Queue Request (6)
- \_\_\_ Page (7)
- \_\_\_ Night Ring On/Off (010)
- \_\_\_ Programming Night Ring (011)
- \_\_\_ Group DND Cancel (012)
- \_\_\_ Group Call Forward Cancel (013)
- \_\_\_ Group DND/FWD Cancel (014)
- \_\_\_ Individual DND Cancel (015)
- \_\_\_ Ind. Call FWD Cancel (016)
- \_\_\_ Ind. DND/FWD Cancel (017)
- \_\_\_ Talkback Speaker Music On/Off (018)
- \_\_\_ Clear System Alarm (019)
- \_\_\_ Program System Speed Dial (020)
- \_\_\_ Set Time of Day (021)

**MODEM**

- 300 Baud (260) \_\_\_
- 1200 Baud (270) \_\_\_

PROGRAMMING

**FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET**

**[CA] C.O. LINE EQUIPMENT STATUS (EQU):**

Equipped lines: \_\_\_\_\_

Day DISA lines: \_\_\_\_\_

Night DISA lines: \_\_\_\_\_

Incoming-only lines: \_\_\_\_\_

Outgoing-only lines: \_\_\_\_\_

Pulse-dialing lines: \_\_\_\_\_

Line subject to toll restriction: \_\_\_\_\_

Lines exempt from LCR Only: \_\_\_\_\_

Line keys by tenant group: *Refer to the chart on the next page.*

**[CB] C.O. LINE GROUPS (LGRP):**

Line group 1: \_\_\_\_\_

Line group 2: \_\_\_\_\_

Line group 3: \_\_\_\_\_

Line group 4: \_\_\_\_\_

Line group 5: \_\_\_\_\_

Line group 6: \_\_\_\_\_

Line group 7: \_\_\_\_\_

Line group 8: \_\_\_\_\_

FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

[CC] SPECIFIC C.O. LINE INFORMATION (LINE):

|                                              |  |  |  |  |
|----------------------------------------------|--|--|--|--|
| Circuit Number                               |  |  |  |  |
| Equipped Y/N                                 |  |  |  |  |
| C.O. Line ID (up to 7 characters)            |  |  |  |  |
| Day DISA<br>4-Digit Security Code (N/C/I)*   |  |  |  |  |
| Night DISA<br>4-Digit Security Code (N/C/I)* |  |  |  |  |
| Incoming/Outgoing Only                       |  |  |  |  |
| Pulse/DTMF Dialing                           |  |  |  |  |
| Subject to Toll Restrict Y/N                 |  |  |  |  |
| Equal Access Y/N                             |  |  |  |  |
| Absorb Digits (PBX/Local, Repeat)            |  |  |  |  |
| Digit String 1                               |  |  |  |  |
| Digit String 2                               |  |  |  |  |
| Digit String 3                               |  |  |  |  |
| Digit String 4                               |  |  |  |  |
| Digit String 5                               |  |  |  |  |
| Digit String 6                               |  |  |  |  |
| Digit String 7                               |  |  |  |  |
| Digit String 8                               |  |  |  |  |
| Call Cost Type (F/L/T/O)                     |  |  |  |  |
| Exempt from LCR Y/N                          |  |  |  |  |
| Auto Line Y/N                                |  |  |  |  |
| Line Group Assignment                        |  |  |  |  |
| LCR Facility Group Assignment                |  |  |  |  |
| Hunt Group Ring In (pilot #) Day             |  |  |  |  |
| Night                                        |  |  |  |  |
| Stations with: Outgoing Access               |  |  |  |  |
| Allowed Answer Day                           |  |  |  |  |
| Night                                        |  |  |  |  |
| Ring In Day                                  |  |  |  |  |
| Night                                        |  |  |  |  |
| Signal Device Ring In Day                    |  |  |  |  |
| Night                                        |  |  |  |  |
| Line Key Number: Tenant 1                    |  |  |  |  |
| Tenant 2                                     |  |  |  |  |
| Tenant 3                                     |  |  |  |  |
| Tenant 4                                     |  |  |  |  |
| Tenant 5                                     |  |  |  |  |

\* N = Noise Required, C = C.O. and Modem Only, I = Intercom, C.O., and Modem

PROGRAMMING

**FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET (CONT'D)**

**[CD] AUTO AND LINE KEY ASSIGNMENTS (AUTO):**

List of auto lines: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Line keys by tenant group: *Refer to the chart on the previous page.*

**[CEA] ACCESS, ANSWER, AND RING IN (COMM):**

C.O. lines with common access, answer, and ring-in assignments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Stations with outgoing access: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Stations with allowed answer:  
Day: \_\_\_\_\_  
\_\_\_\_\_  
Night: \_\_\_\_\_  
\_\_\_\_\_

Stations with ring in:  
Day: \_\_\_\_\_  
\_\_\_\_\_  
Night: \_\_\_\_\_  
\_\_\_\_\_

Signal device ring in:  
Day: \_\_\_\_\_  
\_\_\_\_\_  
Night: \_\_\_\_\_  
\_\_\_\_\_

**FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET (CONT'D)**

**[CEB] COMMON OUTGOING ACCESS (ACC):**

C.O. lines with common access assignment: \_\_\_\_\_

Stations with outgoing access: \_\_\_\_\_

**[CEC] COMMON ALLOWED-ANSWER AND RING IN (ANS):**

C.O. lines with common answer and ring-in assignments: \_\_\_\_\_

Stations with allowed answer:

Day: \_\_\_\_\_

Night: \_\_\_\_\_

Stations with ring in:

Day: \_\_\_\_\_

Night: \_\_\_\_\_

**[CED] COMMON SIGNALLING DEVICE RING IN (RING):**

C.O. lines with common signalling device ring-in assignment: \_\_\_\_\_

Signal device ring in:

Day: \_\_\_\_\_

Night: \_\_\_\_\_

PROGRAMMING

FIGURE 5-9. STATION PROGRAM PLANNING SHEET

[DAA] SPECIFIC STATION DATA (STN):

|                                         |  |  |  |  |
|-----------------------------------------|--|--|--|--|
| Station Circuit Number to be Programmed |  |  |  |  |
| Equipped Y/N                            |  |  |  |  |
| Intercom Number <i>(reference only)</i> |  |  |  |  |
| User Name (up to 7 characters)          |  |  |  |  |
| Tenant Name/Number                      |  |  |  |  |
| Department Name/Number                  |  |  |  |  |
| Day SCOS:                               |  |  |  |  |
| 0 Unrestricted Y/N                      |  |  |  |  |
| 1 Operator Access Y/N                   |  |  |  |  |
| 2 Toll Access Y/N                       |  |  |  |  |
| 3 International Y/N                     |  |  |  |  |
| 4 Eight Digit Y/N                       |  |  |  |  |
| 5 Area/Office Code Y/N                  |  |  |  |  |
| 6 LCR Only                              |  |  |  |  |
| 7 Alternate Carrier Y/N                 |  |  |  |  |
| 8 Enable ALD Y/N                        |  |  |  |  |
| User Group Number                       |  |  |  |  |
| LCR Class Of Service                    |  |  |  |  |
| Secretarial Intercept                   |  |  |  |  |
| Attendant                               |  |  |  |  |
| Message Center                          |  |  |  |  |
| Alternate Message Source <i>(SL)</i>    |  |  |  |  |
| Disallow Camp-On Tones Y/N              |  |  |  |  |
| Voice Mail Port Y/N <i>(SL)</i>         |  |  |  |  |
| Overflow Line Key Number <i>(K)</i>     |  |  |  |  |
| Speakerphone Enabled Y/N <i>(K)</i>     |  |  |  |  |
| Secondary Voice Path Y/N <i>(K)</i>     |  |  |  |  |
| OHVA Transmit Enabled Y/N               |  |  |  |  |
| OHVA Receive Enabled Y/N <i>(K)</i>     |  |  |  |  |
| Automated Attendant Y/N <i>(SL)</i>     |  |  |  |  |
| Recall Destination                      |  |  |  |  |

*Continued on next page*



FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)

|                                                                                                 |  |  |  |  |
|-------------------------------------------------------------------------------------------------|--|--|--|--|
| Station Circuit Number to be Programmed <i>(Continued)</i>                                      |  |  |  |  |
| Digit Translation Y/N                                                                           |  |  |  |  |
| Location 1                                                                                      |  |  |  |  |
| Location 2                                                                                      |  |  |  |  |
| Location 3                                                                                      |  |  |  |  |
| Location 4                                                                                      |  |  |  |  |
| Location 5                                                                                      |  |  |  |  |
| Location 6                                                                                      |  |  |  |  |
| Location 7                                                                                      |  |  |  |  |
| Location 8                                                                                      |  |  |  |  |
| Location 9                                                                                      |  |  |  |  |
| Location 0                                                                                      |  |  |  |  |
| House Phone Y/N                                                                                 |  |  |  |  |
| C.O. Resize Enabled Y/N                                                                         |  |  |  |  |
| Allow DND Breakthrough Y/N                                                                      |  |  |  |  |
| Outgoing Access Lines                                                                           |  |  |  |  |
| Allowed Answer Day Lines                                                                        |  |  |  |  |
| Night Lines                                                                                     |  |  |  |  |
| Ring In Day Lines                                                                               |  |  |  |  |
| Night Lines                                                                                     |  |  |  |  |
| Account Code Type (S/F/T/N)                                                                     |  |  |  |  |
| <i>If Standard: Index</i><br><i>If Forced: Validate Y/N</i><br><i>If LCR Toll: Validate Y/N</i> |  |  |  |  |
| Hunt Groups <i>(reference only)</i>                                                             |  |  |  |  |
| Page Zone List (1-6) (K)                                                                        |  |  |  |  |
| DSS/BLF <i>(reference only)</i>                                                                 |  |  |  |  |

**FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)**

**[DAC] SOFT FEATURE KEY DEFAULT VALUES (SOFT):**

SLI: *(Keys E through I are not currently used)*

|                | <b>DEFAULT VALUE</b>              | <b>NEW VALUE</b> |
|----------------|-----------------------------------|------------------|
| Key A (top)    | Station Speed Dial (E382)         | _____            |
| Key B          | Redial (E380)                     | _____            |
| Key C          | Least-Cost Routing (E80)          | _____            |
| Key D (bottom) | Individual Hold (E336)            | _____            |
| Key E          | System Speed Dial (E381)          | _____            |
| Key F          | Program Station Speed Dial (E383) | _____            |
| Key G          | Queue Request (E6)                | _____            |
| Key H          | Conference (E5)                   | _____            |
| Key I          | Leave Message (E365)              | _____            |

**GX 24-Line Keyset:**

|       | <b>DEFAULT VALUE</b>           | <b>NEW VALUE</b> |
|-------|--------------------------------|------------------|
| Key A | Individual Hold (E336)         | _____            |
| Key B | Transfer CO Call (E345)        | _____            |
| Key C | Least-Cost Routing (E80)       | _____            |
| Key D | Automatic Line Selection (E89) | _____            |
| Key E | Redial (E380)                  | _____            |
| Key F | System Speed Dial (E381)       | _____            |
| Key G | Queue Request (E6)             | _____            |
| Key H | Page (E7)                      | _____            |
| Key I | Background Music On/Off (E313) | _____            |

**GMX 24-Line Keyset:**

|       | <b>DEFAULT VALUE</b>           | <b>NEW VALUE</b> |
|-------|--------------------------------|------------------|
| Key A | Individual Hold (E336)         | _____            |
| Key B | Transfer CO Call (E345)        | _____            |
| Key C | Automatic Line Selection (E89) | _____            |
| Key D | Hookflash (E330)               | _____            |
| Key E | Redial (E380)                  | _____            |
| Key F | System Speed Dial (E381)       | _____            |
| Key G | Queue Request (E6)             | _____            |
| Key H | Page (E7)                      | _____            |
| Key I | Background Music On/Off (E313) | _____            |

FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)

GMX 12-Line Keyset:

|       | DEFAULT VALUE           | NEW VALUE |
|-------|-------------------------|-----------|
| Key A | Individual Hold (E336)  | _____     |
| Key B | Transfer CO Call (E345) | _____     |

Inter-Tel/DVK 24-Line Keyset:

|       | DEFAULT VALUE                  | NEW VALUE |
|-------|--------------------------------|-----------|
| Key A | Redial (E380)                  | _____     |
| Key B | System Speed Dial (E381)       | _____     |
| Key C | Individual Hold (E336)         | _____     |
| Key D | Transfer CO Call (E345)        | _____     |
| Key E | Page (E7)                      | _____     |
| Key F | Queue Request (E6)             | _____     |
| Key G | Background Music On/Off (E313) | _____     |
| Key H | Automatic Line Selection (E89) | _____     |
| Key I | Hookflash (E330)               | _____     |

Inter-Tel/DVK 8- and 12-Line Keyset:

|       | DEFAULT VALUE           | NEW VALUE |
|-------|-------------------------|-----------|
| Key A | Individual Hold (E336)  | _____     |
| Key B | Transfer CO Call (E345) | _____     |
| Key C | Page (E7)               | _____     |
| Key D | Queue Request (E6)      | _____     |
| Key E | Redial (E380)           | _____     |

PROGRAMMING

FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)

[DAD] COPY STATION INFORMATION (COPY):

COPY STATION  
DATA FROM:

COPY DATA TO:

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

Circuit # \_\_\_\_\_ Circuits \_\_\_\_\_

[DAE] ASSIGN COMMON SCOS TO STATIONS (CCOS):

| STATIONS WITH COMMON SCOS | SCOS |   |   |   |   |   |   |   | USER GP |   |   | LCR ADVANCES |   |   |   |   |   |   |  |
|---------------------------|------|---|---|---|---|---|---|---|---------|---|---|--------------|---|---|---|---|---|---|--|
|                           | 1    | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1       | 2 | 3 | 0            | 1 | 2 | 3 | 4 | 5 | 6 |  |
|                           |      |   |   |   |   |   |   |   |         |   |   |              |   |   |   |   |   |   |  |
|                           |      |   |   |   |   |   |   |   |         |   |   |              |   |   |   |   |   |   |  |
|                           |      |   |   |   |   |   |   |   |         |   |   |              |   |   |   |   |   |   |  |
|                           |      |   |   |   |   |   |   |   |         |   |   |              |   |   |   |   |   |   |  |
|                           |      |   |   |   |   |   |   |   |         |   |   |              |   |   |   |   |   |   |  |

**FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)**

**[DAF] ASSIGN COMMON CO LINE LISTS TO STATIONS (SCOM):**

**STATIONS WITH COMMON C.O. LINE LISTS**

**C.O. CIRCUIT NUMBERS**

|       |                      |
|-------|----------------------|
| _____ | Outgoing: _____      |
| _____ | _____                |
| _____ | Answer/Day: _____    |
| _____ | _____                |
| _____ | Answer/Night: _____  |
| _____ | _____                |
| _____ | Ring In/Day: _____   |
| _____ | _____                |
| _____ | Ring In/Night: _____ |
| _____ | _____                |
| _____ | Outgoing: _____      |
| _____ | _____                |
| _____ | Answer/Day: _____    |
| _____ | _____                |
| _____ | Answer/Night: _____  |
| _____ | _____                |
| _____ | Ring In/Day: _____   |
| _____ | _____                |
| _____ | Ring In/Night: _____ |
| _____ | _____                |

**[DAG] ASSIGN COMMON PAGE ZONES TO KEYSETS (PCOM):**

**KEYSETS WITH COMMON PAGE ZONES**

**PAGE ZONES TO BE ASSIGNED**

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

PROGRAMMING

**FIGURE 5-9. STATION PROGRAM PLANNING SHEET (CONT'D)**

[DAH] MISCELLANEOUS STATION INFORMATION (SMSC):

STATIONS WITH:

- Handsfree Enabled \_\_\_\_\_
- Redial Mode — Last Number Dialed \_\_\_\_\_
- Automatic Answer on C.O. Calls \_\_\_\_\_
- Automatic Answer on Intercom Calls \_\_\_\_\_
- Ring Intercom Always Enabled \_\_\_\_\_
- C.O. Resize Enabled \_\_\_\_\_
- DISA/Automated Attendant DND Override Enabled \_\_\_\_\_
- Secondary Voice Path \_\_\_\_\_

[DAI] INTER-TEL/DVK KEYSSET VOLUME DEFAULT VOLUMES (VOL):

|                                  | NEW SETTING | DEFAULT | RANGE |
|----------------------------------|-------------|---------|-------|
| Handset IC Voice/Tone Level      | _____       | 4       | 1-13  |
| Speakerphone IC Voice/Tone Level | _____       | 3       | 1-16  |
| Handset CO Voice Level           | _____       | 5       | 1-13  |
| Speakerphone CO Voice Level      | _____       | 5       | 1-16  |
| Background Music Level           | _____       | 2       | 1-16  |
| Alerting Tone Level              | _____       | 4       | 1-13  |
| Handset Progress Tone Level      | _____       | 5       | 1-13  |
| Speakerphone Progress Tone Level | _____       | 3       | 1-13  |

FIGURE 5-10. DSS PROGRAM PLANNING SHEET

[DBA] DSS/BLF IDENTIFICATION (DSS):

|           | CIRCUIT NO. | ASSOCIATED KEYS | DSS MAP 1 OR 2 |
|-----------|-------------|-----------------|----------------|
| DSS/BLF 1 |             |                 |                |
| DSS/BLF 2 |             |                 |                |
| DSS/BLF 3 |             |                 |                |
| DSS/BLF 4 |             |                 |                |
| DSS/BLF 5 |             |                 |                |

[DBB] DSS/BLF KEY ASSIGNMENTS (DKEY):

DSS/BLF 1:

| Row | Column |   |   |   |   |   |
|-----|--------|---|---|---|---|---|
|     | 1      | 2 | 3 | 4 | 5 | 6 |
| 1   |        |   |   |   |   |   |
| 2   |        |   |   |   |   |   |
| 3   |        |   |   |   |   |   |
| 4   |        |   |   |   |   |   |
| 5   |        |   |   |   |   |   |
| 6   |        |   |   |   |   |   |
| 7   |        |   |   |   |   |   |
| 8   |        |   |   |   |   |   |
| 9   |        |   |   |   |   |   |
| 10  |        |   |   |   |   |   |

FIGURE 5-10. STATION PROGRAM PLANNING SHEET (CONT'D)

DSS/BLF 2:

| Row | Column |   |   |   |   |   |
|-----|--------|---|---|---|---|---|
|     | 1      | 2 | 3 | 4 | 5 | 6 |
| 1   |        |   |   |   |   |   |
| 2   |        |   |   |   |   |   |
| 3   |        |   |   |   |   |   |
| 4   |        |   |   |   |   |   |
| 5   |        |   |   |   |   |   |
| 6   |        |   |   |   |   |   |
| 7   |        |   |   |   |   |   |
| 8   |        |   |   |   |   |   |
| 9   |        |   |   |   |   |   |
| 10  |        |   |   |   |   |   |



FIGURE 5-11. HUNT GROUP PROGRAM PLANNING SHEET

[E] HUNT GROUPS (HUNT)

|     | Dist./ Lin. | Pilot No. | Circuit or Intercom Numbers | Ann. Stn.* | Overfl. Stn.* | Count | Super |
|-----|-------------|-----------|-----------------------------|------------|---------------|-------|-------|
| 1.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 2.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 3.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 4.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 5.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 6.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 7.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 8.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 9.  | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 10. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 11. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 12. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 13. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 14. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |
| 15. | _____       | _____     | _____                       | _____      | _____         | _____ | _____ |

\*Use "P" to designate a playback device.

Timers: Hunt Group Announcement \_\_\_\_\_  
 Hunt Group Overflow \_\_\_\_\_  
 No Answer Advance \_\_\_\_\_

PROGRAMMING

**FIGURE 5-12. TENANT/ATTENDANT/SECRETARIAL INTERCEPT  
PROGRAM PLANNING SHEET**

**[F] TENANT GROUP ASSIGNMENTS (TNT):**

Tenant group 1 name (up to 20 characters): \_\_\_\_\_

Dept. 1 \_\_\_\_\_

Dept. 2 \_\_\_\_\_

Dept. 3 \_\_\_\_\_

Dept. 4 \_\_\_\_\_

Dept. 5 \_\_\_\_\_

Dept. 6 \_\_\_\_\_

Dept. 7 \_\_\_\_\_

Dept. 8 \_\_\_\_\_

Dept. 9 \_\_\_\_\_

Dept. 10 \_\_\_\_\_

Tenant group 2 name (up to 20 characters): \_\_\_\_\_

Dept. 1 \_\_\_\_\_

Dept. 2 \_\_\_\_\_

Dept. 3 \_\_\_\_\_

Dept. 4 \_\_\_\_\_

Dept. 5 \_\_\_\_\_

Dept. 6 \_\_\_\_\_

Dept. 7 \_\_\_\_\_

Dept. 8 \_\_\_\_\_

Dept. 9 \_\_\_\_\_

Dept. 10 \_\_\_\_\_

**FIGURE 5-12. TENANT/ATTENDANT/SECRETARIAL INTERCEPT  
PROGRAM PLANNING SHEET (CONT'D)**

Tenant group 3 name (up to 20 characters): \_\_\_\_\_

Dept. 1 \_\_\_\_\_

Dept. 2 \_\_\_\_\_

Dept. 3 \_\_\_\_\_

Dept. 4 \_\_\_\_\_

Dept. 5 \_\_\_\_\_

Dept. 6 \_\_\_\_\_

Dept. 7 \_\_\_\_\_

Dept. 8 \_\_\_\_\_

Dept. 9 \_\_\_\_\_

Dept. 10 \_\_\_\_\_

Tenant group 4 name (up to 20 characters): \_\_\_\_\_

Dept. 1 \_\_\_\_\_

Dept. 2 \_\_\_\_\_

Dept. 3 \_\_\_\_\_

Dept. 4 \_\_\_\_\_

Dept. 5 \_\_\_\_\_

Dept. 6 \_\_\_\_\_

Dept. 7 \_\_\_\_\_

Dept. 8 \_\_\_\_\_

Dept. 9 \_\_\_\_\_

Dept. 10 \_\_\_\_\_

PROGRAMMING

**FIGURE 5-12. TENANT/ATTENDANT/SECRETARIAL INTERCEPT  
PROGRAM PLANNING SHEET (CONTD)**

Tenant group 5 name (up to 20 characters): \_\_\_\_\_

Dept. 1 \_\_\_\_\_

Dept. 2 \_\_\_\_\_

Dept. 3 \_\_\_\_\_

Dept. 4 \_\_\_\_\_

Dept. 5 \_\_\_\_\_

Dept. 6 \_\_\_\_\_

Dept. 7 \_\_\_\_\_

Dept. 8 \_\_\_\_\_

Dept. 9 \_\_\_\_\_

Dept. 10 \_\_\_\_\_

[FB] ATTENDANTS (ATT): *There may be more than five attendants. However, there may be only 5 DSS/BLF stations.*

| CIRCUIT NUMBER | ASSOCIATE DSS CIRCUIT | STATIONS SERVED |
|----------------|-----------------------|-----------------|
| P _____        | _____                 | _____           |
| 2 _____        | _____                 | _____           |
| 3 _____        | _____                 | _____           |
| 4 _____        | _____                 | _____           |
| 5 _____        | _____                 | _____           |

[FC] SECRETARIAL INTERCEPTS (SEC):

| SEC. INT. | STATIONS SERVED |
|-----------|-----------------|
| _____     | _____           |
| _____     | _____           |
| _____     | _____           |
| _____     | _____           |
| _____     | _____           |

**FIGURE 5-12. TENANT/ATTENDANT/SECRETARIAL INTERCEPT  
PROGRAM PLANNING SHEET (CONT'D)**

**[FD] MESSAGE CENTERS (MSG):**

| MSG. CTR | STATIONS SERVED |
|----------|-----------------|
| _____    | _____           |
| _____    | _____           |
| _____    | _____           |
| _____    | _____           |
| _____    | _____           |
| _____    | _____           |

**[FE] SPECIAL PURPOSE STATIONS (SPCL):**

Automated Attendants: \_\_\_\_\_

House Phones: \_\_\_\_\_

Voice Mail Ports: \_\_\_\_\_

PROGRAMMING

FIGURE 5-13. PAGE ZONE PROGRAM PLANNING SHEET

[G] PAGE ZONES (PAGE): Enter keyset intercom or circuit numbers and/or talkback speaker numbers to be included in each zone.

Page Zone 1: \_\_\_\_\_

Page Zone 2: \_\_\_\_\_

Page Zone 3: \_\_\_\_\_

Page Zone 4: \_\_\_\_\_

Page Zone 5: \_\_\_\_\_

Page Zone 6: \_\_\_\_\_

FIGURE 5-14. TOLL RESTRICTION PROGRAM PLANNING SHEET

[HA] SCOS INFORMATION (SCOS)

List of Unrestricted Stations \_\_\_\_\_

Lists of Stations with Restrictions:

1 Operator access \_\_\_\_\_

2 Toll Call Access \_\_\_\_\_

3 International Call Access \_\_\_\_\_

4 Eight-Digit Call Access \_\_\_\_\_

5 Area/Office Code Restrict \_\_\_\_\_

6 LCR Only Restriction \_\_\_\_\_

7 Alternate Carrier Access \_\_\_\_\_

8 Enable ALD Number Access \_\_\_\_\_

Stations in User Group 1 \_\_\_\_\_

Stations in User Group 2 \_\_\_\_\_

Stations in User Group 3 \_\_\_\_\_

**FIGURE 5-14. TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)**

LCR Station Class Of Service (Advances):

Unlimited \_\_\_\_\_

0 \_\_\_\_\_

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

5 \_\_\_\_\_

6 \_\_\_\_\_

[HB] OVERLAPPING AREA/OFFICES CODES (OVER):

Do area codes overlap?  Y  N



**FIGURE 5-14. TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)**

[HC] AREA/OFFICE CODES ALLOWED/RESTRICTED (AREA): Circle "Allowed" or "Restricted" to identify office code lists:

Local area code \_\_\_\_\_

User Group 1 -

Allowed Area Codes: \_\_\_\_\_

Restricted Area Codes: \_\_\_\_\_

Extended Area Code 1: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 2: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 3: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 4: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

User Group 2 -

Allowed Area Codes: \_\_\_\_\_

Restricted Area Codes: \_\_\_\_\_

Extended Area Code 1: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 2: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 3: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 4: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

PROGRAMMING

**FIGURE 5-14. TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)**

**User Group 3 -**

Allowed Area Codes: \_\_\_\_\_

Restricted Area Codes: \_\_\_\_\_

Extended Area Code 1: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 2: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 3: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

Extended Area Code 4: \_\_\_\_\_

Allowed or Restricted Office Codes: \_\_\_\_\_

**[HE] ALTERNATE CARRIERS (ALT):** Enter numbers up to 10 digits each, do not include toll field.

- |           |           |
|-----------|-----------|
| 1. _____  | 11. _____ |
| 2. _____  | 12. _____ |
| 3. _____  | 13. _____ |
| 4. _____  | 14. _____ |
| 5. _____  | 15. _____ |
| 6. _____  | 16. _____ |
| 7. _____  | 17. _____ |
| 8. _____  | 18. _____ |
| 9. _____  | 19. _____ |
| 10. _____ | 20. _____ |



(017400) FIGURE 5-15. LCR PROGRAM PLANNING SHEET

[IA] LCR ROUTE GROUPS (ROUT):

Local area code \_\_\_\_\_

|    | Type*  | Area** | Office** | Fac Gps |   |   |
|----|--------|--------|----------|---------|---|---|
|    |        |        |          | D       | E | N |
| 1  | I<br>E | I<br>E |          |         |   |   |
| 2  | I<br>E | I<br>E |          |         |   |   |
| 3  | I<br>E | I<br>E |          |         |   |   |
| 4  | I<br>E | I<br>E |          |         |   |   |
| 5  | I<br>E | I<br>E |          |         |   |   |
| 6  | I<br>E | I<br>E |          |         |   |   |
| 7  | I<br>E | I<br>E |          |         |   |   |
| 8  | I<br>E | I<br>E |          |         |   |   |
| 9  | I<br>E | I<br>E |          |         |   |   |
| 10 | I<br>E | I<br>E |          |         |   |   |
| 11 | I<br>E | I<br>E |          |         |   |   |
| 12 | I<br>E | I<br>E |          |         |   |   |

\*Indicate the type of route group (i.e., local, in-state, etc.).

\*\*Circle I for Included codes or E Excluded codes.

FIGURE 5-15. LCR PROGRAM PLANNING SHEET (CONT'D)

[IB] LCR FACILITY GROUPS (FAC):

| Group | Type* | Circuit Numbers of C.O. Lines | Ordered List of Dial Rules | Numbers Dialed |
|-------|-------|-------------------------------|----------------------------|----------------|
| 1     |       |                               |                            |                |
| 2     |       |                               |                            |                |
| 3     |       |                               |                            |                |
| 4     |       |                               |                            |                |
| 5     |       |                               |                            |                |
| 6     |       |                               |                            |                |
| 7     |       |                               |                            |                |
| 8     |       |                               |                            |                |

\*Indicate the type of line(s) contained in this group (i.e., local, WATS, etc.)

[IC] LCR DIAL RULES (RULE):

1. Echo toll field
2. Echo area code
3. Echo local address (last seven digits)
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

[ID] LCR ADVANCE TIMER (LCRA): Default: 8 Range: 5-255 New value: \_\_\_\_\_

PROGRAMMING

**FIGURE 5-16. SMDR AND ERROR REPORT PROGRAM PLANNING SHEET**

**SMDR OUTPUT (OUTR):**

SMDR Output Port:      APP-P      IOP-S      Modem-M

**SMDR REPORTS (SMDR):**

Calls to be recorded in reports:

|                                                     |   |   |  |
|-----------------------------------------------------|---|---|--|
| All Incoming Calls?                                 | Y | N |  |
| All Local Calls?                                    | Y | N |  |
| All Toll Calls?                                     | Y | N |  |
| All DISA Calls                                      | Y | N |  |
| All Conference Calls?                               | Y | N |  |
| All Ring-In Diagnostics?                            | Y | N |  |
| Record elapsed time in seconds<br>if less than 999? | Y | N |  |
| Suppress all absorbed digits?                       | Y | N |  |
| Suppress all but the first toll digits?             | Y | N |  |

List of stations to be included: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Format:    Wide (80-character)    Narrow (64-character)

**ERROR OUTPUT (OUTE):**

Error Output Port:      APP-P      IOP-S      Modem-M

**ERROR REPORTS (ERR):**

Errors to include:

|                                |   |   |  |
|--------------------------------|---|---|--|
| User detected user errors?     | Y | N |  |
| System detected user errors?   | Y | N |  |
| System detected system errors? | Y | N |  |



FIGURE 5-17. SMDR/SMDA PROGRAM PLANNING SHEET (CONT'D)

CALL COST FACTORS (COST):

Local Area Code: \_\_\_\_\_

Daytime rates in dollars per minute:

- Local Call (0.05): \_\_\_\_\_
- 7-Digit Toll (0.20): \_\_\_\_\_
- 10-Digit Toll (0.50): \_\_\_\_\_
- Operator/International (1.00): \_\_\_\_\_
- Incoming Call (0.00): \_\_\_\_\_

Multiplicative factors:

- Evening (0.65):  Y  N \_\_\_\_\_
- Night and Weekend (0.40):  Y  N \_\_\_\_\_



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TROUBLESHOOTING

## 1. INTRODUCTION

1.1 This section describes the troubleshooting procedures to follow in the event of a system or station instrument malfunction. System repair is limited to replacing parts (keysets, boards, power supply, etc.).

## 2. TROUBLESHOOTING CHECKLIST

2.1 To save time, perform the troubleshooting procedures in the following order:

- (1) Check for proper light-emitting diode (LED) indications on the circuit boards (refer to Figure 6-1 on the following pages).
- (2) Check the alarm message and field service diagnostic output (see pages 6-5 to 6-9).
- (3) Isolate the problem and refer to the appropriate troubleshooting chart (see page 6-10).
- (4) Reset the system through database programming (see page 5-91).

## 3. LIGHT-EMITTING DIODE (LED) INDICATIONS

3.1 LEDs on the front edge of each circuit board indicate specific functions. (Refer to Figure 6-1 on the following pages.) If the LED indications are not correct (or if referred to this page to isolate a problem), follow the procedures outlined in the following paragraphs.

3.2 If the APP RUN or IOP RUN LED is flashing, or if any of the bottom three LEDs on the IOP board are not lit:

- (1) Turn OFF the AC power.

### CAUTION

Always turn OFF the AC POWER before removing or inserting the APP or IOP board.

- (2) Remove the faulty board and check to make sure that all of the components on the board

are properly seated, that no pins are bent, and that adjacent components are not touching.

- (3) Wait 10 seconds and re-insert the board.
- (4) Turn ON the AC power.
- (5) If the LED indications are still incorrect (or if the problem still persists), measure the system voltages using the test points located on the front edge of the IOP board. A digital voltmeter of  $\pm 0.5\%$  accuracy is required. Insert the "common" voltmeter probe into the ground point and insert the other probe into each of the voltage test points. (Refer to Figure 3-19 on page 3-40 in INSTALLATION for voltage test point locations.)
- (6) Perform *one* of the following steps:
  - a. If the system voltages are incorrect, or if they are correct and the LED indications are *still* incorrect, contact Customer Support for assistance.
  - b. If the system voltages are correct and the LED indications are correct, yet the problem still persists, replace the APP and/or IOP board(s).

NOTE: Before replacing the APP board, use the save/restore program to save the customer's database (see page 5-89 in PROGRAMMING). It can then be restored (loaded) into a new APP board if necessary. Make sure the database back-up battery on the new APP board has a charge of at least 2.5VDC (see page 3-38 in INSTALLATION).

3.3 If the POWER-UP LED on a STN, COU, CNF, or MOD board does not go out after two seconds when the AC power is turned on:

- (1) Remove the faulty board and check to make sure that all of the components on the board are properly seated, that no pins are bent, and that adjacent components are not touching.
- (2) Wait 10 seconds and re-insert the board.
- (3) If the LED indications are still incorrect, replace the defective board.

FIGURE 6-1. LIGHT-EMITTING DIODE (LED) INDICATIONS

| BOARD | LOCATION                          | LED                                              | DESCRIPTION                                                                                                                                                                                                                                    |
|-------|-----------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| APP   | A (top)                           | APP RUN                                          | Lit when the APP board is functioning normally. Flashes when the APP board is not operating properly.                                                                                                                                          |
|       | B                                 | FIFO ACTIVE                                      | Unlit unless heavy traffic is causing frequent communication between the APP and IOP boards.                                                                                                                                                   |
|       | C (bottom)                        | BATTERY OFF                                      | Lit when the battery strap on the APP board is placed in the OFF position (over the pins 2 and 3). Will not light if the battery strap is not attached to any pins.                                                                            |
| IOP   | A (top)                           | MAJOR ALARM                                      | Lit when the system is inoperative due to a processor board failure. The power failure transfer feature is activated.                                                                                                                          |
|       | B                                 | DATABASE ERROR                                   | Lit when a database error has caused the system to initialize itself (all programming returned to default values). When the system is first installed, the LED will remain lit until the database is initialized through database programming. |
|       | C                                 | MINOR ALARM                                      | Lit when a minor alarm has occurred. The light goes out when the alarm message is cleared (as described in FEATURES, page 4-88).                                                                                                               |
|       | D                                 | IOP RUN                                          | Lit when the IOP board is functioning normally. Flashes when the IOP board is not operating properly.                                                                                                                                          |
|       | E<br>F<br>G (bottom)              | +30VDC<br>+5VDC<br>-12VDC                        | Lit when the indicated voltages are present. However, this does not ensure that the voltages are within tolerance.                                                                                                                             |
| COU   | A (top)                           | POWER-UP                                         | Lit if the board has not been acknowledged and reset by the system.                                                                                                                                                                            |
|       | B-E (bottom)                      | CIRCUIT (1-4)                                    | Indicates that the C.O. line associated with that circuit is ringing or is in use.                                                                                                                                                             |
| STN   | A (top)                           | POWER-UP                                         | Lit if the board has not been acknowledged and reset by the system.                                                                                                                                                                            |
|       | B-I (bottom)                      | CIRCUIT (1-8)                                    | Lit when the associated station is connected to a speech channel.                                                                                                                                                                              |
| CNF   | A (top)                           | POWER-UP                                         | Lit if the board has not been acknowledged and reset by the system.                                                                                                                                                                            |
|       | B-D<br>E-G<br>H-J<br>K-M (bottom) | CIRCUIT 1<br>CIRCUIT 2<br>CIRCUIT 3<br>CIRCUIT 4 | Lit when the associated conference circuit is in use.                                                                                                                                                                                          |

**FIGURE 6-1. LIGHT-EMITTING DIODE (LED) INDICATIONS (CONT'D)**

| BOARD | LOCATION   | LED                        | DESCRIPTION                                                                                                                                                                            |
|-------|------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MOD   | A (top)    | POWER-UP                   | Lit if the board has not been acknowledged and re-set by the system.                                                                                                                   |
|       | B-D        | EXTERNAL PAGING ZONE (1-3) | Lit when the associated external paging zone is in use.                                                                                                                                |
|       | E          | EXTERNAL PAGING            | Lit when any external paging zone is in use.                                                                                                                                           |
|       | F          | NIGHT TRANSFER RELAY       | Lit when the night transfer relay has been activated by placing the system in night mode through the primary attendant's station.                                                      |
|       | G-K        | TALKBACK SPEAKER (1-5)     | Lit when the associated talkback speaker is receiving a call, a page, or background music.                                                                                             |
|       | L-O        | DTMF DECODER (1-4)         | Lit while a single-line station is being used for dialing or when a DISA or automated attendant call is being dialed. DTMF decoders are selected by the system in reverse order (4-1). |
|       | P (bottom) | MODEM                      | Lit when either the 300-baud or 1200-baud modem is in use.                                                                                                                             |

#### 4. ALARM MESSAGES AND FIELD SERVICE DIAGNOSTICS

4.1 Alarm messages can be programmed to appear on display keysets, in the SMDR printout, or as a separate error printout. When listed in a printout, alarm messages are preceded by + + + and the time of day when the alarm occurred.

4.2 Minor alarm messages can be programmed to appear on all attendant stations' displays or on the primary attendant's display only. If there are no attendants, the messages will appear on a designated system alarm station's display. Refer to PROGRAMMING, page 5-22, for designating which attendants or which station will receive minor alarm messages. Major alarm messages will appear on all display keysets, regardless of programming.

4.3 Possible alarm messages and the associated troubleshooting procedures are outlined in the following sections.

##### A. MINOR ALARMS THAT ARE USER CORRECTABLE

- (1) **#01 EXT XXX — Station Off-Hook:** A station is off hook and idle. (The DSS/BLF key for the station will be fluttering continuously.) Hang up the handset at the station.
- (2) **#02 SMDR Print Timeout, #03 Error Print Timeout, and #04 SMDA Print Timeout:** The indicated printer is not working properly (the cable may be loose or the printer may be out of paper or ribbon).

##### B. MINOR ALARMS REQUIRING ATTENTION FROM SERVICE PERSONNEL

**NOTE:** Before removing the APP board, use the save/restore program to save the customer's database (see page 5-89 in PROGRAMMING). It can then be restored (loaded) into a new APP board if necessary. Make sure the database back-up battery on the new APP board has a charge of at least 2.5VDC (see page 3-38 in INSTALLATION).

- (1) **#10 EXT XXX — Excessive Data Errors:** Check the operation of the indicated keyset. The error may be caused by a defective keyset (perform keyset self-test), defective wiring

(check wiring), defective station cable, or a defective STN board.

- (2) **#11 APP Write Protect Circuit Fail:** The circuitry that prevents the software from accidentally writing to the database is no longer functioning. Replace the APP board and return it for repair.
- (3) **#12 APP Real Time Clock Inop:** The real time clock is not working. Therefore, display keysets and the SMDR will show incorrect time, reminder messages will not work, and the SMDA printout will not occur at the correct time. Replace the APP board and return it for repair.
- (4) **#13 IOP Watchdog Int. of APP Fail:** The IOP watchdog interrupt function of the APP board is inoperative. The APP board cannot detect problems with the IOP processor. Replace the APP and/or the IOP board and return it for repair.
- (5) **#14 APP RS232 Port — No Txt Int.:** The APP RS-232-C port has no transmit interrupt function. Replace the APP board and return it for repair.
- (6) **#15 APP RS232 Port — No Clock:** There is a problem with the clock on the APP board. Replace the board and return it for repair.
- (7) **#16 IOP RS232 Port — No Clock:** There is a problem with the clock on the IOP board. Replace the board and return it for repair.
- (8) **#17 APP Watchdog Interrupt Inop.:** The watchdog interrupt function on the APP is inoperative. It will not be able to detect a loop and allow the system to recover. Replace the APP board and return it for repair.
- (9) **#18 FIFO to IOP Fail/Full Status IOP; #19 FIFO to APP Fail/MT Status IOP:** The indicator on the IOP board that controls the flow of data between the APP and IOP boards during loaded conditions is not operating properly, resulting in faulty system operation during loaded conditions. Replace the IOP board and return it for repair.
- (10) **#20 FIFO to APP Fail/Full Status APP:** The indicator on the APP board that controls the flow of data between the APP and IOP boards

- during loaded conditions is not operating properly, resulting in faulty system operation during loaded conditions. Replace the APP board and return it for repair.
- (11) **#21 IOP Watchdog Int. of IOP Fail, #22 IOP TRAP Failure, #23 IOP Timer Overflow Int. Fail, #24 IOP SWI Interrupt Failure:** The indicated function on the IOP board is not working. Replace the IOP board and return it for repair.
  - (12) **#25 APP Interrupt Failure:** The indicator on the APP board that controls the flow of data between the APP and IOP boards during loaded conditions is not operating properly, resulting in faulty system operation during loaded conditions. Replace the APP board and return it for repair.
  - (13) **#26 FIFO to APP Fail/Full Status IOP:** The indicator on the IOP board that controls the flow of data between the APP and IOP boards during loaded conditions is not operating properly, resulting in faulty system operation during loaded conditions. Replace the IOP board and return it for repair.
  - (14) **#27 FIFO to IOP Fail/MT Status APP:** The indicator on the APP board that controls the flow of data between the APP and IOP boards during loaded conditions is not operating properly, resulting in faulty system operation during loaded conditions. Replace the APP board and return it for repair.
  - (15) **#28 Background Detected Timer Fail:** The interval timer is defective. Replace the APP board and return it for repair.
  - (16) **#29 Watchdog Timeout in Minor Init:** The watchdog function has timed out during an attempted initialization. Replace the APP board and return it for repair.
  - (17) **#30 APP Real-Time Clock Stopped:** The clock on the APP board is defective. Replace the APP board and return it for repair.
  - (18) **#31 APP Real-Time Clock Needs Init:** This message usually appears when the AC power is first turned on. Check that the battery strap on the APP board is in the ON position (over pins 1 and 2). If the battery strap is correct, reset the system by pressing the reset button on the front of the APP board. Then set the system time through the programming terminal or an attendant's keyset. If the message still appears, replace the APP board and return it for repair.
  - (19) **#32 Database Error:** This message usually appears when the system AC power is turned on for the very first time. Check that the battery strap on the APP board is placed in the ON position (over pins 1 and 2). If the battery strap is correct, initialize the system through database programming (see page 5-91). If the DATABASE ERROR LED on the IOP board remains lit after the initialization, replace the APP board and return it for repair.
  - (20) **#33 EXT XXX — Excessive Hardware Failures:** Replace or repair the indicated station's cabling and/or replace the associated STN board or station instrument.
  - (21) **#34 APP ROM Failure:** The ROMs on the APP board are not functional. Replace the software ROMs and/or the APP board and return for repair.
  - (22) **#35 Invalid Alarm:** This indicates a software problem in error handling. Contact Customer Support and report the error message and the circumstances under which it occurred.
- ### C. MAJOR ALARMS THAT REQUIRE IMMEDIATE ATTENTION
- #### 4.4
- If a major alarm is detected for which the APP board is responsible, the APP RUN LED is flashing. If caused by the IOP board, the IOP RUN LED is flashing. The system is inoperable and the power failure transfer feature is activated. When a major alarm occurs, do the following:
- (1) Attempt to reset the system by using the reset switch on the front of the APP board or by using the programming terminal (refer to PROGRAMMING, page 5-91). If the system does not recover from the alarm, continue to the next step.
  - (2) Turn OFF the AC POWER for at least ten seconds and then turn it ON again.

- (3) If the system still does not recover from the alarm, check the system voltages as outlined on page 6-2 and refer to the LED indications on page 6-3. If it is determined that the APP and/or the IOP board is faulty, return it for repair and include any indicated error messages in the problem description. The possible messages include the following:

**APP MAJOR ALARMS**

- APP ROM Failure
- APP Scratch RAM Failure
- APP Database RAM Failure
- APP Interval Timer Failure
- FIFO to APP Fail/MT Status APP
- FIFO to IOP Fail/Full Status IOP
- FIFO to APP Fail/Data Error
- APP Considers IOP Dead
- APP Task Init. Table Error
- APP/IOP Software Compatibility Error
- User Initialization Failure
- User Failure in Exception Processing
- APP Interrupt Level 2 Stuck True
- APP Interrupt Level 3 Stuck True
- APP Interrupt Level 4 Stuck True
- APP Interrupt Level 5 Stuck True
- OS Initialization Failure
- APP Interrupt Level 7 Stuck True

**IOP MAJOR ALARMS**

- IOP RAM Failure
- IOP ROM Failure
- IOP 5 Ms Timer Failure
- IOP Programmable Timer Failure
- IOP ROM/Processor Incompatible
- FIFO to IOP Fail/Data Error
- FIFO to IOP Fail/MT Status IOP
- IOP Bad MCU
- IOP IRQ1 Stuck True

**NOTE:** When returning a faulty board, indicate all applicable error messages on the material return authorization (MRA) tag. For more information on returning equipment, see page 6-41.

**D. FIELD SERVICE DIAGNOSTICS**

**4.5** Field service diagnostics can be programmed to appear in the SMDR printout or as a separate error printout. When listed in a printout, field service diagnostics are preceded by \*\*\* and the time of day when the error message occurred. Possible field service

diagnostics and the associated troubleshooting procedures are as follows:

- (1) **Device Change Failed: X.Y — Device Remains [Keyset, SL Set, or DSS/BLF]:** The system has detected the presence of a device on a circuit that is equipped for a different type of device. Either change the type of device or properly re-equip the circuit through database programming.
- (2) **?? XX or Board: ?? XX:** This indicates a software problem in error handling. Contact Customer Support and report the error message and the circumstances under which it occurred.
- (3) **Board: Type Number — Error Detected, Passed Re-Init:** This indicates that an error was detected on the board, but the board was re-initialized successfully. If this error message occurs intermittently, no action is necessary. However, if the message occurs repeatedly, replace the board and return it for repair.
- (4) **Board: Type Number — Error Detected, Failed Re-Init:** This indicates that an error was detected on the board and the board failed re-initialization. The board is not functional; replace it and return it for repair.
- (5) **Board: Type Number — Inserted, Failed Init:** This indicates that the board could not be initialized. The board is not functional; replace it and return it for repair.
- (6) **Board: Type Number — Inserted, Passed Init:** This indicates successful detection and initialization of the board. No action is necessary.
- (7) **Board: Type Number — Removed:** This indicates removal of the board. No action is necessary.
- (8) **STNA: X.Y [K/D1]:** The system has detected or received an error from a STN-A or STN-A1 device (keyset or DSS/BLF Unit). The possible accompanying error messages are:
  - a. **IOP Detected Transmission Error:** The system has detected a transmission error from a keyset or DSS/BLF Unit. This message may occur when the line cord is removed from a keyset or DSS/BLF Unit and when

- the 25-pair cable is removed from a STN-A or STN-A1 board. In these cases, no action is required. However, if the error message occurs repeatedly for a STN-A/A1 circuit or a group of STN-A/A1 circuits for which the line cord(s) or the station cable is not being removed, all station cabling and wiring should be checked. If the problem persists, replace the station instrument and/or the STN-A/A1 board and return for repair.
- b. *IOP Detected No-Response Error*: The system has detected a lack of response from a keyset or DSS/BLF Unit. This message generally indicates a hardware problem. Check all station cabling and wiring. If the problem persists, replace the station instrument and/or STN-A or STN-A1 board and return for repair.
- c. *Reconfigure Request*: The system has detected a temporary transmission problem from a keyset or DSS/BLF Unit. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a station circuit or a group of station circuits, check all station cabling and wiring. If the problem persists, replace the station instrument, the APP board, and/or the STN-A or STN-A1 board and return for repair.
- d. *End-Of-Reconfigure Handshake*: This message, which accompanies the Reconfigure Request message, indicates the completion of the station reconfiguration.
- e. *IOP Detected ACIA Hardware Error*: The system has detected a faulty STN-A or STN-A1 circuit. Replace the faulty STN-A or STN-A1 board and return it for repair.
- f. *Inconsistency Error*: The system has detected inconsistent communication between the KSU and the STN-A or STN-A1 device. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a STN-A/A1 circuit or a group of STN-A/A1 circuits, check all station cabling and wiring. If the problem persists, replace the station instrument and/or STN-A/A1 board and return for repair.
- g. *Peripheral Detected Xmit Error*: The STN-A or STN-A1 instrument has detected a transmission error from the KSU. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a STN-A/A1 circuit or a group of STN-A/A1 circuits, check all station cabling and wiring. If the problem persists, replace the station instrument and/or the STN-A/A1 board and return for repair.
- h. *Peripheral Output Queue Overflow*: This indicates that the station user is pushing the keys on the station instrument at an unreasonably fast rate. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly, the station user should be instructed to avoid pushing the station instrument keys so rapidly.
- i. The following errors indicate a problem with the device attached to the STN-A or STN-A1 board. When these errors occur, replace the faulty device and return it for repair.
- Peripheral Watchdog Timeout
  - Peripheral Trap Error
  - Peripheral Timer Error
  - Peripheral SWI Error
  - Peripheral TDRE Error
- j. *?? XX*: The system has detected an invalid data byte from a keyset or DSS/BLF Unit. This message may occur when the line cord is removed from a keyset or DSS/BLF Unit and when the 25-pair cable is removed from a STN-A or STN-A1 board. In these cases, no action is required. However, if the error occurs repeatedly for a STN-A/A1 circuit or a group of STN-A/A1 circuits for which the line cord or the station cable is not being removed, all station cabling and wiring should be checked. If the problem persists, replace the station instrument and/or the STN-A/A1 board and return for repair.
- k. *VX* — This message may appear when a STN-A or STN-A1 device is connected to a STN-A/A1 board and when the system is powered up. The message indicates the



station version number sent to the KSU. If the message reads "V0", no action is necessary. If the message reads anything other than "V0", the STN-A/A1 device is not functioning properly and must be replaced.

1. A message beginning with any of the following prefixes indicates information for the device type name. These messages are for diagnostic purposes only and do not require any action.

STN B:  
COU:  
MOD VC:  
DTMF RCVR:  
CNF:  
EPU:  
NIGHT RING:  
NIGHT SW:  
TALKBACK:

- (9) The following messages indicate minor software errors. Although they detect inconsistent operation, they generally do not warrant a system reset. If any of these messages should occur, note the circumstances under which they occurred and contact Customer Support.

Invalid Input > Keypad: XX State: XXX Input: XX  
Invalid Input > Keypad: XX State: XXX Timer No.: XX  
Invalid Input > SL Set: XX State: XXX Input: XX  
Invalid Input > SL Set: XX State: XXX Timer No.: XX  
Invalid Input > Line: XX State: XXX Input: XX  
Invalid Input > Line: XX State: XXX Timer No.: XX  
Cancel Timer Not Found = \$XX Device = \$XXXX  
Invalid Error Message: Task

- (10) **Single User Abort: Device Type = TTTTT Device Number = \$XX:** This message indicates that a minor software reset has occurred concerning the indicated device. Note the circumstances under which the message occurred and contact Customer Support.

- (11) **Last CP/CO History Freeze and Last CP/CO History Un-Freeze:** By themselves, these messages do not indicate any errors. They are printed to indicate when the last freeze and unfreeze of the CP and CO history queues took place. They should be reported along with the accompanying error messages.

- (12) **Failure to Reset After Volatile Data Change:** Indicates that the programmer did not reset the system after completing a programming session. The system must be reset to avoid possible faulty behavior.

- (13) **Time of Last History Clear:** Indicates the time and date that the error message history was cleared. No action is necessary.

- (14) **Any other error messages:** Note the circumstances under which the message(s) occurred and contact Customer Support.

**NOTE:** When returning a faulty station instrument or board, indicate all applicable error messages on the material return authorization (MRA) tag. For more information on returning equipment, see page 6-41.

## 5. TROUBLESHOOTING CHARTS

5.1 The troubleshooting charts located on the following pages list symptoms, possible causes, and corrective actions for problems. Look up the problem in the appropriate chart and perform the corrective actions in the order given. The troubleshooting procedures for correcting equipment failures have been divided into six categories:

- A. System
- B. C.O. Lines
- C. Features
- D. Keysets
- E. Single-Line Sets
- F. DSS/BLF Units

**NOTE:** Throughout the troubleshooting section of the manual, there are numerous references to replacing the defective part and returning it for repair. However, before returning any part, proper troubleshooting procedures should be used to verify that the part is actually defective. For example, if a STN-A board appears to be defective, swap it with a "known good" STN-A board presently installed in the system. If the problem follows the suspect board, it can be considered defective. For more information on returning defective equipment, refer to page 6-41.

### A. SYSTEM

5.2 If the problem involves one of the following system features, refer to Figure 6-2 on pages 6-12 through 6-15.

- Repeated occurrence of all calls in progress dropping.
- No music-on-hold/background music.
- System battery back-up is inoperative.
- DISA is inoperative.
- All keysets are inoperative.
- Unable to interface with a computer call-up device.
- Programming terminal will not communicate with the system.
- RFI/EMI present over conversations.

### B. C.O. LINES

5.3 If the problem involves one of the following C.O. line symptoms, refer to Figure 6-3 on pages 6-16 through 6-20.

- C.O. line inoperative throughout the system.
- Cannot obtain C.O. dial tone.
- Low volume on all C.O. lines.
- Cannot break C.O. dial tone.
- Cannot place an outgoing call.
- Other station conversations can be heard on the C.O. line.
- Calls are dropped during conversation or when answered.
- C.O. line cannot be reseized.
- Noise on C.O. line at all stations.
- C.O. line remains seized after the call is ended.

### C. FEATURES

5.4 For problems involving the following features, refer to Figure 6-4 on pages 6-21 to 6-26.

- Feature does not appear to work properly.
- Cannot transfer C.O. or intercom calls to other stations.
- Cannot transfer calls to outside numbers.
- Cannot transfer incoming C.O. calls or place them on hold.
- Cannot initiate a conference.
- Cannot initiate an internal page.
- Cannot initiate an external page.
- Cannot initiate a call forward.
- Calls do not follow requested forward.
- Redial feature is inoperative.
- Station is not receiving hunt group calls.
- Station is not receiving pages.
- House phone is inoperative.
- Automated attendant inoperative.

### D. KEYSETS

5.5 If problems involve keysets or their optional equipment, refer to Figure 6-5 on pages 6-27 through 6-33.

- Keypad is inoperative.
- A group of eight keysets is inoperative.
- LCD is inoperative.
- Headset is inoperative.
- Keypad squeals when placing and/or receiving calls.
- No handsfree transmit on GX keypad equipped with an external desk speaker.
- GX keypad squeals when using an external desk speaker.

- Data noise when the keyset is off hook.
- Cannot obtain intercom dial tone.
- Cannot break intercom dial tone.
- Cannot place an intercom call.
- Cannot break C.O. dial tone.
- Data device not operating properly.
- LRA not operating properly.
- Cannot receive off-hook voice announce calls.
- Cannot place off-hook voice announce calls.
- Erratic keyset operation.

**E. SINGLE-LINE SETS**

5.6 The following problems are discussed in Figure 6-6 on pages 6-34 through 6-37.

- Single-line set is inoperative.
- A group of eight single-line sets is inoperative.
- Single-line set will not ring.

- Ring trip is not provided to a group of eight single-line sets.
- AC ringer-equipped single-line sets will not ring.
- Cannot obtain intercom dial tone.
- Cannot place an intercom call.
- Cannot break C.O. dial tone.
- Cannot place off-hook voice announce calls.
- Single-line sets not receiving message waiting indications and/or message lamps not functioning properly

**F. DSS/BLF UNITS**

5.7 For DSS/BLF Unit problems, refer to Figure 6-7 on pages 6-38 and 6-39.

- DSS/BLF Unit is inoperative.
- Incorrect LED indications.
- Calls are transferred to the wrong station.
- Cannot place immediate off-hook voice announce calls.

FIGURE 6-2. SYSTEM TROUBLESHOOTING CHART

| SYMPTOM                                               | PROBABLE CAUSE                                                                                                              | CORRECTIVE ACTION                                                                                                              |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Repeated occurrence of all calls in progress dropping | AC line is not isolated and dedicated                                                                                       | Have isolated, dedicated line installed. Refer to page 3-3 in INSTALLATION for details.                                        |
|                                                       | Defective power supply                                                                                                      | Refer to INSTALLATION, page 3-36, to perform the power supply electrical test. Replace the power supply if faulty.             |
|                                                       | KSU located near a strong magnetic field or other potential source of interference (copy machines, power transformer, etc.) | Relocate the KSU a minimum of 20 feet from any equipment that is a potential source of interference.                           |
|                                                       | IC-CO/CO-CO disconnect timer(s) need(s) adjustment                                                                          | See <i>diald digits</i> field in SMDR, page 4-98 in FEATURES. Set timer(s) to a higher value. Refer to PROGRAMMING, page 5-12. |
|                                                       | Inter-ring silence timer value is set too short                                                                             | Ensure timer value is set longer than the central office ringing is "off." See PROGRAMMING, page 5-12.                         |
|                                                       | Defective APP or IOP board                                                                                                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                 |

NOTE: The central office must provide a minimum of 20mA loop current.

|                                                                     |                                                    |                                                                                                                                |
|---------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| No music-on-hold/background music (external music source connected) | External music source turned off or inoperative    | Check the external music source for proper operation. Optimal input level is .775VRMS (0dB). Refer to INSTALLATION, page 3-76. |
|                                                                     | IOP music strap in OFF or CHIME position           | Move the music strap on the IOP board to the MUSIC position.                                                                   |
|                                                                     | Defective fuse                                     | Inspect the fuse on the front of the IOP board. Replace the fuse if faulty.                                                    |
|                                                                     | Defective cable between music source and IOP board | Repair or replace the cable. Check to see that the proper connector was used. Refer to SPECIFICATIONS, page 2-7.               |
|                                                                     | Defective IOP board                                | Replace the IOP board.                                                                                                         |

FIGURE 6-2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                              | PROBABLE CAUSE                                       | CORRECTIVE ACTION                                                                                                                                                                                         |
|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System battery back-up inoperative. AC operation OK. | Battery back-up switch in OFF position.              | Move switch to the ON position.                                                                                                                                                                           |
|                                                      | Improper power-up sequence                           | Refer to step 10 page 3-74 in INSTALLATION for proper sequence.                                                                                                                                           |
|                                                      | Defective in-line fuse (customer-provided 25A, 125V) | Remove the in-line fuse and check it using an ohmmeter.                                                                                                                                                   |
|                                                      | Defective battery pack                               | Check that the batteries are wired correctly and wires are in good condition. Turn off AC power and check the battery pack output to ensure that it is fully charged. Refer to page 3-74 in INSTALLATION. |
|                                                      | Defective power supply                               | If the battery charge is low, check the power supply float voltage (measured at the battery terminals). It should measure at least 34.5VDC. Replace power supply if faulty.                               |
| DISA inoperative                                     | User error                                           | Refer to the FEATURES, page 4-26, for correct procedures.                                                                                                                                                 |
|                                                      | Telephone not compatible                             | User must dial in from a DTMF telephone.                                                                                                                                                                  |
|                                                      | Programming error                                    | Ensure that the DISA line is identified correctly as a day or night DISA line. Refer to PROGRAMMING, page 5-33.                                                                                           |
|                                                      | System is not equipped for DISA                      | The system must have a MOD-III or MOD-IV board. A CNF board is also required for CO-to-CO DISA calls.                                                                                                     |
|                                                      | COU board not modified for DISA                      | Refer to INSTALLATION, page 3-47, for modification procedures.                                                                                                                                            |
|                                                      | Defective MOD-III, MOD-IV, CNF, or COU board         | Replace the defective board(s).                                                                                                                                                                           |
|                                                      | Defective APP or IOP board                           | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                            |

**NOTE:** Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-152D System. This natural degradation in tone volume may adversely affect the reliability of the DISA feature. Other factors which can affect DISA performance are C.O. line noise and the quality and strength of the DTMF tones generated by the off-premises phone itself.

TROUBLESHOOTING

FIGURE 6-2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                                                                                        | PROBABLE CAUSE                                                                                    | CORRECTIVE ACTION                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All keysets in the system are inoperative. No LED indication when a line key is pressed. +30±6.0VDC measurement (as described on page 6-2) is not present (+30VDC LED is off). | Open or loose connection in the cable between the power supply and the KSU, or a defective cable  | Turn off the AC power. Check to see that DC power cable is properly connected. Repair or replace the power supply, the cable, and/or the APP board if the connection is faulty.                                         |
|                                                                                                                                                                                | Defective power supply or connector                                                               | Use a voltmeter to check the +30VDC voltage at the power supply terminals. If the voltage is not +30 ±6.0VDC, replace the power supply and/or the cable.                                                                |
|                                                                                                                                                                                | Defective STN-A/A1 board                                                                          | Remove all STN-A/A1 boards from the KSU. Replace the STN-A/A1 boards one at a time and check the system voltages on the APP board (refer to page 6-2), until the defective board is isolated. Replace the faulty board. |
|                                                                                                                                                                                | Defective KSU                                                                                     | Check the system voltages on the APP board (refer to page 6-2). Replace the KSU if necessary.                                                                                                                           |
| Unable to interface with computer call-up device (banking machine, answering machine, auto dialer, etc.)                                                                       | Equipment being called is defective                                                               | Ensure that the called equipment is functioning correctly.                                                                                                                                                              |
|                                                                                                                                                                                | DTMF digit duration/pause specifications of called equipment is incompatible with GMX-152D System | Check with the equipment manufacturer for DTMF digit duration/pause specifications. Adjust DTMF digit duration/pause timer. (Refer to page 5-12 in PROGRAMMING.) Default value is 6/100 second.                         |
|                                                                                                                                                                                | C.O. line is designated for dial-pulse signaling                                                  | C.O. line must be designated as DTMF. Refer to page 5-30 in PROGRAMMING.                                                                                                                                                |
|                                                                                                                                                                                | Defective COU board                                                                               | Replace the associated COU board.                                                                                                                                                                                       |
|                                                                                                                                                                                | Defective APP or IOP board                                                                        | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                          |

FIGURE 6-2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                                                        | PROBABLE CAUSE                                                                                                   | CORRECTIVE ACTION                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming terminal will not communicate with the system. The terminal has a good cable and functions correctly when used for other purposes. | Baud rates of the terminal and the board are not the same and/or the communication parameters are not compatible | Refer to page 2-17 for proper settings and complete specifications.                                                                                                                                                                                                                                             |
|                                                                                                                                                | Defective power supply or cable                                                                                  | Check the -12VDC and +12VDC test points on the APP board (refer to page 6-2).                                                                                                                                                                                                                                   |
|                                                                                                                                                | Defective APP or IOP board                                                                                       | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                                  |
| RFI/EMI present over conversations                                                                                                             | AC power source or grounding incorrect                                                                           | Verify that the AC circuit is isolated and dedicated (see page 3-3 in INSTALLATION) and check for proper grounding (see page 3-34 in INSTALLATION).                                                                                                                                                             |
|                                                                                                                                                | Grounding point is source of RFI/EMI                                                                             | While the system is running on AC power, temporarily remove the grounding wire to determine if it is the source of the RFI/EMI. See page 3-34 in INSTALLATION for proper grounding requirements.                                                                                                                |
|                                                                                                                                                | AC power source is causing RFI/EMI                                                                               | If an external battery back-up power source is installed, switch system operation to battery back-up power by unplugging the power source's AC power cord (with grounding wire connected to KSU). If RFI/EMI stops, the AC power source is the cause. Install an RFI/EMI filter or equivalent on the AC outlet. |

NOTE: For further assistance (while on site), contact Customer Support with the following information:

1. Modulation — AM, FM, or other
2. Frequency of the interfering station (in Hz)
3. Broadcast power
4. Distance between KSU and broadcast antenna
5. Who hears RFI:
  - Outside call — inside party only?
  - Outside call — outside party only?
  - Outside call — both parties?
  - Intercom call — one or both parties?
6. Type of instrument(s) on which RFI is heard — 24-line keyset(s), 12-line keyset(s), 8-line keyset(s), or single-line sets

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART

| SYMPTOM                                     | PROBABLE CAUSE                                                                 | CORRECTIVE ACTION                                                                                                                                                                                                                                                   |
|---------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C.O. line inoperative throughout the system | Defective C.O. line from central office                                        | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                             | Line is dedicated to a secondary carrier requiring an access code              | Verify the type of C.O. line. Instruct users to dial access code, if necessary.                                                                                                                                                                                     |
|                                             | Defective cabling or miswired amphenol connector on the COU board              | Using a test set, ensure presence and correct location of the C.O. line at the associated C.O. modular jack assembly.                                                                                                                                               |
|                                             | Programming error                                                              | Ensure that the line is equipped and stations have been given access to it. See to page 5-33 in PROGRAMMING.                                                                                                                                                        |
|                                             | Defective COU board                                                            | Replace the associated COU board.                                                                                                                                                                                                                                   |
|                                             | Defective APP or IOP board                                                     | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                      |
| Cannot obtain C.O. dial tone                | If reorder tone is heard, programming error                                    | Ensure that keyset has outgoing access. Refer to page 5-41 in PROGRAMMING.                                                                                                                                                                                          |
|                                             |                                                                                | Ensure that the keyset is not programmed for LCR only. Refer to pages 5-41 and 5-82 in PROGRAMMING.                                                                                                                                                                 |
|                                             |                                                                                | Ensure line is equipped. Refer to page 5-33 in PROGRAMMING.                                                                                                                                                                                                         |
|                                             | If progress tone is heard, user error                                          | System is programmed to expect a forced account code. Refer to PROGRAMMING, page 5-41 and 5-20.                                                                                                                                                                     |
|                                             | Defective COU board                                                            | Replace the associated COU board.                                                                                                                                                                                                                                   |
| Defective APP or IOP board                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty. |                                                                                                                                                                                                                                                                     |



FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                    | PROBABLE CAUSE                                                              | CORRECTIVE ACTION                                                                                                                                                                                                                                                   |
|------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low volume on all C.O. lines. Cannot break C.O. dial tone. | Defective COU board                                                         | Measure -12VDC at the IOP board test points. (See page 6-2.) If it is not within tolerance, remove all COU boards and check voltage again. If the voltage returns to normal, replace the boards one at a time until the defective board is isolated and replaced.   |
|                                                            | Defective C.O. line from central office                                     | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                                            | Open or loose connection in the cable between the power supply and cardfile | With all COU boards removed, if the -12VDC is still not within tolerance, turn off the system and check the cable and connector with an ohmmeter. Replace or repair the faulty cable.                                                                               |
|                                                            | Defective power supply                                                      | With all COU boards removed, measure -12VDC at the power supply terminals (R - R/BK). If not within tolerance, replace the power supply.                                                                                                                            |
| Cannot break C.O. dial tone                                | C.O. circuit is programmed for wrong signaling type                         | Ensure that C.O. line and C.O. circuit use same type signaling (DTMF or dial-pulse). See PROGRAMMING, page 5-33.                                                                                                                                                    |
|                                                            | Defective C.O. line from central office                                     | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                                            | Timer error                                                                 | If line is DTMF, the DTMF digit duration/pause timer setting may not be compatible with the line. See PROGRAMMING, page 5-12. If dial pulse, the straps on the COU board may be set for the wrong make/break ratio.                                                 |
|                                                            | Defective COU board                                                         | Replace the associated COU board.                                                                                                                                                                                                                                   |
|                                                            | Defective APP or IOP board                                                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                      |

NOTE: See also keyset problems on page 6-31.

TROUBLESHOOTING

**FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)**

| SYMPTOM                                                                          | PROBABLE CAUSE                                                                | CORRECTIVE ACTION                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Cannot place an outgoing call. C.O. dial tone is present. Intercom works.</p> | Programming error                                                             | <p>Check station class of service (SCOS). See PROGRAMMING, pages 5-41 and 5-82. Check that equal access and absorbed digit programming for the line are correct. See PROGRAMMING, page 5-33.</p>                                                                           |                                                                                                                                                                                                                               |
|                                                                                  | Defective C.O. line from central office                                       | <p>At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company.</p> |                                                                                                                                                                                                                               |
|                                                                                  | Defective station instrument                                                  | <p>Replace the station instrument and/or perform the keyset self-test in INSTALLATION, page 3-54.</p>                                                                                                                                                                      |                                                                                                                                                                                                                               |
|                                                                                  | Defective COU board                                                           | <p>Replace the associated COU board.</p>                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |
|                                                                                  | Defective APP or IOP board                                                    | <p>Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.</p>                                                                                                                                                                                      |                                                                                                                                                                                                                               |
|                                                                                  | <p>Other station conversations can be heard on the C.O. line (cross-talk)</p> | Defective C.O. line(s)                                                                                                                                                                                                                                                     | <p>Isolate the line(s) with cross-talk by removing the bridging clips from the COU block. On the telco side of the block, attach a test set to each line and check for cross-talk. If present, contact the phone company.</p> |
|                                                                                  |                                                                               | Defective STN board                                                                                                                                                                                                                                                        | <p>Replace the associated STN board.</p>                                                                                                                                                                                      |
|                                                                                  |                                                                               | Defective COU board                                                                                                                                                                                                                                                        | <p>Replace the associated COU board.</p>                                                                                                                                                                                      |
| Defective APP or IOP board                                                       |                                                                               | <p>Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.</p>                                                                                                                                                                                      |                                                                                                                                                                                                                               |

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                               | PROBABLE CAUSE                                                       | CORRECTIVE ACTION                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outside calls dropped during conversation or upon answering C.O. line | User error (line key being pressed after initial connection is made) | Instruct users not to press the line key while on a call. Or, if necessary, set the C.O. re-seize timer to a higher value. Default value is 3 seconds. See page 5-12 in PROGRAMMING. Or, program the station to disallow C.O. re-seize. See PROGRAMMING, page 5-41. |
|                                                                       | Defective C.O. line from central office                              | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                                                       | Insufficient loop current supplied by central office                 | Central office must supply 20mA minimum loop current.                                                                                                                                                                                                               |
|                                                                       | IC-CO disconnect timer value is set too short                        | Ensure timer value is long enough to ignore normal interruptions in C.O. loop current. Default value is 0.6 seconds. See page 5-12 in PROGRAMMING.                                                                                                                  |
|                                                                       | Inter-ring silence timer value is set too short                      | Ensure timer value is set longer than the central office ring signal is "off." Refer to PROGRAMMING, page 5-12.                                                                                                                                                     |
|                                                                       | Defective station instrument                                         | Replace the station instrument and/or perform the keyset self-test in INSTALLATION, page 3-54.                                                                                                                                                                      |
|                                                                       | Defective COU or STN board                                           | Replace the associated COU or STN board.                                                                                                                                                                                                                            |
| C.O. line cannot be re-seized                                         | Defective APP or IOP board                                           | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                      |
|                                                                       | C.O. re-seize feature is disabled                                    | Check specific station programming as described on page 5-41 in PROGRAMMING. If the C.O. re-seize option has been disabled, the user cannot re-seize a line until it has been disconnected by hanging up or pressing another line key.                              |
|                                                                       | C.O. re-seize timer is set too high                                  | Set the timer to a lower timer value. Default value is 3 seconds. See page 5-12 in PROGRAMMING.                                                                                                                                                                     |

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                              | PROBABLE CAUSE                                     | CORRECTIVE ACTION                                                                                                                                                                                                                                                   |
|------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise on C.O. line at all stations                   | Defective C.O. line                                | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                                      | Defective COU board                                | Replace the associated COU board.                                                                                                                                                                                                                                   |
|                                                      | Defective power supply                             | Refer to INSTALLATION, page 3-36, to perform the power supply electrical test. Replace the power supply if faulty.                                                                                                                                                  |
|                                                      | Defective APP or IOP board                         | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                      |
| C.O. line remains seized after a call has been ended | Characteristic of some ESS central offices         | Central office must provide disconnect signal. Or, install a line release module available from most supply houses.                                                                                                                                                 |
|                                                      | IC-CO or CO-CO disconnect timer value set too long | Central office disconnect signal was not detected by IC-CO or CO-CO disconnect timer. Default value of the IC CO timer is 0.6 seconds; the CO-CO timer is 0.35 seconds. See page 5-12 in PROGRAMMING.                                                               |
|                                                      | Defective C.O. line                                | At the COU block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a known good C.O. circuit. If the problem follows the line, contact the telephone company. |
|                                                      | Defective station instrument                       | Replace the station instrument and/or perform the keyset self-test in INSTALLATION, page 3-54.                                                                                                                                                                      |
|                                                      | Defective COU board                                | Replace the associated COU board.                                                                                                                                                                                                                                   |
|                                                      | Defective APP or IOP board                         | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                      |

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART

| SYMPTOM                                                  | PROBABLE CAUSE                                                                   | CORRECTIVE ACTION                                                                                                                                                                 |
|----------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feature does not work properly                           | User error                                                                       | Refer to FEATURES for procedures. Also, ensure that the feature is available on the software package installed.                                                                   |
|                                                          | Programming error                                                                | Check feature code programming. Refer to PROGRAMMING, page 5-28. Also, check user-programmable feature key programming. Refer to FEATURES, page 4-39, and PROGRAMMING, page 5-50. |
|                                                          | Defective station instrument                                                     | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                       |
|                                                          | Defective STN board                                                              | Replace the associated STN board.                                                                                                                                                 |
| Cannot transfer C.O. or intercom calls to other stations | Defective APP or IOP board                                                       | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                    |
|                                                          | User error (e.g., wrong feature code)                                            | Refer to FEATURES, page 4-57, for procedures.                                                                                                                                     |
|                                                          | Called station is in do-not-disturb                                              | A station in do-not-disturb cannot receive transferred calls.                                                                                                                     |
|                                                          | Call transferred to an illegal intercom number                                   | Use only valid intercom numbers.                                                                                                                                                  |
|                                                          | Called station is in a different tenant group and cross-tenant traffic is denied | To allow such transfers (if desired), place the two stations in the same tenant group or allow cross-tenant traffic. See PROGRAMMING, page 5-22.                                  |
| Cannot transfer calls to outside numbers                 | Defective station instrument                                                     | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                       |
|                                                          | Defective APP or IOP board                                                       | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                    |
| Cannot transfer calls to outside numbers                 | User error (e.g., wrong feature code)                                            | Refer to FEATURES, page 4-57, for procedures.                                                                                                                                     |
|                                                          | Programming error                                                                | Check line access and toll restriction.                                                                                                                                           |
|                                                          | Defective CNF board                                                              | Replace the faulty board.                                                                                                                                                         |

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                   | PROBABLE CAUSE                                                                 | CORRECTIVE ACTION                                                                                                                                                                   |
|-----------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot transfer incoming C.O. calls or place them on hold | User error                                                                     | Refer to FEATURES for procedures.                                                                                                                                                   |
|                                                           | Inter-ring silence timer is set too short                                      | Ensure timer value is set longer than the central office ring signal is "off." Refer to PROGRAMMING, page 5-12.                                                                     |
|                                                           | User error (line key being pressed after initial connection is made)           | Set the C.O. resize timer to a higher value. Default value is 3 seconds. See page 5-12 in PROGRAMMING. Or, program the station to disallow C.O. resize. See PROGRAMMING, page 5-41. |
|                                                           | Programming error                                                              | Check user-programmable feature key programming. Refer to FEATURES, page 4-39.                                                                                                      |
| Cannot initiate a conference                              | User error                                                                     | Refer to FEATURES, page 4-62, for correct procedures.                                                                                                                               |
|                                                           | System is not equipped for conferencing                                        | The system must have a CNF board.                                                                                                                                                   |
|                                                           | System capacity exceeded                                                       | Refer to the maximum system capacities on page 1-6 in OVERVIEW.                                                                                                                     |
|                                                           | Defective station instrument                                                   | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                         |
|                                                           | Defective CNF board                                                            | Replace the CNF board.                                                                                                                                                              |
|                                                           | Defective STN board                                                            | Replace the associated STN board.                                                                                                                                                   |
| Defective APP or IOP board                                | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty. |                                                                                                                                                                                     |

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                          | PROBABLE CAUSE                                                                 | CORRECTIVE ACTION                                                                                                                                                                                          |
|----------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot initiate an internal page | User error                                                                     | Refer to FEATURES, page 4-76, for correct procedures.                                                                                                                                                      |
|                                  | All stations in the paging zone are busy, or an intercom path is not available | Reorder tone is heard. Wait several seconds and then attempt to place the page again. Paging requires an intercom path.                                                                                    |
|                                  | All stations in the paging zone are in do-not-disturb                          | Reorder tone is heard if all stations in the zone are in do-not-disturb and if external paging for the zone is disabled.                                                                                   |
|                                  | No stations are programmed to receive pages                                    | Reorder tone is heard. Check paging assignment. Refer to page 5-73 in PROGRAMMING.                                                                                                                         |
|                                  | Defective station instrument                                                   | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                                                |
| Cannot initiate an external page | Defective APP or IOP board                                                     | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                             |
|                                  | User error                                                                     | Refer to FEATURES, page 4-76, for correct procedures.                                                                                                                                                      |
|                                  | Another external zone page is being made or an intercom path is not available  | Reorder tone is heard. Wait several seconds and then attempt to place the page again. Only one external zone page can be made at a time. Paging requires an intercom path.                                 |
|                                  | Defective station instrument                                                   | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                                                |
|                                  | External paging speakers installed incorrectly                                 | While paging, use a test set to check audio on pins 34 and 9 of the MOD-III/IV connector. Refer to INSTALLATION, page 3-27. If audio is present, the problem is in the customer-provided paging equipment. |
| Cannot initiate an external page | Defective MOD-III or MOD-IV board                                              | If audio is absent, replace the MOD-III/IV board.                                                                                                                                                          |
|                                  | Defective APP or IOP board                                                     | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                             |

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                | PROBABLE CAUSE                                     | CORRECTIVE ACTION                                                                                                                                                                                                                                                                                                            |
|----------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot initiate a call forward         | User error                                         | Refer to FEATURES, page 4-64, for correct procedures.                                                                                                                                                                                                                                                                        |
|                                        | User attempting illegal forward                    | Stations are not allowed to set call forward if it forms an unconditional loop, the receiving station is in do-not-disturb, or an invalid intercom number is dialed. SCOS and outgoing access are checked when a call is forwarded to an outside telephone number. Also, LCR cannot be used to forward to an outside number. |
|                                        | Defective station instrument                       | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                                                                                                                                                                  |
|                                        | Defective APP board                                | Refer to page 6-2 to test the system voltages. Replace the board if faulty                                                                                                                                                                                                                                                   |
| Calls will not forward                 | User error                                         | Refer to FEATURES, page 4-64, for procedures.                                                                                                                                                                                                                                                                                |
|                                        | Illegal forward                                    | Conditional forwards (i.e., if busy, if unanswered) may form an undetected loop. If a call forward request forms a conditional loop, the call returns to the first station.                                                                                                                                                  |
|                                        | Defective STN board                                | Replace the associated STN board.                                                                                                                                                                                                                                                                                            |
|                                        | Defective APP or IOP board                         | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                                               |
| Last number redial feature inoperative | User error                                         | Refer to FEATURES, page 4-75, for procedures. Keyset may be programmed for last number saved.                                                                                                                                                                                                                                |
|                                        | System speed-dial number identified as non-display | A system speed-dial number identified as non-display cannot be redialed.                                                                                                                                                                                                                                                     |
|                                        | Defective station instrument                       | Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-54.                                                                                                                                                                                                                  |
|                                        | Defective APP or IOP board                         | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                                               |



FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                               | PROBABLE CAUSE                             | CORRECTIVE ACTION                                                                                                                                                                                                    |
|-------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Station not receiving hunt group calls                | User error                                 | Hunt group calls may have been halted using the hunt group remove feature code (see page 4-18 in FEATURES). Or, the station may be in do-not-disturb or call forward.                                                |
|                                                       | Programming error                          | Check hunt group programming. Refer to page 5-64 in PROGRAMMING.                                                                                                                                                     |
| Station is not receiving pages                        | User error                                 | Pages may have been halted using the page remove feature code (see page 4-76 in FEATURES). Or, the station may be in do-not-disturb.                                                                                 |
|                                                       | Programming error                          | Check page zone programming for the station. See PROGRAMMING, pages 5-41 and 5-73.                                                                                                                                   |
| House phone is not working properly or is inoperative | User error                                 | Incoming calls take precedence over outgoing calls. Refer to FEATURES, page 4-74.                                                                                                                                    |
|                                                       | Programming error (database)               | Ensure that the station is designated as a house phone. Refer to page 5-41 or page 5-72 in PROGRAMMING. Also, make sure the station has been assigned the proper SCOS and line access. See page 5-41 in PROGRAMMING. |
|                                                       | Programming error (database or speed-dial) | Ensure that the correct numbers are in appropriate day number and night number (speed-dial) locations. Refer to page 4-74 in FEATURES.                                                                               |

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                         | PROBABLE CAUSE            | CORRECTIVE ACTION                                                                                             |
|---------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------|
| Automated attendant inoperative | User error                | A DTMF phone is required. Refer to FEATURES, page 4-12.                                                       |
|                                 | DTMF decoder unavailable  | If a DTMF decoder is not available, the caller is transferred to the automated attendant's attendant.         |
|                                 | Programming error         | Automated attendant station(s) must be designated in the database. Refer to PROGRAMMING, pages 5-41 and 5-72. |
|                                 | Defective playback device | Replace the playback device.                                                                                  |

**NOTE:** Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-152D System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone itself.

FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART

| SYMPTOM                                                                                                                              | PROBABLE CAUSE                                                                            | CORRECTIVE ACTION                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Keyset inoperative. LED indication present while any key with an LED is held down. Reorder tone is heard when key is pressed.</p> | <p>Programming error (circuit not equipped; display shows STN CIRCUIT IS UN-EQUIPPED)</p> | <p>Equip the circuit. Refer to PROGRAMMING, page 5-41.</p>                                                                                                                                                      |
|                                                                                                                                      | <p>Programming error (circuit identified as DSS/BLF; no reorder tone is heard)</p>        | <p>Identify the circuit for keyset use. Refer to page 5-41 in PROGRAMMING.</p>                                                                                                                                  |
|                                                                                                                                      | <p>System lockout caused by excessive data errors (displays SYSTEM LOCKOUT)</p>           | <p>Remove and replace the line cord to reset the keyset.</p>                                                                                                                                                    |
|                                                                                                                                      | <p>Defective cabling or connections</p>                                                   | <p>Ensure that all cables are correctly connected to the modular jack as shown in Figure 3-1 on page 3-7 in INSTALLATION. Check for loose or open connections in the station cabling and the line cord.</p>     |
|                                                                                                                                      | <p>Defective keyset</p>                                                                   | <p>Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.</p>                                                                                                  |
|                                                                                                                                      | <p>Defective STN-A/A1 board</p>                                                           | <p>Replace the associated STN-A/A1 board.</p>                                                                                                                                                                   |
| <p>Keyset inoperative. No LED indication when any key is pressed. No audio is present.</p>                                           | <p>Defective APP or IOP board</p>                                                         | <p>Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.</p>                                                                                                                           |
|                                                                                                                                      | <p>Defective fuse on the associated STN-A/A1 board</p>                                    | <p>Turn off the AC power, remove the fuse, and use an ohmmeter to check the fuse; replace if faulty.</p>                                                                                                        |
|                                                                                                                                      | <p>Defective keyset</p>                                                                   | <p>Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.</p>                                                                                                  |
|                                                                                                                                      | <p>Defective cabling or connections</p>                                                   | <p>Ensure that 30VDC is present at the modular jack and polarity is correct. Check for loose or open connections in the station cabling and the line cord. Refer to Figure 3-1 on page 3-7 in INSTALLATION.</p> |
|                                                                                                                                      | <p>Defective STN-A/A1 board</p>                                                           | <p>Replace the associated STN-A/A1 board.</p>                                                                                                                                                                   |

FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                                                   | PROBABLE CAUSE                                                                          | CORRECTIVE ACTION                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A group of 8 keysets inoperative. No LED indication when a line key is held down. All affected keysets are located on one STN-A/A1 board. | Defective fuse on the associated STN-A or STN-A1 board                                  | Turn off the AC power, remove the fuse, and use an ohmmeter to check the fuse; replace if faulty.                                                                                                                                                                                                      |
|                                                                                                                                           | Defective STN-A/A1 board                                                                | Replace the associated STN-A/A1 board.                                                                                                                                                                                                                                                                 |
|                                                                                                                                           | Defective station amphenol connector or cable attached to the associated STN-A/A1 board | Remove cable from board. Using an ohmmeter, verify the pinout of the cable. (Refer to the information on pages 3-12 and 3-17 in INSTALLATION.) Ensure that 30VDC is present at the modular jack and polarity is correct. Check for loose or open connections in the station cabling and the line cord. |
|                                                                                                                                           | Defective receptacle on backplane                                                       | Replace the KSU.                                                                                                                                                                                                                                                                                       |
| LCD inoperative. Otherwise, keyset functions normally.                                                                                    | Defective LCD Unit or LCD ribbon cable.                                                 | Replace the LCD Unit or ribbon cable. Refer to page 3-54 in INSTALLATION.                                                                                                                                                                                                                              |
|                                                                                                                                           | Improper installation or LCD contrast maladjusted                                       | Refer to INSTALLATION, page 3-54. If the keyset has a potentiometer, adjust the contrast if necessary.                                                                                                                                                                                                 |
|                                                                                                                                           | Defective ribbon cable connector                                                        | Replace the keyset.                                                                                                                                                                                                                                                                                    |
| Optional headset inoperative                                                                                                              | User error                                                                              | Ensure the enable headset feature code (315) was entered. Check feature code programming to see if code was changed. Refer to page 5-28 in PROGRAMMING.                                                                                                                                                |
|                                                                                                                                           | Incorrect or defective headset                                                          | Ensure the headset contains a dynamic microphone, or a carbon microphone and an external AC power source. Replace headset if necessary.                                                                                                                                                                |
|                                                                                                                                           | Defective keyset                                                                        | Try another keyset.                                                                                                                                                                                                                                                                                    |
|                                                                                                                                           | Defective APP or IOP board                                                              | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                         |

FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PROBABLE CAUSE                               | CORRECTIVE ACTION                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Keypad squeals on outside calls or when receiving a handsfree intercom call from a single-line station (feedback)                                                                                                                                                                                                                                                                                                                                                              | Speaker volume is too loud                   | Reduce feedback by lowering speaker volume using keypad volume controls.                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Poor acoustics                               | Poor acoustics can cause poor quality on handsfree calls. Try placing a private call.                                                                                   |
| NOTE: A two- to four-wire converter is used during communication between keysets and single-line stations. Reflection is a normal characteristic of these converters. Feedback on intercom calls is eliminated when the single-line station user places a private intercom call by pressing the pound (#) key before dialing the intercom number or by entering the ring intercom always feature code — 367 (provided the keypad user does not press the SPKR key to respond). |                                              |                                                                                                                                                                         |
| No handsfree transmit on GX keypad with optional external desk speaker installed.                                                                                                                                                                                                                                                                                                                                                                                              | Strap out of place                           | Ensure that the speakerphone enable strap under the baseplate is placed on the pins labelled P and reset the keypad.                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Microphone gain adjustment incorrect         | Adjust the microphone gain according to the instructions on page 3-57 in INSTALLATION.                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Defective keypad                             | Try another keypad.                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Defective APP or IOP board                   | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                          |
| Keypad squeals on GX keypad with optional external desk speaker installed.                                                                                                                                                                                                                                                                                                                                                                                                     | External speaker located too close to keypad | External speaker must be located a minimum of four feet from the keypad.                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Microphone gain adjustment incorrect         | Adjust the microphone gain according to the instructions on page 3-57 in INSTALLATION.                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Speaker volume is too loud                   | Reduce feedback by lowering speaker volume using keypad volume controls.                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Poor acoustics                               | Poor acoustics can cause poor quality on handsfree calls. Try placing a private call. Or, install the GX Speakerphone Module instead (see page 2-11 in SPECIFICATIONS). |

FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                      | PROBABLE CAUSE                                                                              | CORRECTIVE ACTION                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data noise in any off-hook condition                                                                         | Defective cabling or connections (e.g., line cord, amphenol connector, bridging clip, etc.) | Check for loose or open connections, or crossed wires.                                                                                                                                |
|                                                                                                              | Defective keyset                                                                            | Try another keyset.                                                                                                                                                                   |
|                                                                                                              | Defective STN-A/A1 board                                                                    | Replace the associated STN-A/A1 board.                                                                                                                                                |
| Cannot obtain intercom dial tone. No tone heard; C.O. line works.                                            | Defective keyset                                                                            | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                               |
|                                                                                                              | Defective STN-A/A1 board                                                                    | Replace the associated STN-A/A1 board.                                                                                                                                                |
|                                                                                                              | Defective APP or IOP board                                                                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                        |
| Cannot break intercom dial tone.                                                                             | Defective keyset                                                                            | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                               |
|                                                                                                              | Defective STN-A/A1 board                                                                    | Replace the associated STN-A/A1 board.                                                                                                                                                |
|                                                                                                              | Defective APP or IOP board                                                                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                        |
| Cannot place intercom call. Intercom dial tone is present, but reorder tone is heard when call is attempted. | User error (or station is in a different tenant group and cross-tenant traffic is denied)   | Invalid intercom number or improper dialing procedure. See FEATURES, page 4-43, for procedures. (Or, ensure the stations are in the same tenant group or allow cross-tenant traffic.) |
|                                                                                                              | Defective keyset                                                                            | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                               |
|                                                                                                              | Defective STN-A/A1 board                                                                    | Replace the associated STN-A/A1 board.                                                                                                                                                |
|                                                                                                              | Defective APP or IOP board                                                                  | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                        |

FIGURE 6-5. KEYSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                     | PROBABLE CAUSE             | CORRECTIVE ACTION                                                                                       |
|-----------------------------|----------------------------|---------------------------------------------------------------------------------------------------------|
| Cannot break C.O. dial tone | Defective keyset           | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty. |
|                             | Defective COU board        | Replace defective COU board.                                                                            |
|                             | Defective STN-A/A1 board   | Replace the associated STN-A/A1 board.                                                                  |
|                             | Defective APP or IOP board | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                          |

NOTE: See also C.O. line problems on page 6-17.

|                                                                                       |                                                      |                                                                                                                                        |
|---------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Data device (connected to Inter-Tel/DVK or GMX 24-line keyset) not operating properly | User error                                           | Refer to manufacturer's operating instructions.                                                                                        |
|                                                                                       | Secondary voice path busy (if installed)             | The keyset will not transmit data calls when the secondary voice path or speaker-<br>phone are in use. Refer to page 4-81 in FEATURES. |
|                                                                                       | Problem with data device                             | Disconnect data device and check operation according to the manufacturer's instructions.                                               |
|                                                                                       | Data Port Module not installed properly or defective | Check Data Port Module installation and strap settings. Refer to INSTALLATION, page 3-63. Replace if defective.                        |
|                                                                                       | Defective keyset                                     | Try another keyset.                                                                                                                    |
|                                                                                       | Defective STN-A/A1 board                             | Replace the associated STN-A/A1 board.                                                                                                 |
|                                                                                       | Defective APP or IOP board                           | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                         |

FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                               | PROBABLE CAUSE                                       | CORRECTIVE ACTION                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LRA device connected to keyset not operating properly | Problem with LRA device                              | Disconnect LRA device and check operation according to the manufacturer's instructions.                                                                                                                                                                                                      |
|                                                       | Data Port Module not installed properly or defective | Check Data Port Module installation and strap settings. Refer to INSTALLATION, page 3-63. Replace if defective.                                                                                                                                                                              |
|                                                       | Defective keyset                                     | Try another keyset.                                                                                                                                                                                                                                                                          |
|                                                       | Defective APP or IOP board                           | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                               |
| Cannot receive off-hook voice announce calls          | Programming error                                    | Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-22), that the called keyset is programmed to receive OHVA calls, and that the calling keyset is programmed to transmit OHVA calls (PROGRAMMING, page 5-41).                                        |
|                                                       | User error                                           | The called station is a single-line set, GX keyset, or a GMX 12-line keyset (these station instruments cannot receive OHVA calls) or a keyset that is programmed not to receive OHVA calls. Or, the called keyset user may have blocked the OHVA call. See FEATURES, page 4-49, for details. |
|                                                       | Incorrect installation                               | The keyset must have a secondary voice path installed. Refer to INSTALLATION, pages 3-19 to 3-21, for details.                                                                                                                                                                               |
|                                                       | Secondary voice path busy                            | The keyset will not receive off-hook voice announce calls when the secondary voice path or speakerphone are in use. Refer to FEATURES, page 4-49.                                                                                                                                            |
|                                                       | Defective keyset                                     | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                                                                                                                                      |
|                                                       | Defective STN-A1 board                               | Replace the associated STN-A1 board.                                                                                                                                                                                                                                                         |
|                                                       | Defective APP or IOP board                           | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                               |



FIGURE 6-5. KEYSSET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                          | PROBABLE CAUSE                        | CORRECTIVE ACTION                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot place off-hook voice announce calls       | Programming error                     | Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-22), that the called keyset is programmed to receive OHVA calls, and that the calling keyset is programmed to transmit OHVA calls (PROGRAMMING, page 5-41).                                                       |
|                                                  | User error                            | The called station is a single-line set, GX keyset, or a GMX 12-line keyset (these station instruments cannot receive OHVA calls) or a keyset that is programmed not to receive OHVA calls. Or, the called keyset user may have blocked the OHVA call. Refer to page 4-49 in FEATURES for more information. |
|                                                  | Secondary voice path busy             | The called keyset cannot receive off-hook voice announce calls when its secondary voice path or speakerphone are in use. Refer to FEATURES, page 4-49.                                                                                                                                                      |
|                                                  | Defective keyset                      | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                                                                                                                                                     |
|                                                  | Defective STN-A/A1 board.             | Replace the associated STN-A/A1 board.                                                                                                                                                                                                                                                                      |
|                                                  | Defective APP or IOP board            | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                              |
| Erratic keyset operation (lamp status incorrect) | Station cable exposed to interference | Ensure proper station cable runs. Refer to INSTALLATION, page 3-6.                                                                                                                                                                                                                                          |
|                                                  | Station loop limits exceeded          | Perform the station loop resistance test as outlined on page 3-22 in INSTALLATION.                                                                                                                                                                                                                          |
|                                                  | Defective keyset                      | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                                                                                                                                                     |
|                                                  | Defective STN-A/A1 board.             | Replace the associated STN-A/A1 board.                                                                                                                                                                                                                                                                      |
|                                                  | Defective APP or IOP board            | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                                              |

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART

| SYMPTOM                                                                            | PROBABLE CAUSE             | CORRECTIVE ACTION                                                               |
|------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------|
| Single-line set completely inoperative.                                            | Defective set              | Replace the single-line set.                                                    |
|                                                                                    | Defective cabling          | Check amphenol connector and station cabling. Refer to INSTALLATION, page 3-12. |
|                                                                                    | Defective STN-B/B2 board   | Replace the associated STN-B/B2 board.                                          |
| Single-line set inoperative. Talk battery present.                                 | Programming error          | Ensure the circuit has been equipped. Refer to PROGRAMMING, page 5-41.          |
|                                                                                    | Defective set              | Replace the single-line set.                                                    |
|                                                                                    | Defective STN-B/B2 board   | Replace the associated STN-B/B2 board.                                          |
|                                                                                    | Defective MOD-III/IV board | Replace the MOD-III/IV board.                                                   |
|                                                                                    | Defective APP or IOP board | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.  |
| Single-line set inoperative. Calls ring in. Talk battery is present.               | Defective set              | Replace the single-line set.                                                    |
|                                                                                    | Defective STN-B/B2 board   | Replace the associated STN-B/B2 board.                                          |
|                                                                                    | Defective MOD-III/IV board | Replace the MOD-III/IV board.                                                   |
| A group of eight single-line sets inoperative. All are on the same STN-B/B2 board. | Loose amphenol connector   | Ensure connector is securely attached to the STN-B/B2 board.                    |
|                                                                                    | Defective STN-B/B2 board   | Replace the associated STN-B/B2 board.                                          |

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                 | PROBABLE CAUSE                                                    | CORRECTIVE ACTION                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Single-line set will not ring for C.O. or intercom calls. Talk battery is present. Calls can be placed. | STN-B2 or single-line set ring straps not set for correct ringing | Set the associated strap for the correct ringer (AC or DC). Refer to INSTALLATION, pages 3-42 and 3-71.                                                                                                |
|                                                                                                         | Defective ring generator and/or improper cabling                  | If using an AC ringer, you must install a ring generator on the STN-B2 board that has proper REN for the stations it supports. Check the ring generator cabling. Refer to page 2-14 in SPECIFICATIONS. |
|                                                                                                         | Defective set                                                     | Replace the set.                                                                                                                                                                                       |
|                                                                                                         | Defective STN-B/B2 board                                          | Replace the associated STN-B/B2 board.                                                                                                                                                                 |
| Ring trip is not provided to a group of eight single-line sets. Outgoing calls are not affected.        | Defective APP or IOP board                                        | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                         |
|                                                                                                         | -48VDC absent from STN-B2 board                                   | Defective connection or incorrect installation of -48VDC on the STN-B2 board. Using a voltmeter, measure the -48VDC (V/G pair) at the STN-B2 block. Refer to INSTALLATION, pages 3-12 to 3-17.         |
|                                                                                                         | Defective cabling                                                 | Using a voltmeter, measure the -48VDC input at the amphenol connector (pins 49 and 24). Refer to Figure 3-8 on page 3-17 in INSTALLATION.                                                              |
|                                                                                                         | Defective STN-B2 board                                            | Replace the associated STN-B2 board.                                                                                                                                                                   |

TROUBLESHOOTING

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                                                                                                                           | PROBABLE CAUSE                                                           | CORRECTIVE ACTION                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A group of AC ringer-equipped single-line sets will not ring for C.O. or intercom calls. Talk battery is present. Calls can be placed. All stations are on the same STN-B2 board. | Ringer generator not attached to STN-B2 board                            | Defective connection or incorrect installation of ring generator to STN-B2 board. Using a voltmeter, measure the ring generator input (V/S pair) at the STN-B2 block. Refer to INSTALLATION, pages 3-12 to 3-17. |
|                                                                                                                                                                                   | Defective cabling or miswired amphenol connector on the STN-B2 board     | Using a voltmeter, measure the ring generator input on the associated amphenol connector (pins 50 and 25). Refer to Figure 3-8 on page 3-17 in INSTALLATION.                                                     |
|                                                                                                                                                                                   | Defective STN-B2 board                                                   | Replace the associated STN-B2 board.                                                                                                                                                                             |
| No AC ringer-equipped single-line set will ring for C.O. or intercom calls. Talk battery present. Calls can be placed.                                                            | Defective APP or IOP board                                               | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                   |
|                                                                                                                                                                                   | Defective ring generator                                                 | Ring generator connected to a STN-B2 board must be 110VAC, 30Hz. Use a voltmeter to measure the output. It must have the proper REN to ring the stations it supports. See SPECIFICATIONS, page 2-14.             |
|                                                                                                                                                                                   | Defective cabling or miswired amphenol connector on all STN-B2 boards    | Using a voltmeter, measure the ring generator input on all amphenol connectors (pins 50 and 25). Refer to Figure 3-8 on page 3-17 in INSTALLATION.                                                               |
| Cannot obtain intercom dial tone. No sound is heard.                                                                                                                              | Defective APP or IOP board                                               | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                   |
|                                                                                                                                                                                   | Either a DTMF decoder, intercom path, or tone generator is not available | Single-line station user will hear busy tones when any of the necessary resources are not available. User may camp on.                                                                                           |
|                                                                                                                                                                                   | Defective set                                                            | Replace the single-line set.                                                                                                                                                                                     |
|                                                                                                                                                                                   | Defective STN-B/B2 board                                                 | Replace the associated STN-B/B2 board.                                                                                                                                                                           |
|                                                                                                                                                                                   | Defective MOD-III/TV board                                               | Replace the MOD-III/TV board.                                                                                                                                                                                    |
|                                                                                                                                                                                   | Defective APP or IOP board                                               | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                   |

**FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)**

| <b>SYMPTOM</b>                                                                                           | <b>PROBABLE CAUSE</b>                                                            | <b>CORRECTIVE ACTION</b>                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot place intercom call.<br>Dial tone present, but<br>reorder tone heard.                             | User error                                                                       | Try the call again. User may have dialed an invalid number.                                                                                                                            |
|                                                                                                          | Defective set                                                                    | Replace the single-line set.                                                                                                                                                           |
|                                                                                                          | Defective MOD-III/IV board                                                       | Replace the MOD-III/IV board.                                                                                                                                                          |
|                                                                                                          | Called station is in a different tenant group and cross-tenant traffic is denied | To allow such calls (if desired), place the two stations in the same tenant group or allow cross-tenant traffic. See PROGRAMMING, page 5-22.                                           |
| Cannot break C.O. dial tone                                                                              | Defective set                                                                    | Replace the single-line set.                                                                                                                                                           |
|                                                                                                          | Defective STN-B/B2 board                                                         | Replace the associated STN-B/B2 board.                                                                                                                                                 |
| <b>NOTE: See also C.O. line problems on page 6-17.</b>                                                   |                                                                                  |                                                                                                                                                                                        |
| Cannot place off-hook voice announce calls                                                               | Programming error                                                                | Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-22) and that the station is programmed to transmit (page 5-41).                              |
|                                                                                                          | User error                                                                       | Called station is a single-line set or a keyset that is not equipped with a secondary voice path.                                                                                      |
|                                                                                                          | Defective APP or IOP board                                                       | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                         |
| Single-line sets not receiving message waiting indications and/or message lamps not functioning properly | Programming error                                                                | Message waiting indication option must be enabled in the database. Refer to page 5-22 in PROGRAMMING.                                                                                  |
|                                                                                                          | Single-line set with message lamp not installed on STN-B2 board                  | In order for single-line set message waiting lamps to function, the set must be installed on premises on a STN-B2 board. And the STN block must be equipped with a 48VDC power supply. |

FIGURE 6-7. DSS/BLF UNIT TROUBLESHOOTING CHART

| SYMPTOM                                                                   | PROBABLE CAUSE                                               | CORRECTIVE ACTION                                                                                                                                               |
|---------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DSS/BLF Unit inoperative. No LED indication present while key is pressed. | Defective STN-A/A1 fuse                                      | Replace the fuse if faulty.                                                                                                                                     |
|                                                                           | Defective cabling                                            | Ensure 30VDC present at the DSS/BLF modular jack and polarity is correct. Check for loose or open connections. Refer to Figure 3-1 on page 3-7 in INSTALLATION. |
|                                                                           | Defective DSS/BLF Unit                                       | Replace the DSS/BLF Unit.                                                                                                                                       |
|                                                                           | Defective STN-A/A1 board                                     | Replace the associated STN-A/A1 board.                                                                                                                          |
| DSS/BLF Unit inoperative. LED indication present while key is pressed.    | Programming error                                            | Circuit is identified for keyset use. Refer to page 5-41 in PROGRAMMING. Circuit must be equipped for DSS/BLF Unit use.                                         |
|                                                                           | Defective DSS/BLF Unit                                       | Replace the DSS/BLF Unit.                                                                                                                                       |
|                                                                           | Defective STN-A/A1 board                                     | Replace the associated STN-A/A1 board.                                                                                                                          |
|                                                                           | Defective APP or IOP board                                   | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                  |
| DSS/BLF Unit LED indications incorrect                                    | Cable exposed to interference                                | Refer to INSTALLATION, page 3-6, for correct cabling procedures.                                                                                                |
|                                                                           | Programming error                                            | Check DSS key assignment in PROGRAMMING, page 5-62.                                                                                                             |
|                                                                           | DIP switch (GX) or strap (DVK) configuration set incorrectly | Check that the switch or strap is in the proper location. Refer to INSTALLATION, pages 3-66 to 3-34, for instructions.                                          |
|                                                                           | Defective DSS/BLF Unit                                       | Replace the DSS/BLF Unit.                                                                                                                                       |
|                                                                           | Defective APP or IOP board                                   | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                  |
| Calls are transferred to the wrong station                                | User error                                                   | Refer to FEATURES, pages 4-57 and 4-83, for procedures.                                                                                                         |
|                                                                           | Programming error                                            | Check DSS/BLF key assignments. Refer to PROGRAMMING, page 5-62.                                                                                                 |

FIGURE 6-7. DSS/BLF UNIT TROUBLESHOOTING CHART (CONT'D)

| SYMPTOM                                                                      | PROBABLE CAUSE             | CORRECTIVE ACTION                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot place immediate off-hook voice announce calls (using the DSS/BLF key) | Programming error          | Ensure that the system option for off-hook voice announce is enabled, that the immediate off-hook voice announce option is enabled, that the DSS/BLF station is programmed to transmit, and that the called keyset is programmed to receive. Refer to pages 5-22 and 5-41 in PROGRAMMING.    |
|                                                                              | User error                 | The called station is a single-line set, a GX keyset, a GMX 12-line keyset (these sets cannot receive OHVA calls), or a keyset that is programmed not to receive OHVA calls. Or, the called keyset user may have blocked the OHVA call. Refer to page 4-49 in FEATURES for more information. |
|                                                                              | Defective keyset           | Perform the keyset self-test as described in INSTALLATION, page 3-54, and replace the keyset if faulty.                                                                                                                                                                                      |
|                                                                              | Defective DSS/BLF Unit     | Perform the DSS/BLF Unit self-test (see INSTALLATION, page 3-66) and replace the DSS/BLF Unit if faulty.                                                                                                                                                                                     |
|                                                                              | Defective STN-A/A1 board   | Replace the associated STN-A/A1 board.                                                                                                                                                                                                                                                       |
|                                                                              | Defective APP or IOP board | Refer to page 6-2 to test the system voltages. Replace the board(s) if faulty.                                                                                                                                                                                                               |

TROUBLESHOOTING

## 6. CUSTOMER SUPPORT

### A. TECHNICAL SUPPORT

6.1 If problems persist when installing or servicing Inter-Tel equipment, *certified technicians* may contact Inter-Tel's Customer Support Department for assistance. They can be reached from 7:00 A.M. to 5:00 P.M. Mountain Standard Time at 602-961-9000 or 1-800-669-5858.

### B. EMERGENCY ASSISTANCE

6.2 After office hours and on weekends, call 602-961-0277 and leave your message with the voice mail service. A Customer Support Product Specialist will return your call as soon as possible, usually within an hour. Please remember that this is an emergency number for *critical system problems only*. Sales questions, equipment orders, etc., can only be handled during normal business hours.

### C. INTER-TEL SYSTEMS INFORMATION SERVICE (ISIS)

6.3 ISIS is available to distributors 24 hours a day, seven days per week. Following the instructions given in ISIS, you can access tech tips, application notes, and technical training schedules. You may access ISIS for as long as you like; however, if you go four minutes without responding to a prompt, the call will automatically be disconnected.

6.4 To access ISIS, you will need a terminal and a modem with the following characteristics:

- Bell 103 or 212 standard modem or equivalent.
- 0-300 or 1200 baud rate.

- Full-duplex communication capability (parity is not checked).

#### 6.5 TO ACCESS ISIS:

- (1) Dial 602-961-1825.
- (2) When you hear the modem tone, activate your modem according to the manufacturer's instructions.
- (3) Press the RETURN key repeatedly until the terminal responds with USERNAME.
- (4) Enter ISIS and press RETURN.
- (5) Your terminal will print ENTER ACCESS CODE.
- (6) Enter 150377 and press RETURN.
- (7) Your terminal will print ENTER DISTRIBUTOR CODE.
- (8) Enter your distributor code (Inter-Tel account number as it appears on your monthly invoice) and press RETURN.
- (9) Your terminal will print WELCOME TO ISIS, followed by a series of menus that will guide you to the information you need.
- (10) When you are finished, select EXIT ISIS from the main menu and terminate your call according to the instructions for your modem.

**NOTE:** If you have any problems, please exit ISIS and report the problem to Customer Support between 7:00 A.M. and 5:00 P.M. (MST).



## 7. DEFECTIVE UNIT RETURN POLICY

### IMPORTANT

For complete information on returning equipment, refer to the *current* Inter-Tel Incorporated Material Return Policy (document part number 835.1065). This document includes specific information on the following subjects: warranty, procedures to follow when returning equipment, equipment damaged in shipment, insurance, repair policy, and advance replacement policy.

#### 7.1 TO RETURN A DEFECTIVE UNIT FOR REPAIR:

- (1) Obtain an MRA number from Inter-Tel's Order Processing Department. Write the MRA number and ATTN: MRA on the outside of each carton being returned. *INTER-TEL DOES NOT ACCEPT EQUIPMENT IF THE MRA NUMBER IS NOT ON THE CARTON.*
- (2) On the repair tag, identify the unit by the equipment name, part number, and serial number. (Repair tags are available from Inter-Tel.)
- (3) Describe the defect in detail and, if applicable, the circuit number related to the defect. Include applicable alarm messages and/or field service diagnostics, if possible. Document the estimated length of time the part had been in service prior to the failure. *ALL EQUIPMENT RETURNED FOR REPAIR MUST BE TAGGED WITH COMPLETE DETAILED INFORMATION REGARDING THE DEFECT OR IDENTIFICATION OF THE PROBLEM.*
- (4) Attach the upper portion of the repair tag to the defective equipment. Retain the bottom portion for your files.
- (5) Properly package the equipment for shipping (i.e., return in original package or equivalent). *WARRANTY MAY BE VOIDED IF EQUIPMENT IS IMPROPERLY PACKAGED.*

## 7. DEFECTIVE UNIT RETURN POLICY

### IMPORTANT

For an effective installation or returning equipment, refer to the correct instructions for the product. Matched Return Policy (document with number 852 1003). This document includes specific information on the following subjects: company procedures to follow when returning equipment, equipment damaged in transit, warranty, return policy, and advance replacement policy.

### 7.1. TO RETURN A DEFECTIVE UNIT FOR CLAIM

- (1) Obtain an MRA number from your distributor. Obtain the following information: Write the MRA number and ATOM MRA on the outside of each carton being returned. WATER-TIGHT IS NOT ACCEPT EQUIPMENT IF THE MRA NUMBER IS NOT ON THE CARTON.

- (3) On the report, identify the unit by the equipment model part number, and serial number. On the report, include a detailed description.

- (5) Describe the defect in detail and a possible cause. Provide the model number related to the defect. In the event of a possible cause, describe the specific problem and the specific equipment. Describe the cause of the defect if possible. Describe the cause of the defect if the part had been returned prior to the failure. ATOM EQUIPMENT RETURNED FOR REPLACEMENT MUST BE RETURNED WITH COMPLETE INFORMATION REGARDING THE DEFECT OR DEFECTIVE PART AND THE PROBLEM.

- (6) Attach the upper portion of the report to the return. Return the report to your distributor.

- (7) Properly package the equipment for shipment. Use return shipping packages or containers. WATER-TIGHT IS NOT ACCEPT EQUIPMENT IS IN PROPER PACKAGING.

## REPLACEMENT PARTS

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### 1. INTRODUCTION

1.1 This section provides the information necessary to order replacement parts for the Inter-Tel GMX-152D System.

### 2. ORDERING PROCEDURE

2.1 When ordering equipment for the GMX-152D System it is necessary to provide the following information to your order processing clerk:

- Company name
- Purchase order number
- Required date of shipment
- Part number(s) of equipment ordered
- Quantity required

### 3. REPLACEMENT PARTS LIST

3.1 Figure 7-1 below and on the next page lists authorized parts available for replacement on the GMX-152D System.

### 4. RECOMMENDED SPARE PARTS

4.1 *It is mandatory that spare parts be kept on hand to ensure the best possible customer service.*

4.2 Figure 7-2 on page 7-3 lists the quantities of spare parts recommended to adequately maintain and service ten GMX-152D Systems.

**FIGURE 7-1. REPLACEMENT PARTS**

| DESCRIPTION                                 | PART NUMBER |
|---------------------------------------------|-------------|
| <b>Station Instruments</b>                  |             |
| GX 24-Line Standard Keyset .....            | 690.3700    |
| GX 24-Line Display Keyset .....             | 690.3800    |
| GMX 24-Line Standard Keyset .....           | 662.3000    |
| GMX 24-Line Display Keyset .....            | 662.3100    |
| GMX 12-Line (non-display) Keyset .....      | 662.3200    |
| Inter-Tel/DVK 24-Line Standard Keyset ..... | 662.3800    |
| Inter-Tel/DVK 24-Line Display Keyset .....  | 662.3400    |
| Inter-Tel/DVK 12-Line Standard Keyset ..... | 662.4000    |
| Inter-Tel/DVK 12-Line Display Keyset .....  | 662.3900    |
| Inter-Tel/DVK 8-Line Standard Keyset .....  | 662.3500    |
| Inter-Tel/DVK 8-Line Display Keyset .....   | 662.3600    |
| GX DSS/BLF Unit .....                       | 690.3100    |
| GMX DSS/BLF Unit .....                      | 662.3300    |
| Inter-Tel/DVK DSS/BLF Unit .....            | 662.3700    |
| GX Single-Line Instrument (SLI) .....       | 690.3300    |

FIGURE 7-1. REPLACEMENT PARTS (CONT'D)

**KSU and Power Supply**

|                                                            |          |
|------------------------------------------------------------|----------|
| KSU Assembly (contains a,b, and c already assembled) ..... | 690.1000 |
| a. Cardfile Assembly (contains 1, 2, and 3 unassembled) .. | 690.1010 |
| 1. Motherboard .....                                       | 680.021  |
| 2. Cardfile .....                                          | 823.1027 |
| 3. RFI/EMI Shield .....                                    | 823.1076 |
| b. Cabinet .....                                           | 823.1077 |
| c. KSU Assembly Hardware .....                             | 828.1054 |
| Power Supply .....                                         | 690.0200 |
| Power Supply Cable .....                                   | 813.1069 |
| Battery Compartment .....                                  | 823.1075 |

**Circuit Boards**

|                                 |          |
|---------------------------------|----------|
| APP .....                       | 690.2200 |
| IOP .....                       | 690.2100 |
| COU (DTMF) .....                | 680.20   |
| COU Rotary Conversion Kit ..... | 828.1032 |
| STN-A .....                     | 680.30   |
| STN-A1 .....                    | 690.2500 |
| STN-B .....                     | 680.31   |
| STN-B2 .....                    | 690.2600 |
| CNF .....                       | 680.40   |
| MOD-IV .....                    | 690.2800 |

**Software**

|                                                                                                             |          |
|-------------------------------------------------------------------------------------------------------------|----------|
| MF-Rated, Extended .....                                                                                    | 827.3043 |
| MF-Rated, Basic .....                                                                                       | 827.3042 |
| KF-Rated, Extended .....                                                                                    | 827.3041 |
| KF-Rated, Basic .....                                                                                       | 827.3040 |
| GMX-152D OPX Software Kit .....                                                                             | 828.1152 |
| GX Update Kit (RAMs, OR-gates, and PAL necessary to<br>upgrade 827.3015/3016 GX software to GMX-152D) ..... | 828.1058 |

**Miscellaneous Equipment**

|                                                                                      |          |
|--------------------------------------------------------------------------------------|----------|
| HVRA Assembly Kit .....                                                              | 680.73   |
| Keypad Data Port Module Kit .....                                                    | 828.1094 |
| Keypad LCD Kit (Large — GX and GMX) .....                                            | 828.1052 |
| Keypad LCD Kit (Large — Inter-Tel/DVK) .....                                         | 828.1168 |
| Keypad LCD Kit (Small — Inter-Tel/DVK) .....                                         | 828.1166 |
| Digital Attendant Playback Device .....                                              | 828.1150 |
| CallMaster/Accounting Package (includes software, PollCat<br>unit, and manual) ..... | 828.1151 |
| Voice Mail Unit (contact Customer Support for a list of<br>available models)         |          |

**Manuals**

|                                               |          |
|-----------------------------------------------|----------|
| Installation & Field Maintenance Manual ..... | 690.8001 |
| Owner's Guide .....                           | 690.8006 |
| Keypad User Guide .....                       | 690.8014 |
| Single-Line Set User Guide .....              | 690.8003 |
| DSS/BLF Unit and Attendant User Guide .....   | 690.8004 |
| Keypad Quick Reference Guide .....            | 835.1069 |
| SLI Quick Reference Guide .....               | 835.1068 |

FIGURE 7-2. RECOMMENDED SPARE PARTS

| PART NUMBER | DESCRIPTION                            | QUANTITY |
|-------------|----------------------------------------|----------|
| 690.2200    | APP Board                              | 1        |
| 690.2100    | IOP Board                              | 1        |
| 680.20      | COU Board (DTMF)                       | 2        |
| 828.1032    | COU Rotary Conversion Kit              | 1        |
| 680.30      | STN-A Board                            | 2        |
| 690.2500    | STN-A1 Board                           | 2        |
| 680.31      | STN-B Board                            | 2        |
| 690.2600    | STN-B2 Board                           | 2        |
| 680.40      | CNF Board                              | 1        |
| 690.2800    | MOD-IV Board                           | 1        |
| 690.0200    | Power Supply                           | 1        |
| 690.1000    | KSU Assembly                           | 1        |
| 690.3700    | GX 24-Line Standard Keypad             | 1-10*    |
| 662.3000    | GMX 24-Line Standard Keypad            | 1-10*    |
| 662.3200    | GMX 12-Line (non-display) Keypad       | 1-10*    |
| 662.3800    | Inter-Tel/DVK 24-Line Standard Keypad  | 1-10*    |
| 662.4000    | Inter-Tel/DVK 12-Line Standard Keypad  | 1-10*    |
| 662.3500    | Inter-Tel/DVK 8-Line Standard Keypad   | 1-10*    |
| 690.3100    | GX DSS/BLF Unit                        | 1*       |
| 662.3300    | GMX DSS/BLF Unit                       | 1*       |
| 662.3700    | Inter-Tel/DVK DSS/BLF Unit             | 1*       |
| 690.3300    | GX Single-Line Instrument (SLI)        | 1-4*     |
| 828.1052    | Keypad LCD Kit (Large — GX and GMX)    | 1-5*     |
| 828.1168    | Keypad LCD Kit (Large — Inter-Tel/DVK) | 1-5*     |
| 828.1166    | Keypad LCD Kit (Small — Inter-Tel/DVK) | 1-5*     |
| 828.1094    | Keypad Data Port Module Kit            | 1        |
| 680.73-2    | HVRA Assembly Kit                      | 1        |

- \* Quantities should be based on the types of station instruments that the majority of customers are using.



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## DEFAULT FEATURE CODES

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|                         |         |
|-------------------------|---------|
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| Stations .....          | 100-219 |
| Talkback Speakers ..... | 221-225 |
| Hunt Groups .....       | 231-245 |
| 300-Baud Modem .....    | 260     |

### Attendant Feature Codes:

|                                        |      |
|----------------------------------------|------|
| Clear System Alarm .....               | 019  |
| Night Ring On/Off .....                | 010* |
| Program Stations for Night Ring .....  | 011* |
| Program System Speed Dial .....        | 020* |
| Remote Feature Cancel:                 |      |
| Group Do-Not-Disturb Cancel .....      | 012  |
| Group Call Forward Cancel .....        | 013  |
| Group DND/FWD Cancel .....             | 014  |
| Individual Do-Not-Disturb Cancel ..... | 015  |
| Individual Call Forward Cancel .....   | 016  |
| Individual DND/FWD Cancel .....        | 017  |
| Set Time of Day .....                  | 021* |
| Talkback Speaker Music On/Off .....    | 018* |

\*Primary attendant only

### Station Feature Codes:

|                                                        |     |
|--------------------------------------------------------|-----|
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| Automatic Intercom Access Cancel .....                 | 363 |
| Automatic Line Access .....                            | 360 |
| Automatic Line Access Cancel .....                     | 361 |
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| Call Forward — All Calls If No Answer .....            | 356 |
| Call Forward — All Calls If Busy .....                 | 357 |
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|                                                                           |     |
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