KANDA TELECOM INC.

EKN-2464

ELECTRONIC KEY TELEPHONE SYSTEM

INSTALLATION & MAINTENANCE MANUAL

Revision 3
10/88

NOTICE TO DEALER

The Kanda EKN-2464 Key Telephone System has been registered with the Federal Communications Commission in accordance with provisions of Part 68 Rules and Regulations. In order to comply with these FCC Rules, the following provisions must be made:

1) Direct connection to telephone lines must be made with FCC approved plugs and jacks.

2) Prior to connecting the equipment to the telephone lines, the telephone company must be advised that you wish to connect an FCCregistered device. Other information that must be supplied to the telephone company is:

   a) the model number and manufacturer of equipment
   b) the FCC registration number
   c) the ringer equivalence number
   d) the particular lines affected

3) This equipment may not be connected to party or coin telephone lines.

4) In the event that harm to the telephone line is caused, your equipment should be disconnected until the source of the problem has been determined. Should your device be the source, it should remain disconnected until necessary repairs have been made.

5) Should the telephone company plan to make any changes to their equipment, operations or procedures which might affect operations of customer provided equipment, prior written notification must be given to the user.

6) Repairs to this equipment must be made by the manufacturer or a technician who has been certified by Kanda Telecom Inc. If unauthorized repair is performed, the warranty will become void.

Table of Contents

CONTENTS

1. INTRODUCTION

1.01 This manual contains general and detailed descriptions, installation practices, and maintenance and troubleshooting procedures pertaining to the Kanda EKN-2464 Electronic Key Telephone System.

1.02 Revision 3 currently supersedes all previous documents. Revision 3 includes Sections 9 & 10 along with other additional information and corrections to errors found in the Revision 2 documents.

1.03 Should revision of this documents become necessary in the future, the reasons for reissue will be explained in this section.

2. GENERAL DESCRIPTION

2.01 The EKN-2464 Key Telephone System has been designed for use in small to medium business environments. Flexibility, reliability and ease of use are the primary considerations in the design of this system.

2.02 The EKN-2464 utilizes advanced microprocessor technologies controlling and providing an extensive range of features, functions and capabilities which are easily customized to meet the needs of a wide range of business applications.

2.03 The modular design allows the system to be specifically configured for individual applications and simplifies expansion to allow for future growth.

2.04 The basic EKN-2464 Key Telephone System provides for connection of up to 12 CO (Central Office) lines and as many as 32 telephones. Six internal intercom paths are also provided. The EKN-2464 may be easily expanded to a 24 CO line, 64 station system with the simple addition of the EK-2464 Expansion Cabinet. The EKN-2464 Expansion Cabinet provides connections for an additional 12 CO lines and 32 telephones. All system components including power supply, PCBs (Printed Circuit Boards) and telephone sets are interchangeable and may be used in both systems.

2.05 System operating instructions are safely stored in EPROM (Erasable Programmable Read-Only Memory). Working memory and all customized instructions are held in RAM (Random Access Memory) and are protected against loss in the event of power failure by a lithium back-up battery.

2.06 The microprocessor digitally controls system operation based on instructions found in RAM. CMOS (Complementary Metal-Oxide Semiconductor) crosspoints are employed to provide reliable space division switching of the analog voice paths.

2.07 A total of five types of PCBs contain the common control, crosspoints, power supply, CO line, and station circuits. Other PCBs contain the hardware required for the optional functions and for system expansion.

2.08 The cabinet which houses the PCBs includes the MDF (Main Distribution Frame) which is used for connections to the telephones, Central Office lines and other external facilities. Also included within the cabinet is the system power supply (POWU PCB), and the PCB mounting frame.

2.09 Telephone subsets operate with any combination of DTMF or Rotary Pulse Loop Start CO lines. Standard key telephones include all CO line buttons, feature buttons, dual-color LEDs, and access to all standard features and functions. Handsfree telephones include all capabilities of the Standard key telephones along with a handsfree speakerphone for use on both internal and external conversations. Executive telephones include handsfree speakerphone and LCD display functions. Industry standard single-line telephones may also be used in place of the fully featured key telephone sets.

FCC REGISTRATION

2.10 The Kanda EKN-2464 system has been registered with the Federal Communications Commission as a fully protected key telephone system. The registration information is as follows:

FCC Registration	**BI-792C-17671-KF-E**
Ringer Equivalence	**0.7B**
USOC Jack number	**RJ-21X**

NOTE: This equipment complies with the requirements in Part 15 of the FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception requiring the operator to take whatever steps are necessary to correct the interference.

DOC CERTIFICATION

2.11 The Kanda EKN-2464 system has been approved for use in Canada by the Department of Communications. The registration information is as follows:

DOC Certification number	**(PENDING)**
Load number	**(PENDING)**

U.L. AND C.S.A.

2.12 EKN-2464 has been listed by UL (Underwriters Laboratories Inc.) and has been approved by CSA (Canadian Standards Association).

3. SYSTEM CONFIGURATION

3.01 GENERAL INFORMATION

The EKN-1232/2464 system consists of the Main KSU Cabinet which includes power supply, optional Expansion Cabinet, common control PCBs, station and line PCBs, option PCBs, proprietary electronic key telephones, optional single-line phones and optional station units and enhancements.

Configuring systems to meet individual applications requires addition of various system components as described in the following paragraphs.

3.02 MAIN KSU CABINET

The Main Cabinet is always required for the basic system and includes a PCB mounting shelf, main distribution frame, backplane (motherboard) PCB, fuse panel and a self-contained power supply.
The PCB mounting shelf will accomodate up to three CO/PBX line cards and up to eight station cards providing a maximum capacity of twelve lines and thirty-two stations. The basic system also includes six intercom paths used for internal station to station calling.

3.03 CPU PCB

The basic or expanded system requires one CPU PCB which is installed in a dedicated slot in the Main Cabinet. The CPU PCB performs system control and operating functions and contains necessary input/output circuits, the microprocessor, a system reset switch, six RAM chips and three software PROMs.

3.04 TONE PCB

One TONE PCB is required for either the basic or expanded system. This PCB is installed in a dedicated slot in the Main Cabinet and generates internal system tones such as intercom dial tone, busy tone, alerting tones, confirmation tones, etc. In addition this PCB controls the background and hold music sources.

3.05 STATION PCB

The 4STU PCB includes four station circuits each functioning as a control and interface circuit for one proprietary key telephone. One 4STU is required for every four key telephones installed in the system. Dedicated slots are assigned for station PCBs in both the Main and Expansion cabinets.

3.06 SINGLE-LINE PCB

The 4SLTU PCB is similar to the 4STU PCB except that each single-line PCB allows connection of four industry standard, (DTMF or rotary dial) single-line telephones instead of the proprietary key telephones. The 4SLTU PCBs are direct replacements for the 4STU PCBs and are installed in the slots dedicated for station PCBs. However, the first station slot (marked STU1) in the Main cabinet must be equipped with a 4STU PCB.

When rotary dial, single-line telephones are used nothing other than the 4SLTU PCB is required. However, when DTMF telephones are used a DTMF adapter (4PBRCU) must be installed with each 4SLTU PCB to which the DTMF phones are connected. The 4PBRCU PCB is mounted onto the 4SLTU PCB before it is installed. A 4SLTU PCB which is equipped with a 4PBRCU PCB will support either rotary pulse or DTMF phones.

NOTE: The 4SLTU and 4PBRCU PCBs have been designed to be used with industry standard (500 or 2500 type) telephones. Because of the wide variety of single-line and feature phones available it is not possible to guarantee that all models will operate properly.

3.07 CO LINE PCB

The 4COU PCB includes interface and control circuits for four CO/PBX lines. The 4COU PCB also generates DTMF tones and rotary dial pulses used for signaling on outgoing CO line calls. One of these printed circuit boards is required for every four lines connected to the system. The 4COU PCBs are installed in dedicated slots in both the Main and Expansion cabinets.

3.08 DSS/DOORPHONE PCB
One dedicated slot in the Main Cabinet is assigned for the DHDSU PCB. This printed circuit board is required when one or two DSS/BLF consoles and/or one or two Doorphones are installed in the system.

3.09 ATSMU PCB
The ATSMU is an optional PCB which is required when SMDR is used or when an external answering machine (announcement only) is connected through the system. This PCB is installed in a dedicated slot in the Main Cabinet and includes an interface for both parallel and serial connectors for the SMDR printer (or other device).

3.10 KSU EXPANSION CABINET
When growth beyond twelve lines and/or thirty-two stations is needed, the KSU Expansion Cabinet is used to expand system capacity to twenty-four lines and sixty-four stations. This unit may be included along with the Main cabinet during initial installation or it may be added later when the system expands.

3.11 EXPANSION POWER SUPPLY
Along with the Expansion Cabinet, an additional power supply unit (POWU 4VB) is required for system expansion. This unit is used in addition to the primary power unit (POWU 4VA).

3.12 EXPANSION PCB
Up to two EXPU PCBs may be required for installation in dedicated slots in the Expansion Cabinet. When only station PCBs are installed in the Expansion cabinet no EXPU PCBs are required. However, when 4COU PCBs are installed one EXPU PCB must be added and when both 4COU and 4STU (or 4SLTU) PCBs are installed, two EXPU PCBs must be added.

3.13 KEY TELEPHONE
The proprietary electronic key telephone is the standard station instrument used in the system. It is available as a Basic, Handsfree, or Executive model. The Basic model provides basic features and functions, twenty-four CO line buttons, various feature buttons, microphone and internal speaker. In addition to these items, the Executive model also provides an LCD display and handsfree speakerphone. These two models may be installed in the system in any mixture but it is recommended that an Executive model be used at DSS/BLF stations.

3.14 LCD DISPLAY
An LCD display is provided as one of the features of the optional Executive key telephone model. The LCD provides various visual indications of the status of the telephone and also provides clock and calendar functions. Any or all telephones in the system may be Executive telephones.

3.15 HANDSFREE SPEAKERPHONE
A handsfree speakerphone unit is also provided as an additional feature of the Executive telephone. The speakerphone is installed inside the Executive telephone and allows handsfree conversations on CO/PBX line or intercom calls.

3.16 SINGLE-LINE TELEPHONE
Industry standard, single-line telephones may be used as station instruments in place of the proprietary key telephone. Either DTMF or rotary single-line telephones may be used. Use of single-line telephones requires a special station PCB (4SLTU). (See Par. 3.06)

3.17 DSS/BLF CONSOLE
When the Main Cabinet has been equipped with the optional DHDSU PCB it is possible to install one or two DSS/BLF consoles to allow direct station selection by pushing a dedicated station button. This unit also provides lamp indications for monitoring the status of each station, feature access buttons and other LED indications. Both a thirty-two station unit and a sixty-four station unit are available. (See Par. 3.08)

3.18 DOORPHONE
In addition to the two DSS/BLF consoles, the DHDSU PCB also allows connection of up to two Doorphone units. This allows signaling and conversation between the doorphone unit and key telephones and/or monitoring of specific locations. The Doorphone consists of a signaling button,

microphone and speaker enclosed in a semi-weatherproof housing. (See Par. 3.08)

3.19 4MECOU PCB

The 4MECOU 4VA PCB consists of four modified CO line interface circuits which include balancing circuits and a transfer path and are used to link two systems together. Each of these PCBs is installed in a card slot normally reserved for the standard 4COU 4VA PCB and therefore reduces outside line capacity in increments of four. A dedicated single line station circuit from the second system is connected to a line position served by a 4MECOU circuit in the first system. If desired, both systems may be equipped with one or more 4MECOU PCBs in order to provide links to and from each system. Several 4MECOU PCBs can be installed in each system but each PCB will reduce the line capacity of that system by four.

4. SYSTEM SPECIFICATIONS

4.01 SYSTEM MAXIMUM CAPACITIES

ITEM	BASIC SYSTEM	EXPANDED SYSTEM
CO/PBX LINES	12	24
INTERCOM PATHS	6	6
STATIONS	32	64
DSS/BLF CONSOLES	2	2

4.02 PHYSICAL SPECIFICATIONS

ITEM	HEIGHT	WIDTH	DEPTH	WEIGHT
EKN-2464 Main KSU (fully equipped)	19.25"	24.75"	8.50"	60.47 lb.
EKN-2464 Expansion KSU (fully equipped)	14.75"	24.75"	8.50"	97.42 lb.
EKN-2464 Key Telephone	3.25"	7.88"	8.88"	2.28 lb.
EKN-2464 DSS Console	2.31"	5.88"	8.88"	1.26 lb.

4.03 ENVIRONMENTAL SPECIFICATIONS

	TEMPERATURE	HUMIDITY
OPERATIONAL	14 to 131 Fahrenheit	35% to 90% (at 35 degrees F)
STORAGE	-4 to 158 Fahrenheit	35% to 90% (at 35 degrees F)

4.04 POWER REQUIREMENTS

AC POWER	120VAC, 60Hz, 5.0A
DC POWER (For Battery Backup)	24VDC batteries (See par. 4.07)

4.05 ELECTRICAL, ACOUSTICAL, AND OPERATIONAL SPECIFICATIONS

ITEM	SPECIFICATION
Ringer Equivalence	0.7B
On Hook DC Resistance (Tip to Ring, Tip to Ground, Ring to Ground)	more than 5M ohm at 100VDC more than 30K ohm at 200VDC
On Hook AC Impedance between Tip and Ring during Ring Signal	more than 10K ohms

On Hook AC Impedance between Tip and Ring at Voice Band	more than 36K ohm at 200Hz 115K ohm at 697Hz 115K ohm at 1633Hz 86K ohm at 3200Hz
Ringing Sensitivity	no response at 20Hz, 10Vrms response at 20Hz, 40Vrms
Acoustic Power of Incoming Call Tone	more than 65dBA (10 - 16 dB volume adjustable)
On Hook AC Energy (noise)	less than -55dBm at 200 to 4000Hz
Off Hook DC Resistance	less than 300 ohms at 20mA DC
Metallic Signal Power during Music On Hold	less than -9dBm
Cross Talk Attenuation between any CO line connections	more than 70dB
Return Loss	more than 3.5dB at 200 to 500Hz more than 8dB at 500 to 2500Hz more than 3.5dB at 2500 to 3400Hz
Pulse Signaling Characteristics:	
Speed	10pps (+/- 0.8pps)
Break Ratio	60% (+/- 3%)
Minimum Pause	915ms (+/- 50ms)
Tone Signaling Characteristics:	
Signal Level:	
Low Group	-7dBm (+/- 2dB)
High Group	-6dBm (+/- 2dB)
Pair	less than 2dB
Frequency Deviation	plus or minus 1.5%
Frequency Distortion	less than -20dB at 500 to 3200Hz
Cycle Time	more than 100ms
Duration of Signal	more than 50ms
Minimum Pause	more than 40ms but less than 3 sec.
Maximum Distance between KSU and Subset	STD Tel: 50 ohms & approx 850 ft using 24Awg (or 1400ft using 22Awg) H/F & EXEC: 40 ohms & approx 700ft using 24Awg (or 1100 using 22Awg) Single-Line: 80 ohms & approx 1400ft using 24Awg (or 2300ft using 22Awg)
Maximum Distance between KSU and DSS Console	20 ohms & approx 350ft using 24Awg

4.06 SINGLE LINE SPECIFICATIONS

A Single-Line device must comply with the following specifications for proper operation when connected to the system through the 4SLTU PCB.

On Hook Impedance	more than 3K ohm (16Hz)
Ringing Sensitivity	response at more than 75Vrms (through 3K ohm)

4.05 CURRENT DRAIN AND BACKUP TIME

The following table provides information on approximate current consumption of various system configurations. In addition, it provides the approximate back up time which may be expected when the recommended battery package (Kanda part # 453200) is used to provide standby reserve power.

SYSTEM SIZE	CURRENT (AMPS AT 24VDC) MAX.	TYP.	MIN.	BACKUP TIME (HOURS) MAX.	TYP.	MIN.
8 X 16	2.46	2.18	1.90	4.21	3.67	3.25
8 X 24	3.06	2.78	2.50	3.20	2.88	2.61
8 X 32	3.66	3.38	3.10	2.58	2.37	2.19
12 X 16	2.78	2.36	1.94	4.12	3.39	2.88
12 X 24	3.38	2.96	2.54	3.15	2.70	2.37
12 X 32	3.98	3.56	3.14	2.55	2.25	2.01
16 X 32	4.35	3.79	3.23	2.48	2.11	1.84
16 X 48	5.60	5.04	4.48	1.79	1.59	1.43
16 X 64	6.80	6.24	5.68	1.41	1.28	1.18
20 X 32	4.67	3.97	3.27	2.45	2.02	1.71
20 X 48	5.92	5.22	4.52	1.77	1.53	1.35
20 X 64	6.88	6.30	5.72	1.40	1.27	1.16
24 X 32	4.99	4.15	3.31	2.42	1.93	1.60
24 X 48	6.24	5.40	4.56	1.75	1.48	1.28
24 X 64	7.44	6.60	5.76	1.39	1.21	1.08

5. FEATURES

5.01 A list of features presently available on the EKN-2464 is shown below. Following the name of the feature is a letter indicating whether the feature is standard (S), optional (O), or programmable (P). Additional equipment required for activation or operation of a feature is shown along with any system programs that apply to the feature.

FEATURE	STD/OPT/PROG	EQUIPMENT	PROGRAMS
A-LEAD CONTROL	S		3
ACCOUNT CODES	O	SMDR OPTION	
ADD-ON CONFERENCE	P		29, 45
ALARM INTERFACE	P		28, 53
ALL CALL PAGE, EXTERNAL	P		19, 52
ALL CALL PAGE, INTERNAL	P		8
AMPLIFIED HANDSET VOLUME	S		N/A
ANSWERING MACHINE INTERFACE	O	ATSMU PCB	1, 76
ATTENDANT DSS/BLF CONSOLE	O	DSHDU & DSS/BLF	13, 17
AUTOMATIC INTERCOM CALL-BACK	P		45
AUTOMATIC HELD PARTY DISCONNECT	P		92
AUTOMATIC HOLD	S		N/A
AUTOMATIC HOLD RECALL	P		36, 37
AUTOMATIC LINE SELECTION	P		21, 87
AUTOMATIC NIGHT TRANSFER	P		70, 71
AUTOMATIC PBX PAUSE	S		49
AUTOMATIC PRIVACY	S		4
AUTOMATIC REDIAL	S		N/A
AUTOMATIC SPEAKER ACTIVATION	P		33, 87
AUTOMATIC SPEED DIAL PAUSE	S		(Par. 8.78)
BACKGROUND MUSIC	P		18, 26
CALL DURATION TIMER	O	EXECUTIVE TEL	50, 51
CALL FORWARDING, CO LINE	S		N/A
CALL FORWARDING, FOLLOW ME	P		45
CALL TRANSFER, ANNOUNCED	P		39, 45
CALL TRANSFER, UNANNOUNCED	P		38, 45
CALL WAITING, INTERCOM	S		N/A
CALLING NUMBER DISPLAY	O	EXECUTIVE TEL	N/A
CENTREX COMPATIBILITY	S		1, 49, 55, 70
CLOCK WITH CALENDAR AND ALARM	O	EXECUTIVE TEL	(Par. 8.77)
COMMON AUDIBLE RINGING	P		18
COMMON USE LINES	P		3, 7, 78
CONFIRMATION TONES	P		8
DATA MODEM INTERFACE	O	4SLTU PCB	3
DIAL CALL PICKUP	P		45
DIALED DIGIT DISPLAY	O	EXECUTIVE TEL	N/A
DIRECT INWARD DIALING	O	4SLTU & 4PBRCU	3, 61, 72, 76
DIRECTED CALL PICKUP	S		N/A
DISPLAY TELEPHONE	O	EXECUTIVE TEL	8
DISTINCTIVE RINGING	P		54, 55, 56

DO NOT DISTURB	P		8
DOOR PHONE	O	DHDSU & DOORBOX	12, 32, 59
DUAL COLOR LEDs	S		N/A
EQUAL ACCESS COMPATIBILITY	P		41
EXCLUSIVE HOLD	P		22, 35, 36
EXECUTIVE BARGE-IN	P		4
EXECUTIVE TOLL RESTRICT OVERRIDE	P		65
EXTENDED DTMF SIGNAL	S		N/A
EXTENDED STATION LOOP LIMIT	S		N/A
FACSIMILE INTERFACE	S		3
FEATURE CANCELLATION	P		45
FLASH KEY	S		N/A
FLEXIBLE LINE APPEARANCE	P		58
FLEXIBLE LINE ASSIGNMENT	P		6, 7
FLEXIBLE RINGING ASSIGNMENT	P		7
FLEXIBLE STATION NUMBERING	P		14, 15
FLEXIBLE STATION PROGRAMMING	S		N/A
HANDSFREE ANSWER BACK ON INTERCOM	S		25
HANDSFREE INTERCOM	O	H/FREE or EXEC TEL	N/A
HANDSFREE SPEAKERPHONE	O	H/FREE or EXEC TEL	N/A
HEARING AIDE COMPATIBILITY	S		N/A
I-HOLD INDICATION	P		48
I-USE INDICATION	S		N/A
INTERCOM CAMP-ON	P		45
INTERCOM HOLD	P		45
INTERCOM TRANSFER	S		N/A
LAST NUMBER REDIAL	S		N/A
LINE DISTINCTION	P		1, 54, 55
LINE GROUPS	P		2, 6, 7
LINE HOLD	S		N/A
LINE PRESELECTION	S		N/A
LINE QUEUING	P		1
LINE TRANSFER VIA INTERCOM	P		45
MEET ME ANSWER	P		45
MEET ME CONFERENCE	P		45
MESSAGE WAITING	P		45
MICROPHONE MUTING	S		25
MIXED LINES	P		1
MIXED STATION INSTRUMENTS	S		72
MULTI-LINE CONFERENCE	P		30, 45
MUSIC ON HOLD, EXTERNAL SOURCE	S		77
NIGHT RINGING	P		7, 17, 45, 58
NON-VOLATILE MEMORY	S		N/A
OFF HOOK RINGING	P		16, 59
OFF PREMISE EXTENSIONS	O	4SLTU PCB	72
ON HOOK DIALING/CALL MONITORING	S		25
ON-LINE PROGRAMMING	S		N/A
PABX COMPATIBILITY	S		1, 49, 55, 70
POWER FAILURE RESTART	S		N/A
POWER FAILURE TRANSFER	S		N/A
PRIVACY RELEASE	P		4, 29
PRIVATE LINES	P		6, 7

PROGRAMMABLE FUNCTION KEYS	S		87, (Par. 8.79 & 8.80)
PULSE TO TONE SIGNALING	S		1
PUSH BUTTON DIALING	S		N/A
RESERVE POWER	S		N/A
RING TRANSFER	S		38
RINGING LINE PICKUP	P		20
ROOM MONITORING	P		27
ROTARY PULSE SIGNALING	P		1, 57
SAVED NUMBER REDIAL	S		N/A
SELECTABLE RINGER TONE	S		N/A
SINGLE LINE TELEPHONES	O	4SLTU PCB	72
SPEED DIAL, PERSONAL	S		46
SPEED DIAL, SINGLE BUTTON	P		46, 87, (Par. 8.79)
SPEED DIAL, SYSTEM	S		46, (Par. 8.78)
STATION DSS	P		46, (Par. 8.80)
STATION HUNTING	P		11
STATION MESSAGE DETAIL RECORDING	O	ATSMU PCB	93
STEP CALL	S		45
SYSTEM LINKING	O	4MECOU/4SLTU PCB	1, 72
TELEPHONE DIAGNOSTICS TEST	S		N/A
TENANT SERVICE	P		6, 7, 17
THREE-MINUTE ALARM	P		31
TOLL RESTRICTION BY STATION	P		40
TOLL RESTRICTION, MULTI-DIGIT	P		42, 43, 44
TOLL RESTRICT, SPECIAL CONDITIONS	P		41
TOLL RESTRICTION, SPEED DIAL	P		45, 64
TONE SIGNALING ON INTERCOM	S		24
VOICE CALL ANNOUNCE	S		24
VOLUME CONTROLS	S		N/A
WALL MOUNTING	O	WALL MOUNTING KIT	N/A
ZONE PAGING, EXTERNAL	S		18, 52
ZONE PAGING, INTERNAL	P		8

6. FEATURE DESCRIPTIONS

6.01 A-LEAD CONTROL

The EKN-2464 system provides A-Lead Control for up to six CO Line circuits. These sensing circuits allow connection of external devices directly to the CO lines while providing LED indications to key telephones and activating privacy to prevent interruption. (See FACSIMILE INTERFACE.)

6.02 ACCOUNT CODES

The account code capability is included as a part of the SMDR option. It provides a means by which the account code may be input optionally at any time during the call. The purpose of the account code is to flag call records for billing time and charges to clients. It is possible to input this account code on both incoming and outgoing call records and can be up to eight digits in length. The account code is entered by pushing the OPT button and dialing in the code at any time during an incoming call or any time after the telephone number has been dialed on an outgoing call.

6.03 ADD-ON CONFERENCE

Several internal (maximum 6) parties may be included in an add-on conference. An intercom conference is established when (during the intercom conversation) one station pushes the ADD/DND button, dials a third station and pushes the ADD/DND button again after the third party lifts the handset. Additional stations are added to the conference by repeating the procedure. (A conference may also include up to two CO lines along with the six stations. See MULTI-LINE CONFERENCE.)

6.04 ALARM INTERFACE

It is possible to connect up to two alarm devices to the system and program specific stations to receive an audible signal when these devices are activated. The first two FAX interface circuits (FA1 and FA2) are used to connect the alarm devices which can be either "make" or "break".

6.05 ALL CALL PAGE, EXTERNAL

Both external paging zones may be accessed at the same time if desired. The station user lifts the handset, pushes the ICM button, dials "90" and speaks into the handset. An alerting tone normally precedes the voice page but can be eliminated through a program option. (See ZONE PAGING, EXTERNAL.)

6.06 ALL CALL PAGE, INTERNAL

A voice announcement can be made to all stations at one time by lifting the handset, pushing the ICM button, dialing "80" (or pushing a feature button) and then speaking into the handset. A person hearing the page may then be connected to the paging party if desired. (See MEET ME ANSWER and ZONE PAGING, INTERNAL.)

6.07 AMPLIFIED HANDSET VOLUME

A volume switch on the bottom of both the Standard and Executive telephones can be used to adjust the handset volume from the standard level (SD position) to an amplified level (LD position) for use on low level lines, in areas with high background noise or by persons who are hard of hearing.

6.08 ANSWERING MACHINE INTERFACE

An external answering machine may be connected to a dedicated interface in the system to allow automatic answering and announcements to outside callers during the night mode. When connected through this interface, the answering machine will answer incoming calls, play a pre-recorded message and then disconnect the call. The caller cannot leave a message through this facility. (Also the Single-line Telephone interface may be used to interface auxiliary equipment.)

6.09 ATTENDANT DSS/BLF CONSOLE

A maximum of two optional DSS/BLF consoles can be connected to provide one-touch signaling to stations, internal and external paging and door phones. Station busy indications are also provided. The

DSS/BLF consoles may be connected to any station in the system.

6.10 AUTOMATIC INTERCOM CALL-BACK

After calling a station and receiving a busy tone, the calling station can dial "**". A confirmation tone will be heard if the feature is successfully activated. The calling station can then hang up. As soon as both stations become idle at the same time, the calling party will hear an alerting signal and after lifting the handset a hold recall signal will be heard at the called party. The two stations will be connected when the called party lifts the handset. The originating station can cancel the call-back by lifting the handset and dialing "*1". If the feature is not successfully activated (because another station has already activated the feature for the called station) the confirmation tone will not be heard and the calling station will be placed in the camp-on mode. (See INTERCOM CAMP-ON.)

6.11 AUTOMATIC HELD PARTY DISCONNECT

Provides for held CO line circuits to become idle if the held party hangs up. The disconnect detect timing can be programmed system-wide in 50ms increments from 50ms to 750ms or the feature can be disabled.

6.12 AUTOMATIC HOLD

Pressing the ICM or other feature buttons automatically places a line on hold. Pushing another line button will disconnect the first line. Pressing any button on the DSS/BLF console will put the line on hold.

6.13 AUTOMATIC HOLD RECALL

After a preprogrammed time-out period, a line will ring back at the station which placed it on hold. The time-out period is programmed on a system-wide basis in 10 second increments from 10 seconds up to 42.5 minutes. The duration of the hold recall alerting tone is eight seconds and is repeated each time the recall time-out period expires.

6.14 AUTOMATIC LINE SELECTION

The system will automatically select and seize an idle CO line and activate the speaker when the digit "0" is dialed while on hook. In addition, a line can be automatically selected from one of the line queuing groups by pushing the SPKR button and dialing the queue group number. The system searches for an idle line beginning with the highest numbered line first.

6.15 AUTOMATIC NIGHT TRANSFER

Each evening at a predetermined time the system will automatically switch into night ringing mode. At a preset time the next morning, the day ringing mode will be re-activated. The times of day are selectable by the installer and can be overridden manually in special circumstances.

6.16 AUTOMATIC PBX PAUSE

An automatic three-second pause is provided to allow the PBX enough time to deliver outside dial tone after a line access code is dialed. This is especially useful for speed dialing or redialing. Up to three PBX line access codes can be programmed into the system.

6.17 AUTOMATIC PRIVACY

Calls in progress (either intercom or CO line) are automatically protected against intrusion by other stations. (See EXECUTIVE BARGE-IN and PRIVACY RELEASE.)

6.18 AUTOMATIC REDIAL

When this feature is activated, the last number dialed will be automatically redialed three times. A maximum of sixteen digits can be redialed. To activate, the station user must push the SD/LNR button and then the OPT button while still off hook and connected to the line after dialing a number that is busy or does not answer. Then the station user may go on hook. The HOLD lamp will light to indicate that the feature has been activated. In three minutes the speaker will be activated, a line will be seized and the first redial attempt will be made. After thirty seconds, if the handset has not been lifted, the line will be dropped. After a one minute delay the procedure will be repeated. The third attempt is made after another one minute delay and the feature is disabled. The user must monitor the activity and lift the handset when the called party answers in order to prevent the call from being dropped when the redial attempt times out. In order to disable this feature

while it is active, lift the handset and push the OPT button.

6.19 AUTOMATIC SPEAKER ACTIVATION

While on hook, dial "0" for automatic speaker activation and CO line seizure. Or push a particular CO line button while on hook to automatically activate the speaker and seize the line. The ICM button can also be pushed while on hook to activate the speaker and seize an intercom path.

6.20 AUTOMATIC SPEED DIAL PAUSE

A pause can be programmed into personal or system speed dial numbers if desired. Multiple pauses may also be used. Each pause counts as one digit in the speed dial number. The duration of the pause is preset at three seconds and is automatically inserted when the speed dial number is activated. A pause is entered while programming speed dial numbers by pushing the FLASH button.

6.21 BACKGROUND MUSIC

An external source of music can be connected to the system to provide background music through the speakers on the telephone sets and through the external paging speakers (if desired). This music source can be different than the source used for hold music. Each station user can turn the music on or off by pushing "#" while on hook and can control the volume at his station.

6.22 CALL DURATION TIMER

The optional Executive telephone display provides a call timer which is automatically activated on CO line calls after a programmable time-out period (5 to 180 seconds) after a line is seized. The call duration will remain on the display for 8 seconds after the call is disconnected. On incoming calls, the timer begins immediately after the line is answered. If desired, a program option can be used to disable the automatic activation of the timer so that it must be manually activated. The timer may also be manually started and stopped whether the telephone is busy or idle so that it can be used for other timing functions.

6.23 CALL FORWARDING, CO LINE

Incoming CO line calls can be forwarded to other stations when required. To activate this feature, the forwarding station lifts the handset, pushes the RXFER button, dials the receiving station number and then dials "*". (The number of the receiving station only needs to be entered if it is different from the last time call forwarding was used, otherwise this step can be omitted.) A short tone and slowly flashing RXFER LED will indicate that forwarding has been accomplished while a long tone indicates an error or call forwarding denied. An incoming line which would normally ring at the forwarding station will now be diverted to the receiving station and the RXFER LED at that station will be lit. To cancel, the forwarding station goes off hook and pushes the RXFER button twice. Any station can receive forwarded calls from up to three other stations.

6.24 CALL FORWARD, FOLLOW ME

Incoming intercom calls can be forwarded to another preselected station. To activate call forwarding, the station user pushes the RXFER button while on hook and dials his own station number followed by the station number to which the calls will be transferred. Then the RXFER button is pushed again. A short tone and flashing RXFER LED indicate that forwarding is activated. A long tone indicates an error or forwarding denied. A station can receive forwarded calls from up to ten other stations at one time. To cancel, the forwarding station pushes the RXFER button while on hook, dials his own station number and then pushes the RXFER button again.

6.25 CALL TRANSFER, ANNOUNCED

A CO line call can be transferred by pushing the ICM button (which puts the call on hold), dialing a station number, announcing the call transfer and then pushing the HXFER button. Alternately , the transferring station can hang up after announcing the call without pushing the HXFER button. In this case the receiving station must push the CO line button to retrieve the transferred call. If the call is not picked up at the receiving station within the programmed timeout period, it will ring back at the transferring station.

6.26 CALL TRANSFER, UNANNOUNCED

A CO line call can be transferred without an announcement by pushing the ICM button, dialing a station number and pushing the HXFER button. If the call is not picked up at the receiving station within the programmed timeout period, it will ring back at the transferring station. (See RING TRANSFER.)

6.27 CALL WAITING, INTERCOM

A station user receiving a busy tone after dialing another station can dial "1" to send a ringing signal through the speaker of the busy station. If the called station is using the speakerphone this feature cannot be activated and the calling station will continue to receive a busy tone. If the called station is an Executive telephone (with LCD display), the number of the waiting station will be shown when the "CHK" button is pushed.

6.28 CALLING NUMBER DISPLAY

The LCD display on the Executive telephone shows the calling station number when an intercom call is received. The calling station number is displayed onlywhen the called station is idle.

6.29 CENTREX COMPATIBILITY

The EKN-2464 can be used in conjunction with Centrex lines to enhance the functions and switching capabilities of both systems. Incoming calls on the Centrex lines can be identified by the ringing signal as either external calls or internal Centrex calls. A precisely timed hookflash, and programmable feature buttons provide simple access to Centrex features and funtions.

6.30 CLOCK WITH CALENDER AND ALARM

The LCD display on the Executive telephone provides a clock which shows the time of day, day of the week, month and date. A timer and alarm are also provided. The clocks on all Executive telephones are set at one time throughout the system eliminating the need for individual station users to set their clocks. The alarm and timer are activated at each station.

6.31 COMMON AUDIBLE RINGING

Ringing signals from a CO Line Group can be programmed to be heard through the speakers of each of the external paging zones. Each paging zone may be used to broadcast signals from a different CO Line Group if desired.

6.32 COMMON USE LINES

One CO line group can be designated for common use by all tenant groups in the system. This line group may include as many lines as necessary. If a common use line group is established, it must appear as the first group on all telephones.

6.33 CONFIRMATION TONES

A short tone is heard at the station each time one of the buttons on the phone is pushed. The tone can be enabled or disabled when desired by dialing "*" while on hook. It can also be disabled on a system-wide basis through programming.

6.34 DATA MODEM INTERFACE

A dedicated single line telephone circuit can be used to connect a data modem for analog data transmission. An auto-dial, auto-answer modem may be used if desired. Alternately, the FAX machine interfaces can be used to connect a modem directly to an outside line. (See FACSIMILE INTERFACE.)

6.35 DIAL CALL PICKUP

A station user can answer incoming intercom calls for any other station in the same pickup group. The pickup groups correspond exactly to the internal paging groups. To answer, a station user lifts the handset and dials "#". This feature is sometimes called Alternate Answering. (See DIRECTED CALL PICKUP.)

6.36 DIALED DIGIT DISPLAY

The LCD display on the Executive telephone will show any digits dialed at that telephone. If the number of digits dialed exceed the capacity of the display, the first digits are pushed off the display and the new digits are shown. A maximum of eleven digits may be displayed at a time.

6.37 DIRECT INWARD DIALING

When a specific incoming CO line is dedicated for this function, an outside party can dial into this line and then dial a station number to directly signal that station. This function requires the use of a DTMF single-line telephone circuit.

6.38 DIRECTED CALL PICKUP

A station user can answer an intercom call intended for another station by lifting the handset and dialing the number of the called station.

6.39 DISPLAY TELEPHONE

Executive telephones include an LCD display which provides a clock, alarm, calendar, calling number display and dialed digit display. It also provides indications of other activities at the station. The LCD can display up to eleven digits at a time.

6.40 DISTINCTIVE RINGING

Audible signals for incoming intercom, PABX line and CO line calls are all different in order to allow the station user to distinguish between them. A distinct signal for recalling or transferred lines is also provided.

6.41 DO NOT DISTURB

Each station can be programmed for one of the four levels of DND. Level 0 provides no DND capability at all. Level 1 allows a station user to block CO line ringing at the telephone. Level 2 allows the user to block both CO line ringing and intercom signals. Levels 1 and 2 are activated by pushing the ADD/DND button once while on hook. Normal operation resumes when the ADD/DND button is pushed again. Level 3 provides the user with the option of activating either Level 1 or Level 2 functions. To activate the Level 1 function, the user pushes the ADD/DND button once while on hook. To activate the Level 2 function, the user pushes the ADD/DND button twice while on hook. To resume normal operation, the ADD/DND button is pushed a third time while on hook. The ADD/DND LED will be off when the telephone is in normal mode and will flash at different rates to indicate Level 1 and Level 2. Stations equipped with a DSS/BLF console will be provided with a flashing LED on the appropriate DSS button to indicate stations which have activated Level 2 DND mode. However, the DND condition does not prevent calls or transfers from a DSS/BLF console.

6.42 DOOR PHONE

Up to two door phones can be connected to the system. Pre-programmed stations will be signalled when the button on the door phone is pushed. A double chime will be heard twice at a telephone receiving a call from Doorphone 1. A call from Doorphone 2 is indicated when the double chime is heard four times. Signals from each door phone can be programmed so as to be heard at different key telephones and can be programmed to be heard during day and/or night ringing modes. If desired a special call waiting signal can be sent to busy stations. A call from a door phone can be transferred to another station if desired. A call from a Doorphone is answered by simply lifting the handset at the station hearing the signal or by lifting the handset and dialing "9" at other stations. Station users can call the door phones individually by pushing the ICM button and dialing "93" for Doorphone 1 or "94" for Doorphone 2.

6.43 DUAL COLOR LEDs

The LEDs on all telephone sets indicate the status of the lines by both their flash rates and their color. The color of each LED will either be red or green to indicate status. A station user can confirm his activity on a line by the presence of a green LED while the activity of other stations is indicated by red LEDs. Green LED indications are available for I-USE, I-HOLD, AUTOMATIC HOLD RECALL and incoming (transferred) lines.

6.44 EQUAL ACCESS COMPATIBILITY

Programming options allow toll restricted stations to use alternate long distance companies for making allowed long distance calls while still preserving their basic dialing restrictions. (See TOLL RESTRICTION, SPECIAL CONDITIONS.)

6.45 EXCLUSIVE HOLD

A CO line can be placed on exclusive hold by a station user by pushing the HOLD button twice. This prevents other stations from picking up the held line. The hold condition can be switched between ex-

clusive and standard hold by pushing the HOLD button repeatedly. A special lamp indication shows lines which are on exclusive hold (slow green flash at the activating station and steady red lamp at other stations). The recall time-out period and the duration of the recall signal can be programmed differently than for lines placed on standard hold. When the recall signal expires, the exclusive hold condition becomes standard (non-exclusive) hold. EXCLUSIVE HOLD can be disabled system-wide through programming if desired.

6.46 EXECUTIVE BARGE-IN

Any station can be allowed the ability to override the automatic privacy feature so that the user can join CO line calls in progress for conferencing or monitoring purposes. As many as six stations at a time can join in a conversation through this procedure. No alerting tone is provided when a station user breaks into a conversation in this way. To join a conversation, the user lifts the handset and pushes the busy CO line button. When the SPKR button is pushed, the Standard telephone can monitor the call handsfree and the Handsfree and Executive telephones can both talk and listen (if the microphone is activated).

6.47 EXECUTIVE TOLL RESTRICTION OVERRIDE

Any station user knowing the programmable secret code can enter the code and override the toll restriction at any station in order to make an outside call. The user lifts the handset, pushes the OPT button and dials "*". Then the secret code is dialed, the CO line is seized (within 3 seconds) and the telephone number is dialed. The code can be from 2 to 10 digits in length and must be entered for each call made.

6.48 EXTENDED DTMF SIGNAL

In special situations, (accessing external DTMF activated machines or devices) it may be necessary to lengthen the duration of the DTMF tones output by the system. At any time during the dialing sequence, push "OPT" and dial "#". The DTMF tone duration will now be doubled for any additional dialed digits. This function operates even when the normal dial signal is rotary pulse. When the call is terminated the normal dial signal is restored.

6.49 EXTENDED STATION LOOP LIMIT

The standard station loop limit is 50 ohms for a Standard key telephone, 40 ohms for a Hansfree or Executive key telephone and 80 ohms for a single-line set. By using a larger gauge station wire, the distance from the KSU can be increased for all telephones. An optional 48VDC power unit can be used to extend the single-line set to about 400 ohms (about 5000 feet). (For details on loop limits refer to Section 4 and for information on extending the single-line loop refer to par. 9.05).

6.50 FACSIMILE INTERFACE

Dedicated interfaces in the system allow connection of up to six facsimile machines to individually selected CO lines. These interfaces provide privacy and busy lamp indications for each line when in use by a FAX machine. In order to operate properly, the FAX machine must be capable of providing an "in use" signal. (The use of each of the two alarm interfaces reduces the FAX capacity by one.)

6.51 FEATURE CANCELLATION

Through system programming, groups of features can be enabled or disabled system wide. These features are enabled in the system default program. The groups of features are:

- Group 1 : Meet Me Answer, Meet Me Conference, Dial Call Pickup
- Group 2 : Call Forward-Follow Me, Night Transfer
- Group 3 : Unannounced Call Transfer, Announced Call Transfer
- Group 4 : Add-On Conference, Multi-Line Conference, Intercom Hold
- Group 5 : Step Call, Intercom Camp-On, Intercom Call-Back, Message Waiting
- Group 6 : (Presently Unused)
- Group 7 : Toll Restrict Disable On System Speed Dialing

6.52 FLASH KEY

A quick depression of the FLASH button provides a precisely timed hookswitch flash of 600ms for use in feature activation on CO lines, Centrex lines or PABX lines. An extended depression of the FLASH button provides a disconnection of the line.

6.53 FLEXIBLE LINE APPEARANCE
Allows line group appearances to be arranged differently from one station to the next so that line groups do not appear in the same position on all telephones. If a common use line group exists, it must appear in the first line group position.

6.54 FLEXIBLE LINE ASSIGNMENT
Up to 36 line groups can be established through programming. Each line group can include as many lines as are necessary and each line may be included in several groups. Each station is allowed access to as many as two outgoing and three incoming line groups. A common use line group may be established which is available to all stations.

6.55 FLEXIBLE RINGING ASSIGNMENT
Individual CO line groups can be programmed to ring at any or all stations in any combination required by the user. Each line group can be designated at each station for day ringing, night ringing, day and night ringing or no ringing at all.

6.56 FLEXIBLE STATION NUMBERING
Telephones can be programmed for either two or three digit station numbers but all telephones in the system must have the same number of digits. The station number assigned can be any number from 10 to 79 or from 100 to 799 inclusive. All telephones must be assigned a station number and each number can be assigned to only one telephone.

6.57 FLEXIBLE STATION PROGRAMMING
Many features and functions are assigned to stations on an individual basis through the system programming. By this means, the capabilities of individual stations can be quite different.

6.58 HANDSFREE ANSWER BACK ON INTERCOM
When a station user hears a voice announcement from another station through the speaker on the telephone, he can answer without lifting the handset (if the microphone is enabled). (Refer to VOICE CALL ANNOUNCE and MICROPHONE MUTING.)

6.59 HANDSFREE INTERCOM
The Executive telephone includes a handsfree speakerphone which provides the ability to carry on intercom conversations without lifting the handset. Handsfree intercom calls may be answered and originated via the speakerphone mode. (See HANDSFREE SPEAKERPHONE.)

6.60 HANDSFREE SPEAKERPHONE
The Executive telephone includes a handsfree speakerphone which allows conversations on the intercom or outside lines without the use of the handset. A separate volume control is provided for adjusting the speakerphone level.

6.61 HEARING AIDE COMPATIBILITY
The proprietary key telephones used with the EKN-2464 system comply with FCC regulations governing the installation of hearing aide compatible telephones in specific locations.

6.62 I-HOLD INDICATION
The distinctive flash rate and green color of the CO line LED indicates lines which have been placed on hold by the individual stations. The indication at others stations is a slow flash and red LED.

6.63 I-USE INDICATION
The special flash rate and green color of the LED indicates the CO line in use at a particular station.

6.64 INTERCOM CAMP-ON
After dialing a station number and receiving a busy tone, the calling station can dial "*" and remain off hook. When the called station becomes idle, it will ring (or the voice announce tone will be heard) and the two stations will be connected when the called station lifts the handset (or he can answer back handsfree in the case of a voice call announce.) Dialing the "*" a second time changes the camp-on to AUTOMATIC INTERCOM CALLBACK. A station in the camp-on mode has priority over a station in the automatic callback mode.

6.65 INTERCOM HOLD

A call to or from another station can be placed on hold by pushing the HOLD button. However, the intercom station is disconnected if the handset is replaced or if a CO line button is pushed.

6.66 INTERCOM TRANSFER

An intercom call can be transferred to another station by following the conferencing procedure. Once the conference is established, the original station hangs up leaving the other two stations connected. (See ADD-ON CONFERENCE.)

6.67 LAST NUMBER REDIAL

The last number dialed either manually or by speed dialing can be automatically redialed. It is possible to redial a string of up to sixteen digits. To redial a number, seize the CO line, push the SD/LNR button and dial "*". Numbers dialed by use of the programmable feature buttons or a number that has been "saved" are not considered to be the "last number". Therefore numbers can be dialed by use of the feature buttons or can be "saved" and a number dialed previously will still be retained as the "last number". Last Number Redial cannot be used after a line has been seized by means of the Line Queuing feature.

6.68 LINE DISTINCTION

Lines can be individually designated as being direct CO lines or PABX lines. This capability allows toll restriction, line access and other functions to operate properly on each type of line. Also, the incoming ringing signal may be different for CO lines and PABX lines.

6.69 LINE GROUPS

Lines can be divided into groups and individual stations can be allowed access to one or two of these groups for incoming calls and one or two groups (along with a common use line group) for outgoing use. The lines in each group must be sequential and each line occupies its own line button position on the telephone set. The order in which the line groups appear on the telephone may be arranged as required for each station but the common use line group (if it exists) must appear as the first group of lines on each telephone. A maximum of 36 line groups can be established with individual lines being included in as many groups as necessary.

6.70 LINE HOLD

A call on an outside line can be placed on hold by simply pushing the HOLD button. A lamp indication shows the line which was placed on hold with a distinctive flash and green color at the station which placed the line on hold. Other stations receive a different LED flash rate and a red LED. (See AUTOMATIC HOLD RECALL, I-HOLD and EXCLUSIVE HOLD.)

6.71 LINE PRESELECTION

When a station user wants to seize a line before the handset is lifted, the CO button may be pushed first. The handset must be lifted (or the speaker turned on within three seconds to seize the line. Through programming, an option may be selected to automatically activate the speaker when a CO line button is pushed.

6.72 LINE QUEUING

When all of the lines in any of the four queue groups are busy, a station user can reserve the first available idle line by pushing the HOLD button and dialing the digit for the particular queue group. (The HOLD button will flash to indicate that a line has been reserved.) When a line in that queue group becomes idle, it rings at the first station having placed a queue on that group. The station user lifts the handset and pushes the CO line button to seize the reserved line. A programming option allows automatic seizure when the handset is lifted. If the line is not seized within the 20 second time-out period, it will become idle or ring at the next station having reserved it. Each tenant group has access to as many as four line queue groups. One line in each of the four queue groups may be reserved by a station at any one time but a maximum of eight stations at a time may place a reservation on any single queue group. If the reservation is denied, the user will hear a reorder tone. Only outgoing CO lines may be reserved.

6.73 LINE TRANSFER VIA INTERCOM

A CO line can be answered at one station and transferred to another. After the line is seized, the ICM

button is pushed and the station number is dialed (or a DSS button is pushed). The HXFER button is then pushed to transfer the CO line either before or after the called station answers. The call can also be transferred by signalling the station, announcing the call and allowing the called station to pick up the call by pushing the appropriate CO line button. (See CALL TRANSFER, ANNOUNCED and CALL TRANSFER, UNANNOUNCED.) If the transferred call is unanswered, it will recall to the transferring station after the time-out period.

6.74 MEET ME ANSWER

After making a paging announcement, the paging station can dial "#" to allow the paged party to directly answer. After hearing an internal page, any station in the paged group can be connected to the calling station by lifting the handset and dialing "#". To answer a page to another paging group or to an external page zone, the station user lifts the handset and dials "#" and the page access zone number.

6.75 MEET ME CONFERENCE

After making an internal page, the station user pushes the ADD/DND button to allow other stations to join in a conversation. Station users wishing to talk with the paging party lift their handsets and push the ADD/DND button. A maximum of six stations may be included in a conference in this way. A conference cannot be established by this method through the external paging zones.

6.76 MESSAGE WAITING

After dialing a station number and receiving a busy tone (or no answer), a message can be left for that station by dialing '0'. The MESSAGE lamp at the called station will flash to indicate a message waiting. A station receiving a message can check to see which station has left the message by pushing the CHK button and dialing "*" while on hook. The number of the station will be displayed on the LCD. The receiving station can lift the handset, push the ICM button and dial "*" to automatically signal the party who left the message. A station leaving a message can cancel the message by lifting the handset and dialing "*0". Each station may receive one message from a standard key telephone and one message from each of the two DSS stations at any one time. When multiple messages are returned, the priority is DSS #1 first, DSS #2 second and key telephone station third. Any station may leave as many messages as necessary.

6.77 MICROPHONE MUTING

When a private conversation is necessary during a handsfree call, the MIC button can be pushed to cut off the microphone. Microphone muting applies to all handsfree calls including intercom handsfree response. A program option allows the default mode of the microphone to be either on or off. Preceding a voice announce internal call, a single alerting tone indicates to both called and calling parties that the microphone is active at the called station and a double tone indicates that the microphone is disabled. When the telephone is idle, the handset can be lifted and the MIC button pushed to change the microphone mode. During a handsfree call the MIC button can now be pushed to change the microphone mode for the current call. It will revert to the preset mode when the call is terminated.

6.78 MIXED LINES

Both rotary pulse and DTMF lines can be connected to the same system. The type of dial signaling used on each line is determined through system programming. Dialing on rotary pulse lines may be changed to DTMF during dialing by pushing "#".

6.79 MIXED STATION INSTRUMENTS

Telephone sets used in the system can be a mixture of different types of key telephones and single-line sets.

6.80 MULTI-LINE CONFERENCE

During a conversation on a CO line, a second line may be added by pushing OPT, ADD/DND, then the second CO line button and ADD/DND again. As many as six intercom stations can then be included in the two-line conference by pushing ADD/DND, ICM and then dialing the station number and pushing ADD/DND again when the called party lifts the handset. The first station may then hang up to transfer the conference to the second party or the procedure can be repeated to add other stations. (See ADD-ON CONFERENCE.)

6.81 MUSIC ON HOLD, EXTERNAL SOURCE

An external source of music can be connected to the system to provide music to CO lines which are on hold. Separate inputs are provided for hold music and background music so that different sources could be used for each.

6.82 NIGHT RINGING

Line ringing can be programmed for stations other than those that ring during the day ringing mode. The ringing assignments are programmed for line groups and not for individual lines. The night ringing mode may be automatically activated and/or deactivated at specified times of day. In addition to the line ringing, stations may also be designated as restricted or non-restricted stations during the night ringing mode. If restricted, the stations assume the limitations of Toll Restriction Class F.

There are several options available for manually changing the ringing mode. It can be manually activated by the key telephone at Station 10 by lifting the handset, pushing the RXFR button, dialing "0#" (the RXFR LED will light and a short tone is heard) and replacing the handset. To return to the normal ringing mode, lift the handset at Station 10 and push the RXFR button twice (the LED will go out and a short tone is heard). The NIGHT button on the DSS console can be pushed to activate and deactivate the night ringing mode. Both the NIGHT LED and the RXFR LED will be lit when night ringing is activated.

Through programming (See Program 17.) individual tenant groups are allowed to activate their own night ringing mode. This is done through any key telephone within the tenant group in the same way as previously described for Station 10.

6.83 NON-VOLATILE MEMORY

System memory and programming is protected against loss in the event of a commercial power failure by a small lithium battery mounted on the CPU PCB. Absence, failure or discharged condition of this battery is indicated by the flashing letters "BAT" on the displays of the Executive telephones.

6.84 OFF HOOK RINGING

Stations may receive low volume ringing signals even while off hook to indicate an incoming call. This feature is enabled or disabled on a system-wide basis through programming.

6.85 OFF PREMISE EXTENSIONS

The SLTU PCB may be installed to allow connection of Off Premise single-line station instruments. The instrument used at the OPX station is an industry standard single-line telephone. In addition to the SLTU PCB, a 48VDC power supply must be provided to power the Off Premise instruments. Some of the features available to the single-line set include intercom and CO line access, CO line transfer, hold, internal and external paging access, and activation of call waiting, camp-on, and automatic intercom callback.

6.86 ON HOOK DIALING/CALL MONITORING

It is not necessary to lift the handset before dialing a number (either an a CO line or intercom). The SPKR button is pushed to activate the speaker and a line or the intercom is seized. The number can then be dialed while the handset is in the cradle. If the telephone is equipped with a handsfree speakerphone, the conversation can proceed when the called party answers. Without the speakerphone, the handset must be lifted when the called party answers.

6.87 ON-LINE PROGRAMMING

System programming can be accomplished without interrupting or affecting call processing or other system activities.

6.88 PABX COMPATIBILITY

The EKN-2464 may be installed behind an existing PABX system. Features and capabilities such as timed hookflash, automatic pause after PBX line access code, direct line access during night ringing mode, programmable feature buttons and CO/PBX line distinction are included which facilitate operation in this application.

6.89 POWER FAILURE RESTART
If the system shuts down due to commercial power failure, it will automatically restart itself when the power is restored.

6.90 POWER FAILURE TRANSFER
Operation during commercial power failure can be provided by use of standard single-line telephones. Relays which are included for each line reroute the lines to a customer provided single-line telephone when power fails.

6.91 PRIVACY RELEASE
The ADD/DND button is provided on each telephone set to allow the user to temporarily disable privacy in order to establish conference calls. Privacy may also be disabled permanently for any or all stations by activating the EXECUTIVE BARGE-IN feature through programming.

6.92 PRIVATE LINES
Lines or groups of lines may be programmed so as to be accessable by only one station for its private use. This is an application of FLEXIBLE LINE ASSIGNMENT. (See also LINE GROUPS.)

6.93 PROGRAMMABLE FUNCTION KEYS
Each telephone includes eight feature buttons which can be programmed for use as both speed dial and paging access or DSS buttons.

6.94 PULSE TO TONE SIGNALING
When required, the dial signals on the CO lines can be switched from rotary pulse to DTMF in the middle of the dialing sequence by pushing "#". Later, when Last Number Redial is used, the dialing will automatically change from pulse to tone.

6.95 PUSH BUTTON DIALING
All key telephone sets are equipped with pushbutton dial pads. The dial signal can be either rotary pulse or DTMF or a mixture of the two.

6.96 RESERVE POWER
The system power supply includes relay and charging circuits which provide reserve battery backup when the optional batteries are connected. This arrangement may be used to provide either full system operation or only outside line operation in order to increase the maximum backup time. Connections to outside lines are maintained when the commercial power is interrupted and when it resumes.

6.97 RING TRANSFER
Instead of first voice announcing to a station, a CO line can be transferred directly to the selected station with a ringing signal. If the line is unanswered, it recalls at the station initiating the transfer after a programmable time-out period. While talking on the CO line, the transferring station pushes the ICM button and dials the station number (or pushes a DSS button) and then pushes the XFER button and hangs up. The receiving station hears the ring transfer signal and sees a green CO line LED. The transferring station has the ability to select the mode of signaling (voice or ringing). (See CALL TRANSFER, UNANNOUNCED.)

6.98 RINGING LINE PICKUP
This feature allows the station user to lift the handset (or activate the speaker) and be connected automatically to the incoming ringing line or intercom call. Normally only stations receiving the audible signal may automatically answer an incoming line. However, a program option allows any station to automatically answer the line even though ringing is not heard at that telephone or the automatic pickup can be completely disabled forcing all station users to push the line button to answer the calls. When several lines are ringing at the same time, the line which has been ringing for the longest time will be the line answered.

6.99 ROOM MONITORING
It is possible to activate the microphone of a station in another location in order to monitor that area. At the telephone to be monitored, the handset is lifted, the OPT and FLASH buttons are pushed and then the handset is replaced. At the monitoring station the OPT and FLASH buttons are pushed while on hook. The procedures are repeated to disable the monitoring feature. Several telephones can monitor

a specific station at the same time but a telephone can monitor only one station at a time. The monitored condition of the telephone is temporarily suspended when the handset is lifted to place a call or when a call rings in.

6.100 ROTARY PULSE SIGNALING

Individual lines can be designated to receive rotary pulse dial signaling from the system. The pulse speed is 10pps and the make/break ratio is or 66%.

6.101 SAVED NUMBER REDIAL

A number dialed on a CO line can be saved and automatically redialed at a later time even though it may not be the last number dialed. A maximum of 18 digits can be saved and redialed in this way. To store the "saved" number, push the OPT button and then the SD/LNR button after having dialed the number manually, by speed dialing or by Last Number Redial. To redial the number, seize a CO line, push the SD/LNR button and then dial "#". AUTOMATIC REDIAL also applies to this feature.

6.102 SELECTABLE RINGER TONE

Each telephone set has an internal ringer selection switch which allows a choice of one of the three different ringing signals so that different telephones can be identified by sound.

6.103 SINGLE LINE TELEPHONES

Optional PCBs allow single-line telephones to be connected to the system to replace the key telephones. Up to one half of the system station capacity can be replaced by single-line sets. Single line telephones with rotary dials are can be used or optional PCBs can be added to allow use of both rotary and DTMF telephones. Capabilities of single line telephones are limited but, among other things, these telephones are allowed to seize lines to make outgoing calls, answer incoming lines, transfer lines, make intercom calls, access internal and external paging.

6.104 SPEED DIAL, PERSONAL

Each station user has access to ten individual speed dial numbers which are activated by seizing a line, pushing the SD/LNR button and dialing a two-digit code (90 through 99). The individual station users program the speed dial numbers by going off hook, pushing the SD/LNR button, dialing "*" and the selected speed dial code and then the telephone number to be stored. The user then goes on hook or pushes the SD/LNR button again and repeats the procedure for the next speed dial code. Each speed dial number can include up to eighteen digits (and pauses). (See AUTOMATIC SPEED DIAL PAUSE.)

6.105 SPEED DIAL, SINGLE BUTTON

Each station user can program up to eight buttons on the telephone to be used as speed dial buttons. Each of these eight buttons can be used to activate two (either system or personal) speed dial numbers. These buttons can also be used for direct station selection (DSS) and for feature access. Then buttons are programmed by lifting the handset, pushing the SD/LNR button and dialing "*". Then the chosen button is pushed, the two-digit speed dial code to be assigned to the button is dialed and the SD/LNR button is pushed again. (See PROGRAMMABLE FEATURE BUTTONS.)

6.106 SPEED DIAL, SYSTEM

Up to 90 telephone numbers can be programmed for use by all stations in the system. To activate speed dialing, the SD/LNR button is pushed after seizing an idle CO line and a two-digit code (00 through 89) is dialed. These speed dial numbers may or may not be subject to toll restriction depending on the user's requirements. These speed dial numbers can include up to eighteen digits (and pauses) and are entered in the same way as the personal speed dial numbers except that storing may only be done by the telephone connected to the first station circuit (normally station #10). (See SPEED DIAL PERSONAL and AUTOMATIC SPEED DIAL PAUSE.)

6.107 STATION DSS

Each station user can program up to eight buttons on the telephone for use as direct station selection buttons. These button are programmed for DSS use (or internal paging access) by lifting the handset, pushing the SD/LNR button, pushing the chosen button and then dialing in the station number. Then the SD/LNR button is pushed again and the handset is replaced (or the procedure is repeated for the

next button). (See PROGRAMMABLE FUNCTION BUTTONS.)

6.108 STATION HUNTING

As many as ten station hunt groups may be established through programming with up to eight stations included in each group. By dialing "#" and the hunt group number (0 through 9), a calling station will be connected to the first idle station in that hunt group. The stations in each hunt group and the order in which the hunting proceeds from one station to the next is determined by system programming. The type of signaling (voice or tone) can be changed by dialing "1" after dialing the hunt group access code.

6.109 STATION MESSAGE DETAIL RECORDING

As an option, an SMDR PCB can be installed in the system to provide details of each station user's call records. The call records can be output to either a serial or parallel printer (or other device) and include the station number, line number, digits dialed, time of the call, duration of the call, account code and other items. Optionally incoming call records and short duration calls can be ignored.

6.110 STEP CALL

When a called station is busy or does not answer, the next station number in sequence can be called by dialing "#". The "#" can be dialed repeatedly to signal several stations sequentially. This feature cannot be used, however, after dialing a station in the DND mode. STEP CALL can also be used after signaling an idle station that does not answer while using the STATION HUNTING feature.

6.111 SYSTEM LINKING

Two or more systems can be linked together to allow intercom calling and CO line transfer between the systems. This allows expansion of the station and line capacity of the overall system.

6.112 TELEPHONE DIAGNOSTICS TEST

A test routine is available for checking the telephone LEDs, button operation and speaker operation. To enter the test mode, the line cord is connected to the telephone while the "WRITE" button is being depressed. The "WRITE" button is then released and the test procedures are carried out by pushing particular buttons on the telephone in a specific sequence.

6.113 TENANT SERVICE

Access to line groups is programmed for each station individually. Each station is allowed access to as many as two outgoing and two incoming line groups as well as access to a group of common use lines. Stations having access to the same line groups interact as members of a common tenant group. Internal calling (intercom) between tenant groups is allowed. This is an application of the FLEXIBLE LINE ASSIGNMENT feature.

6.114 THREE-MINUTE ALARM

During outside line conversations, an alerting tone is delivered every three minutes to the station user as a reminder of the elapsed time. This tone may be disabled through programming if desired.

6.115 TOLL RESTRICTION BY STATION

Individual stations are assigned, through programming, to one of the seven available toll restriction classes. (See also TOLL RESTRICTION, MULTI-DIGIT.)The basic definitions of each of these classes are as follows:

Class A

Stations designated as Class A are exempt from toll restriction and are allowed to dial all calls.

Class B

Class B stations are prohibited from dialing "0" and international calls. All other dialing is allowed unless prohibited by entries in one or more of the "deny" lists.

Class C

Stations under Class C restriction are prevented from dialing "0" or any calls outside the local area code. Lists can be applied to this class to further limit dialing or to allow some long distance calling.

Class D

Class D stations are allowed only to dial local telephone numbers. These stations are prohibited from dialing "0". Lists can also be applied to this

class to further limit dialing or to allow certain long distance calls.

Class E
The basic dialing capabilities of stations in this class are exactly the same as those of Class D stations. Different lists of allowed and denied codes can be applied to provide different dialing capabilities than those of Class D stations.

Class F
Class F stations are only allowed internal (intercom) calling. These stations are prevented from making any outside calls except when one or more "allow" lists are assigned for their use.

Class G
Stations under Class G restriction are allowed only intercom calling.

6.116 TOLL RESTRICTION, MULTI-DIGIT

There are eight lists available which allow the basic functions of each toll restriction class to be altered to some extent. Some of these lists are automatically applied to certain toll restriction classes while other lists may be applied as required. As a result, stations assigned to different toll classes may be subject to widely varying degrees of restriction. The functions of the eight lists are as follows:

List 1 - COMMON RESTRICTIONS
Up to ten three-digit codes may be enterd into this list as commonly restricted codes. All stations in Class B through Class G will be prevented from dialing these codes as the first three digits of an outgoing call. These codes may be area codes, local office codes, or special service numbers.

List 2 - BASIC RESTRICTIONS
As many as ten three-digit codes can be entered into this list as restricted codes for stations under classes C through G. These codes are denied when dialed as the first three digits of an outgoing call. These may be area codes, local office codes, or special service codes just as in List 1.

List 3 - COMMON ALLOWED CODES
A maximum of ten three-digit codes may be programmed into List 3. These codes are similar to the codes described under List 2 except that dialing of these codes is permitted to stations under Class C through Class E.

List 4 - SPECIAL ALLOWED CODES
Up to ten codes may be included in this list and each code is seven digits in length. These codes may be complete local telephone numbers or the first digits of a long distance number. Restricted stations are allowed to dial these codes as long as this list has been assigned to their respective toll restriction class.

List 5 - SPECIAL ALLOWED CODES
This list is identical to List 4. It may be applied to individual toll classes along with or instead of List 4.

List 6 - SPECIAL DENIED CODES
List 6 may contain up to ten codes of seven digits each. These codes may be complete local telephone numbers or the first digits of a long distance number. Stations are prohibited from dialing these codes as long as the list has been assigned to their respective toll class. This list may be assigned to toll restriction Classes B through F.

List 7 - SPECIAL DENIED CODES
List 7 is identical to List 6. It may be applied to individual toll classes along with or instead of List 6.

List 8 - PBX CODES
Three PBX line access codes of up to two digits each can be entered into this list. Stations having access to this list are allowed to dial these codes in order to seize an outside line regardless of their other dialing capabilities. Once the line is seized, any additional dialing is monitored for restriction as usual. (Entries are made to this list through Program 49.)

6.117 TOLL RESTRICTION, SPECIAL CONDITIONS

Along with the toll classes and toll restriction lists, there are three special conditions which may be set to allow for special applications and circumstances. These conditions are as follows:

Condition 1 - TRUNK ACCESS
When this is enabled, the basic definitions and parameters for each Toll Class are activated. This condition should remain enabled to allow the basic toll restriction plan to operate properly.

Condition 2 - TOLL ACCESS
This provides a means by which the digit "1" can be absorbed or ignored when it appears as the leading digit of a dialed number. This allows the toll restriction to operate properly in areas where dialing "1" is not required before dialing a long distance or area code call. It is also useful in areas where local office codes resemble area codes by having a "0" or "1" as the second digit.

Condition 3 - EQUAL ACCESS
This provides a means by which the equal access dialing plan can be used without adverse effect on the toll restriction program. By use of this condition, a station user may be allowed to dial "10XXX" (where "XXX" is the alternate long distance carrier code). After these digits are dialed the remainder of the dialed digits are monitored and the number is denied only if it conflicts with the station user's toll restriction parameters.

6.118 TOLL RESTRICTION, SYSTEM SPEED DIAL
In addition to the other toll restriction considerations, it is possible to designate which system Speed Dial numbers are available for use by stations in each Toll Class. All system Speed Dial numbers are exempt from toll restriction.

6.119 TONE SIGNALING ON INTERCOM
As an alternative to voice call announce, a station user can dial "1" after dialing another station number to cause the called station to ring. The "1" could also be dialed after pushing a DSS button. In this case the called party must lift the handset to answer the call. The intercom ringing signal is different from the CO line ringing signal. Through programming, the primary signaling mode (either voice announce or ringing) is established system-wide. Once established the alternate signaling mode is activated by dialing the "1" after the station number.

6.120 VOICE CALL ANNOUNCE
A station user can dial another station number and, after hearing the call announce alerting tone, speak into the handset and be heard through the speaker at the called station. The called party can answer without lifting the handset. (See HANDSFREE ANSWER BACK ON INTERCOM and TONE SIGNALING ON INTERCOM.)

6.121 VOLUME CONTROLS
Separate ringer and speaker volume controls are provided on the EKN-1232/2464 key telephone set. This allows incoming signal levels to be adjusted differently than the level for handsfree or speaker monitoring, background music and voice announcements.

6.122 WALL MOUNTING
An optional mounting kit allows telephone sets to be wall mounted. By reversing the wall mount bracket, it can also be used as a desk stand for the telephone.

6.123 ZONE PAGING, EXTERNAL
External paging speakers can be connected to the system and split into two groups for zone paging. These zones may be accessed individually or at the same time. (See ALL CALL PAGE, EXTERNAL.) The station user lifts the handset, pushes the ICM button and dials a code ("91" or "92") to access either of the paging zones. Both zones can be accessed at the same time by dialing "90". The alerting tone which normally precedes the voice page can be eliminated through a program option. These external paging paths are one-way only.

6.124 ZONE PAGING, INTERNAL
Stations can be divided into as many as nine internal paging groups. Each group can be accessed individually or all groups can be accessed at the same time for voice paging through the speakers of the telephone sets. The station user lifts the handset, pushes the ICM button and dials the two-digit code (81 through 89) for one of the internal paging zones and speaks into the handset. All zones can be accessed at once by dialing "80". (See ALL CALL PAGE, INTERNAL.)

7. INSTALLATION

7.01 SITE SELECTION

The location selected for the installation of the KSU and main distribution frame should meet the following requirements:

a) Adequate space should be available for mounting the KSU and other necessary equipment as well as allowing easy access for initial installation and subsequent maintenance.

b) Station and line cabling requirements should be considered for both the initial installation and future system expansion.

c) The KSU should be located at least 10 feet (3 meters)from other electronic equipment such as copy machines, electric typewriters, computers, etc.

d) A dedicated 120VAC, 60Hz commercial power outlet should be available within the length of the power cord. This circuit should not be shared with other equipment and should not include a switch which might accidentally be turned off. A surge protection device should be used to protect the system from power surges and fluctuations.

e) The location should be free of direct sunlight, corrosive fumes and excessive dust. The temperature should be maintained at -10 to +55 degrees Centigrade (+14 to +131 degrees Fahrenheit). The relative humidity should not exceed 95% at +35 degrees Centigrade (+95 degrees Fahrenheit).

f) A good quality earth ground of less than 200 ohms must be available. A 14-gauge copper wire connected to a metal cold water pipe or ground rod is recommended.

g) Key telephones must be located within 700 feet of the KSU when 24AWG station wire is used or up to 1100 feet from the KSU when 22AWG station wire is used. Single line telephones may be located up to 1400 feet from the KSU when using 24 AWG station wire or 2300 feet when using 22AWG station wire.

h) Wiring to individual station sets must be home-run from the KSU. Two-pair twisted station wire of at least 24 gauge should be used for each wiring run. Multi-pair or non-twisted pair wire is not recommended.

CAUTION: Installation and service should be performed only by qualified personnel. Before any work is performed on the Main or Expansion KSU Cabinets, be sure that the power cord is disconnected to prevent the possibility of hazardous electrical shock.

7.02 INSPECTION

While unpacking the equipment, visually inspect each item for signs of shipping damage. Equipment which is suspected to have been damaged should not be used in order to avoid possible damage to other system components. Packing materials should be stored for later use if it becomes necessary to ship equipment.

7.03 MAIN CABINET

The EKN-2464 Main Cabinet (KSU) provides a maximum capacity of 12 lines and 32 stations. It includes the motherboard (MB 4VA), main distribution frame (MDF 4VA) and power supply (POWU 4VA). Also included is the provision for adding an expansion power supply (POWU 4VB) and the connectors required for joining the Expansion Cabinet.

7.04 WALL MOUNTING

A bracket, bolts and wood screws are packed with the Main Cabinet to allow the system to be wall mounted on a backboard. The bracket should first be secured to the backboard at a level that will allow convenient access to the cabinet. (The top of the Main cabinet will be 19.25 inches above the top of the bracket. If used, the top of the Expansion Cabinet will be approximately 34 inches above the top of the bracket.) Rest the empty Main Cabinet on the bracket to mark and install two wood screws in the keyhole slots at the top of the cabinet. (The slots are on 12.75 inch centers.) Tighten the wood screws

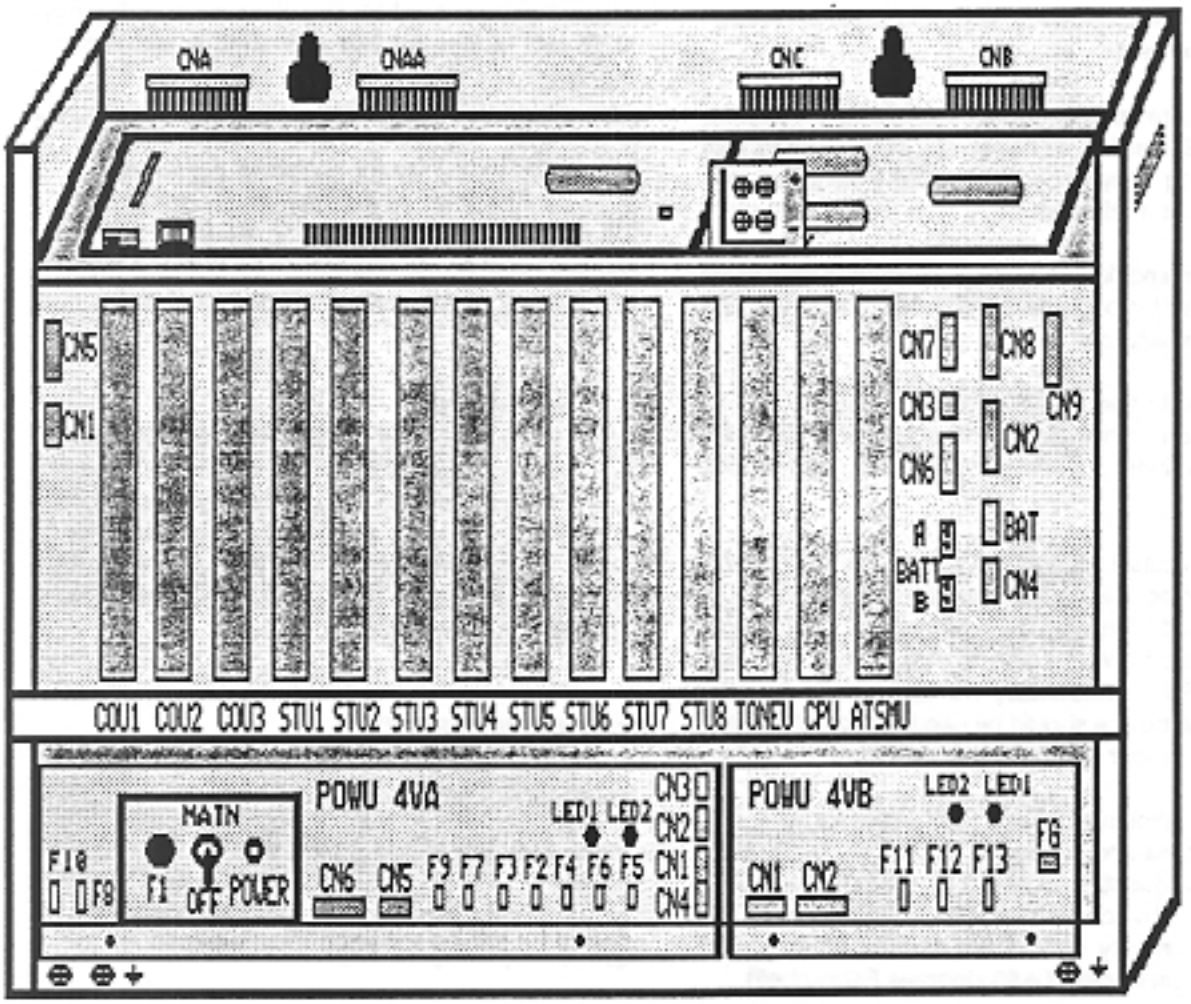

FIGURE 1. EKN-2464 Main Cabinet with top and front covers removed and Expansion Power Supply installed.

in the keyhole slots and bolt the cabinet securely to the bracket.

7.05 FLOOR MOUNTING

Optional floor mounting brackets are available which are used to elevate the cabinet from the floor surface to reduce the risk of damage caused by contact with chemicals or solutions used in cleaning or floor maintenance. The brackets also provide better cabinet ventilation.

7.06 CABINET ACCESS

The PCB mounting shelf and the power supply in the Main Cabinet are accessable by loosening the six phillips-head screws on the front of the main cabinet. The front cover can then be removed by lifting and pulling it forward. Completely remove the four phillips-head screws from the top cover to expose the MDF.

CAUTION: Removal of the cabinet cover exposes the power supply. Be very careful to avoid the possibility of electrical shock when performing any work on the system while the cover is removed.

7.07 POWER SUPPLY

The Main Cabinet includes a self contained power supply which provides all necessary power to the basic system. A dedicated circuit must be provided for the system. (See Site Selection.) Before inserting any PCBs into the cabinet or installing batteries, check all power supply fuses (F1 through F10), plug the power cord into the commercial power outlet and turn the main power supply switch on. Next turn the main switch off, unplug the power cord and check the fuses again. Replace any blown fuses and repeat the procedure. If fuses are blown again, the fault must be isolated and corrected before proceeding.

7.08 RESERVE BATTERY BACKUP

The main power supply includes charging and relay circuits to provide uninterrupted battery backup which allows use of the system during commecial power failure. Screw terminals located on the MDF PCB of the Main Cabinet (marked EXT BAT + and EXT BAT-) allow connection of batteries which provide the emergency power. The batteries connected to the system should be wired in series to provide 24VDC. Be sure that the polarity of the batteries matches the polarity of the battery connection terminals when they are being wired to the system.

WARNING: Severe damage to the EKN-2464 system may result if the polarity of the batteries is reversed during connection to the system.

7.09 MAIN CABINET MDF WIRING

An MDF PCB (MDF 4VA) is located at the top of the Main Cabinet and includes five 25-pair Amphenol-type plugs (Male) for wiring of key or single-line telephones, power failure telephones, DSS consoles, CO lines and auxiliary equipment. These connectors are marked ACN1 through ACN5.

7.10 CO/PBX LINE CONNECTIONS (CO1 - CO12)

Connector ACN1 is provided for connection of twelve CO lines and twelve single-line power failure telephones to the system. The first twelve pairs are used for connecting CO lines and are designated as CO1T and CO1R through CO12T and CO12R. The system is not sensitive to the polarity of the CO lines therefore reversal of these connections will cause no problem.

7.11 POWER FAILURE TRANSFER (N1 - N12)

The next twelve pairs (pairs 13 through 24) are used optionally for connection of standard single-line telephones for use as power failure telephones in the event that power to the system is lost. The connections for power failure telephones are designated as N1T and N1R through N12T and N12R. A single-line telephone wired to N1T and N1R will automatically be connected to the CO Line 1 (CO1T and CO1R) when the power fails. This arrangement follows through until all lines are connected to power failure telephones with like numbering.

7.12 CONNECTOR ACN1 WIRING

The wiring arrangement for connector ACN1 for CO lines and single-line power failure telephones follows:

TERM NAME	COLOR CODE	TERM NAME	COLOR CODE
CO1T	W/BL	NT1T	BK/GN
CO1R	BL/W	NT1R	GN/BK
CO2T	W/0	NT2T	BK/BR
CO2R	O/W	NT2R	BR/BK
CO3T	W/GN	NT3T	BK/S
CO3R	GN/W	NT3R	S/BK
CO4T	W/BR	NT4T	Y/BL
CO4R	BR/W	NT4R	BL/Y
CO5T	W/S	NT5T	Y/O
CO5R	S/W	NT5R	O/Y
CO6T	R/BL	NT6T	Y/GN
CO6R	BL/R	NT6R	GN/Y
CO7T	R/O	NT7T	Y/BR
CO7R	O/R	NT7R	BR/Y
CO8T	R/GN	NT8T	Y/S
CO8R	GN/R	NT8R	S/Y
CO9T	R/BR	NT9T	V/BL
CO9R	BR/R	NT9R	BL/V
CO10T	R/S	NT10T	V/O
CO10R	S/R	NT10R	O/V
CO11T	BK/BL	NT11T	V/GN
CO11R	BL/BK	NT11R	GN/V
CO12T	BK/O	NT12T	V/BR
CO12R	O/BK	NT12R	BR/V
		(NOT USED)	V/S
		(NOT USED)	S/V

7.13 STATION CONNECTIONS (ST1 - ST32)

Three 25-pair connectors are provided for wiring from the KSU cabinet to external cross-connect blocks. From the external cross-connect frame all wiring to stations should be done with two-pair twisted station wire (22AWG - 24AWG). The connectors provided for station wiring are marked ACN2, ACN3 and ACN4. Connections for each key telephone are designated as T, R, BR, and BT. ACN2 is used for connecting telephones to the first twelve station cicuits. ACN3 is used for connecting telephones to station circuits 13 through 24. ACN4 is used for connecting telephones to the last eight station circuits (25 through 32) of the Main Cabinet and (when installed) the first four telephones of the Expansion Cabinet.

The first pair of station wires (T & R) are polarity sensitive and provide Tip and Ring to the telephone. The key telephone will not operate if the wiring of this pair is reversed. The second pair of station wires (BT & BR) provide power to the key telephone and are also polarity sensitive.

7.14 CONNECTOR ACN2-ACN4 WIRING

The wiring arrangement for connectors ACN2, ACN3 and ACN4 is identical except that the last four station connections (ST33 through ST36) on ACN4 are only used when the Expansion Cabinet is installed to increase the system capacity. The details of connector ACN2 are as follows:

PORT & TERM		COLOR CODE	PORT & TERM		COLOR CODE
ST1	T	W/BL	ST7	T	BK/GN
	R	BL/W		R	GN/BK
	BT	W/0		BT	BK/BR
	BR	O/W		BR	BR/BK
ST2	T	W/GN	ST8	T	BK/S
	R	GN/W		R	S/BK
	BT	W/BR		BT	Y/BL
	BR	BR/W		BR	BL/Y
ST3	T	W/S	ST9	T	Y/O
	R	S/W		R	O/Y
	BT	R/BL		BT	Y/GN
	BR	BL/R		BR	GN/Y
ST4	T	R/O	ST10	T	Y/BR
	R	O/R		R	BR/Y
	BT	R/GN		BT	Y/S
	BR	GN/R		BR	S/Y
ST5	T	R/BR	ST11	T	V/BL
	R	BR/R		R	BL/V
	BT	R/S		BT	V/O
	BR	S/R		BR	O/V
ST6	T	BK/BL	ST12	T	V/GN
	R	BL/BK		R	GN/V
	BT	BK/O		BT	V/BR
	BR	O/BK		BR	BR/V
			(NOT USED)		V/S
			(NOT USED)		S/V

7.15 AUXILIARY TERMINALS

The connector marked ACN5 is provided for connections to various additional pieces of equipment including DSS consoles, Doorphones, Music sources, Paging equipment etc. The following paragraphs describe the wiring and use of this connector.

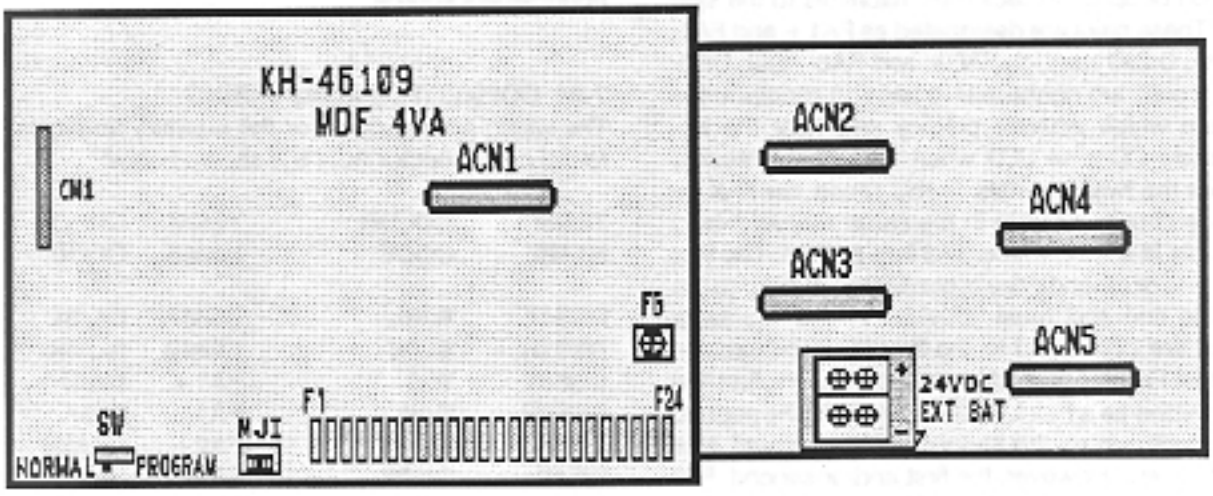

FIGURE 2. EKN-2464 Main Cabinet MDF (MDF 4VA)

7.16 DSS/BLF CONSOLES

The first two pairs of connector ACN5 are used for wiring of optional DSS/BLF consoles. The designations for these pairs are DSS1T and DSS1R (W/BL, BL/W) and DSS2T and DSS2R (W/O, O/W). Each DSS/BFL console requires its own dedicated pair of wires.

7.17 DOORPHONES

Two Doorphones may be connected to the third and fourth pairs. The third pair is designated as DH1T and DH1R (W/GN, GN/W) and is used for Doorphone 1. The fourth pair is designated as DH2T and DH2R (W/BR, BR/W) and is used for Doorphone 2.

7.18 EXTERNAL HOLD MUSIC SOURCE

An external music source for music on hold may be connected to the fifth pair which is designated as EXMOHA and EXMOHB (W/S, S/W). A dry "make" contact operates when any line is placed on hold and remains closed until there are no more lines on hold. The sixth pair is used for connection to this contact and is designated as EXMOHCA and EXMOHCB (R/BL, BL/R). The contact rating is 30VDC, 1AMP maximum.

7.19 EXTERNAL PAGING

The seventh through tenth pairs are used to connect single-zone (one or two-way) external paging equipment. The first paging amplifier (or amplified speaker) is connected to SP1T and SP1R (R/O, O/R).

A dry "make" contact is provided on SPC1T and SPC1R (R/GN, GN/R) which operates automatically when the paging zone is accessed and can be used to switch power to the amplifier or to mute background music through the speakers. The contact is rated at 30VDC, 1AMP maximum.

The second paging amplifier is connected to SP2T and SP2R (R/BR, BR/R). A contact for this zone is also provided on SPC2T and SPC2R (R/S, S/R). The second paging zone and contact are identical to the first.

7.20 EXTERNAL BACKGROUND MUSIC SOURCE

The eleventh pair on connector ACN5 (BK/BL, BL/BK) is designated as BGMA and BGMB and is used as an input for an external music source for use as background music through the speakers in the key telephones.

7.21 FACSIMILE (FAX) INTERFACE

Pairs twelve through seventeen are used for connection of up to six facsimile machines to the system. These pairs are designated as FA1 + and FA1- (BK/O, O/BK) through FA6+ and FA6- (Y/O, O/Y). These pairs are connected to sensing circuits in the system which activate privacy and light the appropriate CO Line LED when a short is detected across the two terminals. In this sense, the FAX interface circuits operate in the same way as A-lead controls in a mechanical 1A2 key system. The Fax machine or other device is connected directly to the outside line and must provide "in use" contacts which are connected to the Fax interface circuits. The first Fax interface circuit will control the first line designated as a Fax Line in Program 3, the second circuit will control the second line designated as a Fax line, etc. However, the first and/or second Fax interface circuit may be used for alarm purposes instead (see par. 7.22). In this case the first Fax Line would be controlled by the second or third Fax interface circuit.

7.22 EXTERNAL ALARM INTERFACE

The first two facsimile circuits described in paragraph 7.21 may be used, instead, for connecting external alarm circuits. In this case, these circuits will sense a change in the condition of the alarm device ("make" or "break" contact) and the system will deliver an audible alarm to selected stations. No voltage should be applied to these terminals. Program 28 is used to specify the use of these terminals for alarm purposes and to select the type of alarm device being used ("make" or "break"). Program 53 is used to select stations which are to receive the alarm. (See Section 8.)

7.23 ANSWERING MACHINE INTERFACE

Pair eighteen is designated as AMA and AMB (Y/GN, GN/Y) and is used to connect an external answering machine to the system. This interface allows connection of an announcement-only answering machine which will automatically answer and deliver a message to callers on selected CO lines. The maximum duaration allowed for this message is 30 seconds. This interface does not allow callers to leave a message on the machine.

In addition, the ninteenth pair designated as AMCA and AMCB (Y/BR, BR/Y) provides a dry "make" contact which is used to switch power to turn the answering machine on and off or to activate the announcement source.

7.24 CONNECTOR ACN5 WIRING

The wiring arrangement for the auxiliary terminals found on connector ACN 5 is shown below:

TERM NAME	COLOR CODE	TERM NAME	COLOR CODE
DSS1T	W/BL	BGMA	BK/BL
DSS1R	BL/W	BGMB	BL/BK
DSS2T	W/O	FA1+	BK/O
DSS2R	O/W	FA1-	O/BK
DH1A	W/GN	FA2+	BK/GN
DH1B	GN/W	FA2-	GN/BK
DH2A	W/BR	FA3+	BK/BR
DH2B	BR/W	FA3-	BR/BK
EXMOHA	W/S	FA4+	BK/S
EXMOHB	S/W	FA4-	S/BK
EXMOHCA	R/BL	FA5+	Y/BL
EXMOHCB	BL/R	FA5-	BL/Y
SP1T	R/O	FA6+	Y/O
SP1R	O/R	FA6-	O/Y
SPC1T	R/GN	AMA	Y/GN
SPC1R	GN/R	AMB	GN/Y
SP2T	R/BR	AMCA	Y/BR
SP2R	BR/R	AMCB	BR/Y
SPC2T	R/S	(The remaining pairs	
SPC2R	S/R	of ACN 5 are not used.)	

7.25 SYSTEM EXPANSION

An Expansion Cabinet (EX KSU) is available to allow system growth beyond the capacity of the Main Cabinet up to a maximum of 24 lines and 64 stations. An expansion power supply (POWU 4VB) and one or two EXPU PCBs are also required for system expansion. The Expansion Cabinet is mounted immediately above the Main Cabinet.

7.26 EXPANSION CABINET

Mount the Expansion Cabinet above the Main cabinet and secure it with the included bolts and screws to the backboard and the Main Cabinet. Remove the top and front covers from both the Main and Expansion Cabinets.

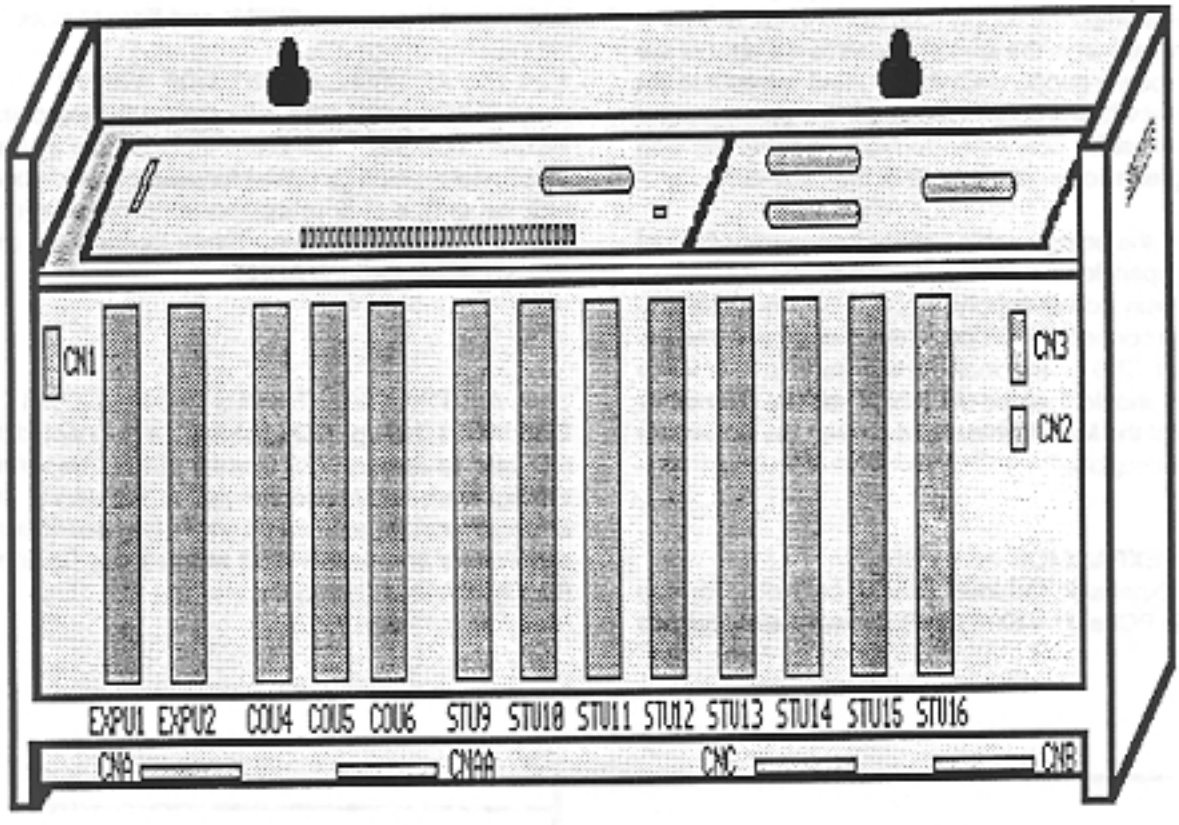

FIGURE 3. EKN-2464 Expansion Cabinet with top and front covers removed.

The Expansion Cabinet includes the necessary loose cables required to connect it to the Main Cabinet. Locate cables on the MDF of the Main Cabinet which are marked CNA, CNAA, CNC, and CNB. Connect the cables to the connectors with the same marking in the Expansion Cabinet. Disconnect the white cable from connector CN9 in the Main Cabinet. Install the violet cable between CN5 of the Main Cabinet and CN1 of the Expansion Cabinet. Then install the grey cable between CN6 of the Main Cabinet and CN2 of the Expansion Cabinet. Finally install the orange cable between CN8 in the Main Cabinet and CN3 in the Expansion Cabinet. When completed there will be seven cables connecting the MDFs of the two cabinets together. Be sure that the cables match the connectors and that they are tightly connected.

CAUTION: Service should be performed only by qualified personnel. Before any work is performed on or near the main or expansion power supplies, be sure that the main power cord is disconnected to prevent the possibility of hazardous electrical shock.

7.27 EXPANSION POWER SUPPLY

In addition to the main power supply (POWU 4VA), an expansion power supply (POWU 4VB) is required when the Expansion Cabinet is installed. Three cables and a ground wire are required and are included with the expansion power supply. Mount the expansion power supply (component side up) in the Main Cabinet in the area provided to the right of the main power supply (POWU 4VA) and secure it to the cabinet with the screws provided. The green ground wire must be connected to the cabinet frame with the green screw at the front of the cabinet.

Install the orange cable between connector CN2 of the expansion power supply and connector CN6 of the main power supply. Install the grey cable between connector CN1 of the expansion power supply and CN5 of the main power supply. The white cable should then be used between the connector CN9 of the Main Cabinet and CN3 of the expansion power supply.

7.28 EXPANSION PCB (EXPU)

The Expansion Cabinet includes card slots for two EXPU PCBs. The EXPU PCB allows system growth beyond twelve CO lines. When the Expansion Cabinet is equipped with one or more 4COU (CO line) PCBs but no 4STU (station) PCBs, one EXPU PCB must be installed in the slot marked EXPU1. When the Expansion Cabinet is equipped with both 4COU PCBs and 4STU PCBs, an EXPU PCB must be installed in both the EXPU1 and EXPU2 slots.

7.29 EXPANSION CABINET MDF WIRING

An MDF PCB (MDF 4VB) is located at the top of the system Expansion Cabinet and includes four 25-pair Amphenol-type plugs (Male) for wiring of additional key or single-line telephones, power failure telephones and CO lines. These connectors are marked ACN6 through ACN9.

7.30 ADDITIONAL CO LINES (CO13 - CO24)

CO Line 13 through CO Line 24 are connected to the first twelve pairs of connector ACN6. The wiring arrangement for connector ACN6 is exactly the same as for connector ACN1 which is used for connecting the first twelve lines in the Main Cabinet. (See Par. 7.10 and 7.12)

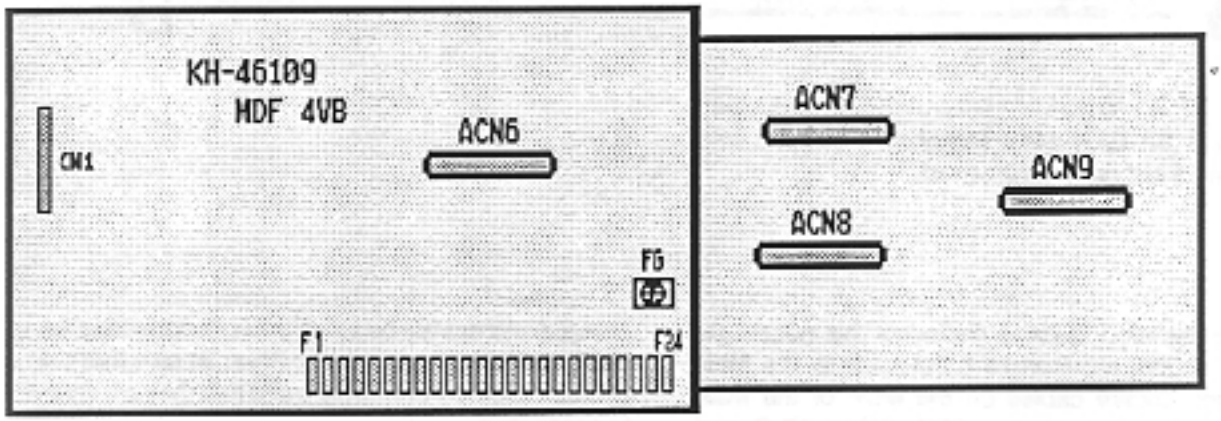

FIGURE 4. EKN-2464 Expansion Cabinet MDF (MDF 4VA)

7.31 ADDITIONAL POWER FAIL TRANSFER (CO13 - CO24)

Power Failure telephones for CO Line 13 through CO Line 24 are connected to the thirteenth through twenty fourth pairs of connector ACN6. The wiring arrangement is exactly the same as for connector ACN1 in the Main Cabinet. (See Par. 7.11 and 7.12) The last pair of connector ACN6 is unused.

7.32 ADDITIONAL STATION CONNECTIONS (ST33 - ST64)

Station circuits 33 through 36 are connected to station instruments on the seventeenth through twenty-fourth pairs of connector ACN4 in the Main cabinet. Telephones are wired to station circuits 37 through 64 through connectors ACN7, ACN8 and ACN9 of the Expansion Cabinet. The wiring arrangement for these connectors is the same as for ACN2, ACN3 and ACN4 in the Main Cabinet except that only the first eight pairs of ACN9 are used. (See Par. 7.13 and 7.14)

PRINTED CIRCUIT BOARD (PCB) INSTALLATION

CAUTION: The printed circuit boards are comprised of components that are sensitive to electostatic discharge and should be handled only by persons who are familiar with procedures and take precautions to prevent such damage.

7.33 INSPECTION

While unpacking the printed circuit boards, visually inspect them for signs of shipping damage. Items which are suspected to have been damaged should not be used in order to avoid possible damage to other system components. Packing materials should be stored for later use if it becomes necessary to return equipment.

7.34 INSTALLATION

The PCB mounting shelves in both the Main and Expansion cabinets
are plainly marked to indicate the type of PCB which should be installed in each slot. Be sure that the appropriate PCB is mounted in each slot in order to prevent damage. Carefully align the PCB in the card slot in the upright position with the component side to the left. Slide the PCB toward the back of the mounting shelf being carefully that the PCB plug and the shelf connector are perfectly aligned. Apply firm and even pressure to the PCB until it is firmly seated.

7.35 PCB OPTIONS AND ADJUSTMENTS

Several system options and adjustments are available through switch settings, jumpers, program plugs and variable resistors on the various printed circuit boards. The following paragraphs describe the procedures and the locations of these items.

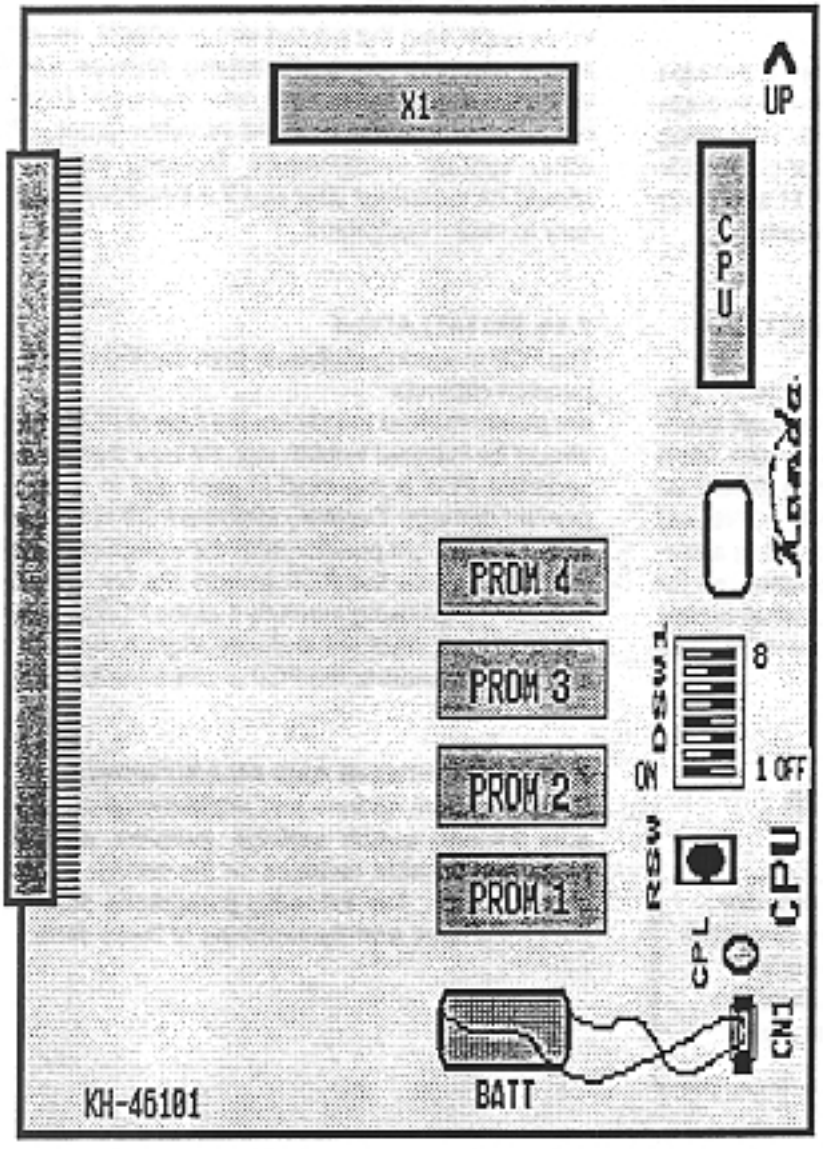

FIGURE 5. CPU PCB

7.36 CPU PCB

The CPU 4VA PCB includes an LED (marked CPL) which flashes to indicate that the system is operational. A reset (RSW) switch is used to reset the microprocessor and for system initialization.

The lithium battery packed with the CPU PCB protects the system programming in the event of power loss. It should be connected to the plug marked CN1 and securely attached to the PCB with the black plastic strap.

A bank of dip switches marked DSW1 is located above the reset switch and includes eight switches. Switch 1 must be in the "OFF" position in order for system programming to take place. This switch should otherwise remain in the "ON" position to enable the lithium battery and prevent loss of programmed data. Switch 4 is used to select the battery backup operation mode. In the "OFF" position, the backup batteries will provide power only for CO line conversations through the handset in order to conserve the batteries. In the "ON" position, all system functions will be fully operational but for a much shorter period of time. Switch 8 is used to specify the expanded (24 line, 64 station) system in the "OFF" position and the basic (12 line, 32 station) system in the "ON" position. The system may not operate properly unless Switch 8 is set to the proper position. All other switches on DSW1 should remain in the "OFF" position.

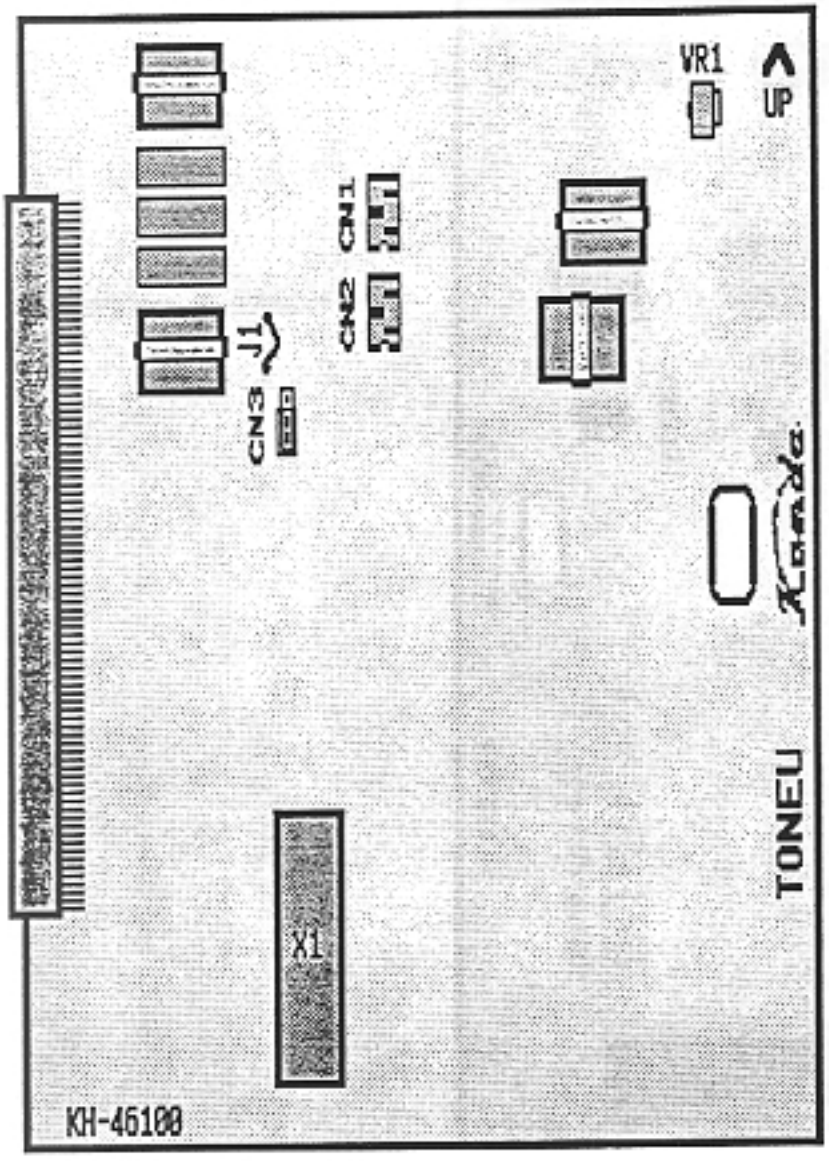

FIGURE 6. TONE PCB

7.37 TONE PCB

The TONE 4VA PCB includes a variable resistor marked VR1 which is used to adjust the output volume of the external hold music source. This allows a single music source to be used for both background music and hold music. The volume adjustment at the music source is set appropriately for background music and VR1 is then used to alter the volume of the hold music if necessary.The program plugs on CN1 and CN2 should not be removed or reversed. With the Tone PCB in the upright position the "dimple" on the program plugs should be at the bottom. The program plug on CN3 is used for factory tests and should remain on pins 1 and 2.

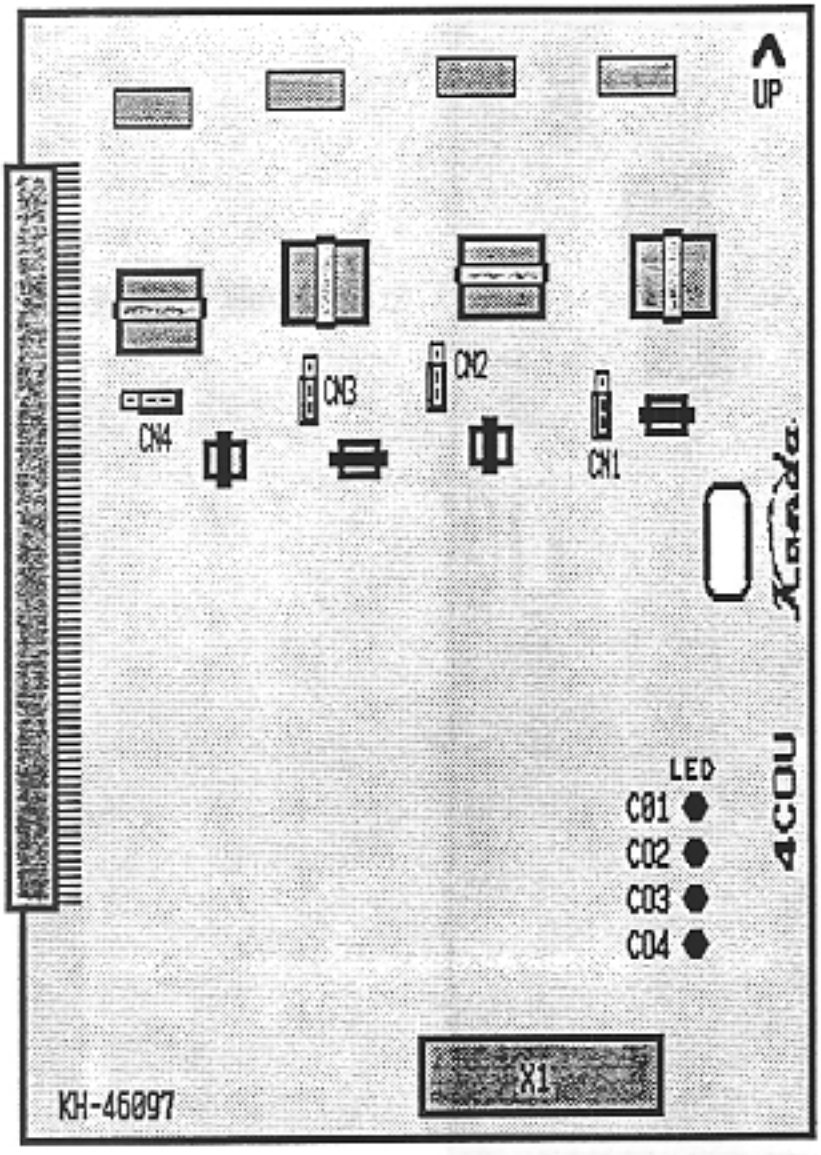

FIGURE 7. 4COU PCB

7.38 CO/PBX LINE PCB

There are no options or adjustments available on the 4COU 4VA PCB. There are four connectors marked CN1, CN2, CN3, and CN4 which are used only for factory tests. The program plugs on these connectors should remain on pins 1 and 2.

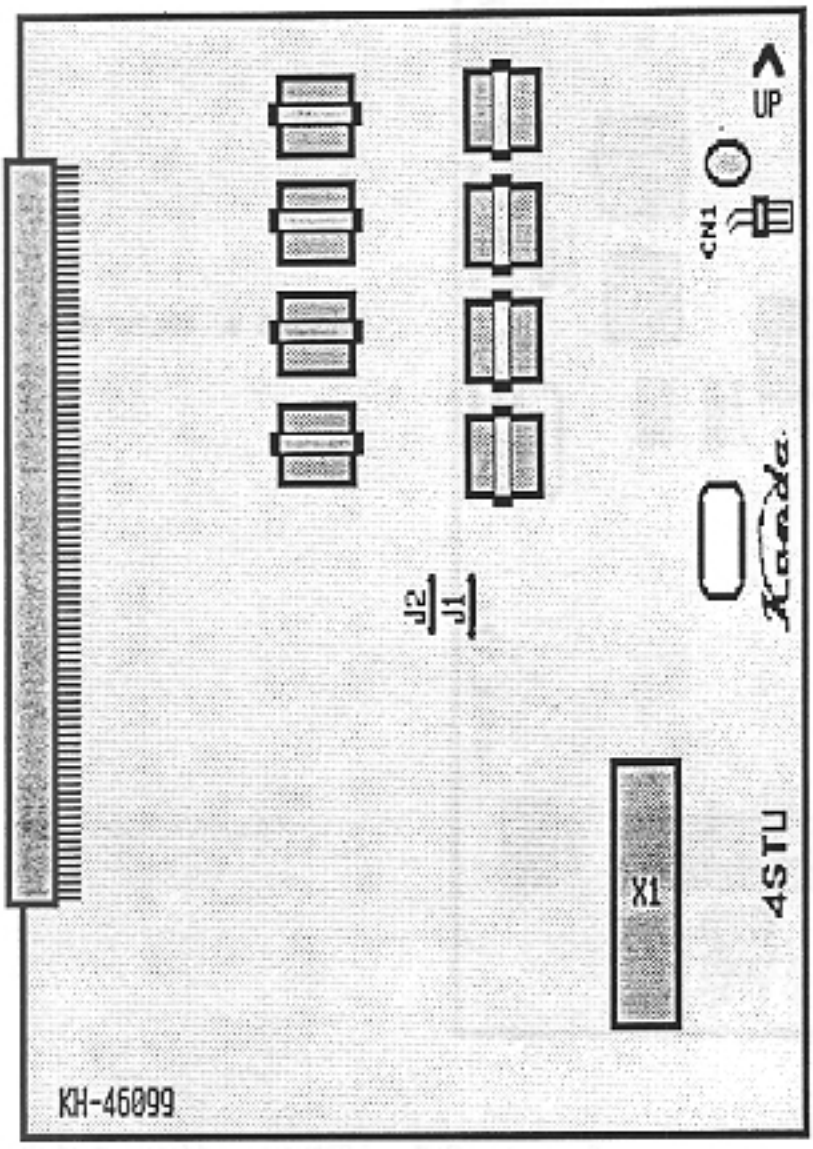

FIGURE 8. 4STU PCB

7.39 STATION PCB

The 4STU 4VA PCB requires no adjustments or option selections. Connector CN1 is present on this PCB but is used only for factory tests.

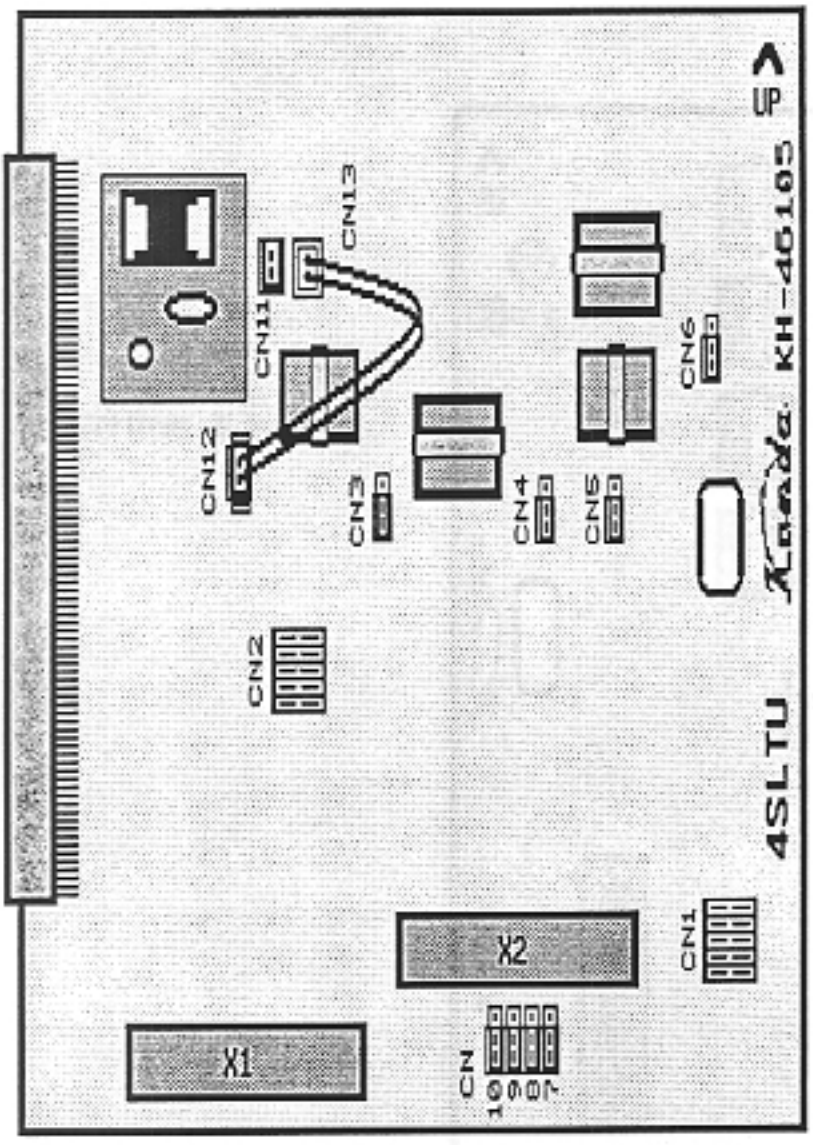

FIGURE 9. 4SLTU PCB

7.40 SINGLE-LINE PCB

The 4SLTU 4VA PCB includes two plugs marked CN1 and CN2 which are used to connect the 4PBRCU 4VA PCB when DTMF single line phones are used. Connectors CN3 and CN7 are used to select the function of the first circuit on the 4SLTU PCB. When the program plugs of both these connectors are placed on pins 1 and 2, the Circuit will support a single line telephone. When both program plugs are on pins 2 and 3 the circuit can be used (along with a dedicated CO line) to provide Direct Inward Dialing. Connectors CN4 and CN8 are used for the same purpose for the second circuit.

Connectors CN5 and CN9 are used for the third circuit and connectors CN6 and CN10 are used for the fourth circuit.

Connectors CN11 and CN13 are used to select Local or Off Premise Station use. For local single line stations the jumper cable from connector CN12 should be connected to CN13. For Off Premise single line stations the cable from CN12 should be attached to CN11. For Off Premise or Extended Loop Stations an external 48VDC power source must also be input through the BT and BR terminals of the fourth circuit of the SLTU PCB. (See Sect. 9)

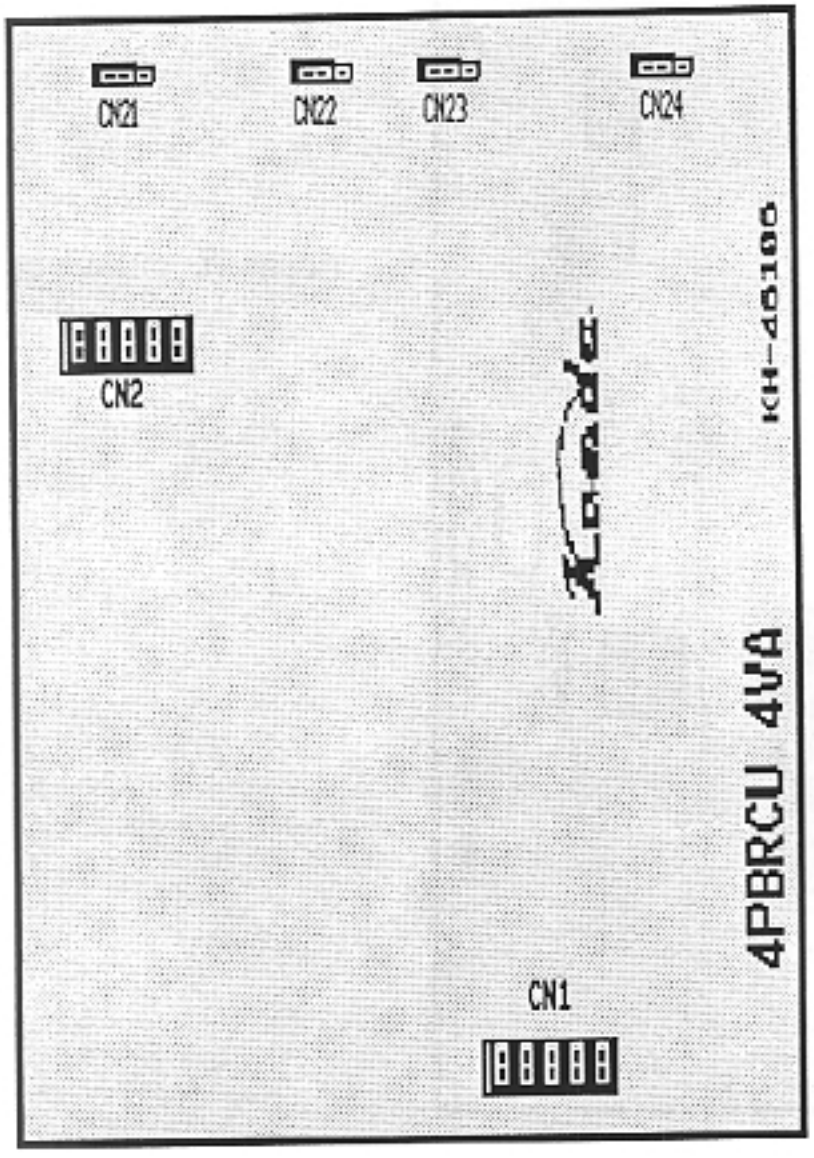

FIGURE 10. 4PBRCU PCB

7.41 4PBRCU PCB

The 4PBRCU 4VA PCB is used to allow DTMF single line phones to be used with the 4SLTU 4VA PCB. Two connectors marked CN1 and CN2 mate with the plugs marked CN1 and CN2 on the 4SLTU PCB for mounting of the 4PRBCU PCB. The program plugs on connectors CN21, CN22, CN23 and CN24 are used to select the use of the first, second, third and fourth circuits respectively. When these plugs are placed on pins 2 and 3, the associated circuit will support a single line telephone. When the plugs are placed on pins 1 and 2, the associated circuit can be used for Direct Inward Dialing use.

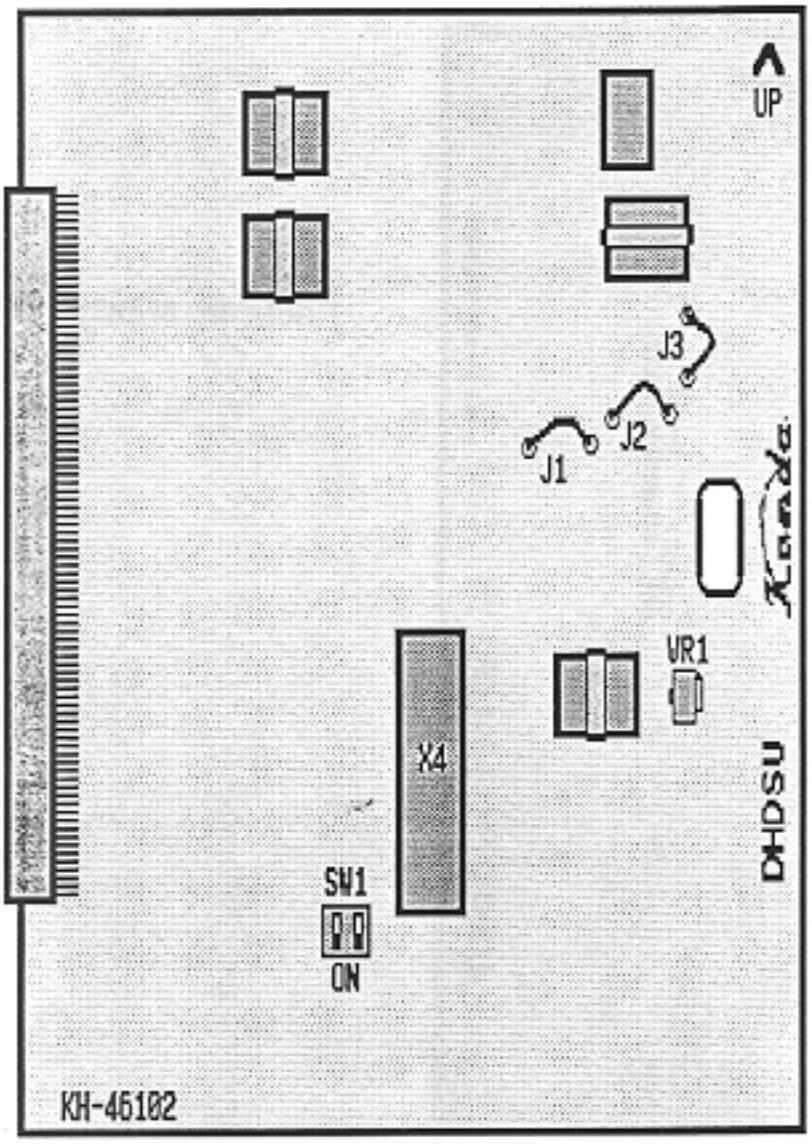

FIGURE 11. DHDSU PCB

7.42 DHDSU PCB

There is a bank of two switches marked SW1 on the DHDSU 4VA PCB. Switch 1 is set to the "on" position when Doorphone 1 is installed and to the "off" position when Doorphone 1 does not exist. Switch 2 is used in the same way for Doorphone 2. A variable resistor marked VR1 is used to adjust the receiving volume at the doorphones.

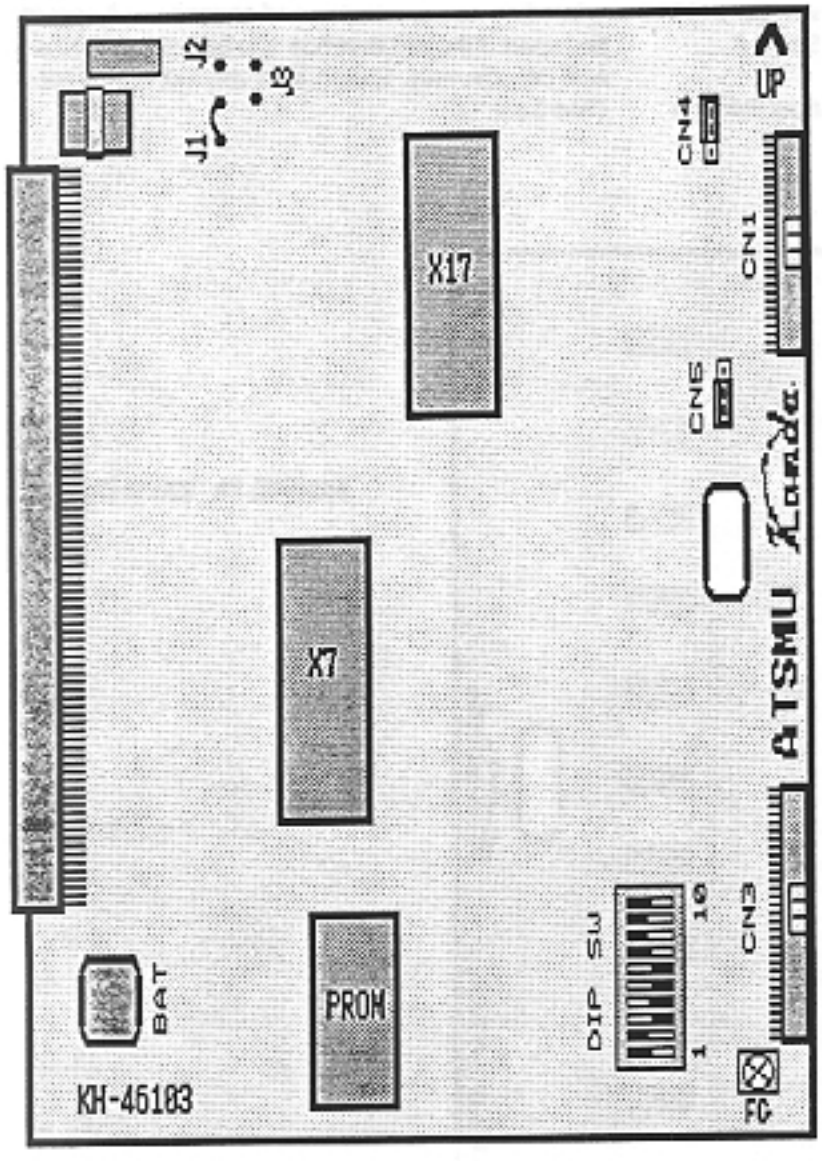

FIGURE 12. ATSMU PCB

7.43 ATSMU PCB

Jumpers J1 and J2 on the ATSMU 4VA PCB are used for factory tests. The plug for J1 should remain on pins 2 and 3 while the plug for J2 should remain on pins 1 and 2. The switch bank marked DIP SW includes ten switches which are used for SMDR output options. Switch 1 selects one stop bit when "open" or two stop bits when "closed". Switch 2 provides 8 bits when "open" or seven bits when "closed".

Switches 3 and 4 are used to select parity. With Switch 3 "closed" and Switch 4 "open" there will be no parity check. With Switch 3 "open" and Switch 4 "closed" the parity check will be even. With both Switch 3 and Switch 4 "closed" the parity check will be odd.

Switches 5, 6, and 7 are used to set the baud rate. When all three are "open" the baud rate will be 110. When Switch 5 is "closed" but Switches 6 and 7 are "open" the baud rate will be 300. With Switch 6

"closed" and Switches 5 and 7 "open" the baud rate will be 600. With Switches 5 and 6 "closed" and Switch 7 "open" the baud rate will be 1200. And when Switch 7 is "closed" the baud rate will be 2400 regardless of the settings of Switches 5 and 6.

Switch 8 should be "closed" to allow output through the serial RS232C connector or "open" for output through the parallel Centronics connector. Switch 9 should be "closed" if the call duration should be printed as hours, minutes and seconds or it should be "open" if the call duration is to be printed in hours and minutes only. Switch 10 is unused at present. (See Sect. 10)

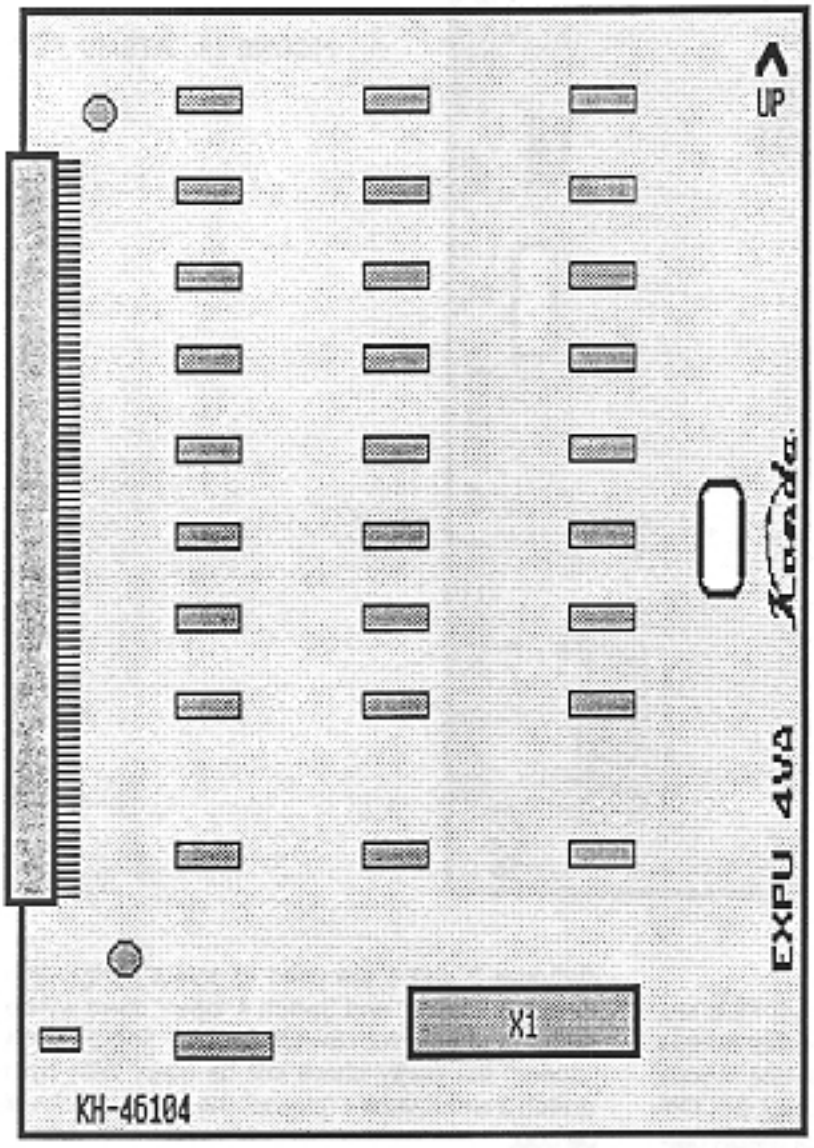

FIGURE 13. EXPU PCB

7.44 EXPU PCB

This PCB may be required for system expansion. (See par. 7.28) There are no options or adjustments on this PCB.

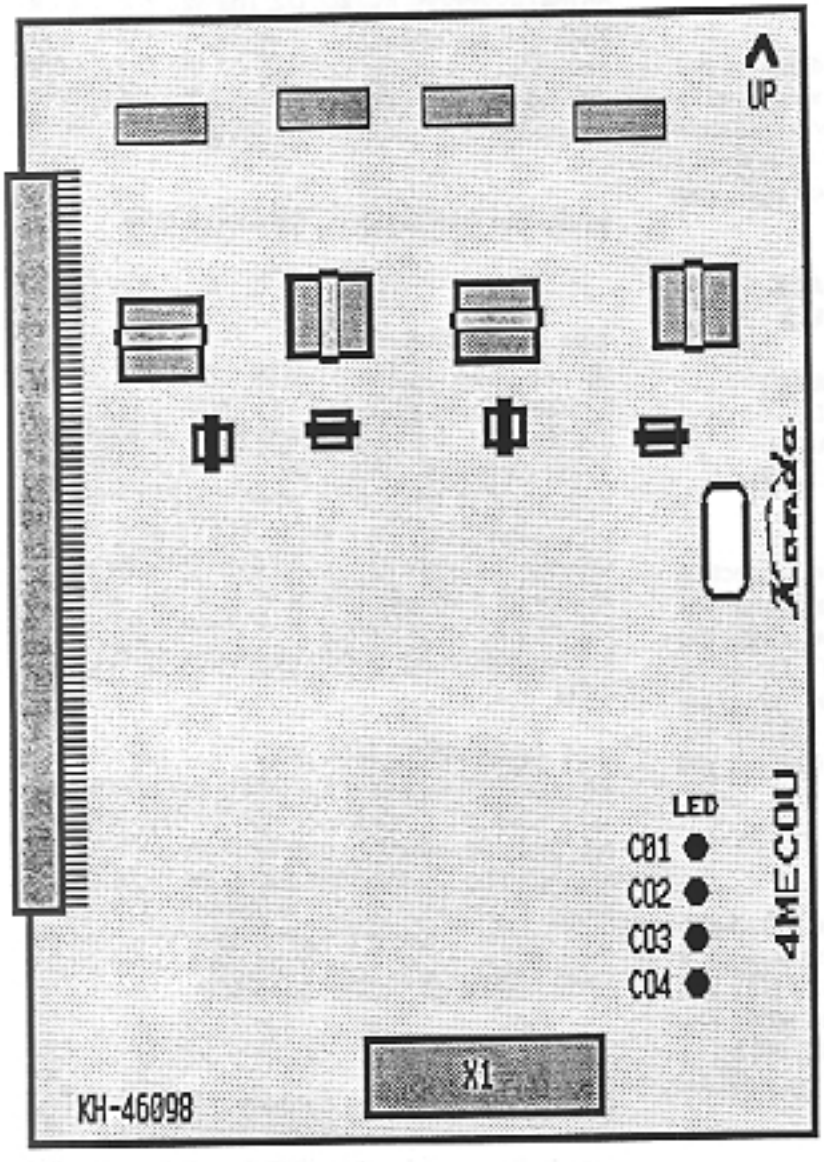

FIGURE 14. 4MECOU PCB

7.45 4MECOU PCB

This PCB is used in conjunction with the 4SLTU PCB when two or more systems are linked together (See par. 3.19). No options or adjustments are available on this printed circuit board.

STATION INSTALLATION

7.46 KEY TELEPHONE

Both the Basic and Executive key telephones are fully modular and are designed to be connected to the system through a standard four conductor modular jack. The wiring from the MDF PCB should be connected to the modular jack for each key telephone as follows:

MDF DESIGNATION	MODULAR JACK TERMINALS
T	W/BL (or GREEN)
R	BL/W (or RED)
BT	W/O (or BLACK)
BR	O/W (or YELLOW)

7.47 DSS/BLF CONSOLES

The DSS/BLF Consoles are arranged for connection in the same way as the key telephones except that only one pair of wire is required. The wire from the MDF PCB marked DSS1T (or DSS2T) should be connected to the W/BL or green (Tip) terminal of the modular jack and the wire maked DSS1R (or DSS2R) should be connected to the BL/W or red (Ring) terminal.

7.48 SINGLE-LINE TELEPHONE

Single line telephones require only one pair of station wire. When a single line telephone is used, it should be connected to the appropriate T (Tip) and R (Ring) pair of station wires from the MDF. The second pair of station wires (BT and BR) will be inactive for station positions supported by a 4SLTU PCB.

Single line telephones may be installed at distances of up to 5000 feet from the KSU but in this case an option strap must be changed on the SLTU PCB (See par. 7.40) In addition, an external 48VDC power source must be provided as an input on the BT & BR terminals of the fourth station circuit of the respective SLTU PCB.

7.49 DOORPHONE

The wire from the MDF PCB marked DH1A (or DH2A) should be connected to the screw terminal on the Doorphone marked D2. The wire from the the MDF PCB marked DH1B (or DH2B) should be connected to the screw terminal on the Doorphone marked D1. The wiring is correct if the red light on the Doorphone lights when a call is established.

MISCELLANEOUS CONNECTIONS

7.50 FACSIMILE

Up to six FAX machines can be connected directly to separate CO lines. Each of the six pairs of terminals (FA+ / FA-) provided through connector ACN5 are used to activate privacy and provide busy indications to telephones when the FAX machine connected to that line is in use. The sensing circuits connected to each pair of FA+/FA- terminals are activated by a closure (short) on this pair. The FAX machine (or other device) must provide the closure in order for this function to work properly. (See par. 7.21)

7.51 ANSWERING MACHINE

An announcement-only answering machine can be connected to the system through the AMA and AMB terminals. Specific lines may be programmed to be answered by the machine during the night ringing mode. The announcement is played and the line is then disconnected. It is not possible to record the caller's message through this facility.

7.52 DATA MODEM

Data modems may be connected instead of FAX machines directly to outside lines. The FAX terminals (FA+ / FA-) may then be used to activate privacy and provide busy indications when the modem is in use. (See par. 7.50) A data modem could also be connected directly to a single-line telephone circuit to allow access and use of any one of several lines in auto-dial and auto-answer modes. A third method of connection is to bridge the modem to the T and R leads of a standard key telephone. In this mode, the station user must go off hook at the key telephone and select a line. The modem can then be used on the selected line.

8. SYSTEM PROGRAMMING

8.01 GENERAL PROCEDURE

Customizing the operation and features through programming allows the system to be tailored to a wide variety of specific applications. Programming is accomplished through a series of entries performed at an Executive key telephone connected to the first station circuit (Station 10).

8.02 SYSTEM INITIALIZATION

It is important to initialize system memory before initial programming of a newly installed system is performed. This procedure clears the the memory of any potentially troublesome data which may have been stored in memory during factory testing or system installation. To initialize system memory, locate the switch bank marked DSW1 on the CPU PCB and place Switch 1 in the "OFF" position. Then push the reset (RSW) button. The LED on the CPU will momentarily go out and then begin flashing again. The RAM memory has now been cleared and all programs are returned to their default settings.

NOTE: Except when system programming is being performed, Switch 1 on DSW1 of the CPU PCB must be in the "ON" position in order to prevent loss of programmed data in the event of power failure or system reset.

8.03 PROGRAMMING POSITION

Programming must be performed through an Executive telephone connected to Station Position 10. This may be done while the telephone is physically located at its normal installed site. In addition, a modular jack marked MJI is provided on the left side of the MDF PCB for programming purposes. A switch to the left of the modular jack is used to activate the jack. In many cases it will be more convenient to program the system while near the KSU. Plug an Executive telephone into the modular jack and put the switch in the "Program" position. The telephone will now be fully functional and the jack at the normal Station 10 location will be disabled. Remember to return the switch to the "Normal" position when programming is completed.

8.04 PROGRAMMING MODE

To enter the program mode place Switch 1 of DSW1 on the CPU PCB to the "OFF" position. Remove the clear lense covering the line designation card from the Executive telephone. A small pushbutton marked W (WRITE) is located just below the button for CO Line 12. Since the pushbutton is located below the suface of the telephone cover, a non-metal, nonconductive object should be used to momentarily depress the button. The LCD on the telephone will clear and display "00". The telephone is now in program mode.

8.05 EXITING PROGRAM MODE

When program changes have been completed, depress the W (WRITE) pushbutton again and the LCD will display "P". This is a reminder that Switch 1 of the DSW1 switch bank on the CPU PCB is in the "OFF" position. Return Switch 1 to the "ON" position, depress the pushbutton again and the telephone will return to normal mode with the LCD returning to the clock display.

8.06 SYSTEM DEFAULT SETTINGS

The initialization procedure loads the system default program settings into RAM memory. These default settings provide basic system settings for each programmable option. Individual program options may or may not require change depending on specific system applications. Default settings for each program function are included with the individual program information.

PROGRAM OPTIONS

8.07 PROGRAM NUMBERS

The following paragraphs describe the available programmable options and procedures for activating them. Each set of options includes a program number which is entered on the telephone dial pad to activate that particular programming procedure. The programs do not necessarily need to be per-

formed sequentially but the steps for each program must be followed closely. The program numbers do not necessarily run consecutively but this should be no cause for concern.

NOTE: An example of each program procedure is provided along with the description of the program. Remember that the entries and the resulting LCD displays shown in this manual are only examples. The actual entry and display will vary depending on the actual digits entered to meet the requirements of each installation.

8.08 LINE TYPE - PROGRAM 1

Used to set up each line in the system. First the line number is entered (two-digits). Then a single-digit is entered to specify the type of line. Use "0" to specify an idle circuit (no line connected). Enter "1" for a standard Loop Start line, "3" for a PBX station circuit (when system is behind PBX), or "6" for an intersystem line (when two systems are linked together). No other entries are valid.

Next the dial signaling is selected ("0" for rotary pulse or "1" for DTMF). Then the queue group number is assigned ("0" for no queuing or "1" through "4" for one of the four queue groups). Next is night line and automatic answering functions. A line may be designated as a Night Line by entering "1" or a standard line by entering "0". When the "1" is entered for Auto Answering the line will be answered during night ringing mode by an external answering machine which delivers an announcement but does not record a message. If no answering machine is installed "0" should be selected. The default settings are "10100" for each line.

PROGRAM NUMBER 1

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01-	Enter Program Number
2	*	01-00	Confirm Entry
3	1	01-01	Enter CO Line Number
	5	01-15	
4	*	01-15-10100	Confirm Entry; Current Data displayed
5	3	01-15-01003	Enter Line Type Code
6	1	01-15-10031	Enter Dial Signal Code (0 = rotary; 1 = DTMF)
7	4	01-15-00314	Enter Queue Group Number (0 through 4)
8	1	01-15-03141	Enter Night Line Choice (0 or 1)
9	0	01-15-31410	Enter Auto Answering Choice (0 or 1)
10	*	01-16-10100	Confirm Data Entry; Step to Next line; View Current Data
11	#	00	End Program (When all Lines have been programmed.)

8.09 LINE GROUP ASSIGNMENT - PROGRAM 2

This is used to assign a series of lines to a CO Line Group. The Line Group Number is entered, then the first line in the series is entered and then the last line is entered. Lines in each group must be consecutive. Each group can contain as many or as few lines as necessary and a line can be included in as many groups as necessary. A maximum of 36 line groups may be established through this program. Only Line Group 01 is established in the default program and it includes all lines.

PROGRAM NUMBER 2

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
2	*	02-00	Confirm Entry
3	1	02-01	Enter CO Line Group Number (01 - 36)
4	*	02-01-01 24	Confirm Entry; Current Data displayed
5	0	02-01-10 24	Enter First Line in Line Group (01 - 24)
	4	02-01-04 24	
6	*	02-01-04-24	Confirm Entry
7	1	02-01-04-41	Enter Last Line in Group (01 - 24)
	2	02-01-04-12	
8	*	02-02-00-00	Confirm Data; Step to Next Line; View Current Data
9	#	00	End Program (when all line groups have been programmed)

8.10 LINE FUNCTIONS - PROGRAM 3

This program is used to specify the use or purpose of individual lines. The first entry should be "0" for a standard Loop Start line or "4" if the line will be used for the Direct In Line function. Next enter "1" if a Facsimile machine will be connected to this line or "0" if no FAX is connected. Finally enter "1" if the line will be included in the Common Use Line Group or "0" if it will not. The default settings are "000" for all lines.

PROGRAM NUMBER 3

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
2	*	03-00	Confirm Entry
3	2	03-02	Enter Line Number
4	*	03-02 -000	Confirm Selected Line
5	0	03-02 -000	Enter Chosen Line Function (0 = Std; 4 = DIL)
6	1	03-02 -001	Enter Chosen FAX Function (0 = no; 1 = yes)
7	1	03-02 -011	Enter Common Use Line Choice (0 = no; 1 = yes)
8	*	03-03 -000	Confirm Entries; Step to Next Line; View Current Data
9	#	00	End Program (when all Lines are programmed)

8.11 EXECUTIVE BARGE-IN - PROGRAM 4

Used to allow stations to use the Executive Barge-in feature. First dial in the station number and then dial "0" to prevent barge-in or dial "1" to allow the station to use barge-in. Any number of stations may be allowed the barge-in capability. A maximum of 6 stations at a time are allowed to enter each conversation. All stations are denied barge-in in the default setting.

PROGRAM NUMBER 4

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
2	*	04-00	Confirm Entry
3	1	04-01	Enter Station Number
	0	04-10	
4	*	04-10 -0	Confirm Station Number; Current Data displayed
5	1	04-10 -1	Enter selected Barge-In Function; 0 = disable, 1 = enable Barge-In
6	*	04-11 -0	Confirm Entry; Step to Next Station; View Current Data
7	#	00	End Program (when all Stations have been programmed.)

8.12 OUTGOING LINE GROUP ACCESS - PROGRAM 6

Used to assign up to two outgoing line groups to each station. First the station number is entered, then the first line group (two digits) and finally the second line group (two digits). These line groups are used for making outgoing calls. The default setting provides access by all stations to Line Group 01.

PROGRAM NUMBER 6

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	6	06	Enter Program Number
2	*	06-00	Confirm Entry
3	1	06-01	Enter selected Station Number
	0	06-10	
4	*	06-10-01-00	Confirm Station Number; View Current Data
5	0	06-10-10-00	Enter First Line Group to which Station will have access
	3	06-10-03-00	
6	*	06-10-03-00	Confirm selected Line Group
7	0	06-10-10-00	Enter Second Line Group to which Station will have access
	5	06-10-03-05	
8	*	06-11-01-00	Confirm Entry; Step to Next Station; View Current Data
9	#	00	End Program (when all stations are programmed)

8.13 INCOMING LINE GROUP ACCESS - PROGRAM 7

Used to assign incoming Line Groups to each station and to specify the ringing mode of each line group for each station. First the station number is entered, then the first line group (two digits) and the selected ringing mode for that line group. The valid entries for ringing mode are "0" (no ringing), "1" (day mode ringing), "2" (night mode ringing), and "3" (day and night mode ringing). The second line group and ringing mode are then entered in the same way. Finally access to the Common Use Line group is allowed (by entering "1") or denied (by entering "0") for the station and its ringing mode is entered. Default settings provide incoming access by all stations to Line Group 01 with ringing mode "3" (both day and night mode ringing).

PROGRAM NUMBER 7

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
2	*	07-00	Confirm Entry
3	1	07-01	Enter selected Station Number
	5	07-15	
4	*	07-15-1-000	Confirm Station Number
5	0	07-15-1-000	Enter First Line Group Number to which Station will have access and code for chosen Ringing mode; Valid Line Groups are "01" through "36"; Ringing modes are "0" through "3"
	5	07-15-1-005	
	3	07-15-1-053	
6	*	07-15-2-000	Confirm and Step
7	0	07-15-2-000	Enter Second Line Group Number and code for selected Ringing mode
	7	07-15-2-007	
	1	07-15-2-071	
8	*	07-15-3--00	Confirm and Step
9	1	07-15-3--01	Enter Common Use Line Group status (0 or 1); Enter code for Ringing mode (0 through 3)
	3	07-15-3--13	
10	*	07-16-01-000	Confirm Entry; Step to Next Station; View Current Data
11	#	00	End Program (when all Stations are programmed)

8.14 STATION FEATURES - PROGRAM 8

This program is used to specify Night toll restriction, confirmation tone, DND level and internal paging zone. First enter the station number. Then specify the station's toll restriction status during the night ringing mode. The station retains it's day toll restriction status when "0" is selected or becomes Class F when "1" is selected. Allow (by entering "1") or deny (by entering "0") the confirmation tone when each button is pushed, and specify whether the station is (enter "1") or is not (enter "0") equipped with an LCD display.

Next the DND level available to the station is specified. Selecting "0" prohibits DND activation, "1" allows DND for CO lines only, "2" allows DND for CO lines and intercom calls and "3" allows the user to alternate between CO line and CO line/intercom DND. The last entry specifies which internal paging zone applies to the station. Enter "0" if the station does not receive internal paging or enter "1" through "9" corresponding to the paging group to which the station is assigned. The system default setting for each station is "00030".

PROGRAM NUMBER 8

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	8	08	Enter Program Number
2	*	08-00	Confirm Entry
3	2	08-02	Enter selected Station Number
	5	08-25	
4	*	08-25-00030	Confirm Station Number; Current Data displayed
5	1	08-25-00301	Enter Night Toll Restriction mode (0 = no;1 = yes)
	1	08-25-03011	Enter Confirmation Tone Mode (0 = yes; 1 = no)
	1	08-25-30111	Enter Telephone LCD status (0 = no; 1 = yes)
	3	08-25-01113	Enter selected DND Level (0 through 3)
	4	08-25-11134	Enter chosen Group Page Zone (0 through 9)
6	*	08-26-00030	Confirm Entries; Step to Next Station; View Current Data
7	#	00	End Program (when all stations are programmed)

8.15 STATION HUNTING - PROGRAM 11

This is used to set up station hunt groups. First the hunt group number is entered (0 thru 9) and then the station numbers are entered in the order that the hunting will take place. Each hunt group can have up to 8 stations assigned. No hunt groups are established in the default setting.

PROGRAM NUMBER 11

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	1	11	
2	*	11-0	Confirm Program Number
3	1	11-1	Select Hunt Group Number (0 through 9)
4	*	11-1 1-00	Confirm Hunt Group Number; Current Data displayed
5	3	11-1 1-03	Enter number of First Station in the Hunt Group
	0	11-1 1-30	
6	*	11-1 2-00	Confirm Entry; Step to Next Station Position in Hunt Group
7	3	11-1 2-03	Enter the number of the Second Station in the Hunt Group
	1	11-1 2-31	
8	*	11-1 3-00	Confirm Entry; Step to Next Station Position; After 8th station, auto step to next Hunt Group
9	#	00	End Program (when all stations are programmed)

8.16 DOORPHONE SIGNAL ASSIGNMENT - PROGRAM 12

The purpose of this program is to assign audible signals from each Doorphone to a maximum of ten specific stations. First the Doorphone is selected (Doorphone 1 or 2) and the station number is entered. Next the signaling mode is entered as "0" for no signal, "1" for Day time only, "2" for Night time only or "3" for both Day and Night. This is repeated until all stations for both Doorphones are assigned. No stations are assigned to receive the signal in the default program.

PROGRAM NUMBER 12

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	2	12	
2	*	12-0	Confirm Program Number
3	1	12-1	Enter Doorphone Number (1 or 2)
4	*	12-1 01-000	Confirm Doorphone Number; Current Data displayed
5	2	12-1 01-002	Enter number of Station which will receive the Doorphone Signal;
	5	12-1 01-025	
	3	12-1 01-253	Enter the Signal receiving mode for the selected Station (0 through 3)
6	*	12-1 02-000	Confirm Entries; Step to Next Station Position; View Current Data (After tenth station is entered program steps to next Doorphone)
7	#	00	End Program (when all Stations and Doorphones are programmed)

8.17 DSS/BLF ASSIGNMENT - PROGRAM 13
This is used to select stations which will have DSS/BLF consoles connected. First the station number for DSS Station number 1 is entered. Then the station number for DSS Station number 2 is entered. There are no assignments for DSS consoles in the default program.

PROGRAM NUMBER 13

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	3	13	
2	*	13 01-00	Confirm Program Number
3	1	13 01-01	Enter the number of the Station equipped with DSS #1
	5	13 01-15	
4	*	13 02-00	Confirm Entry; Step to DSS Console 2; View Current Data
5	#	00	End Program (when installed DSS Consoles are programmed)

8.18 FLEXIBLE STATION NUMBERING - PROGRAM 14

Program 14 allows station numbering changes. The first step is to specify the number of digits in the station number. After the program number has been entered and confirmed, dial "00*" . Then enter "002" for two-digit station numbers or "003" for 3-digit station numbers and dial "*" again.

NOTE: If the number of digits used in the station numbers is to be changed, erase all station numbers through operation of Program 15 before making this change.

Next enter the selected station circuit number (10 through 73) which is the same as the default station number. After dialing "*" to confirm, enter the new station number. Repeat by dialing "*" to step to the next station circuit. The station numbers available for use are 10 through 79 or 100 through 799. All stations must have the same number of digits in their station numbers. (All program options that are assigned to a station number will follow the station number if it is reassigned to a different station circuit.) The default setting provides for two-digit station numbers from 10 to 73.

NOTE: During this programming procedure, Steps 3 through 6 are only required when changing the number of station digits (from 2 to 3, or from 3 to 2).

PROGRAM NUMBER 14

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	4	14	
2	*	14-00	Confirm Program Number
3	*	14-00 -002	Confirm again; Step to display current setting
4	0	14-00 -020	Enter Choice of 2-digit (002) or 3-digit (003) Station Numbering Plan
	0	14-00 -200	
	3	14-00 -003	
5	*	14-00	Confirm Entry; Program ready for Station Numbering changes
6	1	14-01	Enter selected Station Port (circuit) Number (10 through 73)
	2	14-12	
7	*	14-12 -012	Confirm Station Port Number; Current Station Number displayed
8	1	14-12 -121	Enter New Station Number (all stations (all stations must have same number of digits; range is 10 to 79 or 100 to 799)
	1	14-12 -211	
	2	14-12 -112	
9	*	14-12 -112	Confirm New Station Number; Step to Next Station Port; Current Data displayed
10	#	00	End Program (when all stations are programmed)

8.19 STATION NUMBER DELETION - PROGRAM 15

This program procedure is used to delete all intercom numbers assigned to all stations. As a result, numbers must be reassigned to all stations through Program 14. This program function is useful when most or all intercom numbers are to be changed.

This program should be used when the number of digits in station numbers is changed. (See Program 14.) When this is done, it is necessary to delete all previous station numbers including those which are assigned to unused station ports. Failure to do this results in an error which will be displayed while running Program 90.

PROGRAM NUMBER 15

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	5	15	
2	*	15 A	Confirm Program Number
3	*		Confirm Again to erase all presently assigned Station Numbers (display clears)
4	#	00	End Program

8.20 OFF-HOOK RINGING - PROGRAM 16

This is a simple procedure to enable or disable the off-hook ringing function for all stations at once. Enter "0" to disable or "1" to enable off-hook ringing. System default setting enables the off-hook ringing function.

PROGRAM NUMBER 16

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	6	16	
2	*	16 -1	Confirm Program Number; Current Data displayed
3	0	16 -0	Enter selected mode (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.21 TENANT NIGHT MODE - PROGRAM 17

This program allows the night ringing mode to be established for all stations in the system at once by a DSS station or individually for each tenant group by any station in that group. Enter "0" to disable the tenant night mode or "1" to allow each tenant to activate their own night ringing. System default setting allows only a DSS station to activate the night ringing mode.

PROGRAM NUMBER 17

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	7	17	
2	*	17 -0	Confirm Program Number
3	1	17 -1	Enter selected mode (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.22 EXTERNAL PAGING OPTIONS - PROGRAM 18

The purpose of this procedure is to set up common audible ringing and background music through the external paging speakers. First the external paging zone (1 or 2) is selected. Next enter a selected line group number (two digits) if desired. Incoming ringing from this line group will be heard through the paging speakers of the selected zone. Finally enter "000" for no music or "100" if the background music should be broadcast through the paging speakers. Repeat the procedure for the second paging zone if necessary. In the default mode, no line ringing or background music is provided through either paging zone.

PROGRAM NUMBER 18

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	8	18	
2	*	18-0	Confirm Program Number
3	1	18-1	Enter selected External Page Zone (1 = Zone 1; 2 = Zone 2)
4	*	18-1-00 000	Confirm selected Zone; Current Data displayed
5	1	18-1-01 000	Enter Line Group Number whose ringing will be heard through the external paging speakers (01 - 36)
	0	18-1-10 000	
6	*	18-1-10-000	Confirm selected Line Group; Current Data displayed
7	1	18-1-10-001	Enter code to disable (000) or enable (100) Background Music through the external speakers
	0	18-1-10-010	
	0	18-1-10-100	
8	*	18-2-00 000	Confirm Entry and Step to Next Zone; (Display clears after Zone 2 entries)
9	Repeat	18-2-00 000	Repeat Steps 5 through 8 for Zone 2
10	#	00	End Program (when all line groups have been programmed)

8.23 EXTERNAL ALL CALL PAGE - PROGRAM 19

This procedure is used to specify which external paging zones will be activated when External All Call Page is accessed. After the program number is entered and confirmed, enter "0" for no all call, "1" to include only Zone 1, "2" to include only Zone 2, or "3" to include both external page zones in the all call page access. There is no all call page established in the default mode.

PROGRAM NUMBER 19

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	1	01	Enter Program Number
	9	19	
2	*	19 -0	Confirm Program Number
3	3	19 -3	Enter code for selected function (0 - 3)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.24 AUTO RINGING LINE PICKUP - PROGRAM 20

This allows a choice of automatic ringing line pick-up. If "0" is entered, a ringing CO Line can only be answered by pushing the CO Line button. If "1" is entered, all key telephones having access to the line can lift the handset and be connected to the ringing line automatically. If "2" is entered, only ringing telephones may automatically answer the line by lifting the handset. In the system default mode, there is no automatic line pickup.

PROGRAM NUMBER 20

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	0	20	
2	*	20 -0	Confirm Program Number
3	2	20 -2	Enter code for selected function; "0" = No auto answer; "1" = all phones; "2" = ringing phones
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.25 AUTO IDLE LINE SEIZURE - PROGRAM 21

Any one of four possible outgoing line seizure methods may be selected through this program. After the program number is entered and confirmed a single-digit code is entered to activate one of the methods. Enter "0" if it should be possible to seize the line only by pushing the line button while off-hook. Enter "1" to allow users to push the SPKR button and dial a Queue Group number to automatically seize the highest numbered available line in that Queue Group. Enter "2" to allow users to dial "0" while on-hook to automatically seize the highest available line in any Queue Group. Or enter "3" to allow users to use either of the two automatic seizure methods. The default setting provides for no automatic line seizure (option "0").

PROGRAM NUMBER 21

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	1	21	
2	*	21 -0	Confirm Program Number
3	3	21 -3	Enter code for selected function (0 - 3)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.26 EXCLUSIVE HOLD - PROGRAM 22

This program is used to enable (enter "1") or disable (enter "0") the Exclusive Hold feature on a system-wide basis. When disabled, it is not possible to place a line in the Exclusive Hold condition. Exclusive Hold is enabled in the default setting.

PROGRAM NUMBER 22

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	2	22	
2	*	22 -0	Confirm Program Number
3	1	22 -1	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.27 INTERCOM SIGNALING PREFERENCE - PROGRAM 24

Used to select the primary method of intercom signaling. Enter "0" for voice announce or enter "1" for ringing at called stations. (The signaling method can be switched for individual calls by dialing "1" after the station number.) In the default mode, voice signaling is provided.

PROGRAM NUMBER 24

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	4	24	
2	*	24 -1	Confirm Program Number
3	0	24 -0	Enter selected function code (0 = voice; 1 = tone)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.28 MICROPHONE PREFERENCE - PROGRAM 25

Used to set up the normal system-wide condition of the microphones in all telephones. Enter "0" if the microphones are normally "on" or enter "1" if the microphones are normally "off". Microphones are normally "on" in the default setting.

PROGRAM NUMBER 25

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	5	25	
2	*	25 -1	Confirm Program Number
3	0	25 -0	Enter selected function code (0 = on; 1 = off)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.29 BACKGROUND MUSIC - PROGRAM 26

This is a system-wide program to enable or disable background music to be played through the speakers of the telephones. Enter "0" to deny background music or "1" to allow it. (The music can be turned on or off at each station by the user.) Background music is disabled by the system default setting.

PROGRAM NUMBER 26

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	6	26	
2	*	26 -0	Confirm Program Number
3	1	26 -1	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.30 ROOM MONITORING - PROGRAM 27

Used to allow or deny activation of the room monitoring function. Enter "0" to deny the feature or "1" to allow it. This function is denied in the system default program.

PROGRAM NUMBER 27

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	7	27	
2	*	27 -0	Confirm Program Number
3	1	27 -1	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.31 ALARM ACTIVATION - PROGRAM 28

This program is used to activate the alarm circuits by first selecting the alarm (enter "1" or "2") and then entering "0" to disable or "1" to enable the circuit. Next enter "0" if the alarm circuit is connected to a "break" contact or enter "1" if connected to a "make " contact. This procedure must be performed for both alarm circuits. The system default setting disables both alarm circuits but sets the contacts as "make".

PROGRAM NUMBER 28

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	8	28	
2	*	28-0	Confirm Program Number
3	1	28-1	Enter selected Alarm Circuit (1 or 2)
4	*	28-1 -0 0	Confirm Entry; Current Data for Alarm Circuit displayed
5	1	28-1 -1 0	Enter Alarm Activation code; (0 = off; 1 = on)
6	*	28-1 -0-0	Confirm Entry
7	1	28-1 -1-1	Enter code for Make (1) or Break (0) activation
8	*	28-2 -0 0	Confirm Entry and Step to Alarm Circuit; (display clears after Alarm Circuit #2)
9	#	00	End Program (when Alarms have been programmed)

8.32 CONFERENCING MODE - PROGRAM 29

The method of establishing an internal conference is determined through this program function. When option "0" is selected, a conference may be established by adding one station at a time through the add-on conference procedure. When option "1" is selected, the ADD/DND button becomes a privacy release button which allows multiple stations to join in a conversation simultaneously. The system default mode provides the add-on ("0") function.

PROGRAM NUMBER 29

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	2	02	Enter Program Number
	9	29	
2	*	29 -0	Confirm Program Number
3	1	29 -1	Enter selected function code; 0 = add-on; 1 = privacy release
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.33 MULTI-LINE CONFERENCE - PROGRAM 30

The ability to connect two outside line together with one or more stations for conferencing can be allowed or denied through this program. To deny the two-line conferencing enter "0" or to allow it, enter "1". This function is allowed in the default mode.

PROGRAM NUMBER 30

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	0	30	
2	*	30 -1	Confirm Program Number
3	0	30 -0	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.34 THREE MINUTE ALERTING TONE - PROGRAM 31

When the three minute alerting tone is enabled, users on CO line calls will hear an alerting tone every three minutes as a reminder of the elapsed time. Disable the tone by entering "0" or enable it by entering "1". The tone is disabled in the default setting.

PROGRAM NUMBER 31

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	1	31	
2	*	31 -0	Confirm Program Number
3	1	31 -1	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.35 DOORPHONE SIGNAL TYPE - PROGRAM 32

The signal received by station users from a Doorphone may either be a double tone or 30 seconds of continuous ringing. To select the double tone enter "0". To select continuous ringing enter "1". The double tone is provided by the system default mode.

PROGRAM NUMBER 32

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	2	32	
2	*	32 -0	Confirm Program Number
3	1	32 -1	Enter selected function code (0 = double tone; 1 = continuous)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.36 AUTOMATIC SPEAKER ACTIVATION - PROGRAM 33

It is possible to enable or disable automatic speaker activation. If enabled, a station user may simply push the ICM or a CO Line button to automatically turn the speaker on and seize the intercom path or CO Line. If disabled, the speaker button must be pushed (either before or immediately after) the ICM or CO Line button is pushed. Automatic activation is enabled in the default setting.

PROGRAM NUMBER 33

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	3	33	
2	*	33 -1	Confirm Program Number
3	0	33 -0	Enter selected function code (0 = disable; 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.37 EXCLUSIVE HOLD RECALL TIMER - PROGRAM 35

Enter a 3-digit code to select the Exclusive Hold timeout duration. The line on Exclusive Hold will recall at the end of the selected timeout period. Valid entries are from "001" to "255" with each code representing multiples of 10-second increments so that "001" equals 10 seconds and 255 represents 2,550 seconds (or 42.5 minutes). ("000" may not be entered when the Exclusive Hold feature is enabled.) The default setting is "018" (3 minutes).

PROGRAM NUMBER 35

STEP	ENTRY	LCD DISPLAY	REMARK
		00	(Beginning Display)
1	3	03	Enter Program Number
	5	35	
2	*	35 -000	Confirm Program Number; Current Data displayed
3	0	35 -000	Enter selected Recall Time-out Duration; Valid settings are in 10-second increments from 001 to 255; ("000" is invalid when Exclusive Hold is enabled)
	6	35 -006	
	0	35 -060	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.38 EXCLUSIVE HOLD RECALL TONE - PROGRAM 36

This program is used to specify the duration of the alerting tone when a line on Exclusive Hold recalls at the holding station. At the end of the recall signal the line will automatically revert from an Exclusive Hold condition to a standard hold condition allowing any other station user to pick up the call. Valid entries are from "001" to "255" with each code representing multiples of 10-second increments so that "001" equals 10 seconds and 255 represents 2,550 seconds (or 42.5 minutes). ("000" may not be entered if Exclusive Hold is enabled.) The default setting is "018" (3 minutes).

PROGRAM NUMBER 36

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	6	36	
2	*	36 -000	Confirm Program Number; Current Data displayed
3	0	36 -000	Enter selected Recall Tone Duration; Valid settings are in 10-second increments from 001 to 255; ("000" is invalid when Exclusive Hold is enabled)
	2	36 -002	
	0	36 -020	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.39 HOLD RECALL TIMER - PROGRAM 37

Enter a 3-digit code to select the hold timeout duration. The line on hold will recall at the end of the selected timeout duration for a period of 8 seconds. The recall signal will then stop and return again each time the recall timeout duration expires. Valid entries are from "000" to "255" with each code representing multiples of 10-second increments so that "001" equals 10 seconds and 255 represents 2,550 seconds (or 42.5 minutes). If "000" is entered, the line will remain in the hold condition and will not ring back at the holding station. The default setting is "018" (3 minutes).

PROGRAM NUMBER 37

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	7	37	
2	*	37 -018	Confirm Program Number; Current Data displayed
3	0	37 -180	Enter selected Recall Time-out Duration; Valid settings are in 10-second increments from 000 to 255; (000 provides no recall)
	1	37 -801	
	2	37 -012	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.39 UNSCREENED TRANSFER TIMEOUT - PROGRAM 38

This procedure allows a timeout to be specified for unscreened transfers. Any line transfer that occurs as a result of the "XFER" button being pushed is considered an unscreened transfer. The transferred line will ring at the receiving station until the time expires and then recall to the transferring station. Valid entries are from "000" to "255" which are increments of 10 seconds. Therefore choosing "001" would provide a 10 second timeout while "255" would provide a timeout of 2550 seconds (or 42.5 minutes). If "000" is entered, the recall will ocurr instantly which effectively disables the unscreened transfer feature. The default setting is "006" (60 seconds).

PROGRAM NUMBER 38

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	8	38	
2	*	38 -006	Confirm Program Number; Current Data displayed
3	0	38 -060	Enter selected Recall Time-out Duration; Valid settings are in 10-second increments from 000 to 255; (000 provides instant recall)
	1	38 -601	
	2	38 -012	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.40 CO LINE TRANSFER TIMEOUT - PROGRAM 39

Program 39 is exactly the same as Program 38 except that this one is used to establish the recall timeout period for screened transfers. Any intercom call made after placing a line on hold (either manually or automatically) is considered as an attempt at screened transfer. When this occurs the green CO Line LED will appear at the called station. The default setting is "000" which effectively disables this feature by preventing the green LED from being transferred to the called station..

PROGRAM NUMBER 39

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	3	03	Enter Program Number
	9	39	
2	*	39 -000	Confirm Program Number; Current Data displayed
3	0	39 -000	Enter selected Recall Time-out Duration; Valid settings are in 10-second increments from 000 to 255; (000 causes an instant recall)
	1	39 -001	
	8	39 -018	
4	*		Confirm entry; display clears
5	#	00	End Program

8.41 TOLL RESTRICTION CLASS - PROGRAM 40

Used to assign one of the seven (A thru G) toll rstriction classes to each station. The station number is entered and the the number (0 thru 6) for the toll class is entered. All stations are Class A in the default setting. The definitions of each of the Toll Classes is as follows:

Class A - (Entry code "0") - Totally unrestricted.

Class B - (Entry code "1") - Prohibited from dialing "0" and international calls. Allow and Deny Lists can be applied.

Class C - (Entry code "2") - Allowed to dial only local area code calls. Dialing "0" prohibited. Allow and Deny Lists can be applied.

Class D - (Entry code "3") - Allowed to dial only local calls. Dialing "0" and "1" prohibited. Allow and Deny Lists can be applied.

Class E - (Entry code "4") - Same as Class D. Allow and Deny Lists can be applied.

Class F - (Entry code "5") - Allowed only internal intercom calling unless Allow Lists are applied.

Class G - (Entry code "6") - Allowed only internal intercom calling.

PROGRAM NUMBER 40

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	0	40	
2	*	40-00	Confirm Program Number
3	1	40-01	Enter selected Station Number
	2	40-12	
4	*	40-12 -0	Confirm Station Number; Current Toll Class displayed
5	2	40-12 -2	Enter code for selected Toll Restriction Class; (0 - 6)
6	*	40-13 -0	Confirm Entry; Step to Next Station; View Current Data
7	3	40-13 -3	Enter code for selected Toll Restriction Class; (0 - 6)
8	*	40-14 -0	Confirm Entry; Step to Next Station; View Current Data
9	#	00	End Program (when all stations are programmed)

8.42 SPECIAL CONDITIONS - PROGRAM 41

Program 41 is used to establish special toll restriction conditions. The first entry is used to allow ("1") or deny ("0") Trunk Access. This should always be allowed in order for the North American toll restriction plan to operate properly. The next condition is called Toll Access and is used to specify whether the toll restriction program should ignore (enter "1") the digit "1" when it appears as the first dialed digit or whether the toll restriction program will detect (enter "0") the digit "1" as the first digit. The "ignore" option should be used in areas that do not required dialing "1" before the area code is dialed. The "detect" option should be used in areas that require "1 plus" dialing for long distance area code calling. The last entry is used to allow (enter "1") or deny (enter "0") Equal Access selection of alternate long distance carriers. When Equal Access is allowed, a toll restricted station may dial the code ("10XXX") to select an alternate long distance company in order to place any allowed telephone calls. When denied, a toll restricted station must place any allowed calls through the primary long distance carrier. The default setting for these special conditions is "111".

PROGRAM NUMBER 41

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	1	41	
2	*	41 -000	Confirm Program Number; Current Data displayed
3	1	41 -001	Enter selected Trunk Access mode; (0 = disable; 1 = enable)
4	1	41 -011	Enter selected Toll Access mode; (0 = detect "1"; 1 = ignore "1")
5	1	41 -111	Enter Equal Access mode; (0 = deny 1 ; 1 = allow)
6	*		Confirm Entry; display clears
7	#	00	End Program

THIS PAGE INTENTIONALLY LEFT BLANK

10/88 Kanda EKN-2464 8-39

8.43 TOLL RESTRICTION LISTS 1, 2, & 3 - PROGRAM 42

This program is used for entering allowed and denied codes into Toll Restriction Lists 1, 2, and 3. Each of these three lists may contain up to ten 3-digit codes. These codes represent the first three digits of a dialed number (excluding any PBX line access code or the digit "1" when a toll call is dialed). These digits may represent area codes, office codes or special service codes. Dialing of codes in List 1 is denied to Classes B through G. Codes in List 2 are denied to Classes C through G. Stations under Classes C through E are allowed to dial codes in List 3. (See Par. 6.116)

To enter the codes, dial the program number and confirm and enter "1", "2" or "3" to select the respective List. The first code position and any current entry will be shown. Enter the desired 3-digit dial code and dial "*" to confirm and step to the next code position. Repeat until all desired dial codes have been entered and confirmed. After the tenth dial code is entered and confirmed, the program will automatically step to the first code position of the next List.

Use the first and second programmable feature buttons (F1 and F2) on the telephone to enter a range of digits. Instead of a specific digit, the F1 button represents all digits from 2 through 9. This entry is displayed as "–" on the LCD display. The F2 button represents all digits from 0 through 9. The LCD display represents this entry as "=". Use of these buttons allow a single 3-digit entry to represent multiple dial codes. A complete 3-digit code can be erased by pushing the OPT button while the code is being displayed. (See Par. 6.116) In the default mode List 1 includes "0= =", List 2 includes "–0=" and "–1=" and List 3 includes "800" and "911".

PROGRAM NUMBER 42

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	2	42	
2	*	42-0	Confirm Program Number
3	1	42-1	Select the List by dialing "1" fot List 1, "2" for List 3, or "3" for List 3
4	*	42-1-01-0##	Confirm Selected List; First Code is Displayed
5	4	42-1-01-##4	Enter the Selected 3-digit Dial Code; Enter actual digits or use the "F1" function key for "2 - 9" or "F2" for "0 - 9"
	1	42-1-01-#41	
	1	42-1-01-411	
6	*	42-1-02-	Confirm Entry & Step to next Code Position; Current Data is displayed (if any exists)
7	(Repeat Steps 5 & 6)	42-1-10-	Repeat Steps 5 & 6 until all desired Dial Codes are entered
8	*	42-2-01-	After tenth Code is confirmed the next List will be displayed
9	(Repeat Steps 5 &6)	42-1-10-	Repeat Steps 5 & 6 until all desired Dial Codes in Lists 1, 2, & 3 entered
10	#	00	End Program (when all Lists have been programmed)

8.44 TOLL RESTRICTION LISTS 4, 5, 6, & 7 - PROGRAM 43

Toll Restriction Lists 4, 5, 6, and 7 may each contain up to ten codes with a maximum of seven digits in each code. Lists 4 and 5 are used to specify dial codes which are allowed while Lists 6 and 7 are used for denied codes. (See Par. 6.116) The codes may represent an entire local telephone number or the first seven digits of a long distance telephone number. There is no need to enter the digit "1" for a long distance number or to enter PBX Line Access codes. Program 44 is used to determine which Toll Classes are affected by each of these four lists. (See Par. 8.45)

To program dial codes into these lists, first enter and confirm the program number. Next dial "0" if allow codes (List 4 or 5) are to be entered or "1" for deny codes (List 6 or 7). Then dial "1" for the first allow or deny list (List 4 or 6) or dial "2" for the second allow or deny list (List 5 or 7). Push "*" to confirm these entries and the first code position in the selected list will be displayed along with the telephone number previously entered (if any). Enter up to seven digits which represent the first digits of the desired telephone number. Push "*" to confirm the entry and step to the next code position. After the tenth number is entered and confirmed, the display will automatically step to the first code in the next list. Repeat the procedure until all desired numbers have been entered. Use "#" to exit after all codes in all Lists have been entered and confirmed.

Use the first and second prgrammable feature buttons (F1 and F2) on the telephone to enter a range of digits instead of a specific digit. The F1 button represents all digits from 2 through 9. The F2 button represents all digits from 0 through 9. Use of these buttons allow a single entry to represent multiple telephone numbers. A complete code can be erased by pushing the OPT button while the code is being displayed. In the initial default setting, these lists contain no codes.

PROGRAM NUMBER 43

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	3	43	
2	*	43 -0000	Confirm Program Number
3	1	43 -0001	Enter "0" to select Allow or "1" to select Deny Lists; Enter "1" for the first list or "2" for the second allow or deny list
	1	43 -0011	
4	0	43 -0110	Enter "01" through "10" to select the specific code position
	1	43 -1101	
5	*	101-	Confirm entries; First 3 digits indicate type of list (allow/0, deny/1) and selected code position (01-10); Current Data for code position is displayed (if any exists)
6	9	101- 9	Enter seven digits to represent the first digits of a telephone number which is to be allowed or denied; Use the "F1" function button to symbolize all digits from "2" through "9" or use the "F2" function button for all digits from "0" through "9"
	7	101- 97	
	6	101- 976	
	1	101- 9761	
	2	101- 97612	
	3	101- 976123	
	4	101-9761234	
7	*	102-	Confirm entry & Step to next code position
8	(Repeat Steps 6 & 7)	110-	Repeat Steps 6 & 7 until all desired codes have been programmed; After the tenth code is confirmed, the first code position of the next list is displayed
9	#	00	End Program (when all codes in all lists are entered)

8.45 TOLL LIST ASSIGNMENT - PROGRAM 44

Toll Restriction Lists 4, 5, 6, and 7 may be applied to stations under Toll Classes B through G. Any or all of the lists may apply to any or all of these classes. Any conflicts that may occur between entries in different lists will be overridden by the deny Lists 6 and 7.

Enter and confirm the program number and select the type of Toll List by dialing "0" (for Allow lists) or "1" (for Deny lists). Then dial "1" for the first of the allow or deny lists (List 4 or 6) or dial "2" for the second of the allow or deny lists (List 5 or 7). (Lists are selected in the same way as in Program 43.) Then enter the digits representing the Toll Classes to which the selected List will apply ("1" - "5" for Classes B - F respectively). Confirm the entry by dialing "*" and the display will automatically step to the next Toll List. An entire entry for a specific list can be erased by pushing OPT while the entry is being displayed. Use "#" to exit after all Lists have been assigned and confirmed. In the default settings, the Allow lists are assigned to Classes B through F. The Deny lists are unassigned in the default setting.

PROGRAM NUMBER 44

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	4	44	
2	*	44-00	Confirm Program Number
3	0	44-00	Enter Type of Toll Restriction List (0 = allow, 1 = deny); and the List number (1 or 2)
	1	44-01	
4	*	-01- 0123	Confirm Entries; Current Data displays classes to which selected List will apply
5	1	-01- 01231	Enter code(s) for new Toll Classes to which the List will apply; Codes for any or all Toll Classes may be entered except Class G (code 6); Valid codes are "0" through "5"; Press OPT button to erase all Toll Class assignments from a List
	2	-01- 12312	
	3	-01- 23123	
	4	-01- 31234	
	5	-01- 12345	
6	*	-02-	Confirm Entry; Step to Next List; View Current Data
7	(Enter Codes)	-02-	Repeat Step 5 until all applicable Classes are entered
8	*	-11-	Confirm Entry; (repeat Steps 5 and 6 until all desired Lists are programmed)
9	#	00	End Program (when all Lists are programmed)

8.46 FEATURE DELETION - PROGRAM 45

Through use of this program function, groups of features may be disabled. Enter "0" to enable a feature group or "1" to disable it. All feature groups are enabled in the default settings. The groups of features which may be enabled or disabled as desired are:

1 -Meet Me Answer, Meet Me Conference, and Dial Call Pickup

2 - Call Forward-Follow Me and Night Transfer

3 - Unannounced Call Transfer and Announced Call Transfer

4 - Add-On Conference, Multi-Line Conference and Intercom Hold

5 - Step Call, Intercom Camp-On, Intercom Callback and Message Waiting

6 - (This option is unused at present.)

7 - Toll Restriction Disable on System Speed Dialing

PROGRAM NUMBER 45

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	5	45	
2	*	45-1 -1	Confirm Program Number; Current Data displayed
3	1	45-1 -0	Enter selected function code; (0 = disable; 1 = enable)
4	*	45-2 -1	Confirm Entry; Step to next Feature Group
5	(Repeat)	45-7 -1	Repeat Steps 3 and 4 until all Feature Groups are programmed as desired
6	#	00	End Program (when all groups have been programmed)

8.47 CLEAR SPEED DIAL/FUNCTION BUTTONS - PROGRAM 46

This program procedure clears all system speed dial numbers and causes the programmable function buttons to become DSS buttons for stations 10 through 17. This procedure also erases any alarm settings that may exist at any Executive telephones. To accomplish this, enter and confirm the program number and then push "**".

PROGRAM NUMBER 46

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	6	46	
2	*	46 A	Confirm Program Number
3	*		Confirm Again and Revert to default System Memory; (display clears)
4	#	00	End Program

8.48 AUTO HELD LINE PICKUP - PROGRAM 47
This allows selection of the line pickup method when a held line is recalling the holding station. Entering "0" forces the station user to push the line button to seize the held line. Entering "1" allows the user to automatically seize the line when the handset is lifted. The automatic seizure method only works while the audible recall tone is being heard. Automatic pickup is allowed in the default mode.

PROGRAM NUMBER 47

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	7	47	
2	*	47 -1	Confirm Program Number
3	0	47 -0	Enter selected function code (0 = manual, 1 = automatic)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.50 HELD LINE LED PREFERENCE - PROGRAM 48

This program allows selection of the LED indication of held lines. This procedure does not affect the color of the led indication or access to the held line by other stations. Enter the program number and confirm. Enter "0" for a double wink at the holding station and a slow steady flash at other stations. Enter "1" for a slow steady wink at all stations. Or enter "2" for a double wink at the holding station and a solid LED at all other stations. Option "0" is provided in the default mode.

PROGRAM NUMBER 48

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	8	48	
2	*	48 -0	Confirm Program Number
3	2	48 -2	Enter selected function code (0 - 2)
4	*		Confirm entry; (display clears)
5	#	00	End Program

8.51 PBX LINE ACCESS CODES - PROGRAM 49

This program allows up to three PBX line access codes to be entered into the system. This allows the system to insert automatic pauses in speed dial numbers and numbers automatically redialed. The system also uses these codes to determine toll restriction parameters. Each of the three codes can be either one or two digits. To enter the codes, after the program number has been entered and confirmed, dial "1", "2" or "3" to enter the first, second, or third code. Next dial "1" or "2" to specify whether the code contains one or two digits. Then enter the actual digit or digits of the code. Repeat for the other two codes if required. No access codes are provided in the default setting.

PROGRAM NUMBER 49

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	4	04	Enter Program Number
	9	49	
2	*	49-0	Confirm Program Number
3	1	49-1	Enter selected PBX Line Access Code (1 - 3)
4	*	49-1 -	Confirm Entry; View Current Data (if any)
5	1	49-1 - 1	Enter the number of digits in thePBX Access Code (1 or 2)
6	0	49-1 - 10	Enter the actual digits of the Access Code; (Precede single-digit codes with "0")
	9	49-1 -109	
7	*	49-2 -	Confirm Entry; Step to nex Access Code;t View Current Data
8	(Repeat)	49-3 -	Repeat Steps 5 through 7 as required for all three codes
9	#	00	End Program (when all Access Codes are programmed)

8.52 CALL TIMER ACTIVATION - PROGRAM 50
The Call Duration Timer associated to the Executive telephone with the LCD Display is normally automatically activated. This program allows the automatic activation to be defeated so that the timer operates only when manually activated. Enter and confirm the program number and then enter "0" for manual activation or "1" for automatic activation of the timer. In the default mode, the timer is automatic.

PROGRAM NUMBER 50

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	0	50	
2	*	50 -1	Confirm Program Number
3	0	50 -0	Enter selected function code (0 = manual; 1 = automatic)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.53 OUTGOING CALL TIMER DELAY - PROGRAM 51

The call timer delay can be adjusted through this program so that enough time is allowed for the call to be completed before the timer automatically starts. Valid codes are from "005" to "180" and each code represents the delay time in seconds before the timer begins. The default setting is "020" (20 seconds).

PROGRAM NUMBER 51

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	1	51	
2	*	51 -000	Confirm Program Number; Current Data displayed
3	0	51 -000	Enter selected Timer Delay Duration; Valid settings are in whole seconds from 5 to 180
	1	51 -001	
	5	51 -015	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.54 PAGING ALERT TONE - PROGRAM 52

Used to enable or disable the alerting tone heard through the external paging speakers when an external page zone is accessed. Enter and confirm the program number and then enter "0" to disable the tone or "1" to enable it. The alerting tone is enabled in the default setting.

PROGRAM NUMBER 52

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	2	52	
2	*	52 -1	Confirm Program Number; View current data
3	0	52 -0	Enter selected function code (0 = disable, 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.55 ALARM SIGNAL ASSIGNMENT - PROGRAM 53

Individual stations can be specified to receive the signal when either of the two alarm sensor circuits is activated. After the program number is entered and confirmed, enter the station number and then dial "0" to disable or "1" to enable the alarm signal. Confirm the selection and repeat for additional stations. No stations are assigned to receive the signal in the default program.

PROGRAM NUMBER 53

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	3	53	
2	*	53-00	Confirm Program Number; Current Data displayed
3	1	53-01	Enter the selected Station number number
	0	53-10	
4	*	53-10 -0	Confirm Station Number; Current Data displayed
5	1	53-10 -1	Enter Code for selected Alarm Tone mode (0 = off; 1 = on)
6	*	53-11 -0	Confirm Entry; Step to next Station; View Current Data
7	(Repeat)	53-73 -0	Repeat Steps 5 and 6 as required for all stations
8	#	00	End Program (when all stations are programmed)

8.56 DISCRIMINATED LINE RINGING - PROGRAM 54

This program option is used to enable or disable different ringing signals for CO Lines and PBX Lines designated in Program 1. (This function must be disabled in order to utilize Program 55.) Enter the program number and confirm. Then dial "0" to enable the discriminated ringing signals or dial "1" to disable. Confirm and exit program. The default setting enables ("0") discriminated ringing.

PROGRAM NUMBER 54

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	4	54	
2	*	54 -0	Confirm Program Number
3	1	54 -1	Enter selected function code for Discriminated Ringing ; (0 = enable, 1 = disable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.57 CO LINE RINGING CADENCE - PROGRAM 55

Specific telephones may be programmed through this procedure to receive either an interrupted or continuous incomimg CO line ringing signal. However, if this option is selected, there will be no audible difference between incoming CO Lines and PBX Lines. Enter the program number and confirm. Then enter the selected station number and "0" to select interrupted ringing or "1" for continuous ringing signal. Interrupted ringing is provided to all stations in the default mode.

PROGRAM NUMBER 55

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	5	55	
2	*	55-00	Confirm Program Number
3	1	55-01	Enter selected Station Number
	0	55-10	
4	*	55-10 -0	Confirm Station Number; Current Data displayed
5	1	55-10 -1	Enter code for Line Ringing mode; (0 = interrupted ringing; 1 = continuous)
6	*	55-11 -0	Confirm Entry; Step to next Station; View Current Data
7	(Repeat)	55-73 -0	Repeat Steps 5 and 6 until all stations are programmed
8	#	00	End Program (when all stations are programmed)

8.58 INCOMING RINGING SIGNAL CHANGE - PROGRAM 56

This program is used to convert the audible ringing signal of an incoming call from the standard ringing signal to the hold recall signal after a chosen period of time. This provides a means to indicate audibly that an incoming call requires immediate attention. Enter the program number and confirm. Then enter the three-digit code representing the desired delay time in seconds. Valid entries are from "000" (no change in ringing signal) to "255" (255 seconds). Confirm the entry and exit the program. The delay time set in the default program is "000" so that the ringing will continue unchanged until the call is answered.

PROGRAM NUMBER 56

STEP	ENTRY	LCD DISPLAY	REMARK
		00	(Beginning Display)
1	5	05	Enter Program Number
	6	56	
2	*	56 -000	Confirm Program Number; Current Data displayed
3	0	56 -000	Enter selected Ringing Time-out Duration; Valid settings are in 1-second increments from 000 to 255; (000 provides no change in ringing signal)
	3	56 -003	
	0	56 -030	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.59 ROTARY PULSE SPEED - PROGRAM 57

THIS PROGRAM HAS BEEN DELETED IN ITS ENTIRETY

8.60 FLEXIBLE LINE APPEARANCE/NIGHT STATIONS - PROGRAM 58

Through this program function lines available to individual stations can be arranged to occupy the first line positions on the telephone. After entering this program and selecting a specific station, enter and confirm the lowest numbered line available to that station (other than Common Use Lines, if they exist). Then enter the highest numbered line available to that station and confirm. The lines specified will now appear beginning with the first CO line button of the specified telephone. However, if a Common Use Line Group exists, those lines must be wired to and occupy the first line positions and the lines specified in this program will follow. LED indications will be provided only for Common Use Lines and the lines within the range specified in this program.

NOTE: If the selected station is to be a "night station" which is allowed to answer all lines in the night ringing mode, the lines appearances cannot be changed and the digits "90" must be entered instead of the first CO Line number. Night lines must be specified in Program 3.

In the default setting, all lines appear consecutively at all stations and there are no "night stations" assigned.

PROGRAM NUMBER 58

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	8	58	
2	*	58-00	Confirm Program Number
3	1	58-01	Enter selected Station Number
	0	58-10	
4	*	58-10-01 24	Confirm Station Number; Current Data displayed
5	1	58-10-01 24	Enter number of the first Line available to the selected station (or enter "90" if the selected station will be a Night Station)
	2	58-10-12 24	
6	*	58-10-12-24	Confirm the Line Number (if "90" was entered, the program will step to next station)
5	1	58-10-12-41	Enter number of the last Line available to the selected station
	8	58-10-12-18	
8	*	58-11-01 24	Confirm Entry; Step to next Station; View Current Data; Repeat Steps 5 - 8 for all stations.
9	#	00	End Program (when all desired stations are programmed)

8.61 OFF-HOOK DOORPHONE SIGNAL - PROGRAM 59

This procedure is used to enable or disable the audible doorphone signal to a busy station. After entering and confirming the program number dial "1" to enable or "0" to disable the signal from a door phone to be heard by the station user when the telephone is off-hook. This signal is disabled in the default mode.

PROGRAM NUMBER 59

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	5	05	Enter Program Number
	9	59	
2	*	59 -0	Confirm Program Number
3	1	59 -1	Enter selected function code (0 = disable, 1 = enable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.62 DIAL IN STATION ASSIGNMENT - PROGRAM 61

For each line assigned as a direct Dial In Line in Program 3, a single line station circuit must be dedicated for it's use in Program 72. This program procedure is provided so that the system will know which specific dial in station circuit is assigned to each of the Dial In Lines. Enter and confirm the program number. The LCD display will automatically show the lowest numbered Dial In Line. Enter the station number of the single-line circuit which will serve that Dial In Line. Confirm and the display will show the next Dial In Line or will clear if no other Dial In Lines exist. There are no assignments in the system default mode.

PROGRAM NUMBER 61

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	6	06	Enter Program Number
	1	61	
2	*	61-12 -00	Confirm Program Number. Lowest numbered DIL Line will be automatically displayed
3	4	61-12 -04	Enter a selected Single Line Station Number which will be assigned to serve the displayed Dial In Line
	2	61-12 -42	
4	*	61-18 -00	Confirm and repeat if other Dial In Lines exist. Display will clear when a Station Number is confirmed for use by the last existing Dial In Line.
5	#	00	End Program (when Display clears)

8.63 SPEED DIAL TOLL RESTRICTION - PROGRAM 64

Toll restriction is not applied to System Speed Dial numbers. This procedure is used to specify the range of Speed Dial numbers which are available for use by each Toll Class member. Speed dial codes outside of the range specified will become nonfunctional. This program does not apply to Class A or Class G stations. The range of numbers always begins with Speed Dial Code "00" and the upper limit is then entered for each Toll Class. After the program number is entered and confirmed, enter the code for the Toll Class ("1" through "5" for Toll Class B through F respectively). Then enter the two-digit Speed Dial code which is to be the last code available to that Toll Class. Confirm and repeat for other Toll Classes. All Speed Dial codes are available to Classes B through F in the default setting.

PROGRAM NUMBER 64

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	6	06	Enter Program Number
	4	64	
2	*	64-0	Confirm Program Number
3	1	64-1	Enter selected Toll Class code (1 through 5))
4	*	64-1 -89	Confirm Toll Class; Current Data displayed
5	7	64-1 -97	Enter highest numbered allowable Speed Dial Code for the selected Toll Class
	2	64-1 -72	
6	*	64-2 -89	Confirm Entry; Step to next Toll Class; View Current Data
7	5	64-2 -95	Repeat Steps 5 & 6 for the next Toll Class; (Higher numbered Speed Dial Codes are denied)
	4	64-2 -54	
8	*	64-3 -89	Confirm Entry; Step to next Toll Class; View Current Data
9	(Repeat)	64-5 -89	Repeat Steps 5 through 8 as required for all Toll Classes
10	#	00	End Program (when all Toll Classes are programmed)

8.64 EXECUTIVE TOLL RESTRICT OVERRIDE - PROGRAM 65

Through this program a secret code is entered which can be used to override the toll restriction at any station and allow any desired call to be made.

Enter the program number, confirm and then dial from two to ten digits which will be used as the secret code. Confirm the entry and exit the program. No code exists in the default setting.

PROGRAM NUMBER 65

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	6	06	Enter Program Number
	5	65	
2	*	-	Confirm Program Number; Current Data displayed
3	1	-1	Enter Digits to construct any code desired; Code may be from 2 to 10 digits in length; "*" and "#" may not be used in the Code; Use the OPT button to delete the entire Code if desired
	2	-12	
	3	-123	
	4	-1234	
	5	-12345	
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.65 AUTOMATIC PBX NIGHT TIMER - PROGRAM 70

This program is used to establish the times of day when the night ringing mode for PBX Lines will begin and end. Between the times specified in this program, it will also be unnecessary for station users to dial the PBX line access code to seize a line.

Enter and confirm the program number and then enter the ringing mode to which the line ringing will apply. (This ringing mode corresponds to the ringing mode assigned to each station in Program 7.) Next enter the beginning time of the night ringing mode in 24-hour format and dial "*" to confirm. Finally, enter the ending time of the night ringing mode in 24-hour format, confirm the entry and exit the program. No times are established in the default setting.

PROGRAM NUMBER 70

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
	0	70	
2	*	70-0	Confirm Program Number
3	1	70-1	Enter selected Ringing mode; Corresponds with Ringing modes assigned to Stations in Program 7. (Valid entries are "0" through "3")
4	*	70-1 1-0000	Confirm Entry; Current Data displayed
5	1	70-1 1-0001	Enter new Time in 24-hour format (time when the Ringing mode will change from Day mode to Night mode).
	9	70-1 1-0019	
	3	70-1 1-0193	
	5	70-1 1-1935	
6	*	70-1 2-0000	Confirm Entry; Step to Second Time of Day; View Current Data
7	(Enter Time & Confirm)	70-1 2-0000	Repeat Steps 5 and 6 for Time of Day (when the Ringing will revert to the normal Day mode
8	#	00	End Program

8.66 AUTOMATIC NIGHT TIMER - PROGRAM 71

This procedure is used to enable the automatic night ringing function. Enter the program number and dial "*" to confirm. Then enter the ringing mode to which the line ringing will apply. This corresponds with the ringing modes established for each station in Program 7. The beginning time is then entered in 24-hour format and confirmed and then the ending time is entered in the same way. Each day at the beginning time entered, ringing will be activated for stations under the ringing mode specified in this program. At the ending time, the ringing will automatically revert to the standard mode. No times are established in the default setting.

PROGRAM NUMBER 71

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
	1	71	
2	*	71-0	Confirm Program Number
3	3	71-3	Enter selected Ringing mode; Corresponds to the Ringing modes assigned to Stations in Program 7. (Valid entries are "0" through "3")
4	*	71-3 1-0000	Confirm Entry; Current Data displayed
5	1	71-3 1-0001	Enter new Time in 24-hour format (time when the Ringing mode will change from Day mode to Night mode)
	9	71-3 1-0019	
	3	71-3 1-0193	
	5	71-3 1-1935	
6	*	71-3 2-0000	Confirm Entry; Step to Second Time of Day; View Current Data
7	(Enter Time & Confirm)	71-3 2-0000	Repeat Steps 5 and 6 for Time of Day (time when the Ringing will revert to the normal Day mode)
8	#	00	End Program

8.67 STATION TYPE - PROGRAM 72

Through this procedure, the type of station equipment can be selected. After the selected station number is entered, the appropriate code is entered to specify the type of station instrument. Enter "00" for a Basic or Executive key telephone. Enter "02" for a rotary dial single-line telephone or "03" for a DTMF single-line telephone. Enter "05" when the station circuit will be dedicated for use as a Dial-In circuit. If the selected station circuit will be used as a connecting link between two systems, enter "21". All stations are defined as key telephones ("00") in default mode.

PROGRAM NUMBER 72

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
	2	72	
2	*	72-00	Confirm Program Number
3	1	72-01	Enter selected Station Number
	0	72-10	
4	*	72-10 -00	Confirm Station Number; Current Data displayed
5	0	72-10 -00	Enter code for selected Station Type; Codes are "00" (keyphone), "02" (rotary single-line), "03" (DTMF single-line), "05" (DIL single-line), and "21" (single-line link between systems)
	2	72-10 -02	
6	*	72-11 -00	Confirm Entry; Step to next Station; View Current Data
7	(Repeat)	72-73 -00	Repeat Steps 5 and 6 until all stations are programmed
8	#	00	End Program (when all stations are programmed)

8.68 ANNOUNCEMENT AND DIAL IN MUSIC SOURCE SETUP - PROGRAM 76

This program function is used to enable an external announcement machine which will automatically play a message to callers on specific outside lines during the night ringing mode. (See Program 1.) It is also used to select the audible source heard by a caller using the Direct In Line feature. After dialing a specific station number, the caller will hear either external hold music or ringback tone while witing for the station to answer. Enter the program number and confirm. Then dial "1" to enable the announcement machine or dial "0" to disable it. Next dial "00" if the external hold music is to be heard by a caller using the Direct In Line feature. Or dial "10" if ringback tone is preferred. Confirm the entries by dialing "*" and exit the program. In the default mode the announcement machine is enabled and external hold music is selected.

PROGRAM NUMBER 76

STEP	ENTRY	LCD DISPLAY	REMARK
		00	(Beginning Display)
1	7	07	Enter Program Number
	6	76	
2	*	76 -000	Confirm Program Number; Current Data displayed
3	1	76 -001	Enter "1" if external annoncement device will be used to answer incoming calls; If not, enter "0"
4	1	76 -011	Enter code to select audible source for DIL lines; While waiting for station to answer, the caller will hear ringback tone ("10") or hold music ("00")
	0	76 -110	
5	*		Confirm Entry; display clears
6	#	00	End Program

8.69 DAY AND NIGHT MUSIC SOURCE SETUP - PROGRAM 77

The external music source or the announcement machine may be heard by callers who have been placed on hold. The audible source may be different during the day and night ringing modes. Enter and confirm the program number. Then select the audible source to be heard by the held party during the day ringing mode. Enter "1" for the external hold music source or "2" for the external announcementmachine. Confirm the entry by dialing "*". Next select the audible source heard during the night ringing mode (by entering "1" or "2"). Confirm and exit the program. In the default setting, the external hold music source is selected for both the day and night modes.

PROGRAM NUMBER 77

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
	7	77	
2	*	77-00	Confirm Program Number; Current Data displayed
3	1	77-01	Enter selected CO Line Number
	0	77-10	
4	*	77-10 -1 1	Confirm selected Line; Current Data displayed
5	2	77-10 -2 1	Enter code for Day mode Music Source (1 = EXMOH; 2 = AMA/AMB; See par. 7.17 & 7.21)
6	*	77-10 -2 -1	Confirm selected Music Source
7	2	77-10 -2 -2	Enter code for Night mode Music Source (1 or 2; Same choices as in Step 5)
8	*	77-11 -1 1	Confirm Entry and Step to Next Line; View Current Data
9	(Repeat Entries)	77-24 -1 1	Repeat Steps 5 through 8 for all lines
10	#	00	End Program (when all lines have been programmed)

8.70 COMMON USE LINE GROUP - PROGRAM 78

One group of lines may be designated through this program as a Common Use Line Group for use by all stations in the system.

NOTE: Lines which are to be used as a Common Use Lines must be wired to the system sequentially beginning with the first line position. These lines must appear as the first group of lines at all stations having access.

After the program number has been entered and confirmed, enter the Line Group number for the group selected as the Common Use Group. Confirm the entry by dialing "*" and exit the program. No Common Use Line Group exists in the default setting.

PROGRAM NUMBER 78

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	7	07	Enter Program Number
	8	78	
2	*	78 -00	Confirm Program Number; Current Data displayed
3	0	78 -00	Enter Line Group Number (01 - 36) which has been selected as the Common Use Line Group; (Enter "00" if no Common Use Group exists)
	3	78 -03	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.71 ONE TOUCH AUTODIAL - PROGRAM 87

Each Key telephone includes eight buttons which can be used to activate automatic dialing of a telephone number on outside lines. When enabled through this program function, the autodial buttons will also automatically activate the speaker and select the highest numbered available line before the telephone number is automatically dialed. (The automatic line selection does not occur when a particular line is manually preselected.) When disabled, the line must be selected manually. After entering and confirming the program number, dial "1" to enable the automatic line selection function or dial "0" to disable it. Confirm and exit the program. This function is disabled in the default setting.

PROGRAM NUMBER 87

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	8	08	Enter Program Number
	7	87	
2	*	87 -0	Confirm Program Number
3	1	87 -1	Enter selected code for the One-Touch Autodial function; (1 = enable, 0 = disable)
4	*		Confirm Entry; (display clears)
5	#	00	End Program

8.72 ERROR CHECK - PROGRAM 90

This program is used to check for errors and conflicts in newly entered data and should be run at the end of every programming session. Enter the program number and confirm. If no errors exist the LCD will display "EO" and you may exit the program. If programming errors do exist the LCD will display "E". Dial "*" repeatedly to display the programs that are in conflict. The LCD display will clear after the last program error is shown. Return to each program to correct any problems.

IT WILL NOT BE POSSIBLE TO REMOVE STATION 10 FROM PROGRAMMING MODE UNTIL ALL PROGRAMMING ERRORS OR CONFLICTS ARE RESOLVED.

PROGRAM NUMBER 90

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	9	09	Enter Program Number
	0	90	
2	*	90 E	Confirm Program Number; If programming error exists, "E" will be displayed; If no error exists, "EO" will be shown; (if no error exists, go to Step 4)
3	*	90 (??)	Enter "*" repeatedly to view program numbers which include errors; Display will clear after last program number is shown
4	#	00	End Program (when "EO" is displayed or when last error has been displayed)

8.73 HELD PARTY DISCONNECT TIMING - PROGRAM 92

The held party disconnect detection timing can be adjusted through this program. After entering and confirming the program number, a two-digit code from "00" to "15" is entered which represents the selected disconnect signal detection timing. If it is desired that the held line not be disconnected when the held party hangs up then "00" is entered. Each of the other codes represent 50ms increments so that "01" equals 50ms and "15" equals 750ms. Enter the desired code, confirm the entry and then exit the program. The default setting is 500ms ("10").

PROGRAM NUMBER 92

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	9	09	Enter Program Number
	2	92	
2	*	92 -15	Confirm Program Number; Current Data displayed
3	0	92 -10	Enter Disconnect Detect Timing in 50ms increments from 00 to 15 ; (No disconnection ocurrs when "00" is entered)
	1	92 -01	
4	*		Confirm Entry; display clears
5	#	00	End Program

8.74 SMDR OPTIONS - PROGRAM 93

This program may be used to prevent incoming call records from being printed and to specify a minimum call duration for printed call records. After entering the program, "0" is selected if both incoming and outgoing call records should be printed or "1" is selected if only outgoing call records are required. Dial "*" to confirm the entry. Next a two-digit code is entered and confirmed to establish a minimum call duration. The first digit represents minutes and the second digit represents 10 second increments. Enter "00" if calls of any duration should be printed or enter a code from "01" to "99" to set a mimnimum call duration threshold. The code "01" represents 10 seconds and the code "99" represents 9 minutes and 90 seconds (or 10.5 minutes). The default settings for this program allow both incoming and outgoing call records and calls of any duration to be printed.

PROGRAM NUMBER 93

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	9	09	Enter Program Number
	3	93	
2	*	93-0	Confirm Program Number; Current Data displayed
3	1	93-1	Enter Incoming Call choice; (0 = print; 1 = ignore)
4	*	93-1 -00	Confirm Entry; Current Data for Call Threshold displayed
5	9	93-1 -09	Enter Call Threshold Timing; First digit = Minutes; Second digit = 10-second increments (Valid entries are "00" through "99")
	9	93-1 -99	
6	*		Confirm Entry; display clears
7	#	00	End Program

8.75 CANCEL CHANGES - PROGRAM 99

This program will cancel any changes that have been made during the current programming session and will return the system to the previous program settings. This program function does not return the system to the default settings. This may be useful when extensive programming errors or conflicts are found while running the error check under Program 90.

PROGRAM NUMBER 99

STEP	ENTRY	LCD DISPLAY	REMARKS
		00	(Beginning Display)
1	9	09	Enter Program Number
	9	99	
2	*	99 C	Confirm Program Number; "C" is displayed
3	*	P	Confirm again to cancel all changes made during the current programming session; Display shows "P" to indicate that programming session is ended and Switch1 on CPU is still "off"; Exit the system programming mode (See par. 8.05)

OTHER PROCEDURES

8.76 There are several other customization procedures which are not actual system program options but which the installer/programmer may be required to perform in order to complete the system installation to the user's satisfaction. The following procedures are included as a convenience for this reason. Some of these procedures are performed at Station 10 but not while that station is in the system programming mode.

8.77 CLOCK AND CALENDAR SETTING

The clock and calendar is set for all Executive telephones at Station 10. However, Station 10 is not in the system programming mode when this function is performed. The procedure is included here for the convenience of the installer/programmer.

Lift the handset and push the OPT button. Next push the CLK button and the LCD display will clear. Enter the current year by dialing four digits through the dial pad and then dial "*" to confirm. Next enter the month and date as four digits and dial "*" to confirm. Next enter a single digit to represent the day of the week (0 = Sunday, 1 = Monday, 2 = Tuesday, etc.) and dial "*" to confirm the entry. Enter the time of day as four digits (in 24-hour format) and dial "*" to confirm. Replace the handset to end the Clock/Calendar setting procedure.

NOTE: If incorrect digits are entered at any time during the setting procedure, simply re-enter the correct digits before dialing "". If it is unnecessary to reset a particular item, dial "*" to skip to the next item.*

CLOCK / CALENDAR SETTING

STEP	ENTRY	LCD DISPLAY	REMARKS
		(TIME/DATE)	(Beginning Display ; Time, Date, etc. displayed)
1	LIFT HANDSET	(TIME/DATE)	Lift handset or press "SPKR" button to begin
2	"OPT"	(TIME/DATE)	Press the "OPT" button; (No change in display)
3	"CLK"		Press the "CLK" button; Display clears
4	1	1	Enter the current year as four digits; Each digit is displayed as it is entered; (Steps 4 through 8 in this example shows setting for Monday, January 1, 1989); If error ocurrs simply re-enter
	9	19	
	8	198	
	9	1989	
5	*		Confirm the entry; Display clears
6	0	0	Enter the current Month and Date as four digits; (Example "0101" = January 1); Each digit is displayed as it is entered
	1	01	
	0	010	
	1	0101	
7	*		Confirm the entry; Display clears
8	1	"MON"	Enter the Day of the Week as one digit; "0" = Sunday; "1" = Monday; "2" = Tuesday; etc. (Display shows the digit entered)
9	*		Confirm the entry; Display clears
10	1	1	Enter the present Time as four digits; Time must be entered in 24-hour format; (This example shows setting Time at "2:35 PM"); Each digit is displayed as it is entered
	4	14	
	3	143	
	5	1435	
11	*		Confirm the entry; Display clears
12	REPLACE HANDSET	(TIME/DATE)	Replace the handset or press "SPKR" button to end procedure; The new setting is then displayed

8.78 SYSTEM SPEED DIAL NUMBERS

The EKN-2464 system allows entry of up to 90 system speed dial numbers each of which may be up to eighteen digits in length. These speed dial numbers are activated after a line has been seized by pushing the SD/LNR button and dialing a two-digit code for each speed dial number.

These numbers must be entered into system memory through Station 10 . Station 10 is not in the system programming mode when this procedure is performed.

To enter the system speed dial numbers, lift the handset and press the SD/LNR button. Dial "*" and then the selected speed dial access code (two digits from 00 to 89 inclusive). Dial the telephone number to be stored. Push the FLASH button at the appropriate time while entering digits to enter a 3-second pause. Multiple pauses can be entered by repeatedly pushing the FLASH button but each pause is counted as one of the eighteen possible digits in the speed dial number. Replace the handset to end this procedure or return to STEP 2 to begin entry of another speed dial number.

Note: Personal Speed Dial numbers are entered in exactly the same manner but at each telephone.

SYSTEM SPEED DIAL NUMBERS

STEP	ENTRY	LCD DISPLAY	REMARKS
	(At Station 10 only)	(TIME/DATE)	(Beginning Display ; Time, Date, etc. displayed)
1	LIFT HANDSET	(TIME/DATE)	Lift handset or press "SPKR" button to begin
2	"SD/LNR"	(TIME/DATE)	Press the "SD/LNR" button; (No change in display); Intercom dial tone is heard
3	"*"	-	Enter "*"; Display clears; Intercom tone stops
4	3	-3	Enter the selected Speed Dial code (00 - 89) Code is displayed as it is entered;
	9	-39	
5	1	-39 1	Enter the telephone number which will be dialed when the selected Speed Dial code is used. A maximum of 16 digits may be entered for each Speed Dial code. If more than eleven digits are entered, the first digits entered will disappear from the display. Pauses (3-second duration) may be entered at any time by pressing "FLASH" and are shown as "P" on the display. Each pause is counted as a digit.
	5	-39 15	
	1	-39 151	
	2	-39 1512	
	8	-39 15128	
	3	-39 151283	
	4	-39 1512834	
	8	39 15128348	
	7	9 151283487	
	1	1512834871	
	1	15128348711	
6	REPLACE HANDSET	(TIME/DATE)	Replace the handset or press "SPKR" button to end the procedure or press "SD/LNR" again and repeat for other Speed Dial codes.

8.79 FUNCTION KEY ASSIGNMENT - AUTODIAL FUNCTIONS

Each key telephone is equipped with a row of eight buttons which may be programmed for various functions. (See par. 8.80 for programming internal functions.) Each button can be used to access two speed dial numbers. The primary speed dial function is activated by seizing a line and simply pressing the selected button. (A line will automatically be seized and the speaker will be activated just by pressing the button if this function is enabled in Program 87.)

NOTE: The secondary speed dial function is accessed in the same way except that the OPT button must be pressed before pressing the autodial button. In the secondary autodial mode, the buttons are permanently assigned to activate the first eight system speed dial numbers (codes 00 - 07).

Assigning functions to these buttons must be done at each telephone. To program the buttons for the primary speed dialing function, lift the handset, push SD/LNR, dial "*", and then press the autodial button which is to be programmed. Next enter the two-digit speed dial access code which contains the desired telephone number. This can be either a system speed dial number (codes 00 - 89) or a personal speed dial number (codes 90 - 99). However, a telephone number must have been previously programmed under the chosen speed dial code or the entry will not be allowed. The handset can now be replaced to end the procedure or return to STEP 2 to repeat for another autodial button.

Note: Obviously the LCD display functions in the example below are not provided when Standard or Handsfree telephones are being programmed.

FUNCTION KEY ASSIGNMENT - AUTODIAL FUNCTIONS

STEP	ENTRY	LCD DISPLAY	REMARKS
	(At Individual Key Phones)	(TIME/DATE)	(Beginning Display ; Time, Date, etc. displayed)
1	LIFT HANDSET	(TIME/DATE)	Lift handset or press "SPKR" button to begin
2	"SD/LNR"	(TIME/DATE)	Press the "SD/LNR" button; (No change in display); Intercom dial tone is heard
3	"*"	-	Enter "*"; "-" displayed; Intercom tone stops
4	"F1"	-01	Press the selected Function Key (F1 through F8); "01" through "08" displayed to show the selected button; (F1 button is on far left; F8 is on far right)
5	8	-01 8	Enter the two-digit Speed Dial Access Code which will be activated when the selected Function button is pressed. (It can be either a System or Personal Speed Dial Code.) The digits entered are displayed. (The example shows the F1 button set to activate Speed Dial #89.)
	9	-01 89	
6	REPLACE HANDSET	(TIME/DATE)	Replace the handset or press "SPKR" button to end the procedure or press "SD/LNR" again and repeat for other Function Keys.

8.80 FUNCTION KEY ASSIGNMENT-INTERNAL FUNCTIONS

The eight function buttons may be used as DSS buttons or internal page access as well as for automatic dialing (See par. 8.79). To use the buttons , simply lift the handset and push the selected button.

The function assignment for these buttons must be done at each telephone. To program these buttons, lift the handset, dial "#", and then press the selected button. Next enter a station number (if the button is to be used for station signaling) or enter the two-digit access code for an internal page group or internal all call page (80 -89). Replace the handset to end the procedure or return to STEP 2 to repeat for other buttons.

NOTE: Obviously the LCD display functions show in the example below are not provided when Standard or Handsfree telephones are being programmed.

FUNCTION KEY ASSIGNMENT - INTERNAL FUNCTIONS

STEP	ENTRY	LCD DISPLAY	REMARKS
	(At Individual Key Phones)	(TIME/DATE)	(Beginning Display ; Time, Date, etc. displayed)
1	LIFT HANDSET	(TIME/DATE)	Lift handset or press "SPKR" button to begin
2	"SD/LNR"	(TIME/DATE)	Press the "SD/LNR" button; (No change in display); Intercom dial tone is heard
3	"#"	=	Enter "#"; "=" displayed; Intercom tone stops
4	"F1"	=01	Press the selected Function Key (F1 through F8); "01" through "08" displayed to show the selected button; (F1 button is on far left; F8 is on far right)
5	2	=01 2	Enter the Intercom Number of the telephone which will be signaled when the selected Function button is pressed. Or enter the two-digit Access Code for an Internal Page Group or Internal All Call Page. (The digits entered are displayed). (Example: "F1" will signal Station 28)
	8	=01 28	
6	REPLACE HANDSET	(TIME/DATE)	Replace the handset or press "SPKR" button to end the procedure or press "SD/LNR" again and repeat for other Function Keys.

10/88 Kanda EKN-2464 8-79

9. SINGLE-LINE TELEPHONE / OFF PREMISE EXTENSION

9.01 Industry standard single-line telephones may be used in place of the proprietary key telephones on the EKN-2464 system. The number of single-line telephones is limited by the available power but at least one half of the maximum number of telephones may be single-line telephones. This means that a basic EKN-2464 system will support at least sixteen single-line telephones while the expanded system will support at least thirty-two.

9.02 HARDWARE REQUIREMENTS
The 4SLTU PCB is used in place of the normal station PCB (4STU PCB) to support single-line telephones. Each PCB serves up to four rotary dial, single-line telephones. A 4SLTU PCB may be installed in any station card slot except the first (marked STU1).

When DTMF single-line telephones are to be used, each 4SLTU PCB serving these telephones must be equipped with a 4PBRCU PCB. The 4PBRCU PCB "piggybacks" onto the 4SLTU PCB and allows the use of either DTMF or Rotary single-line phones. (See par. 7.40 & 7.41)

Ring voltage is provided by the 4SLTU PCB which eliminates the need for an external ringing generator. However, current limitations may require the use of more efficient electronic ringers rather than the standard mechanical bell especially when two telephones are bridged to the same single-line circuit. It is recommended that not more than two single-line telephones be connected to the same circuit.

9.03 TELEPHONES
The 4SLTU PCB is designed to work properly with industry standard Rotary Dial (500-type) and DTMF (2500-type) single-line telephones. Other single-line devices may also be connected through the 4SLTU PCB. However, because of the wide variety of single-line devices available, it is not possible to guarantee the proper operation of all of these. (See par. 4.06)

9.04 WIRING
Single-line telephones are connected to the system using the T (tip) and R (ring) leads provided through connectors ACN2 through ACN4 on a basic system and connectors ACN7 through ACN9 on an expanded system. The BT and BR leads are ignored when connecting the single-line telephone except as described in paragraph 9.05.

The single-line telephone may be installed up to 1400 cable-feet from the KSU when 24 Awg cable is used or up to 2300 cable-feet when 22 Awg cable is used.

9.05 PROGRAMMING
Before a single-line telephone (or other device) will operate properly on the EKN-2464 system, a program change must be made to designate the station as a single-line device. Program 72 is used to designate and define the single-line circuit as either rotary dial or DTMF.

9.06 OFF PREMISE EXTENSION
When applications call for single-line telephones to be installed at distances of more than 2300 feet, it is possible to extend the single-line station loop with the addition of an external, customer-provided 48VDC power supply. The output from this power supply should be connected to the unused BT and BR leads on the fourth circuit of each 4SLTU PCB where extended loop is required. The polarity of the connection is not critical. The additional power allows the single-line telephone to be installed up to 5000 cable-feet from the KSU. When the external power supply is used, the jumper on the 4SLTU PCB which is normally connected to CN13 should be placed on connector CN11. This must be done on each 4SLTU PCB to which the external power supply is connected. (See par. 7.40 and Figure 9.)

9.07 SINGLE LINE TELEPHONE OPERATION

The procedures for operation of the single-line telephone are as follows:

MAKING AN OUTSIDE CALL:

- Lift the handset. (Reorder tone will be heard.)
- Push "5" on the dial pad.
- Dial the selected line number. (Line number must be two digits such as 01, 02, 03, etc.)
- Dial the desired telephone number when outside dial tone is heard. (Busy tone will be heard if the selected line is already in use.

AUTOMATIC LINE SELECTION:

- Instead of selecting a specific line, an idle line may be seized automatically by lifting the handset and dialing "0".

or

- A line in a specific Queue Group can be seized by lifting the handset and dialing the Queue Group number (1 through 4).

ANSWERING AN OUTSIDE CALL:

- Simply lift the handset if the line is ringing at the single-line telephone.

or

- Lift the handset. (Reorder tone is heard.)
- Push "5" on the dial pad.
- Dial the two-digit line number.

(This method may be used to retrieve calls placed on hold by another station.)

PLACING AN OUTSIDE CALL ON HOLD:

- Press and release the hookswitch. (The call is placed on hold and intercom dial tone is heard. Only intercom calls may be placed while an outside line is on hold.)

RETRIEVING THE HELD CALL:

- Press and release the hookswitch again. (If this is done after making an intercom call, the intercom call is disconnected and the line is retrieved.)

or

- If the line was placed on hold and the handset replaced, simply lift the handset to retrieve the call.

TRANFERRING AN OUTSIDE CALL:

- Press and release the hookswitch. (The call is placed on hold and intercom dial tone is heard.)
- Dial the desired extension number.
- When the called party answers, replace the handset.

MAKING AN INTERCOM CALL:

- Lift the handset. (Reorder tone is heard.)
- Push "7" on the dial pad. (Intercom dial tone is heard.)
- Dial the desired extension number.
- (Push "1" after dialing the extension number to change the signaling method; voice announce or ringing.)
- (If the extension is busy, push "1" to sebnd the Call Waiting tone.)

ANSWERING AN INTERCOM (or DOORPHONE) CALL:

- After hearing the ringing signal, simply lift the handset.

CALLING A DOOR PHONE:

- Lift the handset. (Reorder tone is heard.)
- Push "7" on the dial pad.
- Dial the number of the Doorphone (93 or 94).

PAGING:

- Lift the handset. (Reorder tone is heard.)
- Push "7" on the dial pad.
- Dial the number of the desired paging zone.
- Speak into the handset to make the announcement.
- Replace the handset.

9.08 SYSTEM LINKING

The 4SLTU PCB is used in conjunction with the 4MECOU PCB for linking two EKN-2464 systems

together. This may be done in order to provide communications paths between two separate systems or to provide a means by which two systems may be used in tandem as though they were one. Although there are limitations to the capabilities provided between two systems, this method is quite practical and cost effective when the application is appropriate.

A single-line circuit from a 4SLTU PCB in one system is terminated as a CO Line (served by the 4MECOU PCB) on the other system. Details of these arrangements are provided in Section 11.

9.09 OTHER APPLICATIONS

The obvious purpose of the 4SLTU PCB is to allow industry standard single-line telephones to be connected to the EKN-2464 system in place of the proprietary key telephones. However, the 4SLTU PCB may permit the use of other single-line devices as long as the specifications of these devices comply with those provided in Paragraph 4.06.

Some of the other single-line devices which may be used are:

- Cordless Telephones
- Data Modems
- Fax Machines
- Answering Machines
- Loud Ringing Bells
- Decorator Telephones
- Call Divertors
- Automated Attendants
- Voice Messaging Systems
- Other Complete Telephone Systems

10. STATION MESSAGE DETAIL RECORDING

10.01 A record of all outside calls may be output by the EKN-2464 system to either a serial or parallel printer or other device for the purposes of client billing, traffic analysis, and toll cost control. The data is output in 80 column, ASCII format at a selectable speed of from 110 to 2400 baud.

10.02 HARDWARE REQUIREMENTS

The ATSMU PCB must be installed in the Main cabinet when SMDR output is required. An interface cable must also be provided which is used to connect the ATSMU PCB to the printer or other terminal device. The interface cable may be either a serial RS-232C cable (part number 453210) or a Centronics-type parallel cable (part number 453220). Both cables are equipped with female connectors. The type of cable needed depends upon the interface required by the terminal device (printer, call accounting machine, storage device, computer, etc.).

10.03 INSTALLATION

The ATSMU PCB must be installed in the Main cabinet in a dedicated slot. Power to the Main cabinet should be off while the ATSMU PCB is being installed. Individual connectors on the ATSMU PCB are provided for both the serial and parallel interface cables.

For proper operation, it is important that the wiring of the terminal device is compatible with the interface cable. The wiring arrangements at the connector end of the interface cables are as follows:

SERIAL:

PIN	SIGNAL
1	GND - Frame Ground
2	RXD - Receive Data into ATSMU
3	TXD - Transmit Data from ATSMU
4	CTS - Clear to Send into ATSMU
5	RTS - Request to Send from ATSMU
6	DTR - Data Terminal Ready from ATSMU
7	GND - Signal Ground
20	DSR - Data Set Ready into ATSMU

PARALLEL:

PIN	SIGNAL
1	STB - Start Bit
2	BIT 1
3	BIT 2
4	BIT 3
5	BIT 4
6	BIT 5
7	BIT 6
8	BIT 7
9	BIT 8
10	ACK
11	BUSY
16	GND - Signal Ground
17	GND - Frame Ground

10.04 SWITCH OPTIONS

A bank of ten switches marked DIP SW is provided for selecting various SMDR output options. (See par. 7.43 and Figure 12.) The available options along with the appropriate switch settings for each are shown in the table below.

STOP BITS: SWITCH 1: ON = 2; OFF = 1					
BITS/WORD: SWITCH 2: ON = 7; OFF = 8					
PARITY:	EVEN	ODD	NO PARITY		
SWITCH 3:	OFF	ON	OFF or ON		
SWITCH 4:	ON	ON	OFF		
BAUD:	110	300	600	1200	2400
SWITCH 5:	OFF	ON	OFF	ON	OFF/ON
SWITCH 6:	OFF	OFF	ON	ON	OFF/ON
SWITCH 7:	OFF	OFF	OFF	OFF	ON
PRINTER:	SERIAL	PARALLEL			
SWITCH 8:	ON	OFF			
DURATION:	HR/MIN	HR/MIN/SEC			
SWITCH 9:	ON	OFF			
SWITCH 10: (not used; normally off)					

10.05 PROGRAM OPTIONS

Program 93 provides a means to ignore incoming call records if desired. It also allows a call duration threshold to be established so that calls of shorter duration will not be output unless an account code has been entered. The minimum call duration may be set in ten second increments from zero to 10 minutes and 30 seconds. (See par. 8.74)

10.06 CALL RECORDS

The information output through the ATSMU PCB is listed below:

DATE - The date is shown on the first line at the beginning of each day's call records. It is printed as Month/Day/Year and is based on the system clock and calendar settings.

SEQ - The first column provides a simple sequential call counter. The three-digit reference number is automatically assigned to each call record. Numbering begins at 001 with the first call each day.

EX1 - The three digits under this heading provides the number of the extension originating an outgoing call or answering an incoming call. If two-digit extension numbers are used, the first digit in this column will always be "0".

EX2 - This column shows the number of an extension receiving a transferred call. A new call record is generated when the call is terminated (or transferred again) showing this extension under column "EX1". When two-digit extension numbers are used, the first digit in this column will always be "0". When a call is not transferred, "000" will be printed in this column.

TK Two digits under this heading show the trunk (or CO line) number which was used for the call.

CAL - This column shows the type of call which generated the record. The call will be displayed as either "INC" (for incoming) or "OUT" (for outgoing).

TIME - The time at which the call occurs is printed under this heading. It is shown in 24-hour format.

DURATION -This column provides the amount of time spent on the call by the extension listed under "EX1". The time may be shown as hours and minutes or as hours, minutes and seconds depending on a switch setting on the ATSMU PCB.

DIAL NO. -The telephone number dialed on an outgoing call is shown under this heading. Up to 30 digits may be shown in this column. If more than 30 digits are dialed, only the first 30 will be shown. If digits are dialed, for some reason, during an incoming call, these also will be shown.

ACCT.NO. -During any call, an account code of up to eight digits may be entered by pushing the "OPT" button and dialing the desired digits. If more than eight digits are entered, the last eight will be shown. No tones will be heard by the outside party when this is done. These digits are intended to be used as means by which calls can be traced and sorted for client billing purposes. The user is not forced to enter these digits. All calls which include an account code will be printed even though the call might normally be ignored because of the incoming call option or the call duration threshold option. (See par. 10.05)

10.07 INTERNAL CALL BUFFER

The ATSMU PCB provides a buffer which is capable of storing approximately 200 call records in the event that the printer (or other device) goes off line, looses power or is otherwise unable to accept data. This memory is protected against loss by a small lithium battery on the ATSMU PCB. When the buffer becomes full, the oldest call records are purged to make room for the newest. When the printer is restored the call records are then output automatically in the same order in which they were stored. A skip in the sequential numbers in the first column of the printout indicates that call records were purged when the buffer became full.

10.08 TROUBLESHOOTING

The majority of the problems encountered in the use of the SMDR option will be due to the serial or parallel cable being miswired or a mismatch in the option settings between the ATSMU PCB and the printer (or other device). It may also be helpful to reset the KSU to clear any trouble.

10.09 SAMPLE PRINTOUT

A sample of the SMDR printout is shown below:

10/16/88

SEQ	EX1	EX2	TK	CAL	TIME	DURATION	DIAL NO.	ACCT.NO.
001	010	000	02	OUT	08:56:34	00:06:23	15128348711	82346333
002	023	035	04	INC	08:59:12	00:00:14		623
003	017	000	12	OUT	08:59:20	00:12:46	1028812124367862	
004	035	000	04	INC	08:59:26	00:26:07		78677
005	076	014	23	OUT	09:32:19	00:03:56	18348714	
006	014	044	23	OUT	09:36:05	00:05:02	18348714	4212
007	044	000	23	OUT	09:41:07	00:04:19	18348714	

KANDA TELECOM INC.
EKN-2464 INSTALLATION AND PROGRAMMING RECORDS

CUSTOMER:_____ CONTACT:_____

ADDRESS: _____ PHONE:_____

INSTALLATION DATE:_____ SYSTEM SERIAL NUMBER:_____

BASIC OR EXPANDED SYSTEM:_____

CO LINES (NUMBER AND TYPE):_____

_____

_____

_____

NUMBER AND TYPE OF TELEPHONES:

STANDARD:_____

HANDSFREE:_____

EXECUTIVE: _____

SINGLE-LINE:_____

TOTAL NUMBER OF STATION INSTRUMENTS:_____

OPTIONAL AND ANCILLARY EQUIPMENT:_____
(Doorphones, FAX, Modems, Paging Amp, etc.)

_____

_____

NOTES/COMMENTS: _____

_____

_____

_____

_____

CO/PBX LINE PROGRAMS (Includes Programs 1, 3, & 57)

LINE NO.	PROGRAM 1					PROGRAM 3			PROGRAM 57
	LINE TYPE	DIAL MODE	QUEUE GROUP	PABX NIGHT	AUTO ANSWER	LINE FUNCTION	FAX LINE	COMMON USE	ROTARY PULSE SPEED
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

PROGRAM 1 (Initial: "10100" all Lines)

LINE TYPE:
0 = NO LINE
1 = STD LOOP START
3 = PABX LINE
6 = INTERSYSTEM LINK

DIAL MODE:
0 = ROTARY PULSE
1 = DTMF

QUEUE GROUP:
0 = NO GROUP
1 = GROUP 1
2 = GROUP 2
3 = GROUP 3
4 = GROUP 4

PABX NIGHT LINE:
0 = NO
1 = YES

AUTO ANSWER LINE:
0 = NO
1 = YES

PROGRAM 3 (Initial: "000" all Lines)

LINE FUNTION:
0 = STD CO LINE
4 = DIRECT IN LINE

FAX LINE:
0 = NO
1 = YES

COMMON USE LINE:
0 = NO
1 = YES

PROGRAM 57 (Initial: 10pps all Lines)

ROTARY PULSE SPEED:
0 = 10pps
1 = 20pps

CO/PBX LINE PROGRAMS (Includes Programs 2, 49, 61, & 78)

PROGRAM 2 - GROUP ASSIGNMENT (Initially only Group 1 exists which includes all lines)

LINE GROUP NUMBER	FIRST LINE	LAST LINE	GROUP NAME OR TYPE	LINE GROUP NUMBER	FIRST LINE	LAST LINE	GROUP NAME OR TYPE
1				19			
2				20			
3				21			
4				22			
5				23			
6				24			
7				25			
8				26			
9				27			
10				28			
11				29			
12				30			
13				31			
14				32			
15				33			
16				34			
17				35			
18				36			

PROGRAM 49 - PBX LINE ACCESS CODES

CODE NO. (1 - 3)	NUMBER OF DIGITS (enter "1" or "2")	LINE ACCESS CODE
1		
2		
3		

NOTE: If code is single-digit, precede entry with "0".

PROGRAM 61 - DIAL IN STATION ASSIGNMENT

DIAL IN LINE NO.	STATION NUMBER USED TO SERVE DIL

PROGRAM 78 - COMMON USE LINE GROUP

LINE GROUP SELECTED AS COMMON USE GROUP	LINES INCLUDED IN SELECTED GROUP
GROUP # _____	

NOTE: LINES IN COMMON USE GROUP MUST BE SEQUENTIAL AND AND WIRED AS THE FIRST LINES ON THE SYSTEM.

CO LINE PROGRAMS (Includes Programs 54, 55, & 56)

PROGRAM 54 - DISCRIMINATED LINE RINGING

AUDIBLE DISTINCTION BETWEEN CO LINES AND PBX LINES (Enter "0" to disable or "1" to enable)	(Initial: "1")

PROGRAM 55 - CO LINE RINGING CADENCE

STATION NUMBER	SELECTED RINGING CADENCE (0 = Interrupted; 1 = Continuous Initial: "0"	STATION NUMBER	SELECTED RINGING CADENCE (0 = Interrupted; 1 = continuous) Initial = "0"
10		42	
11		43	
12		44	
13		45	
14		46	
15		47	
16		48	
17		49	
18		50	
19		51	
20		52	
21		53	
22		54	
23		55	
24		56	
25		57	
26		58	
27		59	
28		60	
29		61	
30		62	
31		63	
32		64	
33		65	
34		66	
35		67	
36		68	
37		69	
38		70	
39		71	
40		72	
41		73	

PROGRAM 56 - INCOMING RINGING SIGNAL CHANGE

TIMEOUT PERIOD FOR INCOMING RINGING SIGNAL TO CHANGE TO HOLD RECALL SIGNAL (Valid settings: 000 - 255 seconds) (Initial: 000 = no signal change)	_____ seconds

STATION PROGRAMS (Includes Programs 4, 6, 7, 8, & 14)

STATION CIRCUIT	Program 14 NEW STATION NUMBER	Program 4 EXECUTIVE BARGE-IN	Program 6 OUTGOING LINE GOUPS		Program 7 INCOMING GROUPS & RINGING MODE			Program 8				
			1	2	1	2	C	NIGHT RESTRICT	CONFIRM. TONE	LCD TEL	DND LEVEL	PAGE ZONE
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												

NEW STATION NUMBER: **PROGRAM 14**
(Initial setting same as circuit number)
2-DIGIT RANGE = 10 THROUGH 79
3-DIGIT RANGE = 100 THROUGH 799

EXECUTIVE BARGE-IN: **PROGRAM 4**
(Initially disabled at all stations)
0 = DISABLED
1 = ENABLED

OUTGOING LINE GROUPS: **PROGRAM 6**
(Initially group 1 at all stations)
LINE GROUP RANGE = 01 through 36
MAXIMUM TWO GROUPS PER STATION

INCOMING LINE GROUPS & RINGING: **PROGRAM 7**
(Initially group 1 accessible and ringing day and night at all stations)
MAXIMUM TWO GROUPS PER STATION
RINGING MODES: 0 = NO RINGING
1 = DAY RINGING
2 = NIGHT RINGING
3 = DAY AND NIGHT
(If a Common Use Group is assigned to the station, enter "1" and the code for Ringing Mode under column "C".)

STATION PROGRAMMING (Includes Programs 4, 6, 7, 8, & 14)

STATION CIRCUIT	Program 14 NEW STATION NUMBER	Program 4 EXECUTIVE BARGE-IN	Program 6 OUTGOING LINE GOUPS		Program 7 INCOMING GROUPS & RINGING MODE			Program 8				
			1	2	1	2	C	NIGHT RESTRICT	CONFIRM. TONE	LCD TEL	DND LEVEL	PAGE ZONE
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												

PROGRAM 8

NIGHT RESTRICTION:
(Initially all stations are unrestricted)
- 0 = NO NIGHT RESTRICTION
- 1 = RESTRICTED TO CLASS F

CONFIRMATION TONE:
(Initially enabled at all stations)
- 0 = TONE DISABLED
- 1 = TONE ENABLED

LCD TELEPHONE:
(Initially set at "0" for all stations)
- 0 = NO LCD
- 1 = LCD EQUIPPED

DND LEVEL:
(INITIALLY SET AT "3" FOR ALL STATIONS)
- 0 = DND DISABLED
- 1 = INTERCOM CALL BLOCKING ENABLED
- 2 = INTERCOM AND CO LINE BLOCKING ENABLED
- 3 = STATION MAY SELECT MODE 1 OR 2

PAGE ZONE:
(Initially stations are not assigned)
- 0 = NO PAGE ZONE ASSIGNED
- 1 = ASSIGNED TO ZONE 1
- 2 = ASSIGNED TO ZONE 2
- 3 = ASSIGNED TO ZONE 3
- |
- 9 = ASSIGNED TO ZONE 9

STATION PROGRAMMING (Includes Programs 40, 53, 58, & 72)

STATION NUMBER	Program 40 TOLL CLASS	Program 53 ALARM SIGNAL	Program 58 LINE APPEARANCE		Program 72 STATION TYPE
			FIRST LINE	LAST LINE	
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					

TOLL CLASS: **PROGRAM 40**
(Initially "A" at all stations)

0 = A: UNRESTRICTED
1 = B: UNRESTRICTED WITH EXCEPTIONS
2 = C: LOCAL AREA CODE WITH EXCEPTIONS
3 = D: LOCAL ONLY WITH EXCEPTIONS
4 = E: LOCAL ONLY WITH EXCEPTIONS
5 = F: INTERCOM ONLY WITH EXCEPTIONS
6 = G: INTERCOM ONLY

ALARM SIGNAL ASSIGNMENT: **PROGRAM 53**

0 = ALARM NOT SENT TO STATION
1 = ALARM SENT TO STATION

STATION TYPE: **PROGRAM 72**
(Initially all stations set at "00")

00 = KEY TELEPHONE
02 = ROTARY SINGLE-LINE
03 = DTMF SINGLE-LINE
05 = DIAL-IN CIRCUIT
21 = INTERSYSTEM LINK
(All other entries are invalid)

LINE APPEARANCE: **PROGRAM 58**
(Initially all lines at all stations)
ENTER THE FIRST AND LAST LINES AVAILABLE TO EACH STATION (OR ENTER "90" AS THE FIRST LINE TO SPECIFY AS A NIGHT STATION)

STATION PROGRAMMING (Includes Programs 40, 53, 58, & 72)

STATION NUMBER	Program 40 TOLL CLASS	Program 53 ALARM SIGNAL	Program 58 LINE APPEARANCE		Program 72 STATION TYPE
			FIRST LINE	LAST LINE	
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					

SYSTEM PROGRAMS (Includes Programs 16, 17, 20, 21, 22, 24, 25, 26, 27, 29, 30, 31, 32, 33, 47, 48, 50, 59, & 87)

PROGRAM NUMBER	PROGRAM TITLE	INITIAL SETTING	NEW DATA	NOTES & COMMENTS
16	OFF-HOOK RINGING	1		0 = DISABLED 1 = ENABLED
17	TENANT NIGHT MODE	0		0 = DISABLED 1 = ENABLED
20	AUTO RINGING LINE PICKUP	0		0 = DISABLED 1 = ENABLED FOR ALL STATIONS 2 = ENABLED FOR RINGING STATIONS
21	AUTO IDLE LINE SEIZURE	0		0 = DISABLED 1 = PUSH SPEAKER AND QUEUE NO. 2 = DIAL "0" ON HOOK 3 = BOTH METHODS 1 AND 2
22	EXCLUSIVE HOLD	1		0 = DISABLED 1 = ENABLED
24	INTERCOM SIGNAL PREFERENCE	0		0 = VOICE SIGNAL 1 = RINGING SIGNAL
25	MICROPHONE PREFERENCE	0		0 = MICROPHONES ON 1 = MICROPHONES OFF
26	BACKGROUND MUSIC	0		0 = DISABLED 1 = ENABLED
27	ROOM MONITORING	0		0 = DISABLED 1 = ENABLED
29	CONFERENCING MODE	0		0 = ADD-ON 1 = PRIVACY RELEASE
30	MULTI-LINE CONFERENCE	1		0 = DISABLED 1 = ENABLED
31	THREE MINUTE ALARM	0		0 = DISABLED 1 = ENABLED
32	DOORPHONE SIGNAL TYPE	0		0 = DOUBLE CHIME 1 = CONTINUOUS RING SIGNAL
33	AUTO SPEAKER ACTIVATION	1		0 = DISABLED 1 = ENABLED
47	AUTO HELD LINE PICKUP	1		0 = DISABLED 1 = ENABLED
48	HELD LINE LED PREFERENCE	0		0 = DOUBLE WINK / SLOW FLASH 1 = SLOW FLASH 2 = DOUBLE WINK / STEADY
50	CALL TIMER ACTIVATION	1		0 = MANUAL ACTIVATION 1 = AUTOMATIC ACTIVATION
59	OFF-HOOK DOORPHONE SIGNAL	0		0 = DISABLED 1 = ENABLED
87	ONE TOUCH AUTODIAL	0		0 = DISABLED 1 = ENABLED

TIMING PROGRAMS (Includes Programs 35, 36, 37, 38, 39, 51, 70, 71, & 92)

PROGRAM NUMBER	PROGRAM TITLE	INITIAL SETTING	NEW DATA	NOTES & COMMENTS
35	EXCLUSIVE HOLD RECALL TIMER	018 (3 min.)		Valid entries: 001 - 255 (10 second increments)
36	EXCLUSIVE HOLD RECALL TONE	018 (3 min.)		Valid entries: 000-255 (X 10 sec) "000" = no recall
37	HOLD RECALL TIMER	018 (3 min.)		Valid entries: 000-255 (X 10 sec) "000" = no recall
38	UNSCREENED TRANSFER TIMEOUT	006 (60 sec.)		Valid entries: 000-255 (X 10 sec) "000" = no transfer effected
39	CO LINE TRANSFER TIMEOUT	000 (none)		Valid entries: 000-255 (X 10 sec) "000" = no recall
51	OUTGOING CALL TIMER DELAY	020 (20 sec.)		Valid entries: 000-255 (X 1 sec)
70	AUTOMATIC PBX NIGHT TIMER Night Mode Beginning Time: Night Mode Ending Time:	 0000 0000		Enter beginning and ending times as 4 digits in 24-hour format.
71	AUTOMATIC NIGHT TIMER Night Mode Beginning Time: Night Mode Ending Time:	 0000 0000		Enter beginning and ending times as 4 digits in 24-hour format.
92	HELD PARTY DISCONNECT TIMING	10		Valid entries: 00 - 15 (50 msec increments)

EXTERNAL PAGING PROGRAMS (Includes Programs 18, 19, & 52)

PROGRAM NUMBER	PROGRAM TITLE	INITIAL SETTING	NEW DATA	NOTES & COMMENTS
19	EXTERNAL ALL CALL PAGE	0		0 = No All Call Page 1 = All Call accesses Zone 1 2 = All Call accesses Zone 2 3 = All Call accesses Zone 1&2
52	PAGING ALERT TONE	1		0 = No Alerting Tone 1 = Alerting Tone Provided

PROGRAM 18 - EXTERNAL PAGING OPTIONS		
PAGE ZONE	LINE GROUP ASSIGNED FOR COMMON AUDIBLE (Enter 01 - 36 ; Initial = 00)	BACKGROUND MUSIC (Initial = 000) (Enter 000 for Off or 100 for On)
1		
2		

TOLL RESTRICTION PROGRAMS (Includes Programs 41 & 42)

PROGRAM 41 - SPECIAL CONDITIONS

	TRUNK ACCESS CONDITION 1	EQUAL ACCESS CONDITION 2	TOLL ACCESS CONDITION 3
INITIAL SETTING	1	1	1
NEW DATA (0 = disable; 1 = enable)			

PROGRAM 42 - TOLL RESTRICTION LISTS 1, 2, & 3

LIST	LIST TYPE	CODE NUMBER	INITIAL SETTING	NEW DATA (Enter 3-digit Code)
1	DENY TO CLASSES B THRU G	1	0 # #	
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
2	DENY TO CLASSES C THRU G	1	* 0 #	
		2	* 1 #	
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
3	ALLOW TO CLASSES C THRU E	1	8 0 0	
		2	9 1 1	
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		

TOLL RESTRICTION PROGRAMS (Includes Program 43)

PROGRAM 43 - TOLL RESTRICTION LISTS 4, 5, 6, & 7

LIST	LIST TYPE	CODE NUMBER	NEW DATA (Initial: No settings)
4	01 (Allow List 1)	01	
		02	
		03	
		04	
		05	
		06	
		07	
		08	
		09	
		10	
5	02 (Allow List 2)	01	
		02	
		03	
		04	
		05	
		06	
		07	
		08	
		09	
		10	
6	11 (Deny List 1)	01	
		02	
		03	
		04	
		05	
		06	
		07	
		08	
		09	
		10	
7	12 (Deny List 2)	01	
		02	
		03	
		04	
		05	
		06	
		07	
		08	
		09	
		10	

TOLL RESTRICTION PROGRAMS (Includes Programs 44, 64, & 65)

PROGRAM 44 - TOLL LIST ASSIGNMENT

LIST	LIST TYPE	INITIAL: CLASSES AFFECTED BY THE LIST (Push "OPT" to erase data)	NEW DATA: CLASSES AFFECTED BY THE LIST (Enter digits "1" - "5" for Classes B - F respectively. Enter all that apply.)
4	"01" Allow List 1	1 2 3 4 5	
5	"02" Allow List 2	1 2 3 4 5	
6	"11" Deny List 1	----------	
7	"12" Deny List 2	----------	

PROGRAM 64 - SPEED DIAL TOLL RESTRICTION

TOLL CLASS	TOLL CLASS NUMBER	INITIAL: AVAILABLE SPEED DIAL NUMBERS	NEW DATA: (Enter the highest Speed Dial number available for each Class.)
B	1	00 - 89	00 - _____
C	2	00 - 89	00 - _____
D	3	00 - 89	00 - _____
E	4	00 - 89	00 - _____
F	5	00 - 89	00 - _____

PROGRAM 65 - EXECUTIVE TOLL RESTRICT OVERRIDE

TOLL OVERRIDE CODE: Enter from two to ten digits which will be used as a secret code to override Toll Restriction. Push "OPT" button to erase the code if desired. (Initial: no entry)
_ _ _ _ _ _ _ _ _ _

MISCELLANEOUS PROGRAMS (Includes Programs 11, 12, 13, & 15)

PROGRAM 11 - STATION HUNTING (Initially no Hunt Groups exist.)

HUNT GROUP NUMBER	STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	STATION 8
1								
2								
3								
4								
5								
6								
7								
8								
9								

PROGRAM 12 - DOORPHONE SIGNAL ASSIGNMENT (No Initial settings.)

DOORPHONE 1:			DOORPHONE 2:		
	STATION NUMBER	SIGNAL MODE		STATION NUMBER	SIGNAL MODE
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		

NOTE: Valid entries for Signal Modes are:

0 = no Signal received
1 = Signal received during Day Mode only
2 = Signal received during Night Mode only
3 = Signal received during Day & Night Mode

PROGRAM 13 - DSS/BLF ASSIGNMENT (No initial settings.)

DSS CONSOLE #1	ASSIGNED TO STATION #_____
DSS CONSOLE #2	ASSIGNED TO STATION #_____

PROGRAM 15 - STATION NUMBER DELETION

NOTE: To delete all assigned station numbers, enter the program number (15) and dial "* *". This should always be done when number of digits is changed (see Program 14.)

MISCELLANEOUS PROGRAMS (Includes Programs 28, 45, 46, & 76)

PROGRAM 28 - ALARM ACTIVATION

	ACTIVATION (0 = Off; 1 = On)	DEVICE TYPE (0 = Break; 1 = Make)
ALARM 1		
ALARM 2		

PROGRAM 45 - FEATURE DELETION

FEATURE GROUP	FEATURES	INCLUDE (0) or DELETE (1) (Initial: all included)
1	Meet-Me Answer, Meet-Me Conference, Dial Call Pickup	
2	Call Forward-Follow Me, Night Transfer	
3	Unannounced Call Transfer, Announced Call Transfer	
4	Add-On Conference, Multi-Line Conference, Intercom Hold	
5	Step Call, Intercom Camp-On, Intercom Callback, Message Waiting	
6	(Presently Unused)	
7	Toll Restriction Disable on System Speed Dial	

PROGRAM 46 - CLEAR SPEED DIAL/FUNCTION BUTTONS

NOTE: After entering the program number (46), dial "**" to confirm and erase the functions previously assigned to the eight programmable buttons on all key telephones.

PROGRAM 76 - ANNOUNCEMENT AND DIAL IN MUSIC SOURCE SETUP

ANNOUNCEMENT DEVICE USED? (0 = no; 1 = yes) (Initial: 0)	AUDIBLE SOURCE HEARD BY CALLER ON DIL LINES (00 = Hold Music; 10 = Ringback) (Initial: 00)

MISCELLANEOUS PROGRAMS (Includes Programs 77, 90, 93, & 99)

PROGRAM 77 - DAY AND NIGHT MUSIC SOURCE SETUP

CO/PBX LINE	DAY MODE HOLD MUSIC SOURCE (1) (Initial: "1")	NIGHT MODE HOLD MUSIC SOURCE (2) (Initial: "1")
	Enter "1" for Hold Music or "2" for auto answer announcement machine.	
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

PROGRAM 90 - ERROR CHECK

NOTE: Enter the program number (90) and dial "*" to check for programming errors. If "EO" is displayed there are no errors. If "E" is displayed, dial "*" repeatedly to see programs which contain errors.

PROGRAM 93 - SMDR OPTIONS

INCOMING CALL (0 = print; 1 = ignore) (Initial: "0")	CALL DURATION THRESHOLD	
	MINUTES (0 -9) (Initial: "0")	SECONDS (0 - 9 X 10) (Initial: "0")

PROGRAM 99 - CANCEL CHANGES

NOTE: To cancel all changes made during the current programming session, enter program number (99) and dial "***".

SYSTEM SPEED DIAL NUMBERS

SPEED DIAL CODE	NAME	TELEPHONE NUMBER (MAXIMUM 17 DIGITS)
00		
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		

NOTE: To enter speed dial numbers at Station 10 the "SPKR" LED must be on. Push the "SD/LNR" and dial the speed dial code (00 through 89) followed by the actual telephone number. Turn off the speaker to quit or enter more numbers by repeating the procedure. While entering a telephone number, push the "Flash" button to enter a pause if required.

SYSTEM SPEED DIAL NUMBERS

SPEED DIAL CODE	NAME	TELEPHONE NUMBER (MAXIMUM 17 DIGITS)
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		

SYSTEM SPEED DIAL NUMBERS

SPEED DIAL CODE	NAME	TELEPHONE NUMBER (MAXIMUM 17 DIGITS)
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		