Strata® S

ELECTRONIC KEY TELEPHONE SYSTEM

INSTALLATION AND MAINTENANCE MANUAL

SERIAL NO. 00019

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Service Requirements

In the event of equipment malfunction, all repairs will be performed by Toshiba America, Inc., Toshiba Telecom, or an authorized agent of Toshiba America, Inc., Toshiba Telecom.

Strata VI®

SYSTEM RECORD SHEET

PROGRAM 01—SYSTEM ASSIGNMENTS (BASIC)

KEY/LED		LED ON	LED OFF
CO 6		M.W.* Ext. 10	Not Equipped
CO 5		M.W.* Ext. 11	Not Equipped
CO 4		—	—
CO 3		—	—
CO 2		3 sec. Pause	1.5-sec. Pause
CO 1		0.5-second Flash	2-sec. Flash
INT 2		Ext. 10 DND Key	NITE
INT 1		Tone First	Voice First

*Message Waiting Center
X = Select (LED on)
Initialized Data: CO 6 LED on; all other LEDs off

NOTE:
Only one message center is permitted; if both Ext's 10 and 11 are chosen as Message Waiting Centers, Ext. 10 will have priority.

PROGRAM 02—SYSTEM ASSIGNMENTS (OPTION)

KEY/LED		LED ON	LED OFF
CO 6		Auto Dial (Station)	Not Equipped
CO 5		—	—
CO 4		—	—
CO 3		—	—
CO 2		—	—
CO 1		Nite Ring/Ext. Page	Not Equipped
INT 2		BGM/Ext. Page	Not Equipped
INT 1		Ext. Page W/All Call	Ext. Page Not Included

X = Select (LED on)
Initialized Data: CO 6 LED on; all other LEDs off

PROGRAM 05—AUTOMATIC RECALL FROM HOLD TIMING

KEY/LED		TIME
CO 6		160 Seconds
CO 5		128 Seconds
CO 4		96 Seconds
CO 3		64 Seconds
CO 2		48 Seconds
CO 1		32 Seconds
INT 2		16 Seconds
INT 1		No Recall

X = Select (LED on)
Initialized Data: 32 seconds

PROGRAM 06
AUTO RELEASE
ON HOLD ENABLE

CO 6	
CO 5	
CO 4	
CO 3	
CO 2	
CO 1	

X = enable (LED on)
Initialized Data:
All LEDs off

PROGRAM 07
AUTO RELEASE
ON HOLD TIMING

CO 6	
CO 5	
CO 4	
CO 3	
CO 2	
CO 1	

X = XB (LED on)
Blank = ESS
Initialized Data:
All LEDs off

PROGRAM 10
PBX BACKUP

CO 6	
CO 5	
CO 4	
CO 3	
CO 2	
CO 1	

X = Connected to PBX Line (LED on)
Init. Data: All LEDs off

PROGRAM 1X—PBX ACCESS CODES

Code	1st Digit	2nd Digit
#1 (11)		
#2 (12)		
#3 (13)		
#4 (14)		

Enter Access Codes (Max: 4)
Initialized Data: None

NOTE:
If the access code is a single digit, enter "" in the second column. If all combinations following a particular 1st digit are to be considered access codes (e.g., 91, 92, 93, etc.), enter "D" (do not care) in the 2nd column.*

PROGRAM 20—TOLL RESTRICTION DISABLE

CO 6	
CO 5	
CO 4	
CO 3	
CO 2	
CO 1	

X = disable (LED on)
Init. Data: All LEDs off

PROGRAM 2X—TOLL RESTRICTION EXCEPTION CODES

Code	1st	2nd	3rd	4th
#1 (21)				
#2 (22)				
#3 (23)				
#4 (24)				
#5 (25)				

Enter Actual Exception Codes (Max: 5)
Initialized Data: None

NOTE:
If codes are less than four digits, enter "" in the remaining spaces.*

PROGRAM 3XX-STATION CO LINE ACCESS

KEY/LED	Feature	Ext. No.															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Allow Access																
CO 5	Allow Access																
CO 4	Allow Access																
CO 3	Allow Access																
CO 2	Allow Access																
CO 1	Allow Access																

X = select (LED on)
Initialized Data: All LEDs on

PROGRAM 5XX-STATION CLASS OF SERVICE

KEY/LED	Feature	Ext. No.															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Privacy Override Allowed																
CO 5	DND Override Allowed																
CO 4	—																
CO 3	20-key EKT																
CO 2	Speakerphone Enable																
CO 1	Auto Dial Allowed																
INT 2	Auto Line Pref. Allowed																
INT 1	Include in All Call																

X = select (LED on)
Initialized Data: CO 1 & 2, INT 1 & 2 LED on; all others off

PROGRAM 6XX-TOLL RESTRICTION CLASSIFICATION

KEY/LED	Feature	Ext. No. 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Allow 411																
CO 5	Allow 1 + 7 digits																
CO 4	Restrict: 1, 0 1st digit 1, 0 2nd digit More than 7 digits Allow: 911, 800 Exception Codes (Prog 2X)																
CO 3	—																
CO 2	—																
CO 1	—																

X = select (LED on) Init. Data: No Restriction

PROGRAM 7XX—STATION OUTGOING RESTRICTION

KEY/LED	Feature	Ext. No. 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Restricted																
CO 5	Restricted																
CO 4	Restricted																
CO 3	Restricted																
CO 2	Restricted																
CO 1	Restricted																

X = select (LED on) Initialized Data: All LEDs off

PROGRAM 8XX—CO RINGING ASSIGNMENTS—DAY

KEY/LED	Feature	Ext. No. 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Ring in Day																
CO 5	Ring in Day																
CO 4	Ring in Day																
CO 3	Ring in Day																
CO 2	Ring in Day																
CO 1	Ring in Day																

X = select (LED on) Initialized Data: Ext 10-all on; all others off

PROGRAM 9XX—CO RINGING ASSIGNMENTS—NIGHT

KEY/LED	Feature	Ext. No. 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CO 6	Ring in Nite																
CO 5	Ring in Nite																
CO 4	Ring in Nite																
CO 3	Ring in Nite																
CO 2	Ring in Nite																
CO 1	Ring in Nite																

X = select (LED on) Init. Data: Ext 11-all on; all others off

FCC REGISTRATION

The ***Strata S*** electronic key telephone system is registered in accordance with the provisions of Part 68 of the Federal Communications Commission's Rules and Regulations.

FCC REQUIREMENTS

Means of Connection

The Federal Communications Commission (FCC) has established rules which permit the ***Strata S*** electronic key telephone system to be connected directly to the telephone network. A locally-provided jack is used for this connection—jacks for this type of customer-provided equipment will not be provided on party lines or coin lines.

Incidence of Harm

If the ***Strata S*** system is malfunctioning, it may also be disrupting the telephone network. The system should be disconnected until the problem can be determined and repaired. If this is not done, the telephone company may temporarily disconnect service.

Telephone Network Compatibility

The telephone company may make changes in its technical operations and procedures. If such changes affect the compatibility or use of the ***Strata S*** system, the telephone company is required to give adequate notice of changes.

Notification of Telephone Company

Before connecting a ***Strata S*** system to the telephone network, the telephone company must be provided with the following:

1) Your telephone number
2) The FCC registration number (BF 287N-13414-KF-E)
3) The ringer equivalence number (0.5 B)
4) The USOC jack required (RJ-25C)

Items 2, 3, and 4 are also indicated on the equipment label.

You must notify the telephone company upon final disconnection of your equipment.

RADIO FEQUENCY INTERFERENCE

Warning:—This equipment generates and uses radio frequency energy and if not installed and used properly (that is, in strict accordance with the manufacturer's instructions), may cause interference to radio and television reception. The equipment has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or telelvision reception, which can be determined by turning the equipment off and on, correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Reorient the telephone equipment with respect to the receiver.
- Move the telephone equipment away from the receiver.
- Plug the key service unit into a different AC outlet so that the KSU and receiver are on different circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How To Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

Strata S®

GENERAL DESCRIPTION

Strata S

GENERAL DESCRIPTION

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01 GENERAL

01.00 Summary Description

01.01 ***Strata S*** is an electronic key telephone system with many standard features utilizing stored program control, custom LSI circuitry, solid-state space division switching, and reduced station cabling. Served by a key service unit (MKSU) housed in a single cabinet, the system has a capacity of three central office/PBX lines, one intercom line, and eight station lines.

01.02 ***Strata S*** utilizes specially designed electronic key telephones (EKTs). Each EKT is connected to the system via industry-standard 2-pair cabling, and is equipped with a push-button dial pad. Solid-state electronics within the MKSU translate signals from the station dial pad into either DTMF or rotary dial signals, as required by the central office.

01.03 ***Strata S*** is electrically compatible with the public telephone network and is also designed to function in a "behind PBX" environment.

01.04 Maintenance procedures are based on quickly locating and replacing defective sub-assemblies, keeping service disruption to a minimum.

02 PHYSICAL DESCRIPTIONS

02.00 Key Service Unit

02.01 Designed for wall mounting, the ***Strata S*** MKSU is housed in a single plastic cabinet (Figure 1) with the following dimensions:

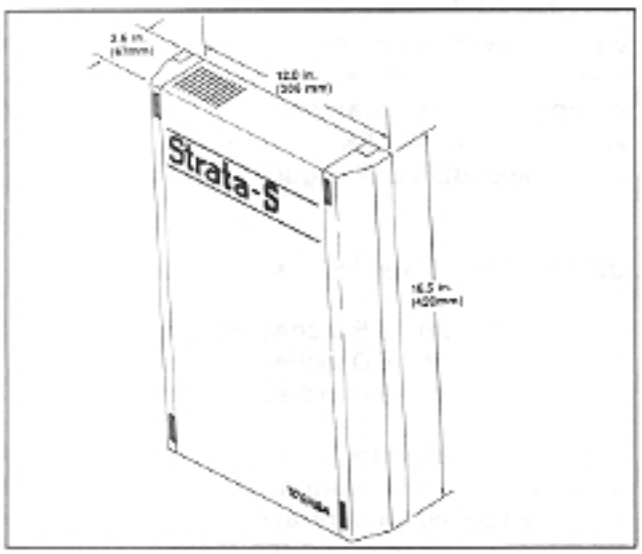

FIGURE 1—MKSU (Dimensions)

Height: 16.5 inches (420 mm)
Width: 12.0 inches (306 mm)
Depth: 2.6 inches (67 mm)
Weight: 6.2 lbs. (2.8 kg)

02.02 The cabinet consists of a base, cover, and side covers (Figure 2)

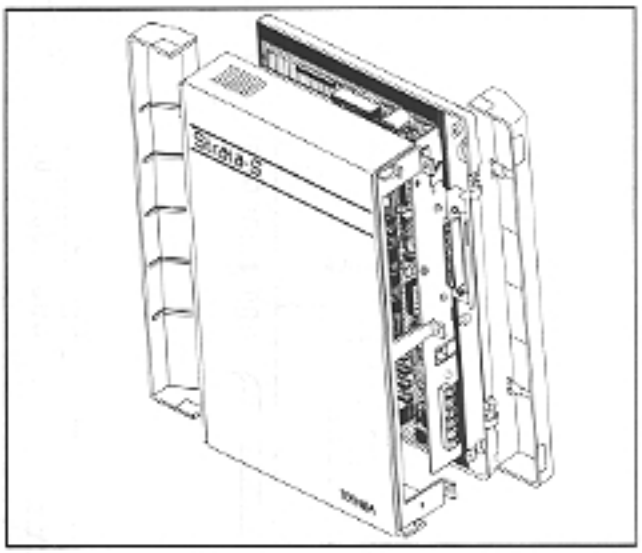

FIGURE 2—MKSU CABINET

02.03 The MKSU is factory-equipped with two PCBs (MMAU and ACOU). The dimensions of these PCBs are:

MMAU: 15.4 x 9.5 inches (390 x 241 mm)
ACOU: 9.4 x 6.3 inches (239 x 160 mm)

02.04 The MMAU PCB is secured to the cabinet base (Figure 3). The ACOU is attached to the MMAU with four screws, and is connected to it via four 10-pin connectors.

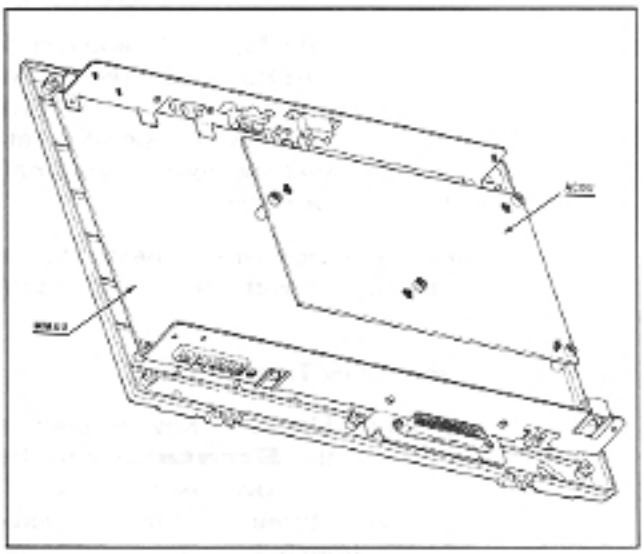

FIGURE 3—MKSU (Internal)

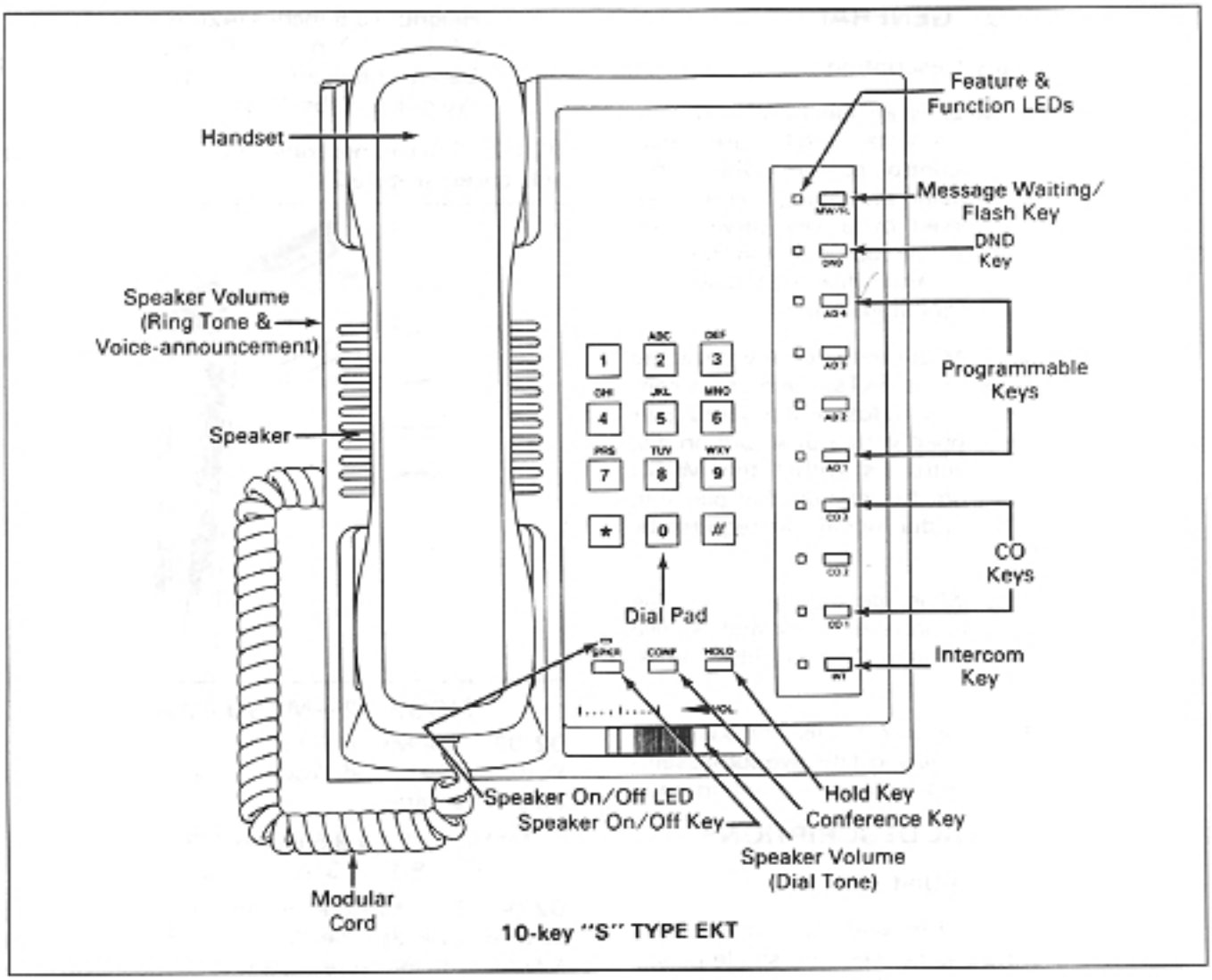

FIGURE 4—10-key "S" EKT

02.05 Optional PCBs (AEPU, AMOU and APFU) are field installed. The AEPU is secured to the MMAU with two screws and is connected to it via two 10-pin connectors. The AMOU and APFU attach to the right side panel and connect via small connector-ended wire harnesses.

02.06 All external devices are connected to the MKSU connector panels with industry-standard connectors.

02.10 Electronic Key Telephones

02.11 Four different Electronic Key Telephones (EKTs) may be used in the ***Strata*** system. The standard EKT (Figure 4), known as a 10-key "S" EKT, is equipped with three permanently dedicated keys and ten line/feature keys. All three optional EKTs are full speakerphones and are equipped with four permanently dedicated keys and either 10 or 20 feature keys. Because of the number of these feature keys, these EKTs are known as a 10-key EKT (Figure 5), a 10-key Busy Lamp Field (BLF) EKT (Figure 6) and a 20-key EKT (Figure 7).

02.12 The 10-key "S" EKT measures:

Height: 3.5 inches (88.9 mm)
Width: 6.0 inches (152 mm)
Depth: 9.0 inches (229 mm)

and is equipped with 13 line and feature keys in addition to its push-button dial pad. Three of the keys are utilized for central office/PBX lines, one for intercom access, and the remaining keys for feature operation.

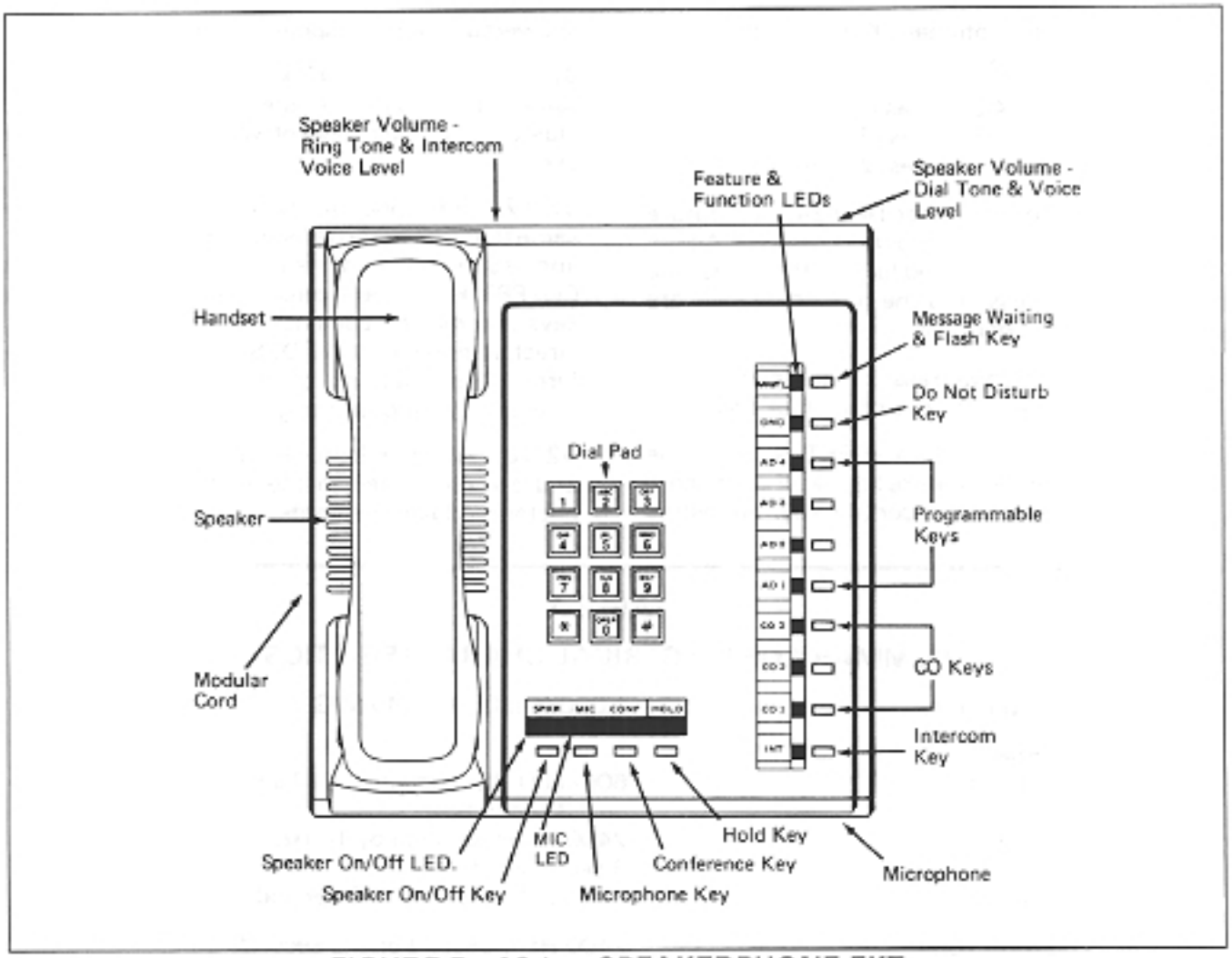

FIGURE 5—10-key SPEAKERPHONE EKT

FIGURE 6—BLF EKT

FIGURE 7—20-key EXECUTIVE EKT

02.13 All three optional EKTs have the same external dimensions:

Height: 4.0 inches (102 mm)
Width: 8.8 inches (224 mm)
Depth: 9.1 inches (230 mm)

Each is equipped with either 14 or 24 line/feature keys in addition to a push-button dial pad. Again, three of the keys are utilized for CO/PBX lines, one for intercom access, and the remaining keys are used for feature operation.

02.14 System software assignments permit some variation to the feature keys on all four EKTs.

02.15. The optional 10-key EKT provides the same programmable feature keys as the standard EKT, plus a microphone control key, handsfree answerback and full speakerphone capability.

02.16 The optional 10-key BLF EKT provides the same features as those listed in Paragraph 02.15, plus an LED indication of which stations are in use.

02.17 The optional 20-key EKT provides the same features as those listed in Paragraph 02.15, and has ten additional feature keys. That is, three CO/PBX keys, one intercom key, and 16 feature keys that may be used as automatic dialing keys, direct station selection (DSS) keys, etc. Three different combinations of feature keys may be selected via programming.

02.18 All EKTs feature modular handset cords and are connected to the system via four-conductor modular line cords.

TABLE A

SUMMARY OF ELECTRICAL CHARACTERISTICS

Station Loop Limits	1,000 ft. (305 M), 24 AWG
Ringing Tone	
CO Line (idle)	600/800 Hz, modulated by 16 Hz, 1 second on—3 seconds off
(busy)	2400 Hz, modulated by 10 Hz, 1 second on—3 seconds off
Intercom Line	600 Hz, 1 second on—3 seconds off
Busy Override Tone	2400 Hz, 1 second on—3 seconds off
Dial Tone (Intercom)	600 Hz, continuous
Ring-back Tone	600 Hz, 1 second on—3 seconds off
Busy Tone	600 Hz, 0.25 second on—0.25 second off
Do Not Disturb Tone	600 Hz, 0.12 second on—0.12 second off
Voice Page Warning Tone	600 Hz, 1 second on only (via EKT speaker)
Executive Override Warning Tone	600 Hz, 0.5 second on only (via handset)
Dialing	Push-button; system-generated DTMF or dial pulse
Primary Power	117 VAC, 60 Hz, 40 VA
Hold Recall Tone	2400 Hz, modulated by 10 Hz, 1 second on—1 second off
Environmental Specifications	
Operating Temperature	32 ~ 122°F (0 ~ 50°C)
Operating Humidity	20 ~ 80% relative humidity (without condensation)

03 ELECTRICAL CHARACTERISTICS

03.01 The electrical characteristics of the system are detailed in Table A.

03.02 The MKSU operates from an external 24 VDC power supply.

03.03 Loss of AC power will cause operational failure of the system. System memory, however, is protected from loss due to power failure with a memory back-up battery. Full system reserve power is available as an option.

04 FEATURES and SERVICES

04.01 The features and services of the ***Strata S*** electronic key telephone system are summarized in Tables B and C, which list the standard and optional features, respectively.

TABLE B

STANDARD FEATURES

SYSTEM

- All Call Voice Page
- Alternate Point Answer
- Automatic Dialing-System
- Automatic Hold Recall
- Automatic Privacy
- Automatic Release from Hold
- Busy Override
- Conference—Multi-station (non-amplified)
- Conference—Multi-trunk (non-amplified)
- Distinctive Ringing
- DTMF and Dial Pulse Compatible
- External Page Interface
- Flash Key (PBX Transfer or CO Dial Tone Recall)
- Flexible Line Ringing Assignment
- Live System Programming
- Message Waiting
- Music-on-hold Interface
- Night Transfer
- Non-blocking Dialing
- Outgoing Call Restriction
- PBX Compatible
- Private CO Lines
- Repeat Last Number Dialed
- Toll Restriction
- Voice or Tone Signalling
- Wall Mountable MKSU

STATION

- Automatic Dialing-Station
- Automatic One-touch Dialing (Programmable)
- Do Not Disturb
- Do Not Disturb Override
- Executive Override of Privacy
- I-called Illumination
- I-hold Illumination
- I-use Illumination
- Modular Handset and Line Cords
- On-hook Dialing
- Push-button Dialing
- Ringing Line Preference

TABLE C

OPTIONAL FEATURES

- 10-key EKT with Speakerphone
- Busy Lamp Field (BLF) EKT
- 20-key Executive EKT
- External Page Amplifier
- Handsfree Answerback
- Microphone Control Key
- Music-on-hold Source
- Speakerphone
- System Battery Back-up
- Wall Mounting Kits for all EKTs

05 SYSTEM OPERATION

05.01 The system (Figure 8) consists of an MKSU, power supply and up to eight EKTs. All connections between the MKSU and the EKTs are made via a customer-provided main distribution frame (MDF). Using modular line cords, the CO lines are then connected between the ACOU and locally-supplied RJ-25C jacks. An external tuner or an AMOU PCB is required if the music-on-hold feature is to be utilized.

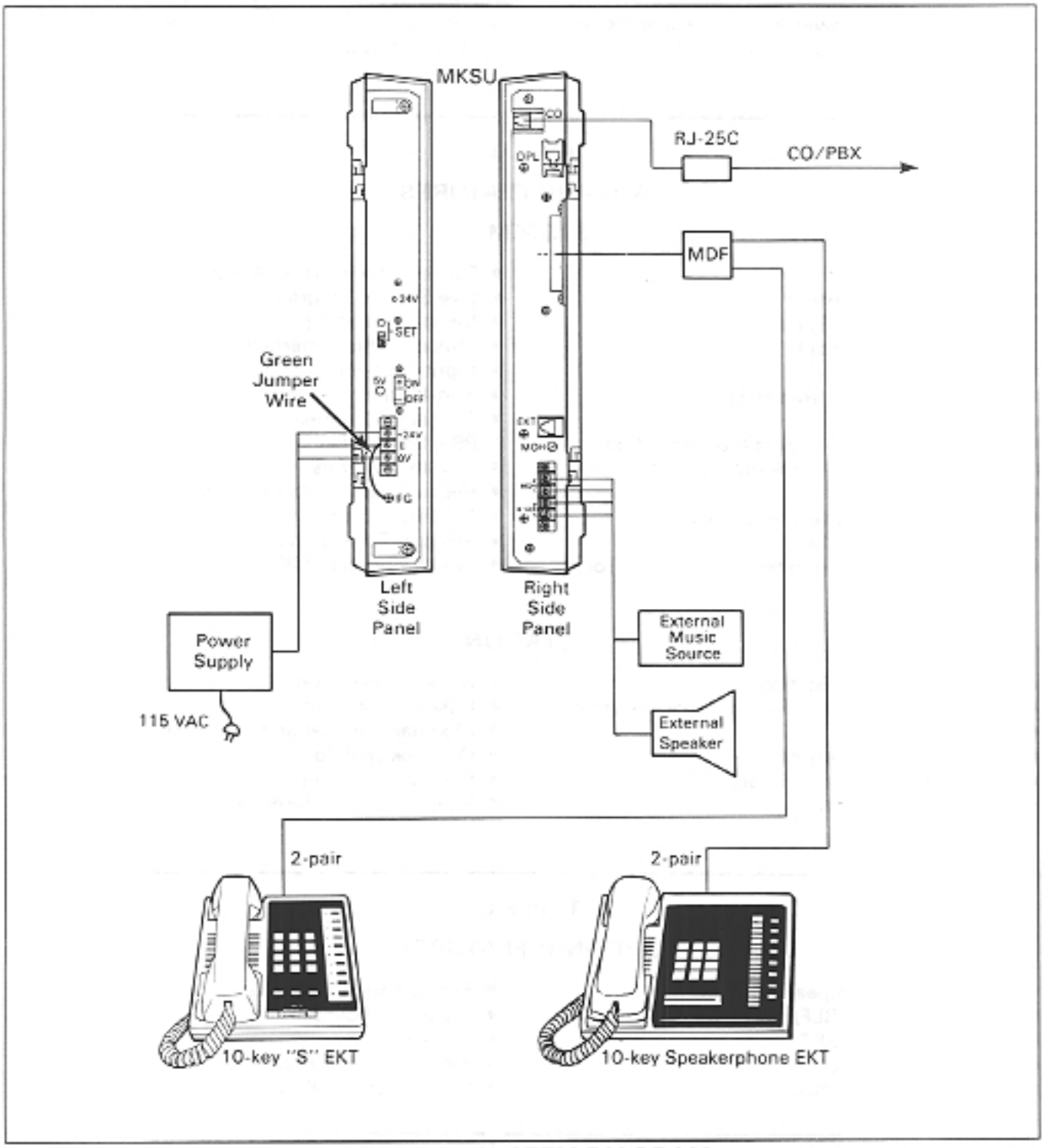

FIGURE 8—SYSTEM DIAGRAM

05.02 A functional block diagram of the ***Strata S*** MKSU is shown in Figure 9; it consists of the main PCB (MMAU), which includes a station interface and central control equipment, and a CO interface (ACOU). The optional Paging Amplifier module (AEPU), internal music-on-hold source (AMOU), and Power Failure module (APFU) are also shown.

05.03 Connections between the station voice lines and the CO lines are via the switching matrix provided on the MMAU. A similar matrix is provided on the MMAU for intercom connection, paging connections and for the distribution of the various system tones (Dial, Busy, etc.).

05.04 The system is under the control of a single-chip microprocessor, which is located, along with the system programs and data memories, on the MMAU PCB.

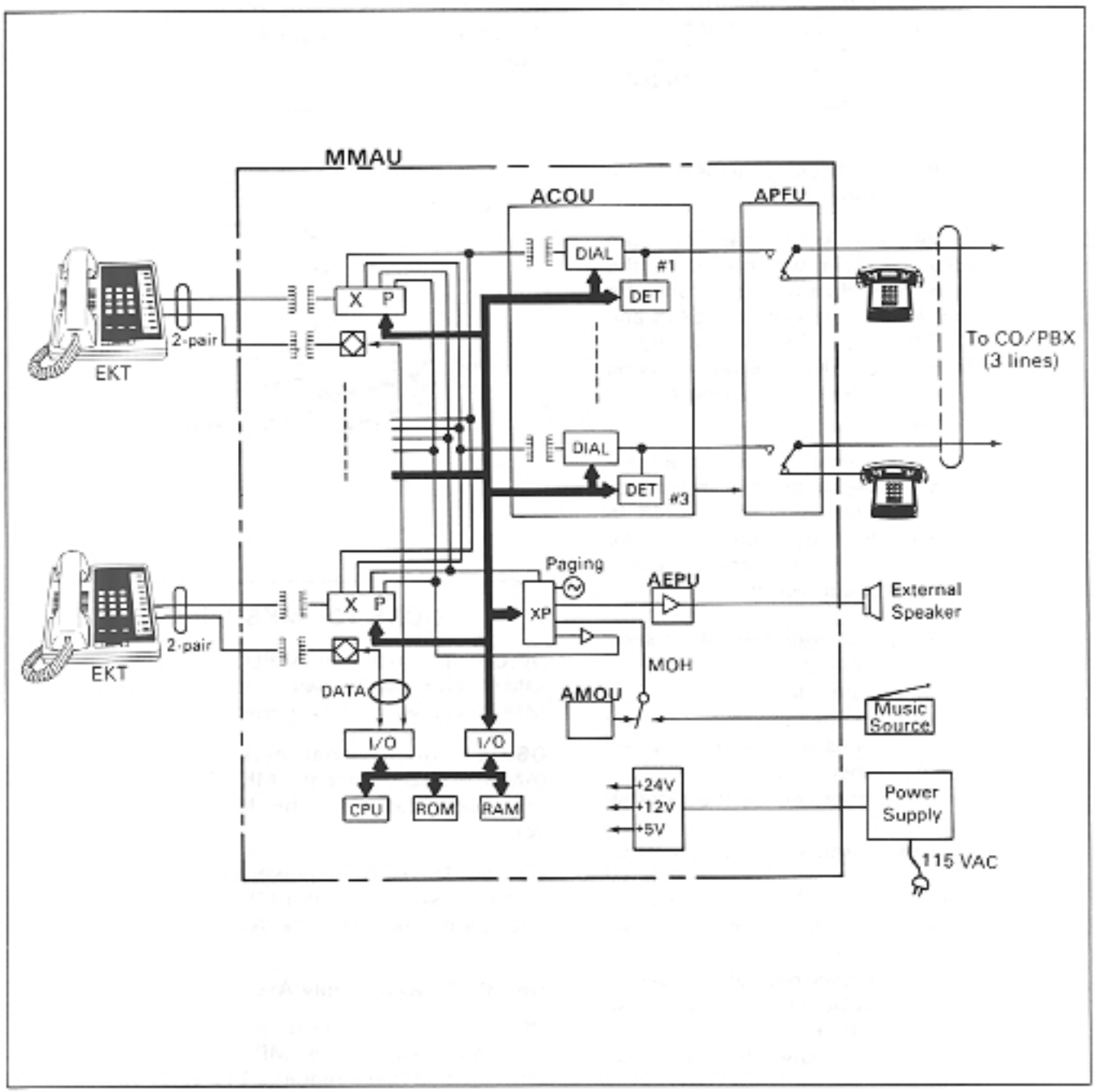

FIGURE 9—FUNCTIONAL BLOCK DIAGRAM

06 SYSTEM CONFIGURATION

06.00 Key Service Unit

06.01 Complete with all options, the MKSU utilizes five circuit boards. The names and functions of the PCBs are:

ACOU (MF or DP):
An interface between the MKSU and the public telephone network or PBX lines. Ring detection, hold and dial outpulsing for three circuits are performed by this PCB. Depending upon local CO requirements, an MF or DP type of ACOU will be provided (MF for DTMF outpulsing; DP for rotary dial outpulsing).

MMAU:
The main PCB of the MSKU, consists of the following four functions:

a) Station Interface—An interface between the MKSU and EKTs, which includes the solid-state space division matrix used for voice connections between the EKTs and the CO/PBX lines. Two-pair wiring is required for each EKT; one pair carrying voice and the other pair carrying data to and from the EKT.

b) Control—All system control functions are performed by the single-chip micro-processor. The system program stored in ROM, the RAM for system operations, and the RAM for system data storage are also located on this circuit board.

c) Tone—Performs a number of miscellaneous system functions:
- Generates system tones.
- Provides the switching matrix for the delivery of tones for both paging and intercom connections.
- Houses the interface for the external page.
- Houses the interface for music-on-hold.

d) Power Regulating—Performs the following:
- Provides connection points for the 24 VDC input power.
- Houses the voltage regulators that provide 12 and 5 VDC for system operation.
- Houses a circuit breaker that protects the 24 VDC, EKT, and MKSU circuits.

AEPU:
An optional 3-watt amplifier for external paging.

AMOU:
An optional music-on-hold source.

APFU:
An optional power failure transfer module used to transfer the CO lines to single line telephones in the event of a power failure.

06.02 The MKSU arrangement illustrated in Figure 10 shows the locations of the various PCBs. The MMAU, which hosts the ACOU, is secured to the MSKU with six screws. The ACOU, attached to the MMAU with four screws, is connected to it via four 10-pin connectors.

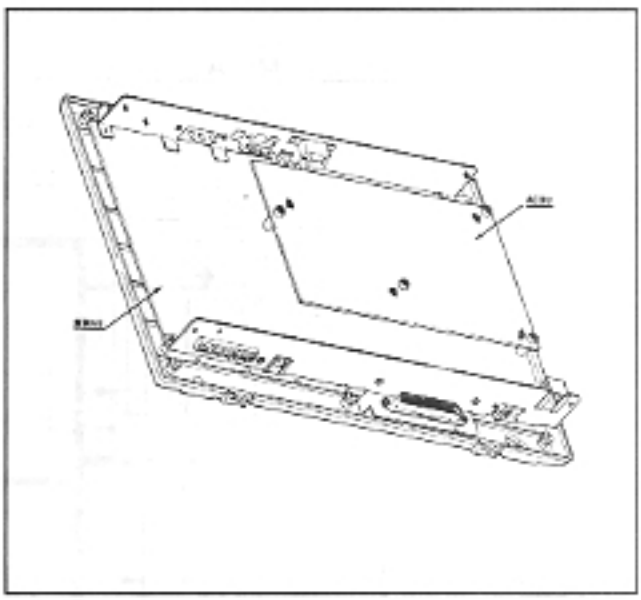

FIGURE 10—MKSU (Interior)

06.03 The optional AEPU is attached to the MMAU with two screws, and connected with the MMAU via two 10-pin connectors.

06.04 The optional music-on-hold source (AMOU) is secured to the MKSU right side panel, and connected with the MMAU via a 3-pin connector.

06.05 The optional power failure transfer unit (APFU) is secured to the MKSU right side panel and connected with the ACOU via four 2-pin connectors.

06.10 Power Supply Assembly

06.11 The system requires 24 VDC. Two power supplies are available; MPSA-200 and MPSA-512. Each of these requires 117 VAC, 60 Hz. The permissible AC input voltage range is 90 ~ 130 VAC.

06.12 An optional battery back-up unit (PBBU) is available for the MPSA-200. With the optional battery back-up assembly installed, all functions of the ***Strata S*** system will continue to operate for several hours (the actual time period is in direct ratio to the type and size of batteries selected) after a loss of normal electrical power. No calls will be disconnected during switch-over to battery power.

FIGURE 11—10-key "S" EKT

06.20 Station Equipment

06.21 The principal components of the 10-key "S" electronic key telephone (Figure 11) are: handset, dial pad, speaker, sliding ringing/speaker volume control, 3-position volume control, one intercom key, three CO/PBX line keys and nine feature keys. LED indicators are provided for all keys except [HOLD] and [CONF] keys. With the exception of the three permanently dedicated keys, the feature keys can be assigned to one of two modes by programming (see Figure 12).

06.22 Standard features of the 10-key "S" EKT include, among other standard features, paging, one-touch automatic dialing keys, and auto-redial. In initialized mode, three of the keys are utilized for CO/PBX lines, one for intercom access, four keys for one-touch automatic dialing and one each for Do Not Disturb and Message Waiting/Flash.

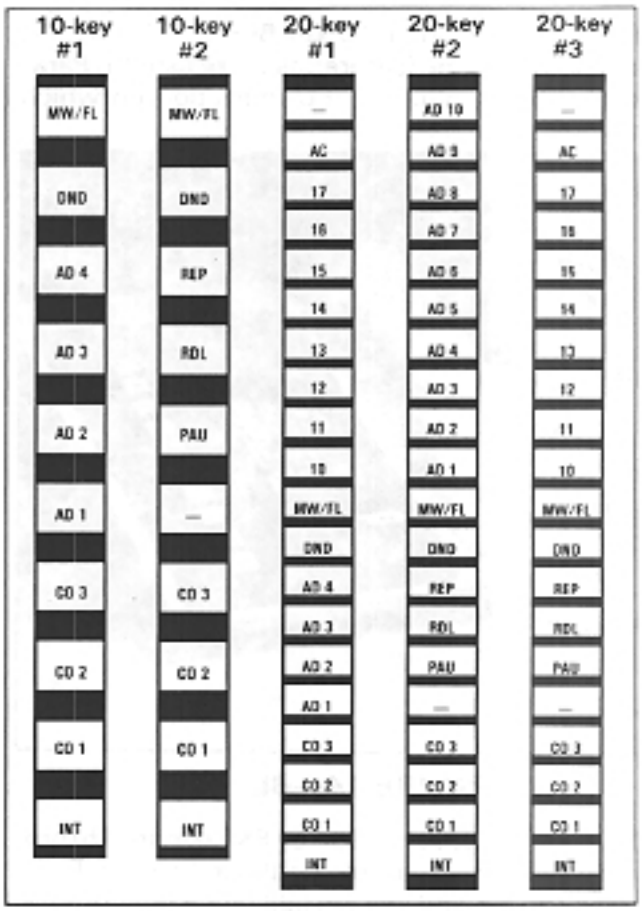

FIGURE 12—KEY LAYOUT

06.23 The optional 10-key EKT (Figure 13) provides the same programmable feature keys as the standard EKT, plus a microphone control key [MIC], handsfree answerback and full speakerphone capability.

FIGURE 13—10-key EKT

06.24 The optional 10-key BLF EKT (Figure 14) provides the same features as those listed in Paragraph **06.23**, plus an LED indication on which stations are in use.

FIGURE 14—BLF EKT

06.25 The optional 20-key EKT (Figure 15) provides the same features as those listed in Paragraph **06.23**, and has ten additional feature keys. That is, three CO/PBX keys, one intercom key, and 16 feature keys that may be used as automatic dialing keys, direct station selection (DSS) keys, etc. Three different combinations of feature keys may be selected via programming, as shown in Figure 12.

FIGURE 15—20-key EKT

06.26 All EKTs feature modular handset cords and are connected to the system via 4-conductor modular line cords.

06.27 All EKTs are easily converted for wall mounting with an optional kit.

06.30 Installation

06.31 External devices are connected to the MKSU via connectors and terminals on the side panels.

a) CO/PBX lines are connected to the MKSU right side panel via a 3-pair modular cord.

b) The station connection points are extended from the MKSU to the MDF using one cable equipped with a standard 50-pin amphenol-type connector. The individual EKTs are connected to the MDF with 2-pair station cable.

c) Screw-terminal barrier strips are mounted on the side of the MKSU to provide attachment points for the following connections:

24 VDC power input (left side)
Music-on-hold source input (right side)
External page output (right side)

06.32 The power supply is mounted to the wall separately from the MKSU and connected to the 24 VDC input on the MKSU left side.

06.40 Maintenance

06.41 Faults in ***Strata S*** are repaired by replacing any faulty component (EKT, printed circuit board, sub-assembly, etc.) and returning it to the manufacturer for repair.

07 FEATURES and OPERATION

07.00 General

07.01 This section contains brief descriptions of the ***Strata S*** features listed earlier in Tables B and C and some associated operating instructions. Detailed operating instructions can be found in either the ***Strata S*** USER GUIDE or *Operating Procedures*, Section 100-003-400, ***Strata S*** *Installation and Maintenance Manual.*

07.10 Standard Features

07.11 System

All Call Voice Page:
Dialing a 1-digit access code permits a station user to page via all EKT speakers and (optionally) the External Page speaker simultaneously.

Alternate Point Answer:
CO/PBX or intercom calls can be answered from any station.

Automatic Dialing-System:
This standard feature allows 40 numbers to be stored in the system memory. After selecting an outgoing line, any station user can cause one of the stored numbers to be outpulsed by dialing the proper address code.

Automatic Hold Recall:
A CO line placed on hold by any station will recall that station after a programmable period of time.

Automatic Privacy:
Privacy is automatic on all connections.

Automatic Release from Hold:
The system automatically releases held CO lines if a disconnect signal is received from the central office.

Busy Override:
After dialing a busy station and receiving a busy tone, the caller can dial a [2] and cause a tone burst to be sounded via the called EKT speaker.

Conference—Multi-station (non-amplified):
Conferencing is permitted to a maximum of four stations and one CO or the intercom line.

Conference—Multi-trunk (non-amplified):
Conferencing of two CO lines and three stations is permitted.

Distinctive Ringing:
CO line and intercom calls are distinguished by different ringing tones.

DTMF and Dial Pulse Compatible:
DTMF or dial pulse signalling can be sent to the CO/PBX line by installing the proper ACOU PCB type.

External Page Interface:
A 600-ohm connection point is provided for a customer-provided external speaker. An amplifier is also required, which can be mounted externally, or the AEPU (see Paragraph **07.20**, External Page Amplifier) can be mounted in the MKSU. If the AEPU is used, the output impedance is 8 ohms. This page circuit is accessed as part of the All Call Voice Page feature.

Flash Key (PBX Transfer or CO Dial Tone Recall):
All EKTs are equipped with a Message Waiting/Flash [MW/FL] key which, when operated while connected to a CO/PBX line, causes a timed "flash" to be transmitted to the CO or PBX. The timing of the flash can be programmed to signal a PBX for feature operation or can be long enough to cause a disconnect and dial tone recall on a CO line. Also see Message Waiting.

Flexible Line Ringing Assignment:
A programmable ring or no ring option is provided for each line selectively by each station. Each line may be programmed to ring all eight stations.

Live System Programming:
Live system programming is accomplished without service interruption to other station users by placing the system in the special programming mode and inputting data via station 17. Station 17 is the only station that is "down" during programming.

Message Waiting:
The designated Message Center can indicate a message is waiting for any station with the Message Waiting LED of that station. Also see Flash Key.

Music-on-hold Interface:
An interface is included for a customer-provided external music source (see Paragraph **07.20**, Music-on-hold Source). CO lines placed on hold will be connected to this source.

Night Transfer:
CO lines can be programmed to ring different stations while in the "Day" or in the "Night" mode. If this feature is to be used, the [DND] (Do Not Disturb) key on station 10 is reassigned to the **NT** function and is then used to select the "Day" or "Night" mode.

Non-blocking Dialing:
Dialing is permitted on the intercom and all three CO lines simultaneously.

Outgoing Call Restriction:
Any station can be selectively restricted from originating calls on any or all CO lines. However, the station will still receive calls on the restricted line(s).

PBX Compatible:
Strata S features, such as toll restriction and automatic dialing, are compatible with PBX operation.

Private CO Lines:
Restrictions may be programmed into the system so that selected CO line(s) may appear only on selected station(s).

Repeat Last Number Dialed:
The last number dialed by each station is always stored by the system and will be dialed automatically whenever the station user selects an outgoing line and depresses the [#] key.

Toll Restriction:
Selectively programmed on a per-station, per-line basis. ***Strata S*** performs toll restriction by rejecting the numbers [0] and [1] as the first or second digit and limiting the total number of digits dialed to seven or eight.

Voice or Tone Signalling:
A programmable system feature that optionally selects either tone ringing or voice page as the primary method of intercom call signalling. The calling station, however, may choose the alternate method by dialing [1] following the station number.

Wall Mountable MKSU:
The MKSU is designed for wall mounting only.

07.12 Station

Automatic Dialing-Station:
Each EKT can store a private list of ten frequently used telephone numbers.

Automatic One-touch Dialing (Programmable):
This feature can be used with an EKT that includes [AD] keys in its programmed assignments.

a) A station number can be stored at each [AD] key.

b) A number stored in the memory can be sent over a CO line by depressing the appropriate [AD] key after accessing the CO line.

NOTE:
Each [AD] key is counted as one of the 10 possible stored numbers available to each station.

Do Not Disturb:
This feature is activated and deactivated by alternate depressions of the [DND] key. A station calling a station that is in the DND mode will receive a fast busy tone.

Do Not Disturb Override (Programmable Option):
After reaching a DND station, that station may be advised that a call is waiting by dialing [2]. A tone signal will be heard at the DND station.

Executive Override of Privacy:
A station that is programmed for this feature will override the automatic privacy feature and enter any existing conversation within the system. A warning tone, however, is inserted before the overriding station is actually connected. A maximum of two stations can be programmed for executive override.

I-called Illumination:
A distinctive flash appears on the intercom LED at the EKT that is actually being called.

I-hold Illumination:
The EKT user is shown a distinctive LED flash to indicate a line actually placed on hold at that EKT. All other stations see the usual on-hold flash.

I-use Illumination:
A distinctive flash rate shows the line presently in use at a given EKT. Other stations see a steadily illuminated LED for that line.

Modular Handset and Line Cords:
All EKTs are equipped with modular handset and line cords.

On-hook Dialing:
Strata S lets you dial your calls with the handset still on-hook. Call progress can be heard via the telephone speaker; no need to pick up the handset until your party answers.

Push-button Dialing:
All ***Strata S*** EKTs are equipped with push-button dial pads.

Ringing Line Preference:
A line ringing at a station can be answered by merely lifting the handset or depressing the [SPKR] key (optional speakerphone EKTs only). The ringing line will be automatically selected.

07.20 Optional Features

10-key EKT with Speakerphone:
An optional EKT provides handsfree answerback and full speakerphone capability.

Busy Lamp Field (BLF) EKT:
An optional 10-key EKT provides handsfree answerback, full speakerphone capability, and an LED panel showing the busy/idle status of

each station. A station in the DND mode will show as busy.

20-key Executive EKT:
An optional executive unit provides handsfree answerback, full speakerphone capability and, via 10 additional feature keys, automatic dialing access, four one-touch automatic dialing telephone numbers, redial last number dialed, a pause key, or may be used as a DSS station.

External Page Amplifier:
This optional external page 3-watt amplifier (AEPU PCB) allows a customer-provided external speaker to be accessed in an all-call operation by dialing [8] on the intercom (see Paragraph **07.11**, External Page Interface).

Handsfree Answerback:
All optional EKTs are equipped for handsfree answerback on voice-announced intercom calls.

Microphone Control Key:
All optional EKTs have a [MIC/MUTE] key that may be used to cut off the microphone when the speakerphone is in use, thereby permitting a private local conversation.

Music-on-hold Source:
This optional electronic music source (AMOU PCB), when installed, illiminates the need for a customer-provided external music source and provides electronic-generated music to CO lines placed on hold.

Speakerphone:
All optional EKTs are fully functional speakerphones.

System Battery Back-up:
An optional PCB can be plugged into the MPSA-200 power supply to provide automatic switching to standby battery power. During normal power conditions the batteries are kept fully charged by the power supply.

Wall Mounting Kits for EKTs:
All ***Strata S*** EKTs are easily converted for wall mounting with optional kits.

INSTALLATION
SECTION 100-003-200
JULY 1984

Strata S

INSTALLATION INSTRUCTIONS

Strata S

INSTALLATION INSTRUCTIONS

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Strata S

INSTALLATION INSTRUCTIONS

ILLUSTRATION LIST

01 GENERAL

01.01 This section describes the installation procedures necessary to ensure proper operation of the ***Strata S*** system.

02 PACKING

02.00 Inspection

02.01 When a ***Strata S*** system is received, examine all packages and carefully note any visible damage. If any damage is found, bring it to the attention of the delivery carrier and make the proper claims.

02.02 Check the number of cartons and the contents of the ***Strata S*** shipment against the purchase order and packing slip. If it is determined that any cartons are missing, contact your delivery carrier immediately. If it is determined that any equipment within a carton is missing, contact your Toshiba supplier immediately.

02.03 After unpacking (prior to beginning the installation), inspect all equipment for damage. If any damage is detected, contact your delivery carrier immediately. If possible, retain all original the packing material.

CAUTION:
When handling (installing, removing, examining, etc.) a printed circuit board, do not touch the back (soldered) side or the edge connector. Always hold a PCB by its edge.

03
MKSU LOCATION REQUIREMENTS

03.00 Power Requirements

03.01 The ***Strata S*** MKSU requires 24 VDC. This is provided by the power supply (MPSA), which in turn requires power from a grounded 115 VAC outlet. The outlet should be protected separately and rated at 15 amps.

03.02 The 54-inch cord provided to connect the MPSA to the MKSU dictates the relative location of the power supply. The power supply is also equipped with a 10-ft. AC power cord.

03.03 Two power supplies are available; MPSA-200 and MPSA-512. The MPSA-200 is used when battery backup power is required.

03.04 An optional battery backup unit (PBBU) is available for the MPSA-200. It is a printed circuit board that mounts inside the power supply housing. The recommended battery pack, which is customer-supplied, consists of two maintenance-free automobile 12 VDC batteries (maximum: 80-amp/hour rating). With the optional PBBU assembly installed, all functions of the ***Strata S*** system will continue to operate for several hours after a loss of normal electrical power (the actual time period is in direct ratio to the type and size of batteries selected). No calls will be disconnected during switch-over to battery power.

03.10 Ventilation Requirements

03.11 Sufficient ventilation should exist to allow dissipation of the heat generated by the power supply and MKSU.

03.20 Environmental Factors

03.21 Humidity at the MKSU location should be within 20 ~ 80% (without condensation), and the temperature should be relatively constant within a range of 32 ~ 122°F (0 ~ 50°C). In addition, exposing the MKSU to an excessive amount of dust and airborne chemicals may cause a failure—take this into consideration during site selection.

03.30 Cabling Considerations

03.31 The MKSU must be located so that all stations are within 1000 cable feet (305 m) of it. Acceptable cable is 22 or 24 AWG inside telephone station cable, jacketed but not shielded, having two or more twisted wire pairs.

04 MKSU MOUNTING

04.00 Wall Mounting the MKSU

04.01 To mount the MKSU on the wall perform the following steps:

1) Remove both side covers from the MKSU (Figure 1).

2) Hold the MKSU against the wall in its planned location and mark the screw locations through the centers of the two keyholes on the upper sides of the MKSU.

3) Lay the MKSU aside for the moment and start two screws into the wall at the marked locations. Use 1-¼-inch panhead wood screws and stop when they have penetrated to half their depth.

4) Hang the MKSU on the two screws and start two additional screws in the lower two holes. Tighten all four screws.

5) Knockouts are provided on the top and bottom of the side covers to permit cables to enter the MKSU. Remove the appropriate knockouts.

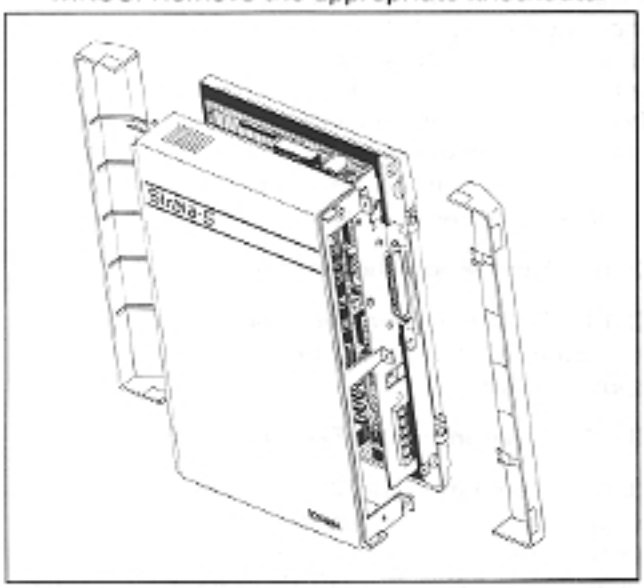

FIGURE 1—SIDE COVERS

6) Reinstall the side covers.

7) Refer to Section **100-003-250**, *MPSA-512 Installation* (or Section **100-003-255**, *MPSA-200 Installation*), and follow the appropriate instructions for installing the selected MPSA. A completed installation with an MPSA-512 should appear as shown in Figure 2.

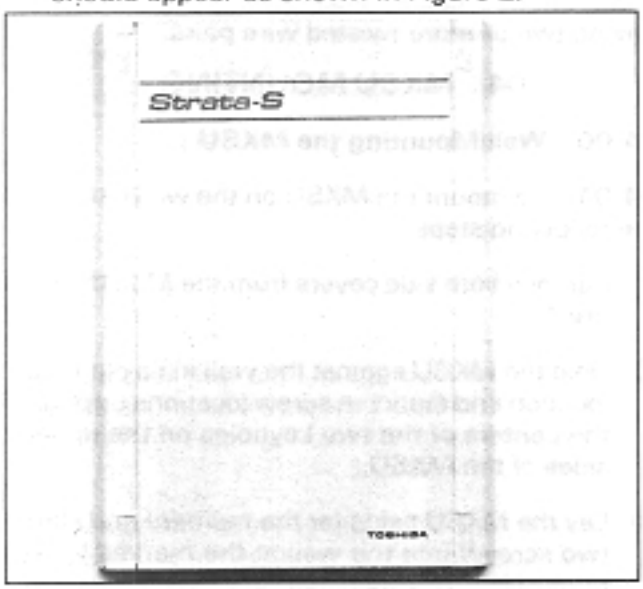

FIGURE 2—WALL MOUNTED MKSU

05 PRINTED CIRCUIT BOARD DESCRIPTIONS

05.01 A maximum of five PCBs can be installed in the MKSU. A maximum of one card of each type can be installed in the system (Figure 3). They are:

- MMAU (KSU Main Unit)
- ACOU (Central Office Unit)
  - Two types of ACOU are available:
    a) MF—used when DTMF outpulsing is required.
    b) DP—used when rotary dial outpulsing is required.
- AMOU (Music-on-hold Source)
  - Installed when Music-on-hold feature is required without an external music source.
- APFU (Power Failure Transfer Unit)
  - Provides a switch-over of all CO/PBX lines to dedicated, customer-provided standard telephones upon power failure.
- AEPU (3-watt External Page Amplifier Unit)
  - Installed when the External Page feature is required with no external PA amplifier.

The MMAU and ACOU PCB are factory-installed in the MKSU.

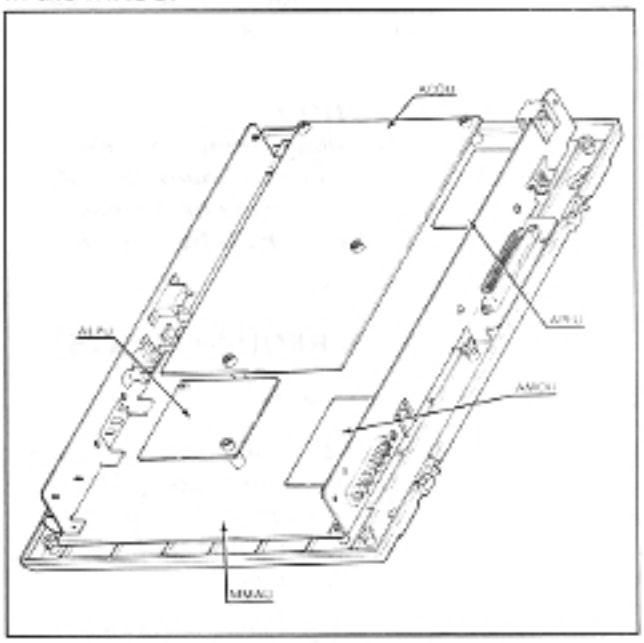

FIGURE 3—MKSU WITH PCBs

06 OPTION SELECTION

06.00 External Page Option Selection

06.01 The external page output appears at the terminals labeled 8/600 on the MKSU right side panel (Figure 4). The output impedance can be selected to be either 8Ω or 600Ω, and is factory-set for 600Ω. In the 600Ω mode an external PA

amplifier is required. Eight ohms is used when the AEPU PCB is installed. The output will then be via a 3-watt amplifier on the AEPU.

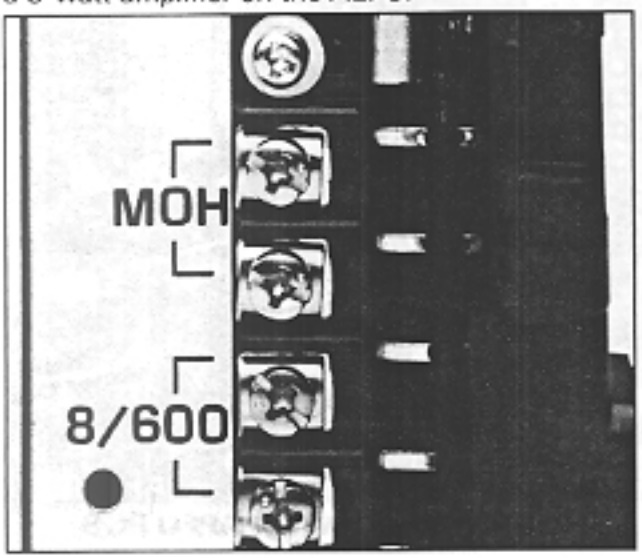

FIGURE 4

EXTERNAL PAGE TERMINALS

06.02 External page options are selected using the **SW2** switch located on the MMAU (Figure 5). Decide if the 8 or 600Ω impedance is required and then make the selection by positioning **SW2** to "8" or "600".

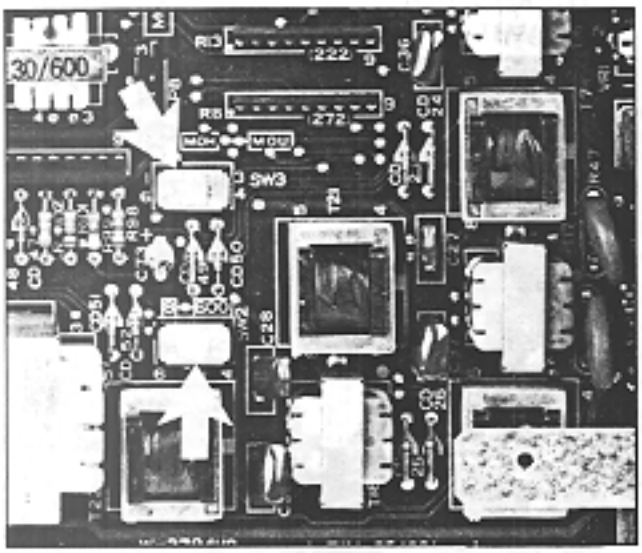

FIGURE 5—MMAU SWITCHES

06.10 Music-on-hold Option Selection

06.11 A customer-provided MOH program source or the optional AMOU PCB may be used. The AMOU provides a source of synthesized music.

06.12 The MOH option is selected using the **SW3** switch located on the MMAU (Figure 5). **SW3** is factory-set in the MOH position for use of an external program source. Move **SW3** to the side marked MOU if the AMOU PCB is to be used.

07 PCB INSTALLATION

07.00 General Information

07.01 The MMAU and ACOU PCBs are factory-installed in the MKSU.

07.02 If any of the optional PCBs (AEPU, AMOU or APFU) are required, the MKSU top cover must be removed as follows:

1) Remove both side covers by swinging them to the left or right, as necessary, and then lifting them straight up.

2) Remove the three screws from the MKSU left side per Figure 6A.

3) Remove the two cable straps and three screws from the MKSU right side per Figure 6B.

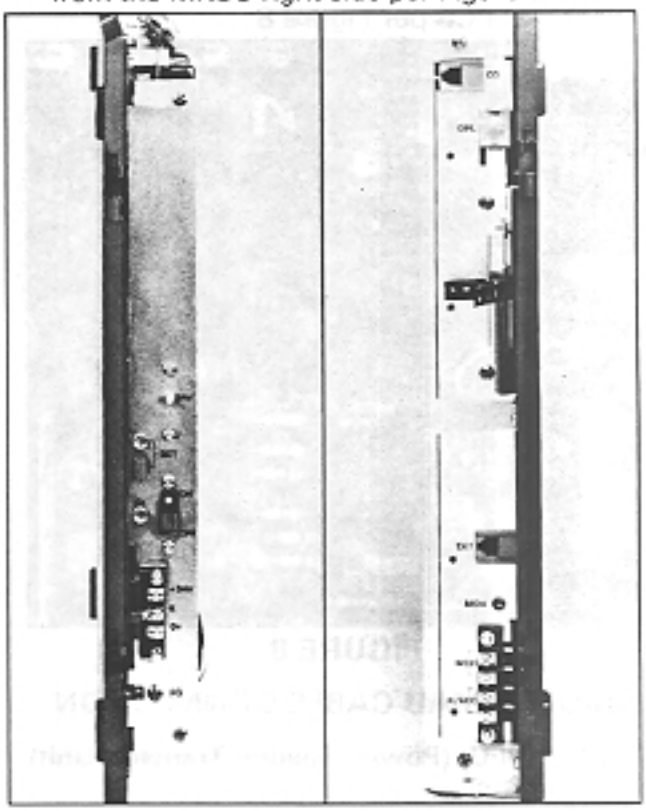

FIGURE 6—MKSU COVER SCREWS

4) Lift the MKSU cover off.

07.10 AMOU (MOH Source) Installation

07.11 Secure the AMOU to the lower part of the MKSU right side panel with the two screws pro-

vided, as shown in Figure 7.

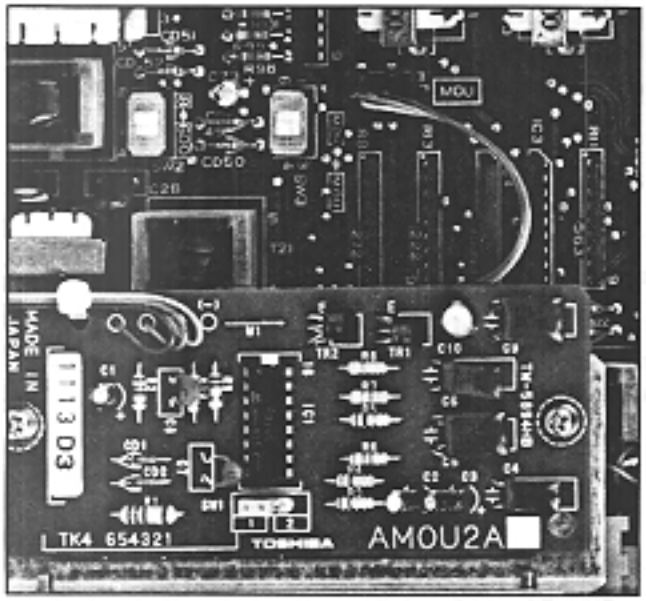

FIGURE 7—MOUNTED AMOU PCB

07.12 Connect the AMOU cable to **P8** on the MMAU PCB per Figure 8.

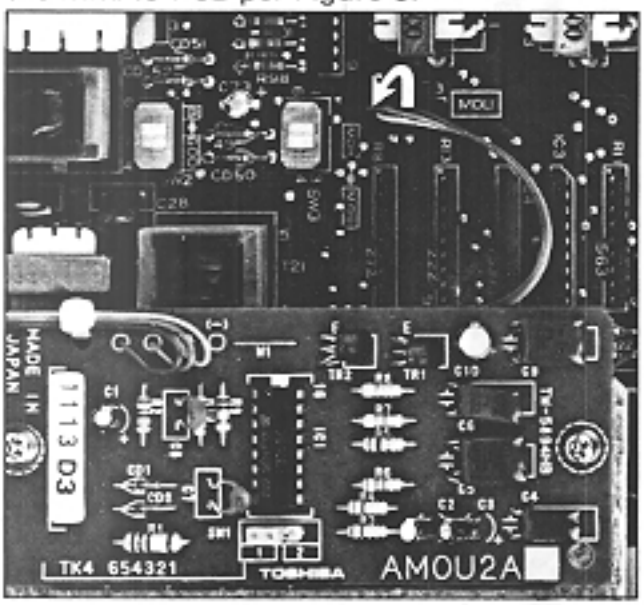

FIGURE 8

AMOU/MMAU CABLE CONNECTION

07.20 APFU (Power Failure Transfer Unit) Installation

07.21 Secure the APFU to the upper part of the MKSU right side panel with the two screws provided, as shown in Figure 9.

07.22 Connect the 8-pin jack (from the OPL jack) into the **P1** plug on the APFU (Figure 10).

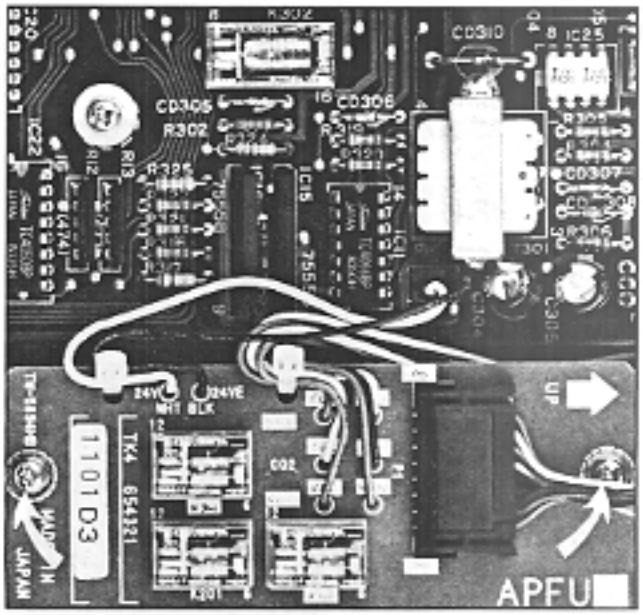

FIGURE 9—MOUNTED APFU PCB

07.23 Refer to Figure 10 and connect the four 2-wire jacks from the APFU to their respective plugs on the top and right side of the ACOU as follows:

APFU	ACOU
WHT, BLK (Power)	P8
RED, GRN (CO 1)	P9
YEL, BLK (CO 2)	P10
BLU, WHT (CO 3)	P11

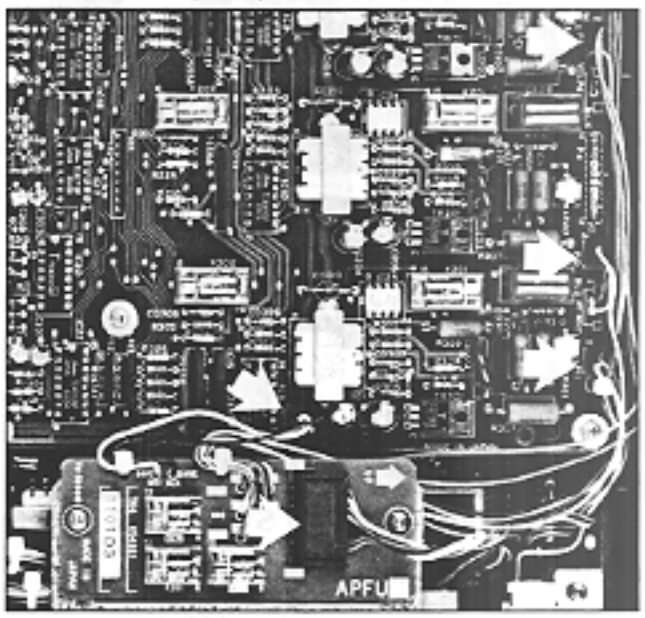

FIGURE 10—APFU CONNECTIONS

07.30 AEPU (External Page Unit) Installation

07.31 The AEPU is installed in the position

shown in Figure 11. Mount the PCB on the 10-pin connectors **P5** and **P6** (note the "▶" arrow on the AEPU and pin alignment when positioning the PCB) and secure it with the two screws provided (Figure 11).

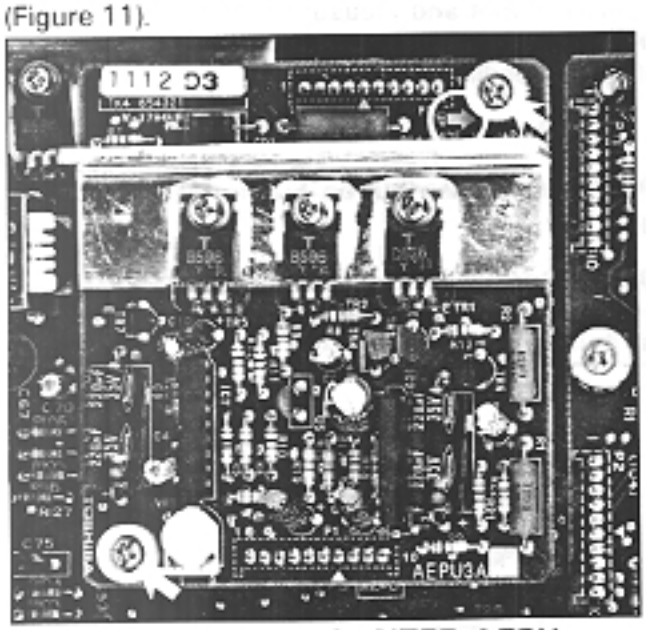

FIGURE 11—MOUNTED AEPU

07.32 Note the location of the volume control in Figure 11. It will be necessary to leave the MKSU cover off until this has been adjusted per Paragraph **11.30**.

07.40 MKSU Cover Installation

07.41 Reinstall the MKSU top cover in the reverse order the instructions in Paragraph **07.02**.

08 POWER CONNECTION

08.00 Cable Connection

08.01 Plug the power supply into a 115 VAC outlet and check its output voltage to be sure it is between 23.2 ~ 28.2 VDC. If the voltage is not within these limits, replace the power supply before proceeding.

IMPORTANT:
On the MPSA-512, verify that the power switch is ON—it will be illuminated

08.02 Disconnnect the power supply from the 115 VAC outlet. Remove the plastic protective cover from the power terminal strip on the MKSU left side panel, and, with the supplied cord, connect the "+24V", "0V" and "G" terminals on the power supply to the corresponding terminals on the MKSU. Secure the DC cord to the MKSU using the plastic cable clamp provided.

IMPORTANT:
On the MPSA-200 and the MKSU, these terminals are titled "+24V", "0V" and "E", respectively.

08.03 The Toshiba ***Strata S*** electronic key telephone system requires a solid earth ground on the "E" terminal on the MKSU left side panel. Failure to provide such a ground may lead to confusing trouble symptoms in the system and, in extreme cases, circuit board failure. In most installations, within the continental United States, the ground provided by the "third wire ground" at the commercial power outlet will be satisfactory for all ***Strata S*** requirements. However, in a small percentage of installations this ground may be installed incorrectly. Therefore, prior to installing a ***Strata S*** system, the third wire ground must be tested for continuity by either measuring the resistance between the 3rd prong terminal (earth ground) and a metal cold water pipe, or by using a commercially available earth ground indicator. If neither procedure is possible, then the test procedures outlined in Paragraph **08.10** should be performed.

WARNING!
Hazardous voltage that may cause death or injury is exposed during the following test. Use great care when working with AC powerline voltage.

08.10 Test Procedure

1) Obtain a suitable voltmeter and set it for a possible reading of up to 250 VAC.

2) Connect the meter probes between the two main AC voltage points on the wall outlet. The reading obtained should be 90 ~ 130 VAC.

3) Move one of the meter probes to the 3rd prong terminal (GND). Either the same reading or a reading of 0 volts should be obtained.

4) If the reading is 0V, leave one probe on the GND terminal and move the other probe to the 2nd voltage terminal. If a reading of 0V is obtained on both voltage terminals, the outlet ***is not*** properly grounded. Omit steps 5 ~ 7, and proceed directly to step 8.

5) If a reading of 0V on one terminal and a reading of 90 ~ 130 VAC on the other terminal is not obtained, the outlet ***is not*** properly grounded. Omit steps 6 & 7, and proceed directly to step 8.

6) If a reading of 0V on one terminal and a reading of 90 ~ 130 VAC on the other terminal is obtained, remove both probes from the outlet.

7) Set the meter on the "OHMS/Rx1" scale, place one probe on the GND terminal and the other probe on the terminal which produced a reading of 0V. A reading of less than 1Ω should be obtained. If a reading of more than 1Ω is obtained, the outlet *is not* adequately grounded.

8) If the above tests show that the outlet is improperly grounded, that condition should be corrected by a qualified electrician (per Article 250 of the National Electrical Code) before the ***Strata S*** system is connected.

08.11 Ensure that the power switch on the MKSU is **OFF**, then plug the power supply into the 115 VAC outlet and measure the voltage at the MKSU input terminals. Correct any problems before proceeding.

09 CABLE CONNECTIONS

09.00 Main Distribution Frame (MDF) Configuration

09.01 One 66MI-50 split connection block (Figure 12) is recommended as the ***Strata S*** main distribution frame (MDF).

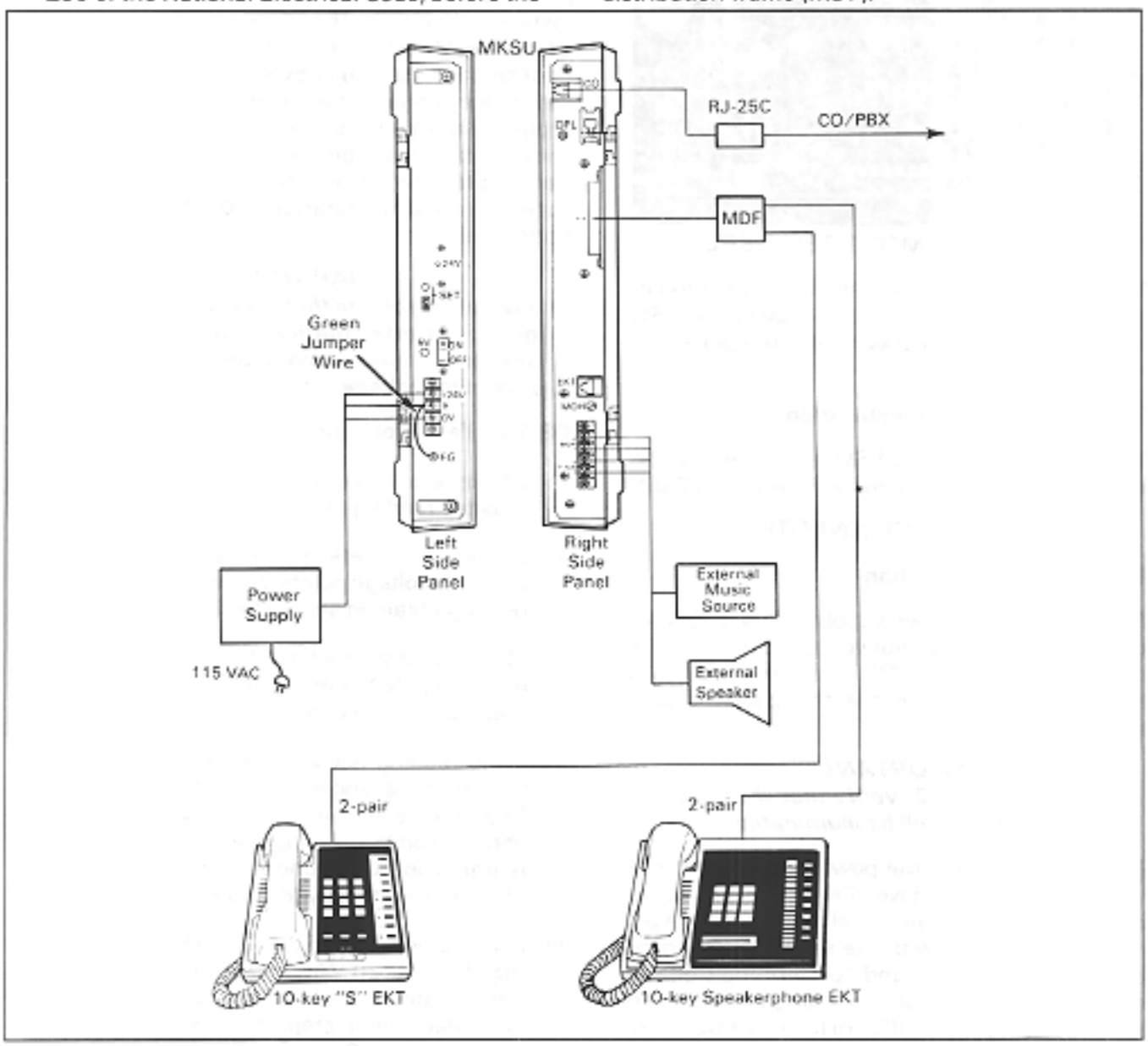

FIGURE 12—SYSTEM DIAGRAM

09.02 A 25-pair male-amphenol-ended cable is connected directly to the female-amphenol-connector on the right side connector panel (Figure 13).

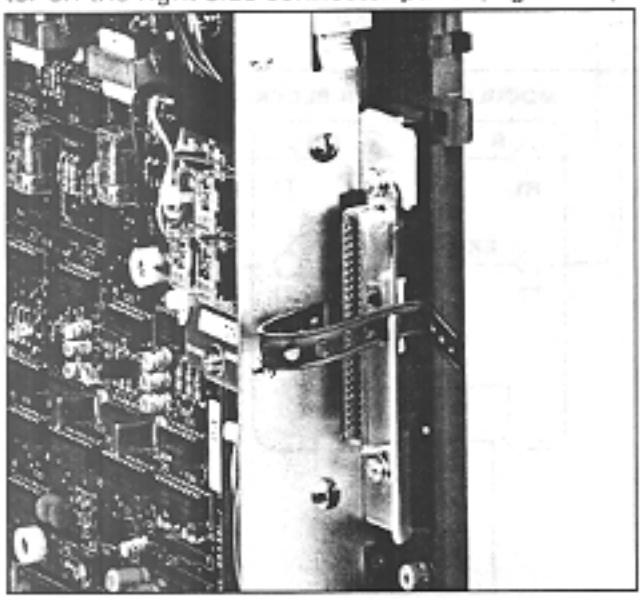

FIGURE 13—MKSU CABLE CLAMPING

09.03 Secure the cable to the panel using the plastic strap and cable clamp provided.

09.04 Use the industry-standard color code sequence and terminate the cable on the MDF block as shown in Figure 14.

09.10 Station Cable Connections

09.11 Terminate the individual 2-pair station cables consecutively on the MDF block; attach them to the side opposite the MKSU cable. Use bridging clips to connect the MKSU cable pairs to the station cable pairs. Refer to Figure 14 for a completed MDF block.

09.12 The cables used for station wiring should be two twisted pair.

09.13 The overall length of the cable run must not exceed 1000 ft. (305 m) for 24 AWG wire.

IMPORTANT:
When installing station cable, do not run parallel to and within 3 ft. of an AC power line. Such power lines should be crossed at right angles (90°) only.

09.14 At the station locations, terminate the station cable in a conventional 4- or 6-conductor modular station connector to accommodate the modular line cord from the EKT. The standard modular EKT cord length is 7 ft., while the maximum allowed length is 25 ft.

09.15 Figure 14 shows the EKT wiring arrangement.

09.16 The various manufacturers of modular station blocks have employed different color codes to indicate the sequence of pairs in their blocks. However, the color code most commonly used is shown in Figure 14. Verify the configuration of your modular blocks before connecting the station cables.

09.20 Intercom Code Assignment

09.21 Intercom codes are assigned permanently to specific cable appearances in ***Strata S***. Make sure the station cables are connected to the proper terminals (Figure 14).

NOTE:
White and blue (T3 and R3) are not used for ***Strata S*** *station line connectors.*

09.30 CO Line Connection

09.31 The CO/PBX lines are introduced into the ***Strata S*** system via a 6-wire modular line cord (no longer than 25 ft.) connected directly to a jack on the right side panel. The opposite end of the cord then terminates directly into a locally-provided RJ-25C jack (Figure 15).

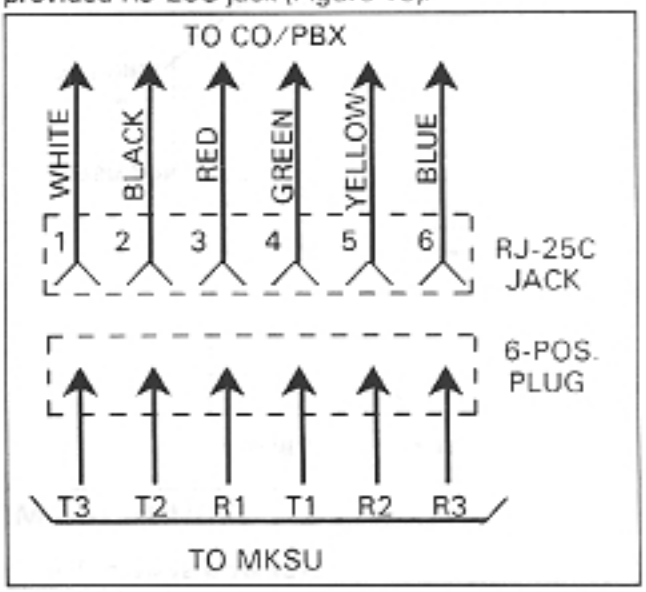

FIGURE 15—RJ25C WIRING

09.32 Secure the modular cord to the panel using the provided plastic cable clamp.

10 EKT INFORMATION

10.00 General

10.01 Four different Electronic Key Telephones

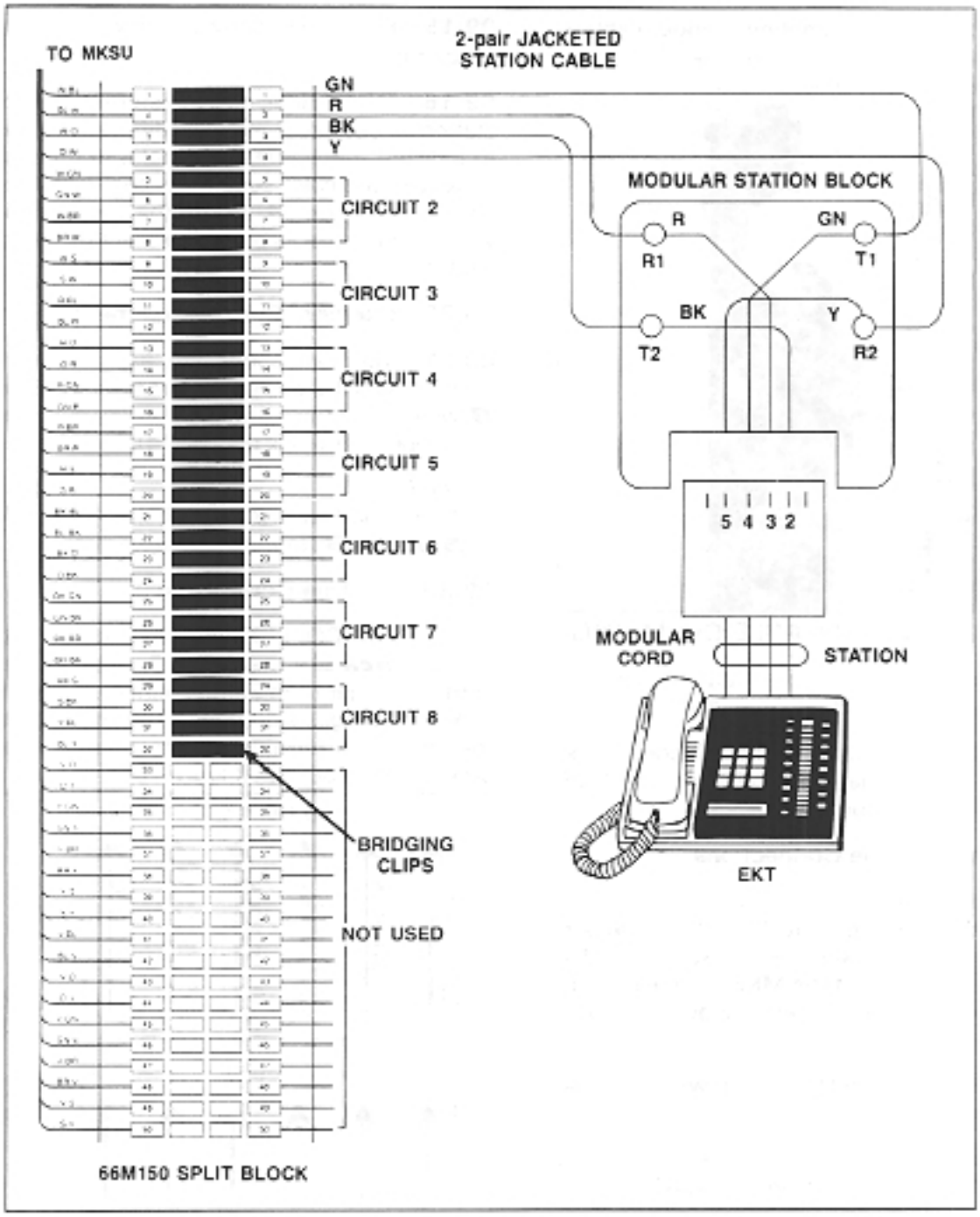

FIGURE 14—MDF/EKT WIRING

(EKTs) may be used in the ***Strata*** system. The standard EKT (Figure 16), known as the 10-key "S" EKT, is equipped with three permanently dedicated keys and ten line/feature keys. The three optional (full speakerphone) EKTs are equipped with four permanently dedicated keys and either 10 or 20 feature keys: 10-key EKT (Figure 17), 10-key Busy Lamp Field (BLF) EKT (Figure 18) and 20-key EKT (Figure 19).

10.02 The 10-key S EKT measures:

Height: 3.5 inches (88.9 mm)
Width: 6.0 inches (152 mm)
Depth: 9.0 inches (229 mm)

and is equipped with 13 line and feature keys in addition to its push-button dial pad. Three of the keys are utilized for central office/PBX lines, one

FIGURE 16—10-key "S" EKT

FIGURE 17-10-key SPEAKERPHONE EKT

FIGURE 18—BLF EKT

FIGURE 19—20-key EKT

for intercom access, and the remaining keys for feature operation.

10.03 All three optional EKTs share the same external dimensions:

Height: 4.0 inches (102 mm)
Width: 8.8 inches (224 mm)
Depth: 9.1 inches (230 mm)

Each is equipped with either 14 or 24 line and feature keys in addition to a push-button dial pad. Again, three of the keys are utilized for CO/PBX lines, one for intercom access, and the remaining keys are used for feature operation.

10.04 The optional 10-key EKT provides the same programmable feature keys as the standard EKT, plus a microphone control key, handsfree answerback and full speakerphone capability.

10.05 The optional 10-key BLF EKT provides the same features as those listed in Paragraph **10.04**, plus an LED indication on which stations are in use.

10.06 The optional 20-key EKT provides the same features as those listed in Paragraph **10.04**, plus ten additional feature keys. That is, three CO/PBX keys, one intercom key, and 16 feature keys that may be used as automatic dialing keys, direct station selection (DSS) keys, etc.

10.07 System software assignments permit some variation to the feature keys on all four EKTs (see Figure 20 for key configurations).

10.08 All EKTs feature modular handset cords and are connected to the system via four-conductor modular line cords. In addition, all EKTs may be used at any or all stations.

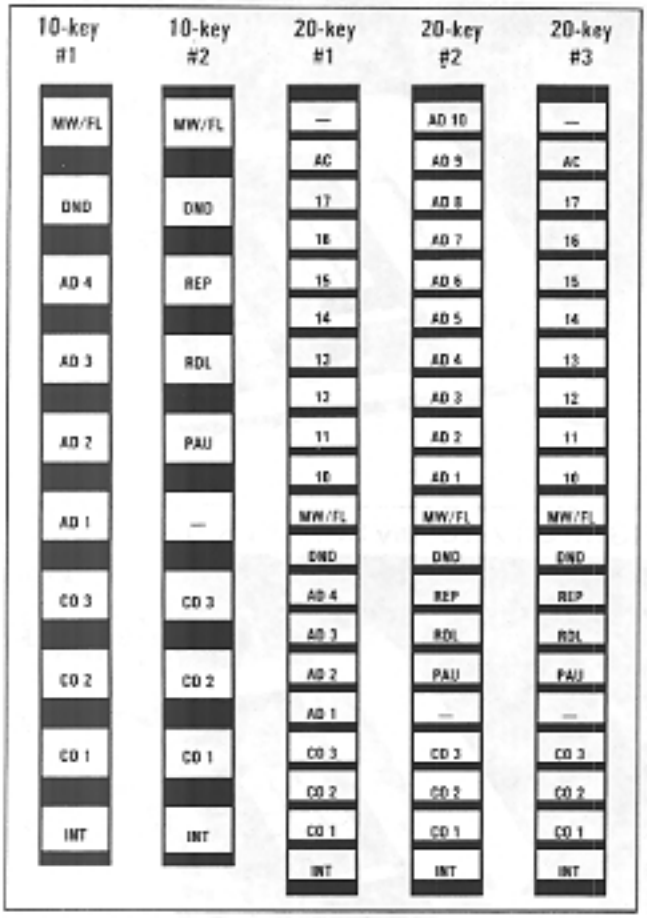

FIGURE 20—KEY LAYOUT

10.10 10-key S EKT Wall Mounting

10.11 An optional "SKWM" kit is required to convert the 10-key S EKT for wall mounting. The "SKWM" kit consists of a metal wall bracket and a handset hanger kit.

10.12 The EKT may be mounted on a wall or any other flat, vertical surface to which the wall bracket can be secured. When selecting the mounting site, consider the EKT weight and the additional stresses to which the mounting will be subjected.

10.13 Mounting screws or mollies, appropriate for the surface on which the telephone is to be secured, must be provided by the installer.

10.14 With the wall bracket the "S" EKT can be mounted to any suitable vertical surface or to a telephone outlet plaster ring (see Figure 21). Secure the wall bracket to the desired wall site, and use a spirit level, if necessary, to make certain the bracket is level.

10.15 The EKT is placed on the wall bracket by

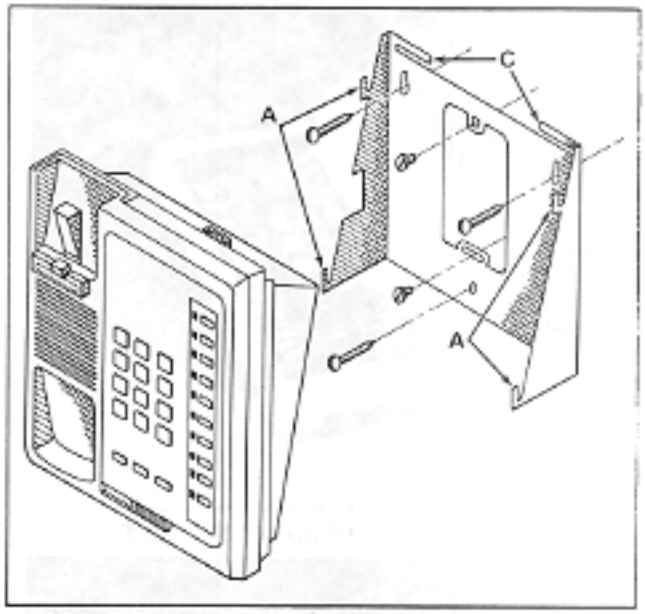

FIGURE 21—WALL MOUNT BRACKET

mating the bracket's four hooks (A—Figure 21) with the four slots on the EKT base (B—Figure 22) and sliding the EKT downward. The EKT is secured in position by bending the two tabs (C—Figure 21) forward in order to prevent upward motion of the EKT.

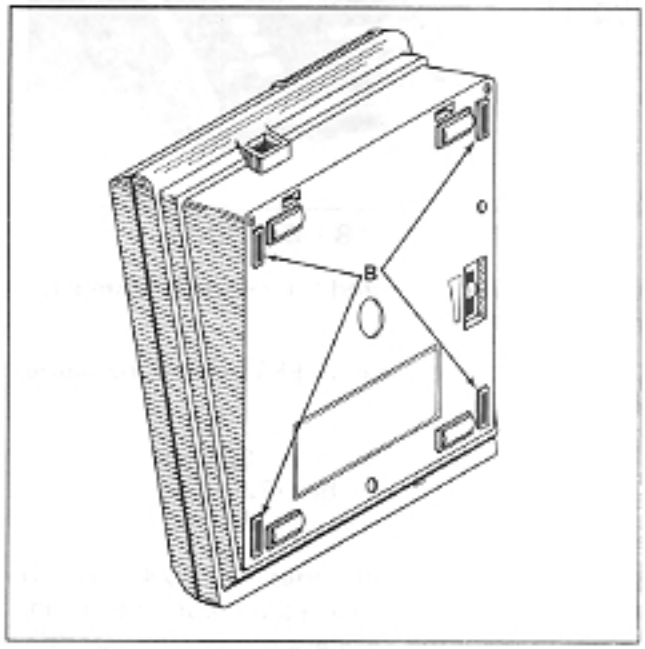

FIGURE 22—BRACKET SLOTS

10.16 Route the tail cord as shown in Figure 23.

10.17 Install the handset hanger kit per Paragraph 10.30.

10.20 Optional EKT Wall Mounting

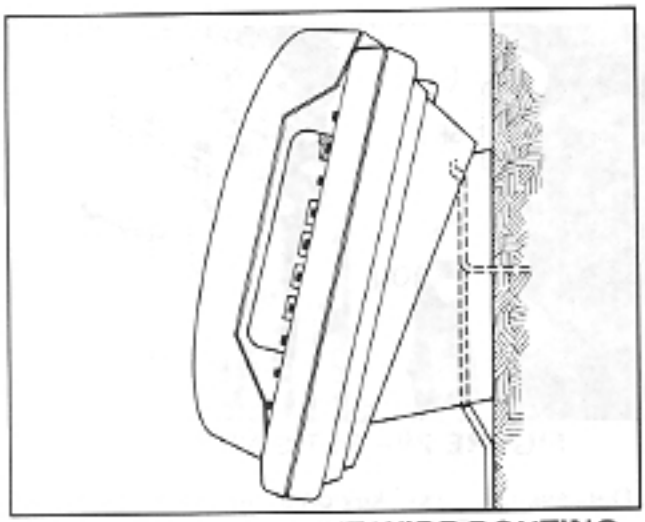

FIGURE 23—"S" EKT WIRE ROUTING

10.21 An optional handset hanger kit (HWMA) is also required to convert the optional EKTs for wall mounting.

10.22 All optional EKTs are mounted in the same manner, and they may be mounted on a wall or any other flat, vertical surface to which the base can be secured. When selecting the mounting site, consider the EKT weight and the additional stresses to which the mounting will be subjected.

10.23 Mounting screws or mollies, appropriate for the surface on which the telephone is to be secured, must be provided by the installer.

10.24 Locking tabs secure the EKT's base. The direction in which the base is attached to the EKT determines whether it will be used as a desk unit or wall unit (it is factory-configured as a desk unit). Disengage the locking tabs by pushing downward on the base (Figure 24).

FIGURE 24

REMOVING OPTIONAL EKT BASE

10.25 Refer to Figure 25, choose which of the knockouts are appropriate for the tail cord route, and then cut them.

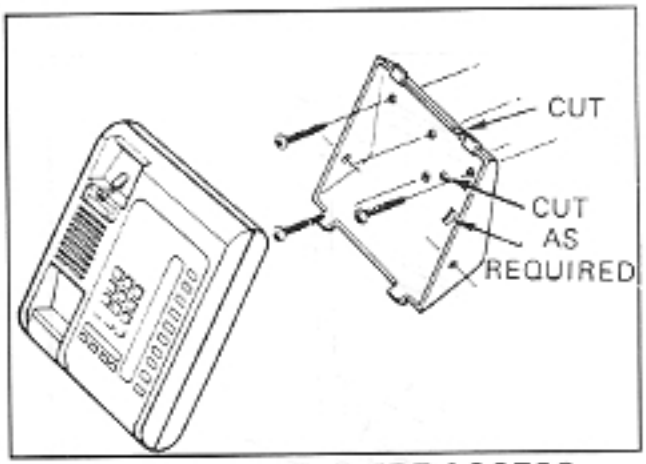

FIGURE 25—EKT WIRE ACCESS

10.26 Secure the base to the desired wall site. Use a spirit level and make certain the top of the base is level and that the deeper portion is down.

10.27 Route the tail cord through the holes in the base and secure the EKT (Figure 26).

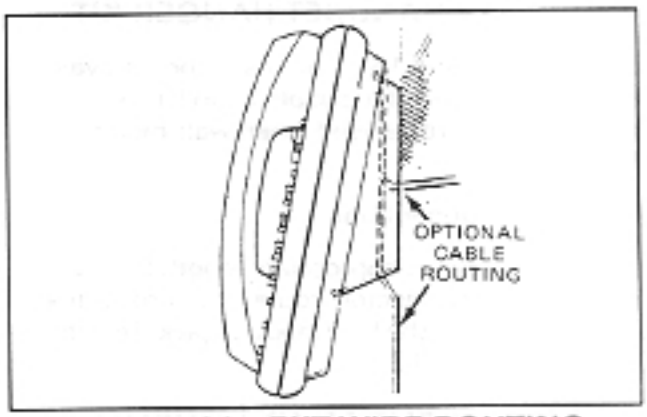

FIGURE 26—EKT WIRE ROUTING

10.28 Install the handset hanger kit per Paragraph 10.30.

10.30 Installing the Handset Hanger Kit

10.31 Refer to Figure 27, the optional handset hanger kit (available from your Toshiba supplier) must be used whenever an EKT is wall-mounted. (When ordering specify if "S" EKT or optional EKT—the HWMA is included in the SKWM kit.) The remainder of the installation is the same for all EKT types.

10.32 Remove the card cover by inserting a paper clip in the hole at one end. Bend the cover up and remove it and the number card.

10.34 Install the handset hanger into place and tighten the screws. Reinstall the number card and card cover.

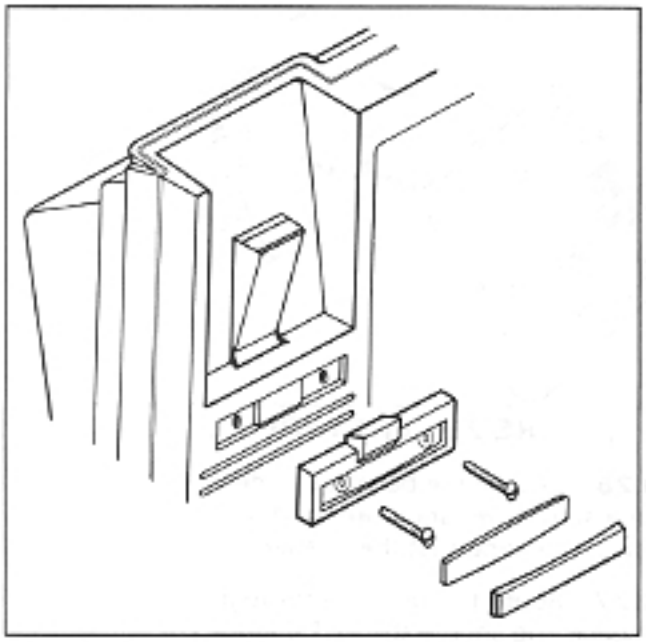

FIGURE 27—HANDSET HANGER KIT

10.35 An optional 13-ft. handset cord is available from your Toshiba supplier, and it is suggested that this cord be used when wall-mounting an EKT.

10.40 EKT Connections

10.41 Connect the appropriate length line cord to the modular connector, route the cord to the EKT and connect to the EKT modular jack. Test the EKT per Paragraph **12**.

11 SYSTEM POWER-UP INITIALIZE

11.01 The ***Strata S*** has a list of standard system data assignments stored in ROM that can be entered at any time by performing the initialize sequence outlined below. The system must be initialized when it is first installed. This will allow the system to be tested and any faults to be corrected before time is spent on programming.

11.02 To initialize the system data memory, refer to Figure 28 and perform the following steps:

a) Place the power switch on the MKSU in the **ON** position.

b) Depress the **SET** switch and allow it to lock.
- SET LED goes on.
- MW/FL LED on station 17 goes on.

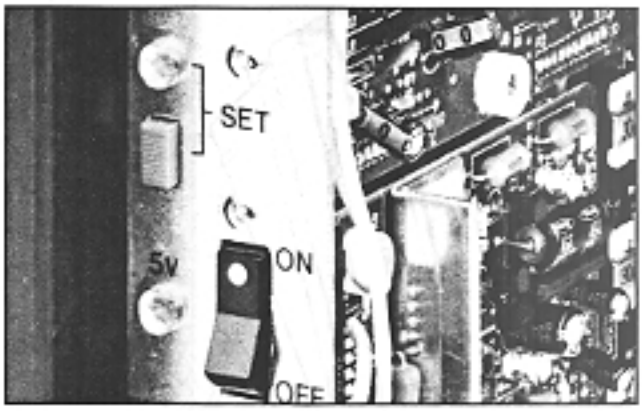

FIGURE 28—SET SWITCH

c) Depress the [SPKR] key on station 17.
- SPKR LED goes on.

d) Dial [#][•][0] on the dial pad.

e) Depress the [CO 1] and [CO 2] keys.
- The corresponding LEDs go on.

f) Depress the [HOLD] key.
- The LEDs on station 17 for intercom through AD 4 begin flickering.

g) Depress and release the **SET** switch again.
- SET LED goes off.
- Station 17 LEDs go off.

h) Cycle the MKSU power switch **OFF** and **ON**.

11.10 Clearing Automatic Dialing

11.11 The Automatic Dialing memory will contain random numbers when the system is powered up initially. To clear the memory; therefore preventing meaningless numbers from being dialed, proceed as follows:

a) Lock in the **SET** switch on the MKSU.
- The SET LED and MW/FL LED on station 17 will go on.

b) Depress the [SPKR] key on station 17.
- SPKR LED will light steadily.

c) Dial [#][*][•] on the dial pad.
- SPKR LED will flash continuously.

d) Depress the [INT] and [CO 2] keys.
- The corresponding LEDs will light.

e) Depress the [HOLD] key.
- All station 17 LEDs (except MW/FL) will go off.

f) Release the **SET** switch on the MKSU.

- The SET LED and MW/FL LED on station 17 will go off.

12 SYSTEM TEST PROCEDURES

12.00 10-key S EKT Functional Check

12.01 In order to verify the basic system functions and confirm the proper functioning of the EKT itself, perform the following test procedure at each station equipped with a 10-key S EKT, beginning with station 10.

12.02 With handset on-hook:

a) Depress the [INT] key.
- INT LED: l-use flash.
- SPKR LED: on steady.
- Listen for intercom dial tone via EKT speaker.

b) Adjust speaker volume with the sliding volume control on the face of the EKT.

c) Depress the [CO 1] key.
- CO 1 LED: l-use flash.
- SPKR LED: on steady.
- Listen for CO/PBX dial tone via EKT speaker.

d) Dial any digit (2 ~ 9) on the dial pad and dial tone will stop.

e) Depress the [MW/FL] key.
- Listen for circuit break followed by dial tone after approximately 2 seconds.

f) Depress the [CO 2] key.
- CO 2 LED: l-use flash.
- SPKR LED: on steady.
- Listen for CO/PBX dial tone via EKT speaker.

NOTE:
If no CO/PBX facility is connected to a CO key, dial tone will not be heard but the LED is still functional.

g) Depress the [CO 3] key.
- CO 3 LED: l-use flash.
- SPKR LED: on steady.
- Listen for CO/PBX dial tone via EKT speaker.

h) Depress the [SPKR] key.
- SPKR LED: off.
- EKT speaker: off.

i) Depress the [DND] key.
- DND LED: on.

j) Depress the [DND] key.
- DND LED: off.

k) Depress the [CO 1] key.
- CO 1 LED: l-use flash.
- SPKR LED: on steady.
- Listen for CO/PBX dial tone via EKT speaker.

l) Depress the [HOLD] key.
- CO 1 LED: l-hold flash.
- Speaker off (no dial tone).
- SPKR LED: off.

m) Depress the [CO 1] key.
- CO 1 LED: l-use flash.
- SPKR LED: on steady.
- Listen for CO/PBX dial tone via EKT speaker.

n) Depress the [CONF] key.
- CO 1 LED: Conference call flash rate.
- Dial tone continues.

o) Depress the [CO 1] and [SPKR] keys.
- CO 1 LED: off.
- SPKR LED: off.
- Dial tone: off.

p) Call EKT from another station.
- Listen for caller's voice via speaker after the single tone signal.
- Called station's INT LED: l-called flash.

q) Dial [1] at calling station.
- Tone signalling heard via the called station's speaker.

r) Adjust the tone signalling volume with the volume control on the bottom of the EKT.

s) Depress the [INT] key.
- INT LED: l-use flash.
- SPKR LED: on.
- Listen for intercom dial tone via the EKT speaker.

t) Lift handset.
- SPKR LED: off.
- Speaker: off.
- Listen for dial tone via handset receiver.

u) Call another station and talk into the handset transmitter.
- Verify that your voice can be heard via called EKT speaker.

v) Hang up.

12.03 This completes the station functional

check for the standard EKT; repeat the procedure for all standard EKTs in the system. See Paragraph 12.10 for optional EKT functional checks.

12.10 Optional EKT Functional Check

12.11 In order to verify the optional EKT's functions and confirm the proper functioning of the EKT itself, perform the following test procedure on each optional EKT.

12.12 With handset on-hook:

a) Depress the [INT] key.
- INT LED: I-use flash.
- SPKR LED: on steady.
- MIC LED: on steady (if equipped).
- Listen for intercom dial tone via the EKT speaker.

b) Adjust speaker volume with the volume control on the rear right-hand side of the EKT.

c) Depress the [CO 1] key.
- CO 1 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

d) Dial any digit (2 — 9) on the dial pad and dial tone will stop.

e) Depress the [MW/FL] key.
- Listen for circuit break followed by dial tone after approximately 2 seconds.

f) Depress the [CO 2] key.
- CO 2 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

NOTE:
If no CO/PBX facility is connected to a CO key, dial tone will not be heard but the LED is still functional.

g) Depress the [CO 3] key.
- CO 3 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

h) Depress the [SPKR] key.
- SPKR & MIC LEDs: off.
- EKT speaker: off.

i) Depress the [DND] key.
- DND LED: on.

j) Depress the [DND] key.
- DND LED: off.

k) Depress the [CO 1] key.
- CO 1 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

l) Depress the [HOLD] key.
- CO 1 LED: I-hold flash.
- Speaker: off (no dial tone).
- SPKR & MIC LEDs: off.

m) Depress the [CO 1] key.
- CO 1 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

n) Depress the [CONF] key.
- CO 1 LED: Conference call flash rate.
- Dial tone continues.

o) Depress the [CO 1] and [SPKR] keys.
- CO 1 LED: off.
- SPKR & MIC LEDs: off.
- Dial tone: off.

p) Call EKT from another station.
- Listen for caller's voice via the called EKT's speaker after the single tone signal.
- Called station's INT LED: I-called flash.

q) Dial [1] at calling station.
- Tone signalling heard via called EKT's speaker.

r) Adjust tone signalling volume with volume control on the rear left-hand side of the EKT being tested.

s) Depress the [INT] key.
- INT LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for intercom dial tone via the EKT speaker.

t) Lift handset.
- SPKR & MIC LEDs: off.
- Speaker: off.
- Listen for dial tone via the handset receiver.

u) Call another station and talk into the handset transmitter.
- Verify that your voice can be heard via the called EKT's speaker.

v) Hold down the [SPKR] key, and set the handset back on-hook.
- INT LED: I-use flash.
- SPKR & MIC LEDs: on steady.

w) Tap the EKT microphone and verify that the sound can be heard via the called EKT speaker.

x) Depress the [MUTE/MIC] key while tapping the microphone and verify that the sound cannot be heard via the called EKT speaker (MIC LED off momentarily—if equipped).

y) Depress the [SPKR] key.
- INT LED: off.
- SPKR & MIC LEDs: off.

12.13 This completes the station functional check for the optional EKTs; repeat the procedure for all optional EKTs in the system.

12.20 Feature Check

12.21 Verify that all system features function properly per Section 100-003-400, *Operating Procedures*.

13 MISCELLANEOUS EQUIPMENT CONNECTIONS

13.00 Wiring Connections

13.01 All connections to the miscellaneous equipment are made via the right side panel of the MKSU, as shown in Figure 29.

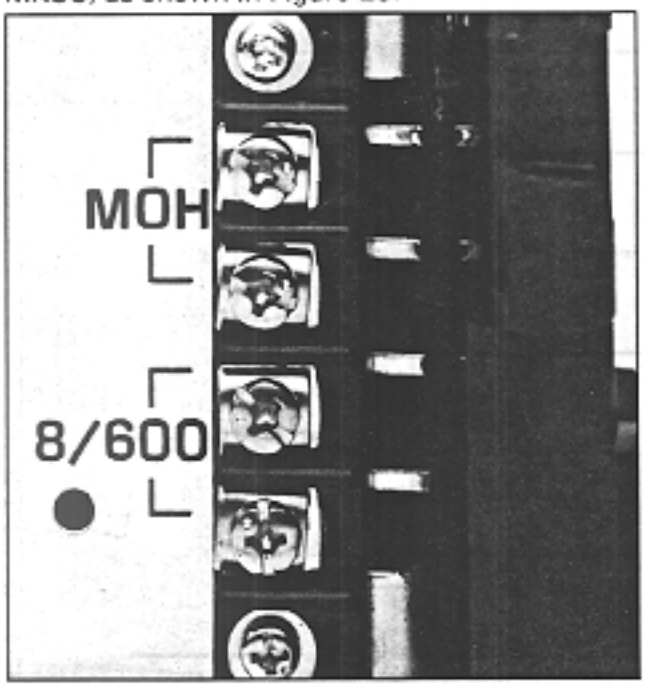

FIGURE 29—MKSU CONNECTION STRIP

13.10 Music-on-Hold Source

13.11 A customer-provided MOH program source (tape deck, tuner, or commercial source) or the optional AMOU PCB may be used as the music-on-hold source.

a) When the AMOU PCB is used, refer to Paragraph **07.10** for installation instructions. Verify that the **SW3** switch on the MMAU is set to MOU (Figure 30). Adjust the volume with the volume control labeled **MOH** on the MKSU right side panel.

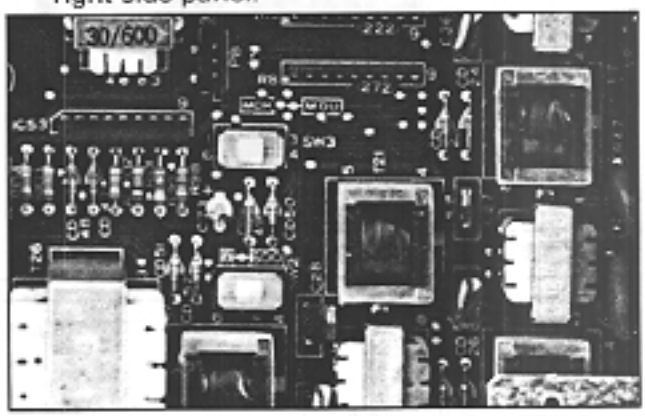

FIGURE 30—MMAU SW3 SWITCH

b) When a customer-provided source is used, connect the MOH source to the MOH terminals on the MKSU right side panel. The input impedance is 600Ω. Verify that the **SW3** switch on the MMAU is set to MOH (Figure 30). Adjust the volume with the volume control labeled **MOH** on the MKSU right side panel.

13.20 External Paging Connections

13.21 ***Strata S*** provides access to an external paging system by dialing 8. The single output connection is made via the 8/600 terminals on the MKSU right side panel, and can be used in one of two ways:

a) Mount the optional 3-watt amplifier (AEPU PCB) and connect the customer-provided speaker cabling directly to the 8/600 terminals (see Paragraph **13.30**).

b) If more than 3 watts are required, an external customer-provided amplifier can be connected to operate the external speaker (see Paragraph **13.40**).

13.30 Direct External Speaker Connection

13.31 The exact number of speakers that may be connected to the 8Ω, 3-watt output will depend

on the type of speaker used, the conductor resistance, and the desired volume.

13.32 Install the AEPU PCB per Paragraph 07.30. The 8Ω output impedance must be selected with the SW2 switch on the MMAU (Figure 31). The switch must be on the side labeled "8".

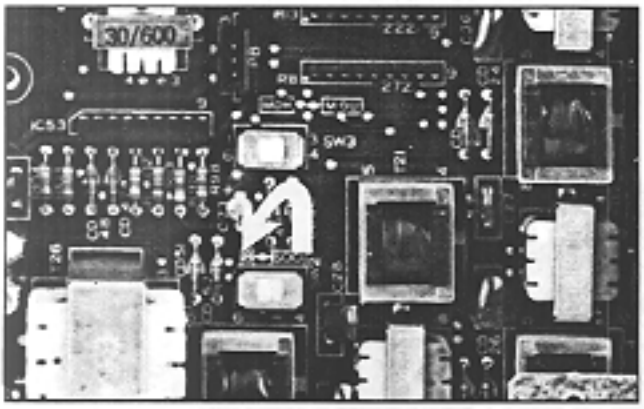

FIGURE 31—MMAU SW2 SWITCH

13.33 Connect the external speaker to the two 8/600 terminals on the modular connector panel on the MKSU.

13.34 Adjust the speaker volume with the volume control on the AEPU PCB (Figure 32).

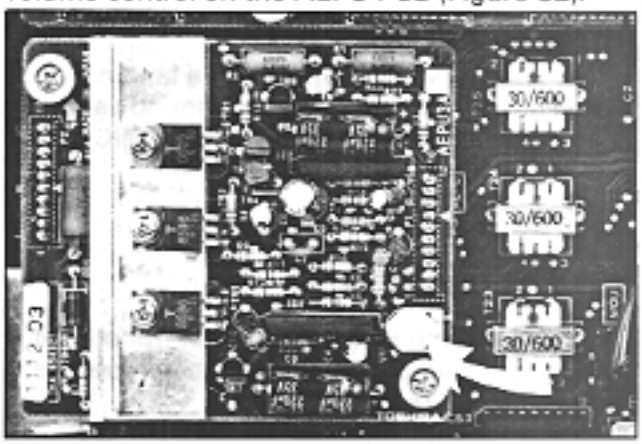

FIGURE 32—AEPU VOLUME SWITCH

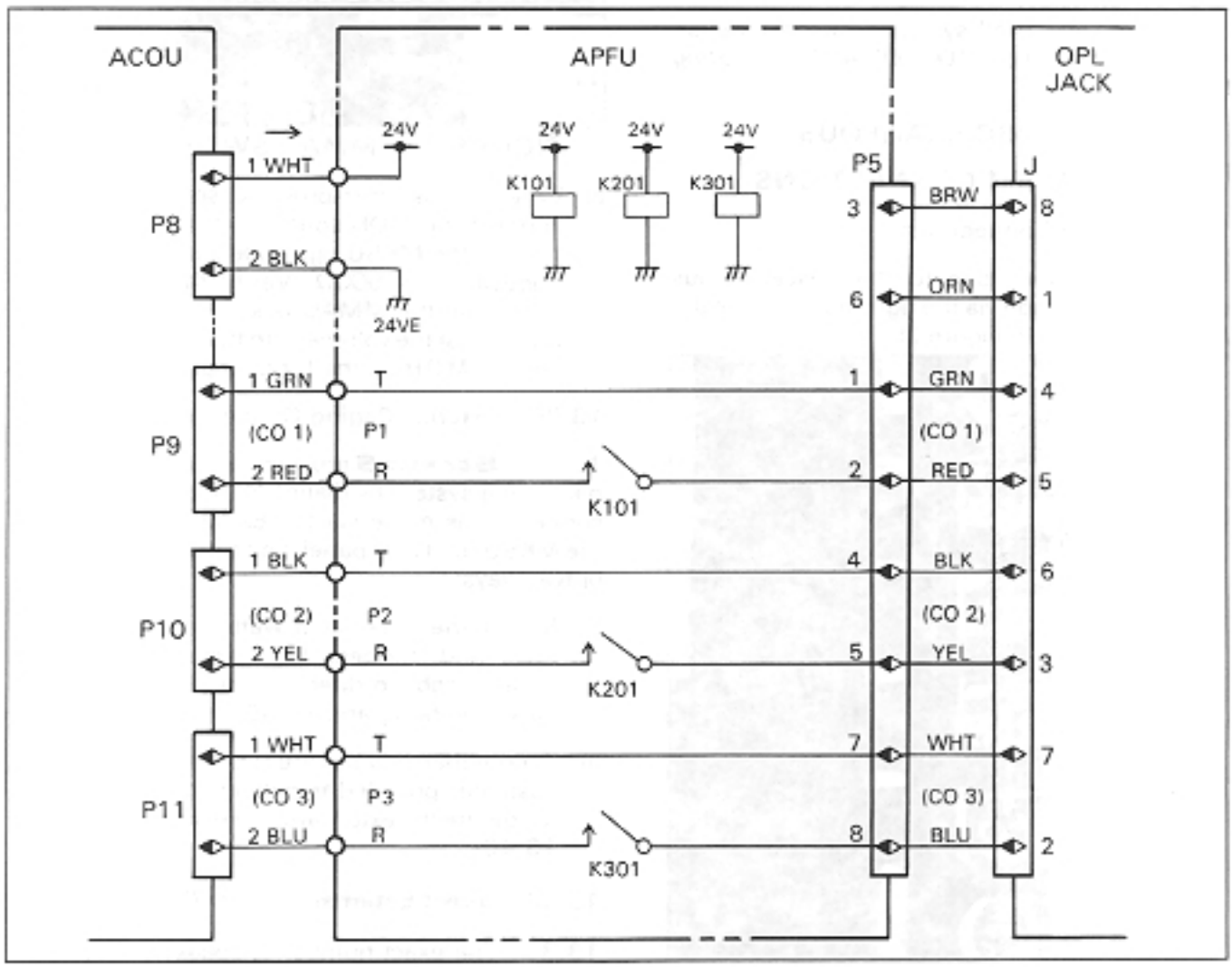

FIGURE 33—POWER FAILURE TRANSFER DIAGRAM

13.40 External Amplifier Connection

13.41 If more power is required than the AEPU amplifier can deliver, a customer-provided external amplifier may be connected to the 8/600 terminals on the MKSU (the AEPU is not required if an external amplifier is used). The external speaker(s) should then be connected to the external amplifier.

13.42 The 600Ω output impedance must be selected with the **SW2** switch on the MMAU (Figure 31).

13.43 The volume level through the system is fixed, all adjustments must be made on the external amplifier.

13.50 Power Failure Transfer

13.51 The power failure transfer feature is designed, upon power failure, to switch the system CO lines directly to dedicated customer-provided conventional telephones.

13.52 The MKSU must be equipped with the APFU PCB and the power failure telephones must be directly compatible with the CO lines.

13.53 A simplified diagram of the power failure transfer feature is shown in Figure 33.

13.54 The power failure telephones are connected to the system via the jack labeled **OPL** on the right side panel of the MKSU. The **OPL** jack will accept either an 8-pin or 6-pin modular plug (pins 1 & 8 are not used).

13.55 Connect the telephones per Figure 34.

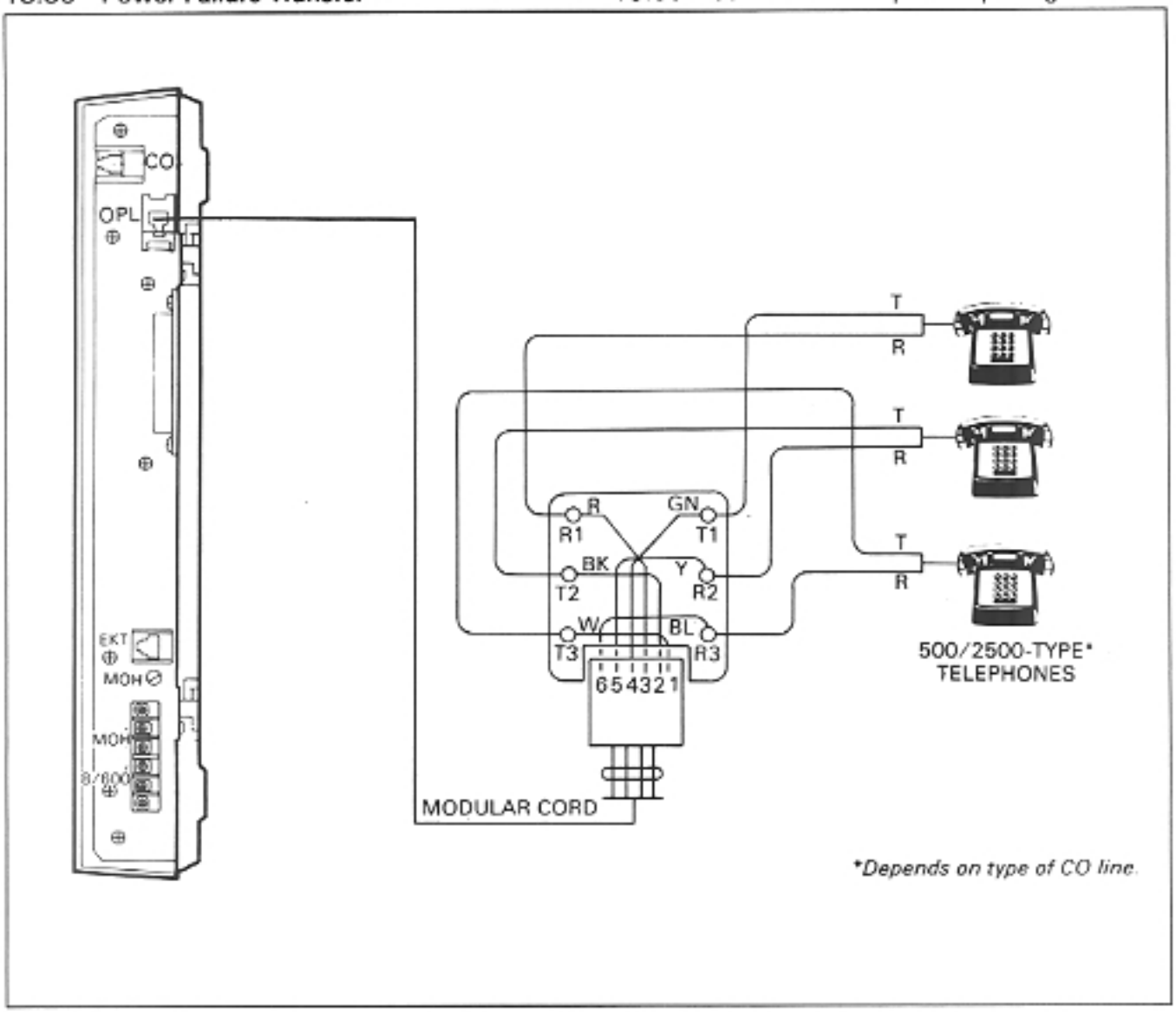

FIGURE 34—PFT TELEPHONE CONNECTIONS

MPSA-512 INSTALLATION
SECTION 100-003-250
JULY 1984

Strata S

POWER SUPPLY (MPSA-512)

INSTALLATION INSTRUCTIONS

Strata S

MPSA-512 INSTALLATION INSTRUCTIONS

TABLE of CONTENTS

ILLUSTRATION LIST

01 GENERAL

01.00 Description

01.01 The MPSA-512 power supply is permanently configured for wall mounting. Its design will not allow proper cooling if it is not mounted upright as shown in Figure 1.

FIGURE 1—MPSA-512

01.02 Unpack and inspect the power supply and the enclosed hardware. Examine the package and make careful note of any visible damage. If any damage is found, bring it to the attention of the delivery carrier and make the proper claims.

01.03 Check the hardware list; if it is determined that any equipment within the carton is missing, contact your Toshiba supplier immediately.

01.04 The following hardware, which is required to connect the MPSA to the system, is supplied with each unit.

ENCLOSED HARDWARE

Quantity	Item
2	AC Fuses—1 spare (2 amp, SLO-BLO 250VAC)
2	DC Fuses—1 spare (2 amp, Fast-BLO, 125VDC)
1	16 AWG, 3-wire Jacketed Cable (54 inches)

01.10 Mounting the MPSA

01.11 The 30-inch MPSA power cord determines its relationship to an AC outlet.

01.12 Choose a suitable vertical location for the MPSA and place the unit on that location.

01.13 Mark the screw locations on the mounting surface through the centers of the two keyholes in the MPSA. Use a spirit level to verify that the drilling points are level.

01.14 Lay the MPSA aside for the moment and start the two screws into the wall at the marked locations. Use 1-¼-inch panhead wood screws (installer supplied), and stop when they have penetrated to half their depth.

01.15 Hang the MPSA on the two screws, and tighten the screws.

NOTE:
If togglers are used, see Section 100-003-255, MPSA-200 Installation, *for the correct application.*

01.20 Fuses

01.21 Remove the spare fuses from the hardware carton, and store them in close vicinity to the unit.

01.22 Remove and inspect the fuses that were shipped inside the MPSA. If either fuse is defective, replace it and order another spare fuse from your Toshiba supplier.

02 POWER CONNECTION

02.00 MPSA Preparation

02.01 Verify that the power switch on the MKSU is in the **OFF** position, and then place the MPSA power switch in the **OFF** position.

02.02 Remove the plastic terminal strip cover (Figure 2).

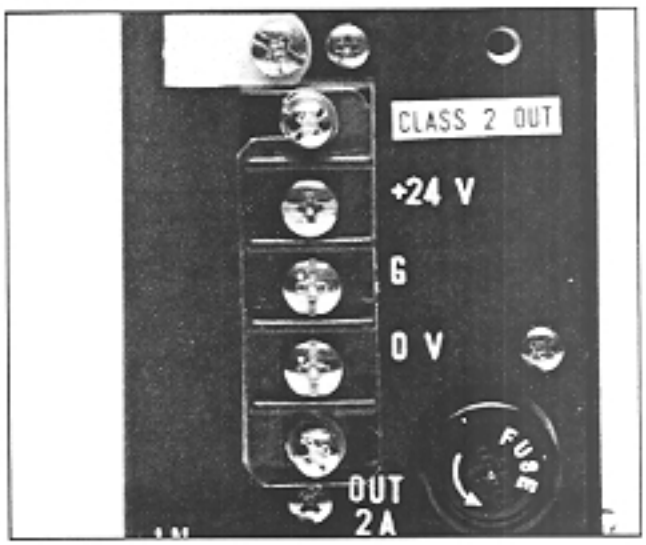

FIGURE 2—TERMINAL COVER

02.03 Refer to Figure 3, and connect the power supply cable in the following order:

White:	+24V
Black:	0V
Green:	G

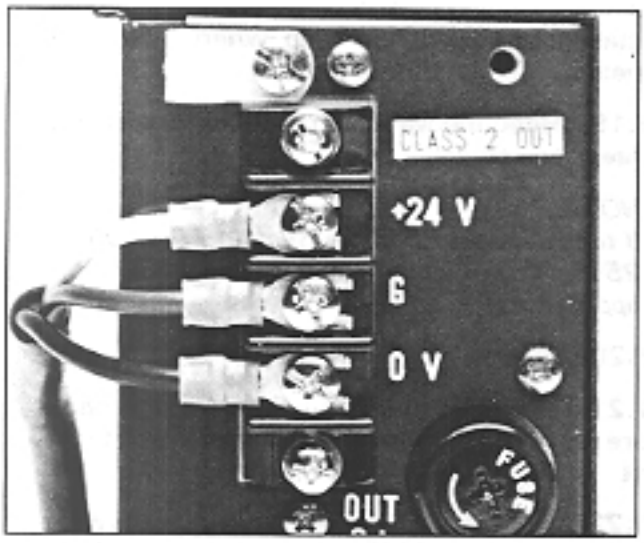

FIGURE 3—CABLE CONNECTION

02.04 Refer to Paragraph **08**, Section **100-003-200**, *Installation*, in order to complete cable connection procedures.

MPSA-200 INSTALLATION
SECTION 100-003-255
JULY 1984

Strata S

POWER SUPPLY (MPSA-200)

INSTALLATION INSTRUCTIONS

Strata S

MPSA-200 INSTALLATION INSTRUCTIONS

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ILLUSTRATION LIST

01 GENERAL

01.00 Description

01.01 The MPSA-200 (Figure 1) is equipped with a reversible, built-in bracket; it is configured

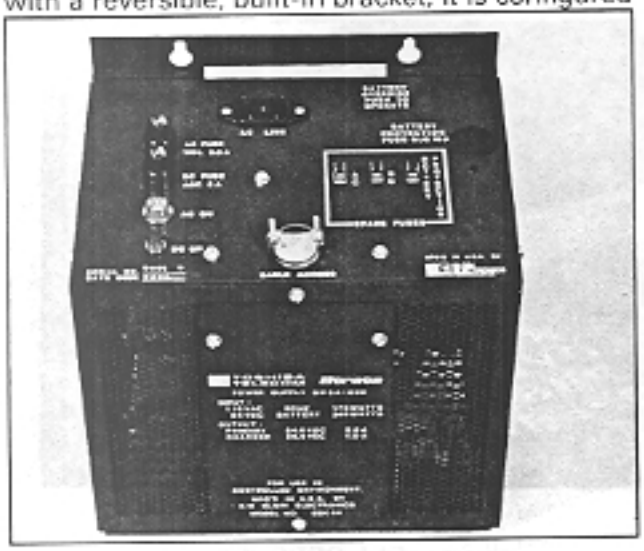

FIGURE 1—MPSA-200

at the factory for mounting on a wall or other vertical surface. In order to mount on a table or horizontal surface securely, the bracket must be reversed to the position shown in Figure 2. This orientation is necessary to assure proper cooling.

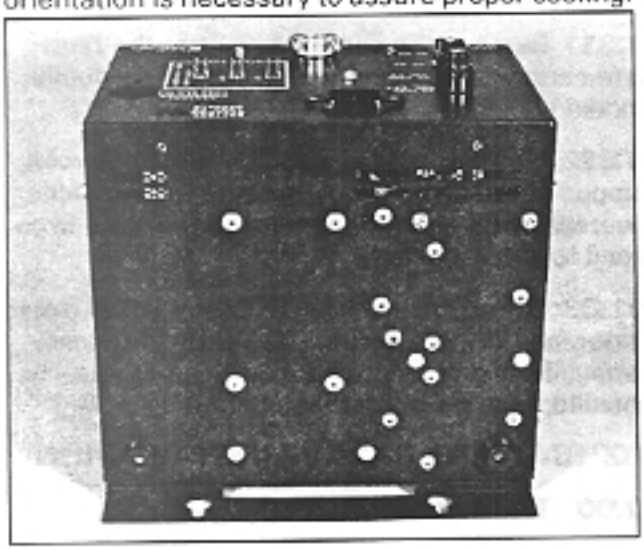

FIGURE 2—REVERSED MPSA MOUNTING BRACKET

01.02 Unpack and inspect the power supply and the enclosed hardware. Examine the package and make careful note of any visible damage. If any damage is found, bring it to the attention of the delivery carrier and make the proper claims.

01.03 Check the hardware list; if it is determined that any equipment within the carton is missing, contact your Toshiba supplier immediately.

01.04 The following hardware, which is required to mount and connect the MPSA to the system, is supplied with each unit.

ENCLOSED HARDWARE

Quantity	Item
2	T.C. Toggler Wall Fasteners (Figure 3)
2	#14 Hex Head Sheet Metal Screws
1	Toggler Key
1	Template
1	Spare AC Fuse (F1, 2.5 amp, SLO-BLO 125-VAC)
1	Spare DC Fuse (F2, 5.0 amp, Fast-BLO, 32-VDC)
1	16 AWG, 3-wire Jacketed Cable (54 inches)

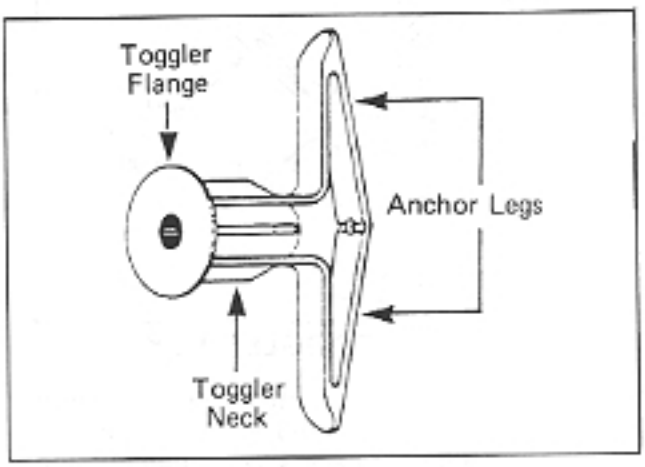

FIGURE 3—TOGGLER

01.10 Surface Preparation

01.11 Choose a suitable location (either vertical or horizontal) for the MPSA and locate the template on that location. If on a wall, use a spirit level to verify that the drilling points are level.

01.12 Place punch marks on the mounting surface through the two "+" marks on the template.

01.13 Drill through the mounting surface with a 5/16-inch bit to prepare the anchoring holes.

01.20 Mounting the MPSA

01.21 Press the anchor legs of the togglers together, and insert them into the anchoring holes

until their neck flanges are flush with the mounting surface (Figure 4). If insertion is difficult, tap them lightly with a hammer.

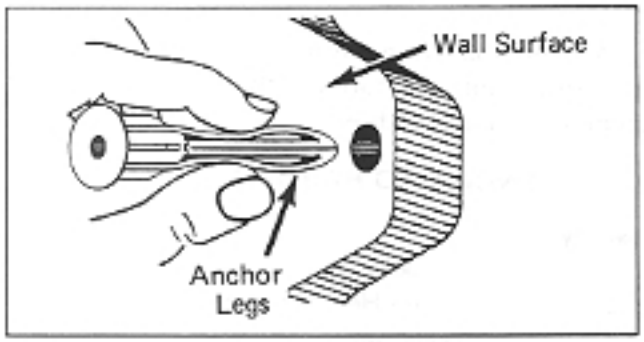

FIGURE 4—TOGGLER INSERTION

01.22 Insert a toggler key into the small hole in the neck of each fastener, as shown in Figure 5. This should cause the anchor legs to "pop" open. Remove the toggler key.

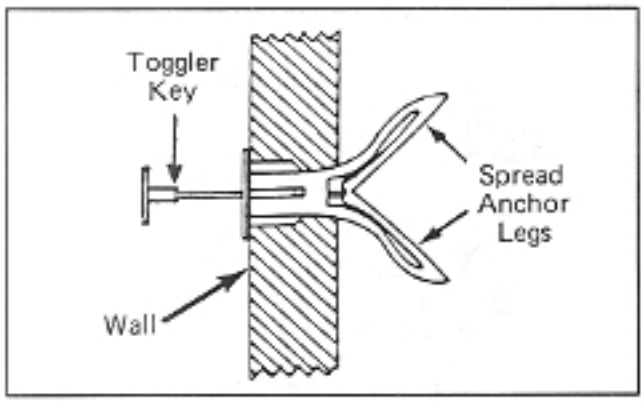

FIGURE 5—TOGGLER KEY

01.23 Thread the screws into the small holes in the center of the togglers. Leave some clearance between the bottom of each screw head and the mounting surface (Figure 6).

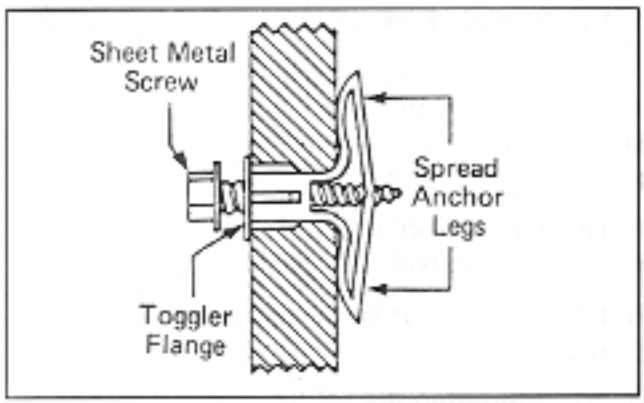

FIGURE 6—TOGGLER SCREW

01.24 Place MPSA against the mounting surface with the screws protruding through the holes.

01.25 Position the power supply so that the narrower portions of the keyholes slip over the screws (Figure 7), and (if the unit is wall-mounted) the weight of the power supply is supported. Tighten the screws.

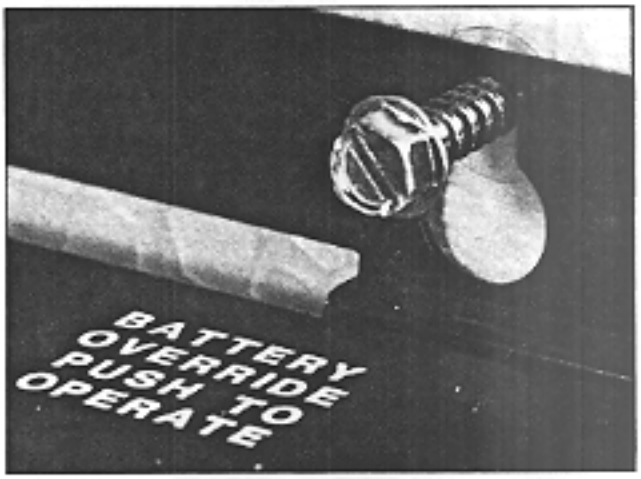

FIGURE 7—MPSA
(Wall Mount Configuration)

01.26 If the power supply is table-mounted, make certain the unit rests on its four rubber "feet" (this is essential for proper cooling) and secured with the mounting bracket.

01.30 Fuses

01.31 Remove the spare fuses from the hardware carton, and place them in their individually marked holders.

01.32 Remove and inspect the fuses that were shipped inside the MPSA. If either fuse is defective, replace it and order another spare fuse from your Toshiba supplier.

01.33 Connect the MPSA to the MKSU per Paragraph **05.20**, Section **100-003-200**, *Installation*. (If a power battery backup unit is to be installed, see next paragraph.)

02 BATTERY BACKUP INSTALLATION

02.00 Description

02.01 The power battery backup unit (PBBU) in Figure 8 is an optional PCB which may be installed in the MPSA-200 to interface with two auxiliary 12 VDC batteries. In the event of an electrical power failure, the PBBU provides an automatic battery power source, permitting a typical ***Strata S*** system to continue normal operations for some time (in direct ratio with the type and size of the batteries chosen).

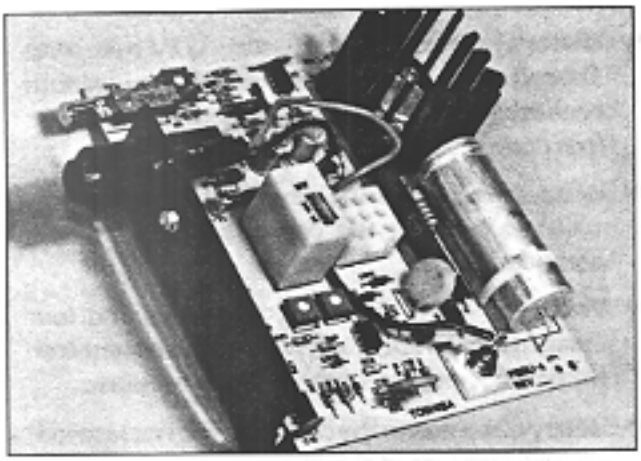

FIGURE 8—PBBU PCB

02.02 The PBBU contains a voltage sensing circuit which causes an electro-mechanical relay to connect the back-up battery power to the system before the MPSA output voltage drops below 21 VDC (at which point system functions would be disrupted and existing calls would be disconnected).

02.03 When the normal source of electrical power is restored, the voltage sensing circuit relay will disconnect the standby battery power source.

02.04 If the standby battery power source output falls below 21 VDC while it is connected to the system, the voltage sensing circuit will cause the relay to disconnect the standby batteries from the system.

02.05 The standby batteries will not be reconnected unless:

- The "Battery Override" switch (Figures 8 and 9) is placed in the **ON** position.

. . . or . . .

- The depleted batteries are replaced by a freshly charged pair and the "Battery Override" switch is turned on and then released.

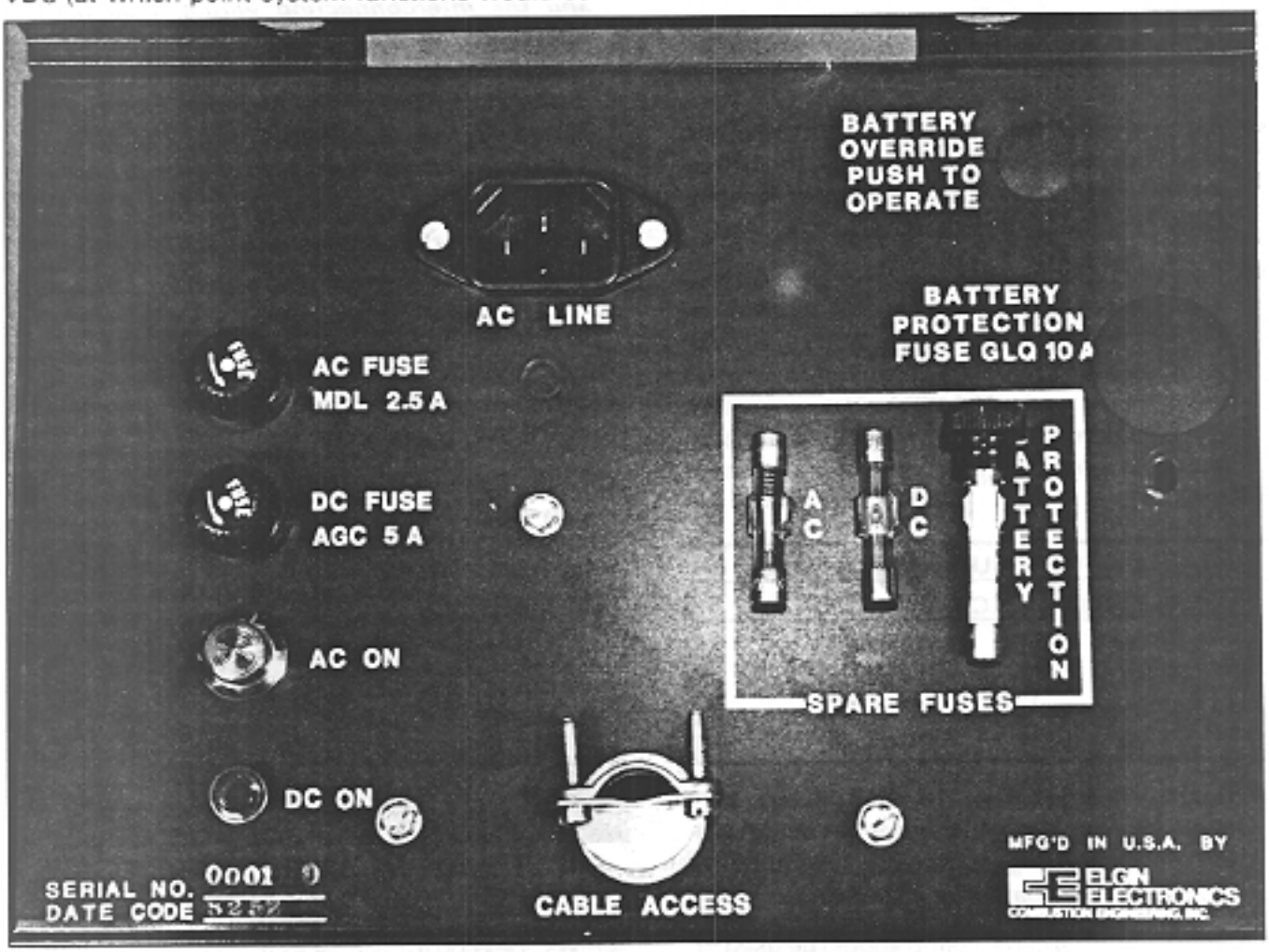

FIGURE 9—MPSA CONTROL PANEL

02.06 The PBBU also contains circuitry to provide the charge current necessary to maintain the batteries at a satisfactory level of charge while the ***Strata S*** system is in normal operation. An external fast charger may also be connected across the battery output terminal connections.

02.07 The PBBU kit contains the following:

- PBBU—power battery backup PCB.
- Fuse—spare battery protection fuse.
- "PBBU-4 REV"—decal to be placed on the front of the MPSA.
- "WARNING"—warning tag for attachment to the 115 VAC power cord.

02.08 In addition to the kit, these installer-provided items are needed to install a PBBU.

- Two Batteries—lead-acid, maintenance-free automobile batteries (80 amp/hr maximum) are recommended. The procedures in Paragraph **02.40** assume batteries with side-mounted terminals are used.
- Battery Rack & Separator—a battery rack and separator should be used to assure the batteries will not tip and spill battery acid or accidentally short the battery terminals.
- Two-Wire Connecting Cable—a 2-wire connecting cable, terminating at one end with ⅜-in. ring terminals and at the other end with ⅛-in. spade terminals, is required to connect the batteries and the MPSA. The minimum wire gauge must be determined by the loop length of the connecting cable (as indicated in Table A).

TABLE A—MINIMUM WIRE GAUGE	
LOOP LENGTH	RECOMMENDED SIZE
12 feet	16 gauge
20 feet	14 gauge
30 feet	12 gauge
50 feet	10 gauge

- Single-Wire Cable—a 16 AWG single-wire cable, approximately 18 inches in length and equipped with ring terminals, is required to connect the two batteries in series.
- Cable Clamp—a cable clamp should be used to prevent cable movement from affecting the batteries.
- Battery Protection—a 10-amp, 32V fuse, or a 10-amp DC instantaneous-tripping circuit breaker, is required to protect the batteries from power surge or short circuit damage.
- Bolts—four ⅜ x ½-in. hex head bolts are required to connect the cable terminals to the batteries.
- Washers—eight ⅜-in. flat washers and four ⅜-in. internal-tooth lock washers are required for the above cable terminal connections.
- Battery Cabinet—if the batteries are not located in a well-ventilated closet or other secure area, protected from fire or sparks, a properly ventilated protective cabinet is required to safeguard them.

CAUTION!

The power supply, battery, battery rack, and the interconnecting wiring shall be installed only by qualified installers, in accordance with all applicable electrical codes and Article 480 of the National Electrical Code. Before installing see the "Installation Instructions" enclosed with each item.

IMPORTANT!

Only trained personnel may service or install the PBBU and power supply.

02.10 MPSA Preparation

02.11 Verify that the power switch on the MMAU is in the **OFF** position, and then disconnect the 115 VAC power cord.

02.12 Remove the MPSA terminal strip cover (Figure 10).

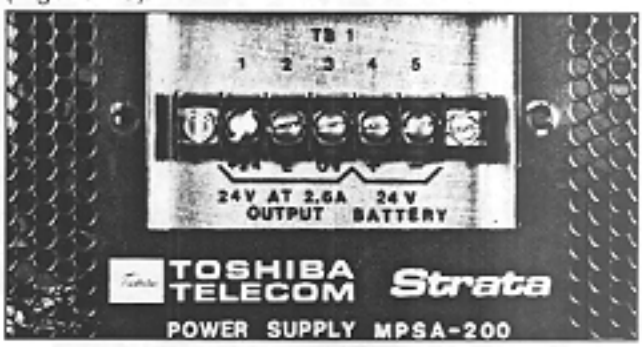

FIGURE 10—MPSA TERMINAL STRIP

02.13 The MPSA cover is secured by ten screws. Viewing the MPSA as if it is wall-mounted, two screws will be located on the front and four on each side.

02.14 Remove all ten screws.

02.15 Remove the cover and set it aside.

02.16 Locate the multi-wire harness in MPSA (Figure 11), it terminates in a nylon connector.

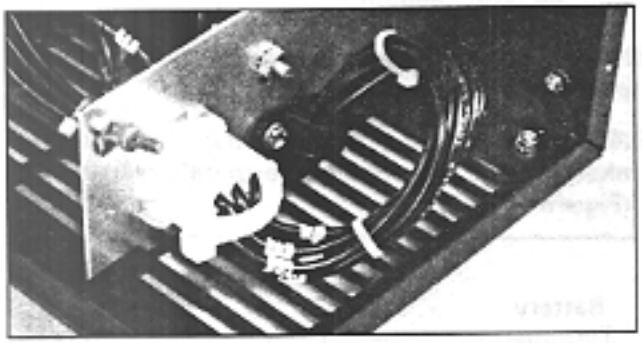

FIGURE 11—WIRE HARNESS IN MPSA

02.17 The harness is loosely secured to the chassis with a cable clamp (Figure 12); the clamp will allow slight harness movement.

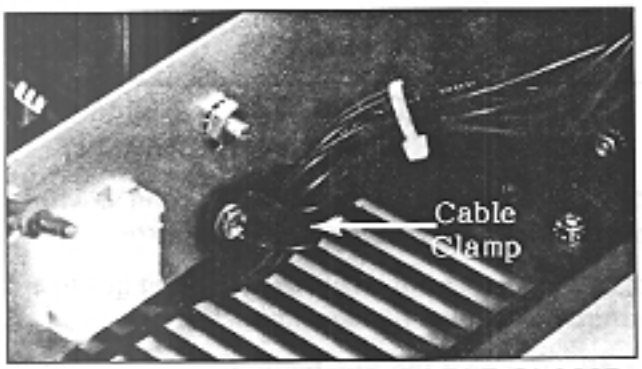

FIGURE 12—HARNESS CABLE CLAMP

02.20 **Installing the PBBU**

02.21 Two plugs are mounted in the MPSA control panel; pop them out and discard.

02.22 Unwrap the PBBU. Remove and save the screw located in the mounting bracket (Figure 13).

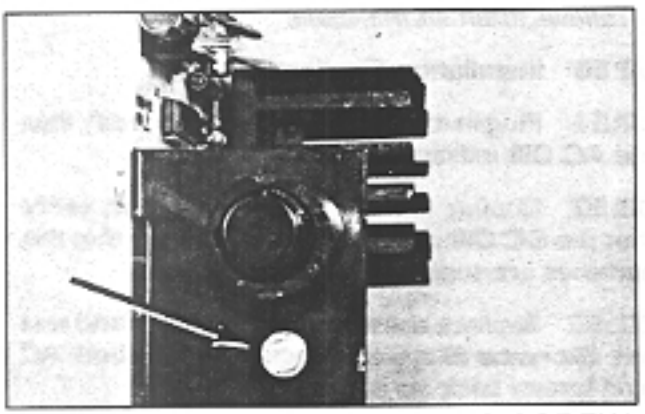

FIGURE 13—PBBU MOUNTING SCREW

02.23 Slip the PBBU fuse holder and battery override button through their respective ports in the control panel (Figure 14). The PBBU mounting bracket should be flush against the rear of the control panel. The harness should flow around the PBBU PCB, with no wires beneath it.

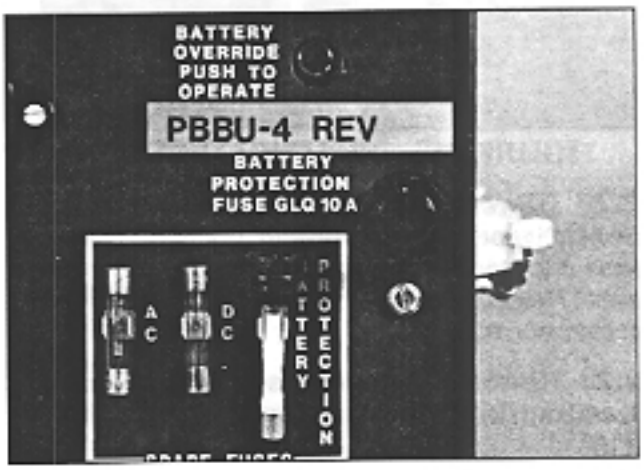

FIGURE 14—MPSA CONTROL PANEL

02.24 Align the two tan-colored PBBU pins with the two holes in the mounting bracket. The harness should flow around the PBBU PCB, with no wires beneath it (Figure 15). Press the pins into the holes until they catch.

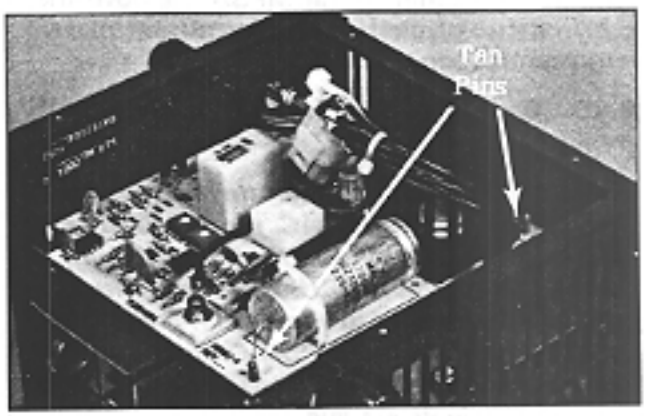

FIGURE 15—PBBU MOUNTING PINS

02.25 Use the previously removed screw and secure the mounting bracket to the control panel.

02.26 Plug the connector into the nine-hole jack in the center of the PBBU. **Do not** force the prongs into the jack, they are keyed so that they can be mated in only one position.

02.27 Make certain that no wires from the harness are caught between the cover and the PBBU heat sink (Figure 16), and replace the MPSA cover. Secure it with the ten screws originally removed.

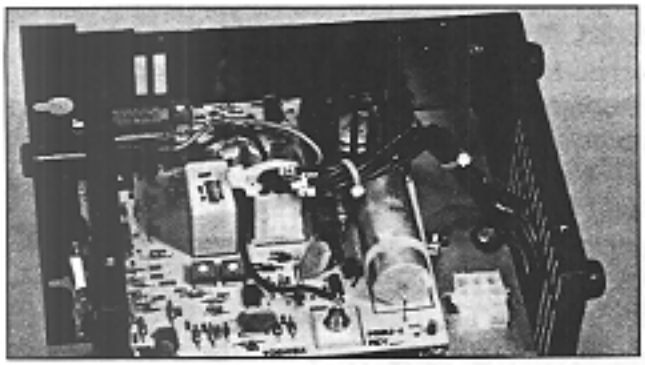

FIGURE 16—PBBU HEAT SINK

02.28 Depress the battery override button (Figure 14). If it catches and stays in, press it again to cause it to release and protrude out of the control panel. The button must be out for the MPSA to operate normally.

02.29 Remove the spare fuse from the PBBU kit, and put it in the holder located on the top of the MPSA.

02.30 **Required Labels and Warning Tags**

02.31 Remove the warning tag from the kit and tie it to the power cord where it connects to the MPSA.

02.32 The "PBBU-4 REV" decal must be placed on the control panel of the MPSA. Remove the decal from the kit, peel the backing off, and place it on the control panel (Figure 14).

02.40 **Battery Connection**

DANGER!

Do not attempt to connect the batteries to the MPSA while the AC power cord is plugged in, or without the MPSA being connected to the MKSU. Do not connect the two-wire cable to the batteries before connecting it to the MPSA. Once the batteries are connected to the MPSA the 24V output terminals are live.

02.41 Select a location for the batteries near the power supply. The loop length of the cable connecting them to the power supply will determine the minimum gauge wire which can be used in the cable. See Table A.

DANGER!

The area in which the batteries are to be located must be well ventilated to prevent a dangerous accumulation of battery gases. The batteries must also be protected from moisture and extreme temperatures.

02.42 Secure the batteries in the battery rack and separator, which should be located in a minimum access area, such as a closet or a well ventilated cabinet.

02.43 Verify that the battery override button is in the **OFF** (out) position.

02.44 Loosen the two screws on the terminal strip identified as 24V/BATTERY.

02.45 Connect the battery fuse (or circuit breaker) lead to the negative terminal on battery #1 (Figure 17).

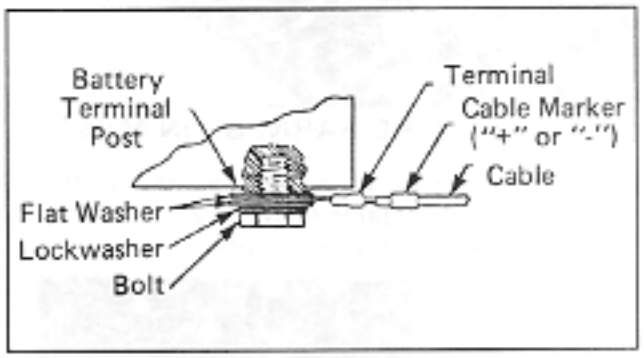

FIGURE 17
BATTERY TERMINAL ATTACHMENT

02.46 Attach the negative wire of the 2-wire cable to the battery fuse (or circuit breaker).

02.47 Connect the positive wire to the positive terminal of battery #2 (see Figure 17).

02.48 Connect the two batteries with the single-wire cable—one end to the positive terminal on battery #1 and the other end to the negative terminal on battery #2 (Figure 18).

NOTE:
Place the cable clamp over the two-wire cable and secure it to either the battery rack or the protective cabinet. Adjust the clamp to relieve strain on the cable.

02.50 **Installation Finalization**

02.51 Plug in the AC power cord, and verify that the **AC ON** indicator is lit.

02.52 Unplug the AC power cord, and verify that the **DC ON** indicator is lit to indicate that the batteries are supplying electrical power.

02.53 Replace the terminal strip cover and test the ***Strata S*** system functions under both AC and battery back-up power.

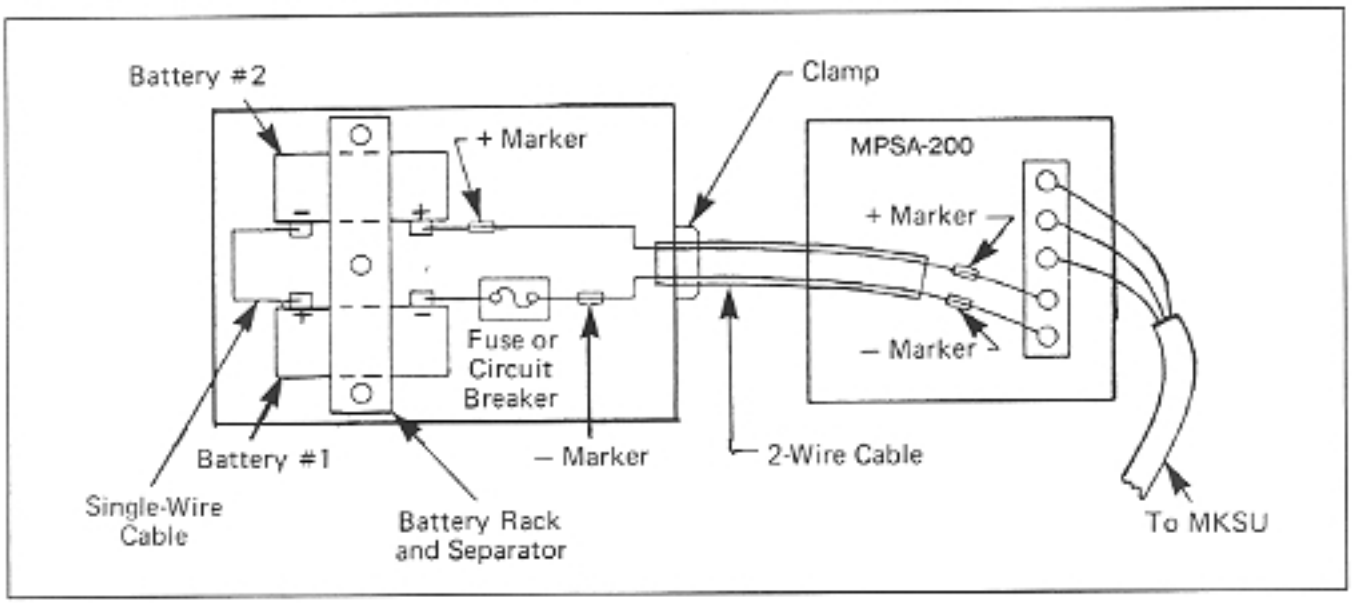

FIGURE 18—RECOMMENDED WIRING DIAGRAM

IMPORTANT!

When testing is complete, make certain that the battery override button is in the OFF position and that the AC ON indicator is lit.

SYSTEM PROGRAMMING
SECTION 100-003-300
JULY 1984

Strata S

PROGRAMMING PROCEDURES

Strata S

SYSTEM PROGRAMMING PROCEDURES

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01 INTRODUCTION

01.01 The data governing overall system operation and feature execution for ***Strata S*** is stored in read-only-memory (ROM) and cannot be altered in the field. However, the data controlling operation of the various options, both system and station, is stored in random-access-memory (RAM) and can easily be changed according to individual installation requirements.

01.02 All ***Strata S*** options are controlled by selections made in the system data tables. An initialization process is provided for verifying predetermined system assignments. The installer can then proceed with any necessary changes.

01.03 All system data changes are made via station 17 (as the input/output device). Whenever the system is placed in the programming mode, the keys on station 17 are used to enter data while its LEDs display the current data. While station 17 is in the programming mode, the remainder of the system may still be used in the usual fashion.

01.04 A memory back-up battery is provided to prevent loss of system data memory in the event of a power failure.

NOTE:
Whenever a system is installed, the system must be initialized. See Paragraph ***02.60.***

02 PROGRAMMING PROCEDURES

02.00 General

02.01 The ***Strata S*** system must be placed in the programming mode before system data can be verified or altered. With the exception of station 17, normal system functions are not suspended while in the programming mode. For convenience, station 17 can be moved from its usual location and plugged directly into the jack marked "**EKT**" on the right side panel of the KSU. *The EKT at the normal station 17 location* ***must be disconnected*** *when this jack is used.*

02.02 When the system is in the programming mode, station 17 is used to enter the system data in one of two ways:

NOTE:
All tables and procedures that follow assume station 17 has the "standard" key pattern ([INT], [CO 1 ~ 3], [AD 1 ~ 4], [DND] *and* [MW/FL]).

- In the majority of programs (Type 1), the [INT], [CO] and [AD] keys are used to change "bits" of system data. The LEDs associated with the various keys show the status of that "bit" before and after key operation. A particular key and LED will have a different meaning, depending upon the program number being used.
- In Type 2 programs, the dial pad is used to enter data. In this case, the system, using the INT, CO and selected AD LEDs, verifies the entered data by displaying the number in Binary format.

02.03 The programming mode is activated by locking in the **SET** switch on the switch panel and then depressing the [SPKR] key on station 17. After the station has been activated, a program number is dialed on the station dial pad, and the system will respond as follows:

Type 1 programs:
Station 17 LEDs will display the existing data in these categories.

Type 2 programs:
AD 2 LED on station 17 will flash continuously. Actual data may be reviewed without alteration by multiple operation of the [#] key.

02.04 Data can be altered while it is being displayed. To input new data via station 17, perform the following:

Type 1 programs:
The state of an LED is altered by depressing its associated key. Depressing the key while the LED is "on" will turn it off and vice-versa.

Type 2 programs:
Data is entered via the dial pad. The LEDs will display the data and digit number in Binary format.

02.05 Once the desired data is entered and displayed, it is written into memory by depressing the [HOLD] key on station 17.

- System and CO line options are written into temporary storage when the [HOLD] key is depressed. After ***all*** changes in these categories have been made, transfer the data into working memory per Paragraph **02.06**.
- Station option data (with the exception of CO line access assignments) are written into the main data memory; therefore, all changes

are effective immediately after the [HOLD] key is depressed. However, it is recommended that the data transfer procedures per Paragraph 02.06 be utilized for added programming protection.

02.06 Data may be secured in working memory as follows:

- Release the **SET** switch on the switch panel, and cycle (rock) the MKSU power switch **OFF** and **ON** to transfer all data into the main data memory. Note, all calls are dropped when this occurs.

02.10 Multiple Station Programming

02.11 Programs 3XX through 9XX are used to select options for individual stations (where XX represents the station number of the station being programmed). To save time, it is possible to program *all* stations simultaneously or in groups.

02.12 Multiple station programming is accomplished by substituting a special group code for the station number part of the program number (XX). The codes are:

[0][0]: All stations
[0][1]: Stations 10 ~ 13
[0][2]: Stations 14 ~ 17

02.13 Once the proper data is selected, depress the [HOLD] key in the usual manner to write it into memory.

02.20 Preparation

02.21 Before ***Strata S*** system data can be programmed, option selections must be made and then indicated on the System Record Sheet (Table 1). The Record Sheet, one of which accompanies each MKSU, will then serve as a programming guide and installation record.

02.22 Programming options are grouped according to the three categories listed below, with several program numbers associated with each category. A different program number is used for each option or group of options being selected.

a) **System Options**
- 01: System Assignments
- 05: Automatic Recall From Hold Timing

b) **CO Line Options**
- 06: Automatic Release On Hold (AROH) Enable
- 07: Automatic Release On Hold Timing
- 10: PBX Backup
- 1X: PBX Access Codes
- 20: Toll Restriction Disable
- 2X: Toll Restriction Exception Codes

c) **Station Options**
- 3XX: Station CO Line Access
- 4XX: Station Type and Flexible Key Assignment
- 5XX: Station Class of Service
- 6XX: Toll Restriction Classification
- 7XX: Station Outgoing Restriction
- 8XX: CO Ringing Assignments-Day
- 9XX: CO Ringing Assignments-Nite

02.23 The System Record Sheet is used to record the assignment of each key/LED for any given program number. For Type 1 programs an "X" placed in the record indicates that the associated LED should be turned on (lit) during the programming process. For Type 2 programs the actual data is recorded.

02.24 After making the system option selections per the following instructions, record the various choices in the System Record Sheet. Use the tables at the end of this section for detailed programming instructions.

02.30 System Options:

01 Program—System Assignments

Six options are selected with this program, using the [INT], [CO 1], [CO 2], [CO 3], [AD 3] and [AD 4] keys to change the status of their respective LEDs. For the options selected, mark an X as indicated.

1) Message Center Station 10—mark an X next to AD 4 if station 10 is to be the message center.

2) Message Center Station 11—mark an X next to AD 3 if station 11 is to be the message center.

NOTE:
Only one message center is permitted; if both stations are chosen as message centers, station 10 will have priority.

3) Pause Timing (PBX Access Code)—mark an X next to CO 3 if a 3-second pause (for dial tone delay) is required after a PBX/CO access code is dialed by the Automatic Dialing feature. Leave blank if a 1.5-second pause is sufficient.

4) Flash Time—mark an X next to CO 2 if the line-open interval produced by the [MW/FL] key

is to be 0.5-second for behind PBX operation. Leave blank if the 2.0-second flash for dial tone recall is required.

5) Station 10 DND/NITE Key—mark an X next to CO 1 if the [DND/NITE] key on station 10 is to be a DND key. Leave blank if [NITE] key is required.

6) Tone First—mark an X next to INT if Tone First intercom signalling is required. Leave blank if Voice First signalling is required.

05 Program—Automatic Recall From Hold Timing

Sets the timing for the Automatic Recall From Hold feature.

1) If a recall is desired, select a time period of 16 – 160 seconds and mark an X next to the appropriate key in the System Record Sheet. The times **are not** accumulative—only one key can be selected.

2) If no recall is required, mark an X next to INT.

02.40 CO Line Options

06 Program—Automatic Release On Hold Enable

Selects whether or not the Automatic Release On Hold (AROH) feature is to function on a given CO line; the CO line keys represent themselves.

- Mark an X next to each CO line that **requires** AROH.

07 Program—Automatic Release On Hold Timing

Selects Cross Bar (XB) or ESS timing for the AROH feature using each CO line key to represent itself.

- Mark an X next to each CO line that requires XB timing; leave blank if ESS timing is required.

NOTE:
Program 07 will have no meaning if AROH was rejected in ***Program 06****.*

10 Program—PBX Backup

Informs the system if the CO line key is actually connected to a PBX station line. The system will recognize PBX access codes on selected line(s).

- Mark an X next to each CO line that **is** to be connected to a PBX station line.

1X Program—PBX Access Codes

Informs the system of the access codes used by the PBX that is connected to the lines selected in **Program 10.** ***Strata*** will recognize the access codes and react appropriately for Toll Restriction, Automatic Dialing and Repeat Last Number Dialed.

- Enter the actual access codes (maximum: 8).

NOTE:
If the access code is a single digit, enter "" in the second column. If all combinations following a particular first digit are to be considered access codes (e.g. 91, 92, 93, etc.), enter "D" (do not care) in the second column.*

20 Program—Toll Restriction Disable

Selects whether or not the Toll Restriction feature is to function on a given CO line; the CO line keys represent themselves.

- Mark an X next to each CO line on which Toll Restriction **is not** to function.

2X Program—Toll Restriction Exception Codes

Informs the system of a maximum of five 4-digit codes (area codes or office codes) that **are** allowed to be dialed by Toll Restricted stations.

- Enter the actual 4-digit codes (maximum: 5).

NOTES:
1) *Stations allowed access to codes 1, 2, and 3 may dial up to seven digits following the 4-digit codes.*
2) *Stations allowed access to codes 4 and 5 may dial up to 29 digits (for MCI, SPRINT, etc.)* ***following*** *the 4-digit codes.*

02.40 Station Options

3XX Program—Station CO Line Access

The ability of an individual station to access any of the CO lines is determined by selections made using this program. A station denied access to a CO line by this program will have neither key nor LED functions for that CO line. Selections must be repeated for all stations.

- Mark an X next to each CO line that **is** to be **accessed** by the station in question.

4XX Program—Station Type and Flexible Key Assignment

Informs the system of the type and style telephone being used at each station (see Figure 1 for representative key designation strips). Selection must be made for each station.

1) Mark an X next to CO 2 if the EKT is equipped with 10-key #2 or 20-key #3 configuration.

2) Mark an X next to CO 1 if the EKT is to have the 10-key #1 or 20-key #2 configuration.

3) Mark an X next to INT if the EKT is to have the 10-key #1 or 20-key #1.

NOTE:
Instructions #1 and #3 cover all available EKTs, #2 is a 20-key exclusive (see Figure 1).

5XX Program—Station Class of Service

Six options are selected with this program, using INT, CO and AD keys to change the status of their respective LEDs. The selections listed below must be repeated for each station. In all cases, mark an X where indicated:

1) Privacy Override—mark an X next to AD 4 if the station **is allowed** the Privacy Override feature.

NOTE:
A maximum of two stations are permitted to use the Privacy Override feature. If more than two are programmed, only the two lowest numbered stations will be allowed to use this feature and the others will be ignored.

2) DND Override—mark an X next to AD 3 if the station **is allowed** the DND Override feature.

3) Speakerphone—mark an X next to CO 3 if the station **is allowed** to use the Speakerphone feature (optional EKT).

4) Microphone Control—mark an X next to CO 2 if the station's speakerphone **is allowed** push-on/push-off microphone control.

5) Automatic Line Preference—mark an X next to CO 1 if the station **is allowed** the Automatic Line Preference feature.

6) All Call—mark an X next to INT if the station **is included** in an All Call page.

6XX Program—Toll Restriction Classification

Eight different Toll Restriction Classifications may be selected by this program using the INT, CO and AD keys. Defines **type** of Toll Restriction that will be functional on individual stations. Selections must be made for each station:

1) Mark an X next to AD 4 if the station **will be allowed** to dial 411.

2) Mark an X next to AD 3 if the station **will be allowed** to dial 911 and 800 numbers.

3) Mark an X next to AD 2 if the station **will be allowed** to dial 1 + 7-digit number.

4) Mark an X next to AD 1 if the station **will be restricted** to dialing 7-digit numbers.

5) Mark an X next to CO 3 if the station **will be restricted** from dialing 0 as the first number.

6) Mark an X next to CO 2 if the station **will be restricted** from dialing 0 as the second number.

7) Mark an X next to CO 1 if the station **will be restricted** from dialing 1 as the first number.

8) Mark an X next to INT if the station **will be restricted** from dialing 1 as the second number.

NOTE:
*The exception codes (4 digits) may be programmed using **Program 2X**. These codes can be any combination of digits and will cause toll restriction to be bypassed—toll restriction may be disabled on a system-wide per-CO line basis using **Program 20**.*

7XX Program—Station Outgoing Call Restriction

Restricts a station from outgoing access to any number of CO lines while leaving it free to answer these lines when they are ringing or on hold. Selections must be made for each station.

- Mark an X next to the CO line that **is** to have **restricted** access by the station in question.

8XX Program—CO Ringing Assignments-Day

Selects which CO lines will ring at a given station when the system is in the "DAY" mode. Selections must be made for each station.

- Mark an X next to each CO line that **is to ring** at the station in question.

9XX Program—CO Ringing Assignment-Night

Selects which CO line will ring at a given station when the system is in the "NITE" mode. Selections must be made for each station.

- Mark an X next to each CO line that **is to ring** at the station in question.

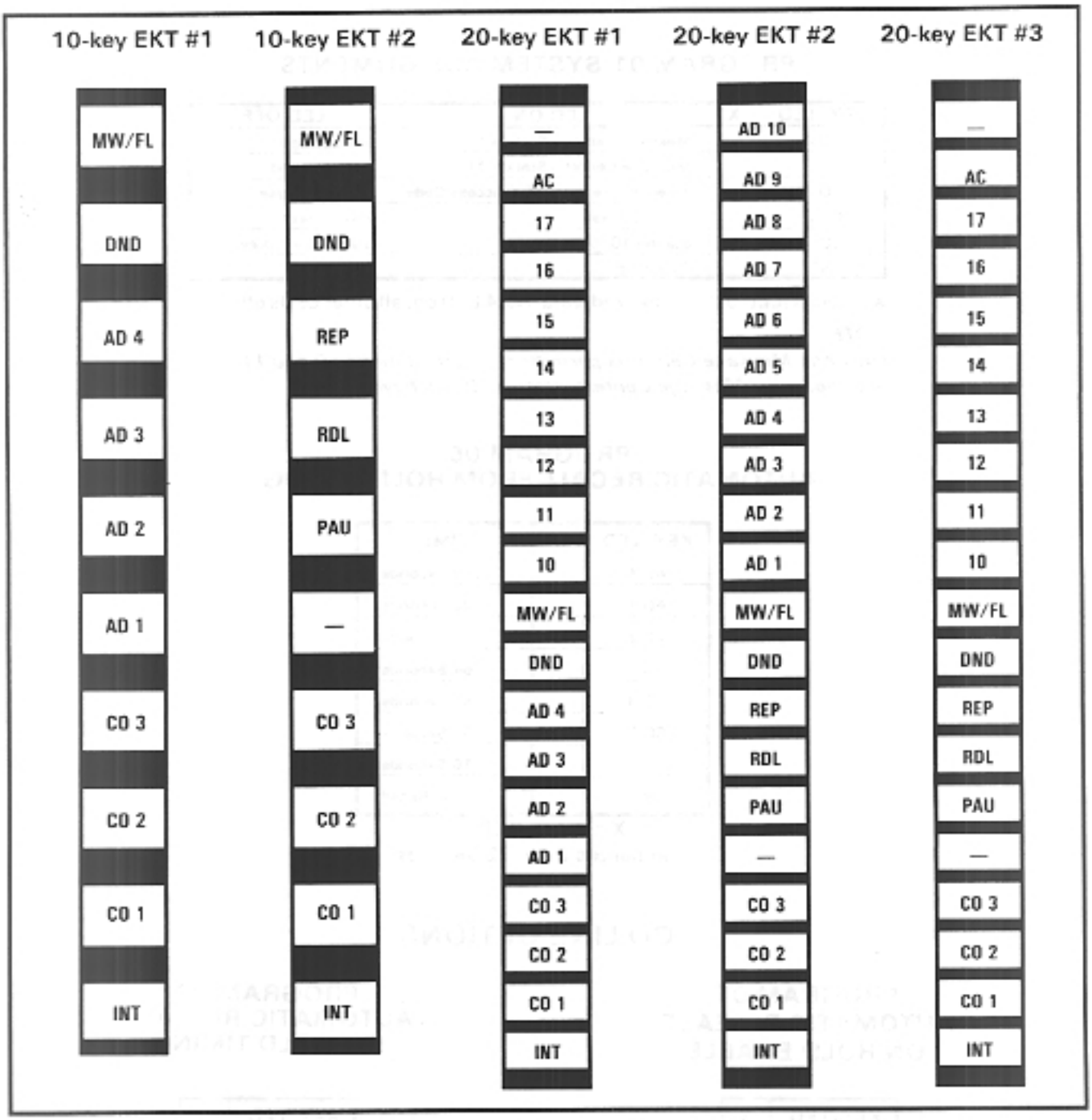

FIGURE 1—EKT KEY ASSIGNMENTS

TABLE 1
SYSTEM RECORD SHEET

PROGRAM 01-SYSTEM ASSIGNMENTS

KEY/LED	X	LED ON	LED OFF
AD 4		Message Center—Station 10	Not Equipped
AD 3		Message Center—Station 11	Not Equipped
CO 3		3-sec. Pause After PBX Access Code	1.5-sec. Pause
CO 2		0.5-sec. Flash	2-sec. Flash
CO 1		Station 10 [DND] Key	Sta. 10 [NITE] Key
INT		Tone First	Voice First

X = Select (LED on) Initialized Data: AD 4 LED on; all other LEDs off

NOTE:
Only one Message Center is permitted; if both stations 10 and 11 are chosen as Message Centers, station 10 will have priority.

PROGRAM 05
AUTOMATIC RECALL FROM HOLD TIMING

KEY/LED	X	TIME
AD 4		160 Seconds
AD 3		128 Seconds
AD 2		96 Seconds
AD 1		64 Seconds
CO 3		48 Seconds
CO 2		32 Seconds
CO 1		16 Seconds
INT		No Recall

X = Select (LED on)
Initialized Data: 32 Seconds

CO LINE OPTIONS

PROGRAM 06
AUTOMATIC RELEASE ON HOLD ENABLE

KEY/LED	X
CO 3	
CO 2	
CO 1	

X = Enable (LED on)
Initialized Data:
All LEDs off

PROGRAM 07
AUTOMATIC RELEASE ON HOLD TIMING

KEY/LED	X
CO 3	
CO 2	
CO 1	

X = XB (LED on)
Initialized Data:
All LEDs off

PROGRAM 10—PBX BACKUP

KEY/LED	X
CO 3	
CO 2	
CO 1	

X = Connected to PBX line (LED on)
Initialized Data: All LEDs off

PROGRAM 1X—PBX ACCESS CODES

CODE	1st DIGIT	2nd DIGIT
#1 (11)		
#2 (12)		
#3 (13)		
#4 (14)		
#5 (15)		
#6 (16)		
#7 (17)		
#8 (18)		

Enter Access Codes (maximum: 8)
Initialized Data: None

NOTE:
If the access code is a single digit, enter "" in the second column. If all combinations following a particular first digit are to be considered access codes (e.g., 91, 92, 93, etc.), enter "D" (do not care) in the second column.*

PROGRAM 20—TOLL RESTRICTION DISABLE

KEY/LED	X
CO 3	
CO 2	
CO 1	

X = Disable (LED on)
Initialized Data: All LEDs off

PROGRAM 2X—TOLL RESTRICTION EXCEPTION CODES

CODE	FIRST	SECOND	THIRD	FOURTH
#1 (21)				
#2 (22)				
#3 (23)				
#4 (24)				
#5 (25)				

Enter actual Exception Codes (maximum: 5)
Initialized Data: None

NOTE:
If codes are less than four digits, enter "" in the remaining spaces.*

PROGRAM 3XX—STATION CO LINE ACCESS

KEY/LED	FEATURE	STATION NUMBERS							
		10	11	12	13	14	15	16	17
CO 3	Allow Access								
CO 2	Allow Access								
CO 1	Allow Access								

X = Select (LED on) Initialized Data: All LEDs on

PROGRAM 4XX—STATION TYPE and FLEXIBLE KEY ASSIGNMENT

(See Figure 1)

KEY/LED	EKT TYPE		STATION NUMBERS							
	10-key	20-key	10	11	12	13	14	15	16	17
CO 2	#2	#3								
CO 1	—	#2								
INT	#1	#1								

X = Select (LED on) Initialized Data: INT LED on; all other LEDs off

PROGRAM 5XX—STATION CLASS OF SERVICE

KEY/LED	FEATURE	STATION NUMBERS							
		10	11	12	13	14	15	16	17
AD 4	Privacy Override Allowed								
AD 3	DND Override Allowed								
CO 3	Speakerphone Enable								
CO 2	Microphone Push-on/Push-off								
CO 1	Auto Line Preference Allowed								
INT	Include in All Call								

X = Select (LED on) Initialized Data: COs 3 & 1 & INT LEDs on; other LEDs off

PROGRAM 6XX—TOLL RESTRICTION CLASSIFICATION

KEY/LED	FEATURE	STATION NUMBERS							
		10	11	12	13	14	15	16	17
AD 4	Allow 411								
AD 3	Allow 911 and 800								
AD 2	Allow 1 + 7 digits								
AD 1	Restrict more than 7 digits								
CO 3	Restrict 0 as 1st digit								
CO 2	Restrict 0 as 2nd digit								
CO 1	Restrict 1 as 1st digit								
INT	Restrict 1 as 2nd digit								

X = Select (LED on) Initialized Data: No Restriction

PROGRAM 7XX—STATION OUTGOING CALL RESTRICTION

KEY/LED	FEATURE	STATION NUMBERS 10	11	12	13	14	15	16	17
CO 3	Restricted								
CO 2	Restricted								
CO 1	Restricted								

X = Select (LED on) Initialized Data: All LEDs off

PROGRAM 8XX—CO RINGING ASSIGNMENTS-DAY

KEY/LED	FEATURE	STATION NUMBERS 10	11	12	13	14	15	16	17
CO 3	Ring in Day								
CO 2	Ring in Day								
CO 1	Ring in Day								

X = Select (LED on) Initialized Data: Station 10—all LEDs on; all others off

PROGRAM 9XX—CO RINGING ASSIGNMENTS-NITE

KEY/LED	FEATURE	STATION NUMBERS 10	11	12	13	14	15	16	17
CO 3	Ring in Nite								
CO 2	Ring in Nite								
CO 1	Ring in Nite								

X = Select (LED on) Initialized Data: Station 11—all LEDs on; all others off

02.60 Initialization

02.61 ***Strata S*** has a list of standard system data assignments stored in ROM that can be entered anytime by initializing the system. The system must be initialized when it is first installed. This will allow the system to be tested and any faults to be corrected before time is spent on programming. Standard data assignments are listed in Table 2.

02.62 To initialize the ***Strata S*** system:

a) Make sure the power switch on the MKSU switch panel is in the **ON** position.

b) Depress the **SET** switch on the switch panel and allow it to lock.
- The SET LED lights.
- The MW/FL LED on station 17 lights.

c) Depress the [SPKR] key on station 17.
- The SPKR LED lights.

d) Dial [#][*][0] on the dial pad.

e) Depress the [CO 1] and [CO 3] keys.
- The corresponding LEDs light.

f) Depress the [HOLD] key on station 17.
- The INT ~ AD 4 LEDs will flash continuously.

g) Depress and release the **SET** switch again.
- Station 17 LEDs stop flashing and return to usual indication.

h) Cycle the power switch **OFF** and **ON**.

02.63 The Automatic Dialing memory will contain random numbers when the system is powered up initially. Therefore, it is necessary to clear the memory to prevent meaningless numbers from being dialed.

a) Lock in the **SET** switch on the MKSU.
- The SET LED and MW/FL LED on station 17 will go on.

b) Depress the [SPKR] key on station 17.
- SPKR LED will light steadily.

c) Dial [#][*][*] on the dial pad.
- SPKR LED will flash continuously.

d) Depress the [INT] and [CO 2] keys.
- Corresponding LEDs will light steadily.

e) Depress the [HOLD] key.
- All station 17 LEDs (except MW/FL) will go off.

f) Release the **SET** switch.
- The SET LED and MW/FL LED on station 17 will go off.

02.70 System Data Entry

02.71 System Data is entered via station 17 while the system is in the "programming mode".

02.72 The system is placed in the programming mode by locking in the **SET** switch on the MKSU. The SET LED and MW/FL LED on station 17 will light while the system is in the programming mode.

NOTE:
All tables and procedures that follow assume station 17 has the "standard" key pattern ([INT], [CO 1~3], [AD 1~4], [DND], [MW/FL]).

02.73 Once the system is in the programming mode, refer to the System Record Sheet for the changes that must be made and select the required program number. Refer to the proper table for detailed instructions for using each different program. Each program should be accomplished sequentially until all necessary changes are made.

TABLE 2
INITIALIZED DATA

SYSTEM OPTIONS

System Assignments—01 Program
- Message Center station 10 = Equipped
- Message Center station 11 = Not Equipped
- Pause Timing = 1.5 seconds
- Flash Key Timing = 2 seconds
- Station 10 DND/Nite Key = Nite key
- Intercom Signalling = Voice first

Automatic Recall From Hold Timing—05 Program
- 32 Seconds

CO LINE OPTIONS

Automatic Release On Hold Assignment—06 Program
- Disabled = All CO lines

Automatic Release On Hold Timing—07 Program
- ESS Timing = All CO lines

PBX Backup—10 Program
- CO Operation = All CO lines

PBX Access Codes—1X Program
- No Codes Assigned

TABLE 2 (continued)

Toll Restriction Disable—20 Program
Toll Restriction = All CO lines
- Ineffective if **Program 6XX** not utilized.

Toll Restriction Exception Codes—2X Program
No Codes Assigned

STATION OPTIONS

Station CO Line Access—3XX Program
Access Allowed = All lines, all stations

Station Type and Flexible Key Assignment—4XX Program
10-key #1/20-key #1 = All stations
- 10-key EKT with 4 AD keys or 20-key with 4 AD and 8 DSS keys.

Station Class of Service—5XX Program
Privacy Override = Not allowed all stations
DND Override = Not allowed all stations
Speakerphone = Allowed all stations
Microphone Control = Momentary
Automatic Line Preference = Enable all stations
All Call = Include all stations

Toll Restriction Classification—6XX Program
No Restrictions = All lines, all stations

Station Outgoing Call Restriction—7XX Program
No Restrictions = All stations

CO Ringing Assignments-Day—8XX Program
All lines ring station 10

CO Ringing Assignments-Nite—9XX Program
All lines ring station 11

02.74 The table and page numbers for the various programs are listed below:

PROGRAM TABLE LIST

TABLE 3
PROGRAM 01—SYSTEM ASSIGNMENTS

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [0] [1] on dial pad.	SPKR LED flashes continuously. AD, CO & INT LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the [AD], [CO] and [INT] keys, turn associated LEDs on or off, as required. The detailed meaning of each key/LED is shown below.	An X on the record sheet means the LED should be on. If the LED is already on, depressing the associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.

NOTE:
If any key/LED is not shown, it is not used.

FEATURE	KEY/LED	LED ON	LED OFF
Message Center (Station 10)	AD 4	Yes	No
Message Center (Station 11)	AD 3	Yes	No
Pause Timing (after PBX acc code)	CO 3	3.0 sec.	1.5 sec.
Flash Key Timing	CO 2	0.5 sec.	2.0 sec.
Station 10 DND/NITE Key	CO 1	DND	Nite
Intercom Signalling	INT	Tone First	Voice First

5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 4
PROGRAM 05—AUTOMATIC RECALL FROM HOLD TIMING

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [0] [5] on dial pad.	SPKR LED flashes continuously. An AD, CO & INT LED will be on according to present data.
4. Refer to the System Record Sheet. Using an [AD], [CO] or [INT] key, turn associated LEDs on or off, as required. The detailed meaning of each key/LED is shown below.	An X on the record sheet means the LED should be on. Only one LED is permitted to be on, depressing another key will turn its associated LED on and turn off the previous LED.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

KEY/LED	X	TIME
AD 4		160 seconds
AD 3		128 seconds
AD 2		96 seconds
AD 1		64 seconds
CO 3		48 seconds
CO 2		32 seconds
CO 1		16 seconds
INT		No Recall

TABLE 5
PROGRAM 06—AUTOMATIC RELEASE ON HOLD ENABLE

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [0] [6] on dial pad.	SPKR LED flashes continuously. CO LEDs are on according to present data.
4. Refer to the System Record Sheet. Using the [CO] keys, turn the associated LEDs on or off, as required. Each CO key/LED represents itself—that is, if the CO 1 LED is on, CO 1 will have the AROH function during normal operation. If the CO 1 LED is off, AROH will not function on that line.	An X on the record sheet means the LED should be on. If the LED is already on, depressing the associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 6
PROGRAM 07—AUTOMATIC RELEASE ON HOLD TIMING

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [0] [7] on dial pad.	SPKR LED flashes continuously. CO LEDs are on according to present data.
4. Refer to the System Record Sheet. Using the [CO] keys, turn the associated LEDs on or off, as required. Each CO key/LED represents itself—that is, if the CO 1 LED is on, CO 1 will use XB (cross-bar) timing for AROH. If the CO 1 LED is off, ESS timing will be used on that line.	An X on the record sheet means the LED should be on. If the LED is already on, depressing the associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

NOTE:
***Program 07** will have no meaning if AROH was rejected in **Program 06**.*

TABLE 7
PROGRAM 10—PBX BACKUP

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [1] [0] on dial pad.	SPKR LED flashes continuously. CO LEDs are on according to present data.
4. Refer to the System Record Sheet. Using the [CO] keys, turn the associated LEDs on or off, as required. Each CO key/LED represents itself—that is, if the CO 1 LED is on, the system assumes that the CO 1 line is connected to a PBX line and will cause features such as Toll Restriction and Automatic Dialing to function accordingly.	An X on the record sheet means the LED should be on. If the LED is already on, depressing the associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	 SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 8
PROGRAM 1X—PBX ACCESS CODES

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [1] [X] on the dial pad. X = 1, 2, 3, etc.—the system will store a maximum of eight codes. Dial [1] [1] (X = 1) to program first access code, [1] [2] (X = 2) to program second access code, etc.	SPKR LED flashes continuously. AD 2 LED will flash.
4. Refer to the System Record Sheet. Using the dial pad, enter the required access code (two digits **must** be entered.) • If the access code is a single digit, enter [*] as the second digit. • If all combinations following a particular first digit are to be considered access codes (e.g. 91, 92, 93, etc.), depress the [DND] key for the second digit.	INT, CO 1, 2 & 3 LEDs will light to display data in Binary format. AD 2 & 3 LEDs will light steadily to indicate which digit is being displayed.

LED	Start	1st Digit	2nd Digit
AD 3			Steady
AD 2	Flash	Steady	
CO 3		Binary Data	Binary Data
CO 2		Binary Data	Binary Data
CO 1		Binary Data	Binary Data
INT		Binary Data	Binary Data

NOTES:
1. *Depressing the [#] key displays the data without changing it. The first [#] will display the first digit; the second [#] will display the second digit, etc.*
2. *To clear existing data without entering a new number, depress the [*] key two times.*

X = LED on
All LEDs off = no data

Binary Numbers:	1	2	3	4	5	6	7	8	9	0	DND
CO 3								X	X	X	X
CO 2				X	X	X	X				X
CO 1		X	X			X	X			X	
INT	X		X		X		X		X		X

5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 9
PROGRAM 20—TOLL RESTRICTION DISABLE

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [2] [0] on dial pad.	SPKR LED flashes continuously. CO LEDs are on according to present data.
4. Refer to the System Record Sheet. Using the [CO] keys, turn the associated LEDs on or off, as required. Each CO key/LED represents itself—that is, if the CO 1 LED is on, Toll Restriction will not function on CO 1. If CO 1 LED is off, Toll Restriction will function on CO 1, etc.	An X on the record sheet means the LED should be on. If the LED is already on, depressing the associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Go to Step 2 in another program table . . . or . . . 6B. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 10
PROGRAM 2X—TOLL RESTRICTION EXCEPTION CODES

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [2] [X] on the dial pad. X = 1, 2, 3, etc.—the system will store a maximum of five codes. Dial [2] [1] (X = 1) to program first exception code, [2] [2] (X = 2) to program second exception code, etc.	SPKR LED flashes continuously. AD 2 LED will flash.
4. Refer to the System Record Sheet. Using the dial pad, enter the required 4-digit exception code (four digits **must** be entered). • If less than four digits are used, enter [*] for remaining digits.	INT, CO 1, 2 & 3 LEDs will light to display data in Binary format. AD 2, 3 & 4 LEDs will light steadily to indicate which digit is being displayed.

Key/LED	Start	1st Digit	2nd Digit	3rd Digit	4th Digit
AD 4					Steady
AD 3			Steady	Steady	
AD 2	Flash	Steady		Steady	
AD 1					
CO 3		Binary Data	Binary Data	Binary Data	Binary Data
CO 2		Binary Data	Binary Data	Binary Data	Binary Data
CO 1		Binary Data	Binary Data	Binary Data	Binary Data
INT		Binary Data	Binary Data	Binary Data	Binary Data

NOTES:
1. *Depressing the [#] key displays the data without changing it. The first [#] will display the first digit; the second [#] will display the second digit, etc.*
2. *To clear existing data without entering a new number, depress the [*] key two times.*

	Binary Numbers:	1	2	3	4	5	6	7	8	9	0	DND
	CO 3								X	X	X	X
X = LED on	CO 2				X	X	X	X				X
All LEDs off = no data	CO 1		X	X			X	X			X	
	INT	X		X		X		X		X		X

5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 11
PROGRAM 3XX—STATION CO LINE ACCESS

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [3] [X] [X] on the dial pad. XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. CO LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the CO keys, turn their associated LEDs on or off, as required. • LED on = Access allowed • Each CO key/LED represents itself—that is, if the CO 1 LED is on, then the station being programmed (XX) is allowed access to CO 1, etc.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 12
PROGRAM 4XX—STATION TYPE and FLEXIBLE KEY ASSIGNMENT

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [4] [X] [X] on the dial pad. XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. INT & CO LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the INT and CO keys, turn their associated LEDs on or off, as required. The detailed meaning of each key is shown below.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.

Key/LED	EKT TYPE*	
	10-key	20-key
CO 2	#2	#3
CO 1	—	#2
INT	#1	#1

**See Figure 1*

5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 13
PROGRAM 5XX—STATION CLASS OF SERVICE

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [5] [X] [X] on the dial pad. XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. INT, CO & AD LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the INT, CO and AD keys, turn their associated LEDs on or off, as required. The detailed meaning of each key is shown below.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.

FEATURE	KEY/LED	LED ON	LED OFF
Privacy Override Allowed	AD 4	Yes	No
DND Override Allowed	AD 3	Yes	No
Speakerphone	CO 3	Allowed	Not Allowed
Microphone Control	CO 2	Push-on/Push-off	Momentary
Automatic Line Preference	CO 1	Allowed	Not Allowed
All Call	INT	Included	Not Included

5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 14
PROGRAM 6XX—TOLL RESTRICTION CLASSIFICATION

<table>
<tr><td>1. Lock in SET switch.</td><td>SET LED on.
Station 17 MW/FL LED on.
System is in program mode.
Normal functions halt on station 17.</td></tr>
<tr><td>2. Depress the [SPKR] key on station 17.</td><td>SPKR LED steady on.</td></tr>
<tr><td>3. Dial [6] [X] [X] on the dial pad. XX = the number of the station(s) to be programmed.
• Enter [0] [0] if all stations are to be programmed simultaneously.
• Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously.
• Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.</td><td>SPKR LED flashes continuously.
INT, CO & AD LEDs will be on according to present data.</td></tr>
<tr><td>4. Refer to the System Record Sheet. Using the INT, CO and AD keys, turn their associated LEDs on or off, as required.
The detailed meaning of each key is shown below.</td><td>An X on the record sheet means the LED should be on.
If the LED is already on, depressing its associated key will turn it off and vice-versa.
LEDs may be turned off and on until the desired pattern is set.</td></tr>
<tr><td colspan="2"><table>
<tr><th>Key/LED</th><th>Data Meaning (LED on)</th></tr>
<tr><td>AD 4</td><td>Allow 411</td></tr>
<tr><td>AD 3</td><td>Allow 911 and 800</td></tr>
<tr><td>AD 2</td><td>Allow 1 + 7 digits</td></tr>
<tr><td>AD 1</td><td>Restrict more than 7 digits</td></tr>
<tr><td>CO 3</td><td>Restrict 0 as first digit</td></tr>
<tr><td>CO 2</td><td>Restrict 0 as second digit</td></tr>
<tr><td>CO 1</td><td>Restrict 1 as first digit</td></tr>
<tr><td>INT</td><td>Restrict 1 as second digit</td></tr>
</table></td></tr>
<tr><td>5. Depress the [HOLD] key to place new data in memory.</td><td>All station 17 LEDs (except MW/FL) go off.</td></tr>
<tr><td>6A. Return to Step 2 in order to continue with this program
. . . or . . .
6B. Go to Step 2 in another program table
. . . or . . .
6C. Transfer data into working memory per Paragraph 02.06.</td><td>SET LED goes off.
Station 17 MW/FL LED goes off.
New data is stored, previous data is erased.</td></tr>
</table>

TABLE 15
PROGRAM 7XX—STATION OUTGOING CALL RESTRICTION

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [7] [X] [X] on the dial pad. XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. CO LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the CO keys, turn their associated LEDs on or off, as required. • LED on = Restricted outgoing calls. • Each CO key/LED represents itself—that is, if the CO 1 LED is on, then the station being programmed (XX) is restricted from outgoing calls on CO 1, etc.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

TABLE 16
PROGRAM 8XX—CO RINGING ASSIGNMENTS-DAY

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [8] [X] [X] on the dial pad.* XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. CO LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the CO keys, turn their associated LEDs on or off, as required. • LED on = Ring in **DAY** mode. • Each CO key/LED represents itself—that is, if the CO 1 LED is on, then the station being programmed (XX) will ring when a call comes in on CO 1 in **DAY** mode.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

NOTE:
*Station(s) being designated to ring must be allowed access by **Program 3XX**.*

TABLE 17
PROGRAM 9XX—CO RINGING ASSIGNMENTS-NITE

1. Lock in **SET** switch.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17.
2. Depress the [SPKR] key on station 17.	SPKR LED steady on.
3. Dial [9] [X] [X] on the dial pad.* XX = the number of the station(s) to be programmed. • Enter [0] [0] if all stations are to be programmed simultaneously. • Enter [0] [1] if four lower numbered stations (10 ~ 13) are to be programmed simultaneously. • Enter [0] [2] if four higher numbered stations (14 ~ 17) are to be programmed simultaneously.	SPKR LED flashes continuously. CO LEDs will be on according to present data.
4. Refer to the System Record Sheet. Using the CO keys, turn their associated LEDs on or off, as required. • LED on = Ring in **NITE** mode. • Each CO key/LED represents itself—that is, if the CO 1 LED is on, then the station being programmed (XX) will ring when a call comes in on CO 1 in **NITE** mode.	An X on the record sheet means the LED should be on. If the LED is already on, depressing its associated key will turn it off and vice-versa. LEDs may be turned off and on until the desired pattern is set.
5. Depress the [HOLD] key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
6A. Return to Step 2 in order to continue with this program . . . or . . . 6B. Go to Step 2 in another program table . . . or . . . 6C. Transfer data into working memory per Paragraph **02.06**.	SET LED goes off. Station 17 MW/FL LED goes off. New data is stored, previous data is erased.

NOTE:
*Station(s) being designated to ring must be allowed access by **Program 3XX**.*

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Strata S

OPERATING PROCEDURES

Strata S

OPERATING PROCEDURES

TABLE of CONTENTS

01 INTRODUCTION

01.00.1 The operations of the various ***Strata S*** electronic key telephones (EKT) will be described in this section. These EKTs are specially designed telephones and are connected to the system using industry standard 2-pair wiring.

02 KEY FUNCTIONS

02.00.0 Standard Key Functions

02.00.1 The standard ***Strata S*** EKT has either 13 or 14 line and feature keys and a push-button dial pad. The following is a general description of each key.

CENTRAL OFFICE LINE KEY [CO]
Accesses an outside line.

INTERCOM KEY [INT]
Accesses the intercom line.

DO NOT DISTURB KEY [DND]
Locks the individual EKT into the Do Not Disturb mode.

MESSAGE WAITING & FLASH KEY [MW/FL]
Used by station 10 or 11 (operator) to indicate when a message is waiting for any other station. When used as a Flash Key, it disconnects and recalls dial tone on a CO line, or is used to access PBX features.

SPEAKER KEY [SPKR]
Turns the speaker ON/OFF.

MICROPHONE KEY [MIC]
(Speakerphone EKTs only)
Cuts off the Speakerphone's microphone for private conversations. This key is labeled "MUTE" on some EKTs.

CONFERENCE KEY [CONF]
Sets up conference calls.

HOLD KEY [HOLD]
Places an outside call on hold.

NIGHT TRANSFER [NT]
Takes the place of the [DND] key on the operator's station and is used to control the system's CO/PBX line ringing pattern.

AUTOMATIC DIALING KEYS [AD]
Single-key automatic dialing for telephone numbers after accessing a CO line.

NOTE
*See Paragraph **07** for a full explanation of the features of the optional EKTs.*

03 VOLUME CONTROLS

03.00.0 10-key "S" EKT

03.00.1 The dial tone volume level on the standard 10-key "S" EKT is controlled by the sliding volume control located on the faceplate of the telephone. A 3-position switch on the bottom of the EKT adjusts the ring tone and intercom voice-announcement volume.

03.01.0 Optional EKTs

03.01.1 The voice and ring tone volume levels on the optional EKTs are controlled by separate volume controls located on the rear of each telephone. The control on the right adjusts speaker volume for dial tone and voice level; the left control adjusts ring tone and intercom voice-announcement volume.

04 TONE & LED ILLUMINATING INDICATIONS

I-Use:
A steady-double flash rate (2.0 seconds on—⅛ second off—⅛ second on—⅛ second off) indicates the CO line presently in use at the EKT that originated the call. Other stations' LEDs will be steady-on for that line.

I-Called:
A pulsating on/off flash rate (10 impulses per second (IPS) for 1 second on and 1 second off) will appear on the INT LED at the EKT being called.

I-Hold:
A fast (4 IPS) flash rate (⅛ second on—⅛ second off) indicates the CO line placed on hold at that EKT. The LEDs of the CO line on hold will flash at a medium rate (¾ second on—¼ second off) at the other stations.

Hold Recall:
A quick flash rate matching the tones (2 IPS for 1 second—10 IPS for 1 second) will remind a station which line has been on hold for the programmed period of time.

Conference:
A very fast flash rate (10 IPS) indicates the CO line presently in the Conference mode. Other stations' LEDs will show the same indication for that line.

CO Incoming Call:
A slow flash rate (½ second on—½ second off) indicates which CO line has an incoming call.

05 MESSAGE WAITING

05.00.0 Message Center

Station 10 or 11 only.

05.00.1 To use Message Waiting

1) Call the appropriate station on intercom.
2) If no answer, depress the [MW/FL] key on the Message Center EKT.
   - This illuminates the MW/FL LEDs on both EKTs.
3) Hang up.
   - This extinguishes the Message Center MW/FL LED (LED on called station remains lit).

05.00.2 To clear the MW/FL LED on the called EKT from the Message Center

1) Call the appropriate station.
2) Depress the [MW/FL] key twice.

05.01.0 Called Station

05.01.1 To use Message Waiting

1) Lift the handset.
2) Call the Message Center on the intercom.
3) After receiving the message(s), hang up.

05.01.2 To clear the MW/FL LED from the called station

1) Lift the handset (without depressing the intercom or a CO/PBX key).
2) Depress the [MW/FL] key.
3) Hang up.

TABLE A

TELEPHONE TONES

Ringing Tone	
CO Line (idle station)	600 Hz/800 Hz, modulated by 16 Hz, 1 second on, 3 seconds off
(busy station)	2400 Hz, modulated by 10 Hz, 1 second on, 3 seconds off
Intercom Line	600 Hz, 1 second on, 3 seconds off
Ring-back Tone	600 Hz, 1 second on, 3 seconds off
Intercom Dial Tone	600 Hz, continuous
Busy Tone	600 Hz, 0.25 second on, 0.25 second off
Do Not Disturb Tone	600 Hz, 0.12 second on, 0.12 second off
Busy & DND Override Tone	2400 Hz, 1 second on, 3 seconds off
Voice Page Warning Tone	600 Hz, 1 second on only (via EKT speaker)
Executive Override Warning Tone	600 Hz, 0.5 second on only (via handset)
Hold Recall	2400 Hz, modulated by 10 Hz—1 second on, 1 second off

06 OPERATING PROCEDURES

06.00.0 Outside Calls

06.00.1 To make an outside call (off-hook dialing)

1) Lift the handset.
2) Depress an available CO key.
   - Listen for dial tone.
   - CO line LED will flash at the I-use rate.
3) Dial the desired telephone number.
4) Hang up when the call is completed.

06.00.2 To receive an incoming call

1) You will hear a CO incoming call ringing tone.
   - The CO line LED will flash at the CO incoming call rate.
2) Lift the handset.
   - CO line LED will flash at the I-use rate.
3) Hang up when the call is completed.

06.01.0 Intercom Calls

06.01.1 To make an intercom call

1) Lift the handset.
2) Depress the [INT] key.
   - You will hear intercom dial tone.
   - INT LED will flash at the I-use rate.

3) Dial the desired station.
   - You will hear a single ring tone.

4) Speak when the ring tone ends.

5) Hang up when the call is completed.

NOTE:
Tone signalling is accomplished by dialing [1] after the station number. An intercom call may be answered at any station.

06.01.2 To receive an intercom call

1) You will hear a single long tone, followed by the caller's voice.
   - The INT LED will flash at the l-called rate.

2) Lift the handset.
   - The INT LED will flash at the l-use rate.

3) Hang up when the call is completed.

06.01.3 Intercom tone signalling (programmable option)

1) You will hear a ringing tone as the primary method of intercom call signalling.
   - Handsfree answerback is inoperative.

2) A voice call can be accomplished by dialing [1].

06.02.0 Call Holding

06.02.1 To hold a call

While connected to an outside call, depress the [HOLD] key.
- The CO line LED will flash at the l-hold rate.

NOTES:
1. *When a CO line is placed on hold it may be picked up at any station.*
2. *An on-hold reminder tone is generated within a pre-determined time at the station that placed the line on hold. The LED flash rate of the recalling line will synchronize with tone.*
3. *Hold is automatically released if the other party hangs up.*

06.03.0 Call Transfer

06.03.1 To transfer a call

1) While connected to an outside call, depress the [HOLD] key.
   - The CO line LED will flash at the l-hold rate.

2) Depress the [INT] key.
   - You will hear intercom dial tone.
   - The INT LED will flash at the l-use rate.

3) Dial the desired station number.

4A) If you hear a single ring tone, announce the call (noting the correct CO line), and hang up.
   - The CO line LED will flash at the l-hold rate until the other station connects with the call.

4B) If the station is busy, you have several choices:
   a) If you are the Message Center, depress the [MW/FL] key.
   b) Depress the appropriate [CO] key and inform the caller of the situation.
   c) Dial [2] for busy override (see Override).

NOTES:
1. *When a CO line is placed on hold it may be picked up at any station.*
2. *An on-hold reminder tone is generated within a pre-determined time at the station that placed the line on hold. The LED flash rate of the recalling line will synchronize with tone.*
3. *Hold is automatically released if the other party hangs up.*

06.03.2 To receive a transferred call.

1) You will hear a single long tone, followed by an announcement.
   - The INT LED will flash at the l-called rate.

2) Lift the handset and acknowledge the announcement.

3) Depress the announced [CO] key.
   - You are now connected with the outside call.

06.04.0 Night Transfer

Programmable option for station 10 only.

06.04.1 To initiate Night Transfer

Depress the [NT] key.
- The NT LED illuminates.
- All incoming calls are automatically transferred to the preselected stations.

06.04.2 To cancel Night Transfer

Return the system to the normal ringing pattern by depressing the [NT] key again.
- NT LED extinguishes.

06.05.0 Conferencing

06.05.1 To conference one station and two CO lines

1) Lift the handset.
2) Depress any available [CO] key.
3) Dial the desired telephone number.
4) Depress the [HOLD] key after the called party answers.
5) Depress a second available [CO] key.
6) Dial the second party's telephone number.
7) Depress the [CONF] key after the second party answers.
8) Depress the **original** [CO] key.
   - Station is now connected to both CO lines.
9) Hang up when the conference call is completed.

06.05.2 To conference two or three stations and two CO lines

1) Lift the handset.
2) Depress any available [CO] key.
3) Dial the desired telephone number.
4) Depress the [HOLD] key after the called party answers.
5) Depress a second available [CO] key.
6) Dial the second party's telephone number.
7) Depress the [HOLD] key after the second party answers.
8) Depress the [INT] key, and call the station(s) to be included in the conference call.
9) Advise the station(s) of the number of the second CO line and tell them to depress that [CO] key when its LED begins the distinctive conference flash.
10) Depress the second [CO] key.
11) Depress the [CONF] key.
    - CO LED changes to conference flash.
    - CO LED changes I-use rate when the other station enters the conference.
12) Depress the [CONF] key again if a third station is to enter the conference call.
13) After the station(s) are entered, depress the [CONF] key, and then the first [CO] key.
14) Hang up when the conference call is completed.

06.05.3 To conference up to four stations and one CO line

1) Lift the handset.
2) Depress any available [CO] key.
3) Dial the desired telephone number.
4) Depress the [HOLD] key after the called party answers.
5) Depress the [INT] key, and call the station(s) to be included in the conference call.
6) Advise the station(s) of the number of the CO line and tell them to depress that [CO] key when its LED begins the distinctive conference flash.
7) Depress the [CO] key.
8) Depress the [CONF] key.
   - CO LED changes to conference flash.
   - CO LED then changes to I-use rate when the other station enters the conference.
9) Depress the [CONF] key again if a third station is to enter the conference call.
10) Repeat for a fourth station, if necessary.
11) Hang up when the conference call is completed.

06.05.4 To conference three or four stations on intercom

1) Using the intercom, advise the third and fourth parties of the conference. Tell them to depress the [INT] key when its LED begins the distinctive conference flash.
2) Using the intercom, call party #2.
3) Depress the [CONF] key.
   - The LED changes to conference flash at all stations.
   - The LED changes to I-use rate when the third station enters the conference.
4) Depress the [CONF] key again to allow a fourth party to enter.
5) Hang up when the conference call is completed.

06.06.0 Automatic Dialing

06.06.1 To dial a frequently called number automatically

NOTE:
*See Paragraph **07.04.0** for optional key usage.*

A) Using the [*] key.

1) Lift the handset.
2) Depress any available [CO] key.
   - Listen for dial tone.
3) Depress the [*] key.
4) Dial the 2-digit address code that corresponds to the desired telephone number.
   - ***Strata S*** will automatically dial the number for you.
5) Hang up when the call is completed.

B) Using an [AD] key.

1) Lift the handset.
2) Depress any available [CO] key.
   - Listen for dial tone.
3) Depress the [AD] key that corresponds to the desired telephone number.
   - ***Strata S*** will automatically dial the number for you.
4) Hang up when the call is completed.

06.06.2 To automatically redial the last number called

NOTE:
*See Paragraph **07.04.0** for optional key usage.*

1) Depress any available [CO] key.
   - Listen for dial tone.
2) Depress the [#] key.
   - ***Strata S*** will automatically dial the last telephone number that was dialed at that station.
3) Hang up when the call is completed.

06.06.3 To chain dial automatically

Automatically dials two or more sets of numbers during one call. For use with long distance routing.

A) Using the [*] key.

1) Lift the handset.
2) Depress any available [CO] key.
   - Listen for dial tone.
3) Depress the [*] key.
4) Dial the 2-digit address code that corresponds to the first telephone number to be dialed.

NOTE:
It is not necessary to wait until the system has finished dialing to proceed with the following steps.

5) Depress the [*] key again.
6) Dial the 2-digit address code that corresponds to the second telephone number to be dialed.
7) Repeat the above steps for each subsequent number to be dialed.
   - ***Strata S*** will automatically dial the numbers for you.
8) Hang up when the call is completed.

B) Using an [AD] key.

1) Lift the handset.
2) Depress any available [CO] key.
   - Listen for dial tone.
3) Depress the [AD] key that corresponds to the first telephone number to be dialed.
4) Depress the [AD] key that corresponds to the second telephone number to be dialed.
5) Repeat the above steps for each subsequent number to be dialed.
   - ***Strata S*** will automatically dial the numbers for you.
6) Hang up when the call is completed.

NOTE:
Telephone numbers within the chain dial sequence can be dialed via [AD] keys or [*] + 2-digit address codes interchangeably. Only the first number dialed during the chain dial will be repeated by the automatic redial, however.

06.06.4 To store telephone numbers.

Telephone numbers can be stored in the system memory by station 10 only.

1) Remove the handset from its hook (do not activate the intercom or a CO line).

2) Depress the [#] and [*] keys, respectively.

3) Dial a 2-digit address code.
   - Codes run consecutively from 60 through 99.

4) Dial the telephone number (up to 16 digits) to be stored.

NOTE FOR BEHIND PBX:
It may be necessary to insert a pause after the trunk access code to allow for dial tone delay. Depress the [MW/FL] key (if the pause is required) after entering the PBX access code.

5) Depress the [#] key to record the number in memory.

6) Repeat the above steps with every number, up to 40, to be stored.

7) Return the handset to on-hook.

8) Write down the address codes and numbers for future reference.

NOTE:
Repeat this procedure to replace the stored telephone numbers with new numbers.

06.06.6 To store a telephone number in station memory

Ten telephone numbers may be stored by each station.

A) Repertory dialing using the [*] key.

1) Lift the handset (do not activate the intercom or a CO line).

2) Depress the [#] and [*] keys, respectively.

3) Dial a 2-digit address code.
   - Codes run consecutively 10 ~ 19.

4) Dial the telephone number (up to 16 digits) to be stored.

NOTE FOR BEHIND PBX:
It may be necessary to insert a pause after the trunk access code to allow for dial tone delay. Depress the [MW/FL] key (if the pause is required) after entering the PBX access code.

5) Depress the [#] key to record the number in memory.

6) Repeat the above steps with every number (up to 10) to be stored.

7) Return the handset to on-hook.

8) Write down the address codes and numbers for future reference.

NOTE:
Repeat this procedure to replace the stored telephone numbers with new numbers.

B) One-key automatic dialing using the [AD] keys.

1) Lift the handset (do not activate the intercom or a CO line).

2) Depress the [#] key.

3) Depress one of the [AD] keys.

4) Dial the telephone number (up to 16 digits) to be stored.

NOTES:
1. *Each AD key actually uses one of the station memory address codes ([AD 1] = 10, [AD 2] = 11, etc.).*
2. *(FOR BEHIND PBX)—It may be necessary to insert a pause after the trunk access code to allow for dial tone delay. Depress the [MW/FL] key (if the pause is required) after entering the PBX access code.*

5) Depress the [#] key to record the number in memory.

6) Repeat the above steps with every number to be stored.

7) Return the handset to on-hook.

8) Write down the address codes and numbers for future reference.

NOTE: Repeat this procedure to replace the stored telephone numbers with new numbers.

06.06.7 To output [*] and [#] tones

When the special [*] or [#] tones must be output (for computer input service or other use), the Automatic Dialing feature must be disabled to permit manual dialing of the [*] and [#] tones.

1) Depress any available [CO] key.

2) Dial any desired telephone number (either manually or by utilizing the Automatic Dialing feature in the usual manner).

3) To disable the Automatic Dialing feature, thereby permitting the [#] and [*] tones to output manually, first press the [*] key and then the [#] key.

NOTE:
Manual dialing only will be possible and the special [#] and [*] tones, as well as digits [0] ~ [9], will be output as dialed. The Automatic Dialing feature will be restored when the EKT is hung up, or the CO line is placed on hold.

06.07.0 On-hook Dialing

Non-speakerphone models—see Paragraph 07 for speakerphone model EKTs.

06.07.1 To make an outside call

1) Leave the handset on-hook.
2) Depress any available [CO] key.
   - Listen for dial tone.
   - CO LED will flash at the I-use rate.
3) Dial the desired telephone number.
4) Lift the handset when the distant party answers.*
5) Hang up when the call is completed.

06.07.2 To make an intercom call

1) Leave the handset on-hook.
2) Depress the [INT] key.
   - INT LED will flash at the I-use rate.
3) Dial the desired station number.
   - You will hear a single ring tone.*
4) Lift the handset to converse.
5) Hang up when the call is completed.

**If busy tone is heard, depress the [SPKR] key to disconnect.*

06.08.0 Handsfree Monitoring

See Speakerphone for speakerphone model EKTs.

Calls placed on hold by the distant party may be monitored "Handsfree."

1) Depress and hold the [SPKR] key.
2) Place the handset on-hook.
3) Release the [SPKR] key.
   - Sounds from the distant party will be heard via the EKT's speaker.
4) Lift the handset to continue the conversation when the distant party returns.

06.09.0 Group Listening

The group listening feature allows all persons present to hear the distant party's responses.

Depress and hold the [SPKR] key.
- SPKR LED lights and distant party's voice is heard via the EKT's speaker (handset is off-hook but inoperative).

When local response is required:
- Release the [SPKR] key.
  - SPKR LED goes off.
  - EKT speaker is silenced.
  - Handset is activated.

Repeat as required.

06.10.0 Paging

06.10.1 To page

1) Lift the handset.
2) Depress the [INT] key and dial [8] for all speakers (EKT and external).
3) Make your announcement twice in a normal voice level.
4) Hang up.

06.11.0 Override

06.11.1 To initiate a busy override signal

After reaching a busy station, you may signal that station that a call is waiting by dialing [2].
- A tone signal will be heard at the busy station.

06.11.2 To override DND (programmable option)

After reaching a DND station, you may signal that station that a call is waiting by dialing [2].
- A tone signal will be heard at the DND station.

06.11.3 To use executive override (programmable option)

Overrides the CO line and intercom privacy feature, and is able to enter any existing conversation within the system. Only two stations can be programmed for this feature.

You may enter any conversation on any CO/PBX line or the intercom by depressing the appropriate key.
- A warning tone, however, is sounded before the overriding station is actually connected.

06.12.0 Do Not Disturb

06.12.1 To engage the Do Not Disturb mode

Depress the [DND] key.
- DND LED will light steady.

06.12.2 To release Do Not Disturb

Depress the [DND] key.
- DND LED will go off.

07 *Strata S* OPTIONS

07.00.0 10-key EKT

07.00.1 The optional 10-key EKT, in initialized mode, is equipped with 14 line and feature keys including three CO keys, an intercom key, [DND], [MW/FL], [SPKR], [MUTE], [CONF], [HOLD] and four [AD] keys. Of the 14 keys, only the [MUTE], [CONF] and [HOLD] keys are not equipped with LEDs (however, the AD LEDs do not operate). See Paragraph **07.30.0** for details of the programmable special feature keys.

07.10.0 BLF 10-key EKT

07.10.1 The optional BLF 10-key EKT has an LED panel showing the busy/idle status of each station. A station in the DND mode will show as busy.

07.20.0 20-key EKT

07.20.1 The optional executive telephone (20-key EKT) provides, in initialized mode (via ten additional feature keys), all keys mentioned above in the 10-key description, plus 10 DSS keys.

07.30.0 Special Key Functions

07.30.1 Each EKT may have various special feature keys in place of or addition to the keys described previously. This paragraph outlines these keys:

REDIAL KEY [RDL]
Will automatically redial the last telephone number dialed after accessing a CO line.

REPERTORY KEY [REP]
Provides access to automatic-dialing address codes.

PAUSE KEY [PAU]
Applies a pause after the CO line access code in automatic-dialing telephone numbers behind a PBX. The [MW/FL] key will not perform this function, on this unit it is used to store a timed flash.

ALL CALL KEY [AC]
Causes an All Call page throughout the system (including both EKT and external speakers) if depressed while the intercom line is idle.

DIRECT STATION SELECTION (DSS) KEYS [10 ~ 17]
Each DSS key corresponds to the intercom numbers of the respective EKTs. The LEDs on these keys indicate the busy lamp field. When the intercom line is not busy (the station LED is not lit), depressing a DSS key assigned to an EKT which is neither busy nor in DND will ring the station.

07.40.0 Automatic Dialing with Special Keys

07.40.1 To dial a frequently called number automatically

Telephone numbers can be dialed by either an [AD] *or by using the* [REP] *key and a 2-digit address code in the usual* ***Strata S*** *manner.*

1) Lift the handset.
2) Depress any available [CO] key.
   - Listen for dial tone.
3) Depress the [REP] key and dial the 2-digit address code corresponding to the desired telephone number.
   - ***Strata S*** will automatically dial the number for you.

07.40.2 To redial the last number called automatically

1) Depress any available [CO] key.
   - Listen for dial tone.
2) Depress the [RDL] key.
   - ***Strata S*** will automatically dial the last telephone number that was dialed from that station.
3) Hang up when the call is completed.

07.40.3 To output the [*] and [#] tones

NOTE:
The [*] and [#] keys will not have the functions they perform on an EKT in initialized mode; they are now free to use for computer access.

1) Depress any available [CO] key.
2) Dial any desired number in the usual manner.
3) Depress either the [*] or [#] key, permitting the [*] or [#] tone to be output.

07.40.4 To store telephone numbers

1) Lift the handset (do not activate the intercom or a CO line).

2A) Depress the [RDL] and [REP] keys, respectively.

3A) Dial a 2-digit address code.
- Codes run consecutively 10 – 19.

. . . or . . .

2B) Depress the [RDL] key.

3B) Depress an [AD] key.

4) Dial the telephone number to be stored (16 digits maximum).

NOTE FOR BEHIND PBX:
It may be necessary to insert a pause after the trunk access code to allow for dial tone delay. Depress the [PAU] key (if the pause is required) after entering the PBX access code. If a PBX feature access code is being stored, a timed flash may be stored by depressing the [MW/FL] key.

5) Depress the [RDL] key to record number in memory.

6) Repeat the above steps with every number to be stored (up to 10).

7) Return the handset to on-hook.

8) Write down the address codes and telephone numbers for future reference.

NOTES:
1. *Repeat this procedure to replace the stored telephone numbers with new numbers.*
2. *The [*] and [#] tones may be output by automatic dialing when the [RDL] key is used for system or station telephone number storage of [*] and [#] tones.*

07.50.0 Speakerphone

07.50.1 To make an outside call with speakerphone (on-hook dialing)

1) Leave the handset on-hook.

2) Depress any available [CO] key.
- Listen for dial tone.
- CO LED will flash at the I-use rate.

3) Dial the desired telephone number.

4) Speak at a normal voice level in the direction of the telephone.

5) Depress the [SPKR] key when the call is completed.

07.50.2 To receive an incoming call (on speakerphone)

1) You will hear a ringing tone.

2) Leave the handset on-hook.

3) Depress the appropriate [CO] key (LED that is flashing at the CO incoming call rate).
- CO LED will flash at the I-use rate.

4) Speak at a normal voice level in the direction of the telephone.

5) Depress the [SPKR] key when the call is completed.

07.50.3 To call on intercom with speakerphone (on-hook dialing)

1) Leave the handset on-hook.

2) Depress the [INT] key.
- Listen for intercom dial tone.
- INT LED will flash at the I-use rate.

3) Dial the desired station number.
- You will hear a single ring tone.

4) Speak at a normal voice level in the direction of the telephone.

5) Depress the [SPKR] key when the call is completed.

07.50.4 To receive an intercom call (handsfree)

1) You will hear a single long tone followed by the caller's voice.
- The INT LED will be flashing at the I-called rate.

2) Leave the handset on-hook.

3) To assure a private conversation, depress the [INT] key.*
- The INT LED will flash at the I-use rate.

4) Speak at a normal voice level in the direction of the telephone.

5) Depress the [SPKR] key when the call is completed (if you depressed the [INT] key earlier).

**If privacy is not required, it is not necessary to depress the [INT] key. However, any other*

station can access the intercom by depressing the [INT] key (this also cancels the connection with the answering station.

NOTES:
To change from speakerphone to handset:
- *Lift the handset.*

To change from handset to speakerphone:
1. *Depress and hold the [SPKR] key.*
2. *Return the handset to on-hook.*
3. *Release the [SPKR] key.*

Strata S

FAULT FINDING PROCEDURES

Strata S

FAULT FINDING PROCEDURES

TABLE of CONTENTS

01 GENERAL

01.01 This section describes the maintenance procedures used for the diagnosis of faults in the ***Strata S*** electronic key telephone system. Faults are classified and then cleared by replacing apparatus and performing operational tests in the sequences prescribed by the fault clearing flow charts in Paragraph 05.

02 FAULT CLASSIFICATION

02.01 A fault classification flow chart is provided to ensure that fault clearing is pursued in a logical sequence (Chart No. 1).

02.02 In the flow charts an assumption is made that the fault was discovered and reported by an EKT user. All faults, therefore, are classified according to the way they would appear at the EKT.

02.03 Faults and associated flow charts are organized into the following categories:

Flow Chart	Title
1	Fault Classification
2	Power Faults
3	Station Faults
4	MKSU Faults
5	CO Line Faults
6	MOH Faults
7	Page Faults
8	Power Failure Transfer Faults

03 FAULT CLEARING PROCEDURES

03.01 Before attempting to clear any fault, ensure that it is in the ***Strata S*** system and not caused by associated external equipment, such as wiring, MOH source, etc.

IMPORTANT!

Many features of the Strata S are assigned, enabled or disabled using software entries as described in *System Programming*. ***Further, with the exception of Programs*** 5XX – 9XX, ***programming changes are not effective until the*** SET ***switch on the MKSU has been released and the MKSU power switch has been cycled off/on (shifting the new data into permanent memory). It is important to verify that the system programming is correct and functional before troubleshooting the hardware.***

In new systems, the initialization procedure must be performed before testing. The system data stored on the MMAU will be protected from loss by a backup battery on that PCB. Therefore, the initialization sequence should not be performed on an existing system.

03.02 Faults in the ***Strata S*** are cleared by replacing PCBs, EKTs or the power supply, as instructed in the flow charts.

03.03 Five symbols are used in the flow charts. These symbols are identified in Figure 1.

03.04 The flow charts are sequentially arranged to permit rapid fault localization with the ***Strata S*** system. All fault clearing must begin with the Fault Classification Flow Chart, which is arranged in the correct fault locating sequence.

03.05 The following precautions must be observed when handling PCBs.

DO NOT:

- Drop a PCB.
- Stack one PCB on top of another.
- Handle a PCB without discharging any static electricity from your person by touching a metal part of the grounded MKSU.
- Touch the PCB contacts with your fingers.

IMPORTANT!

If the fault is not cleared by substituting a PCB, the original PCB must be reinstalled in the MKSU.

04 DEFECTIVE APPARATUS RETURNS

04.01 When defective ***Strata S*** apparatus is shipped for repair, the apparatus must be packed in a suitable container (an original type box is highly recommended).

a) Anti-static container for the ACOU PCB.

b) Plastic bags for EKTs, MKSU, etc.

04.02 NEVER WRITE ON THE APPARATUS ITSELF! Describe the nature of the defect on an information tag, and attach the tag to the front of the unit with string (not wire) so that the tag can remain attached during the testing and repair process.

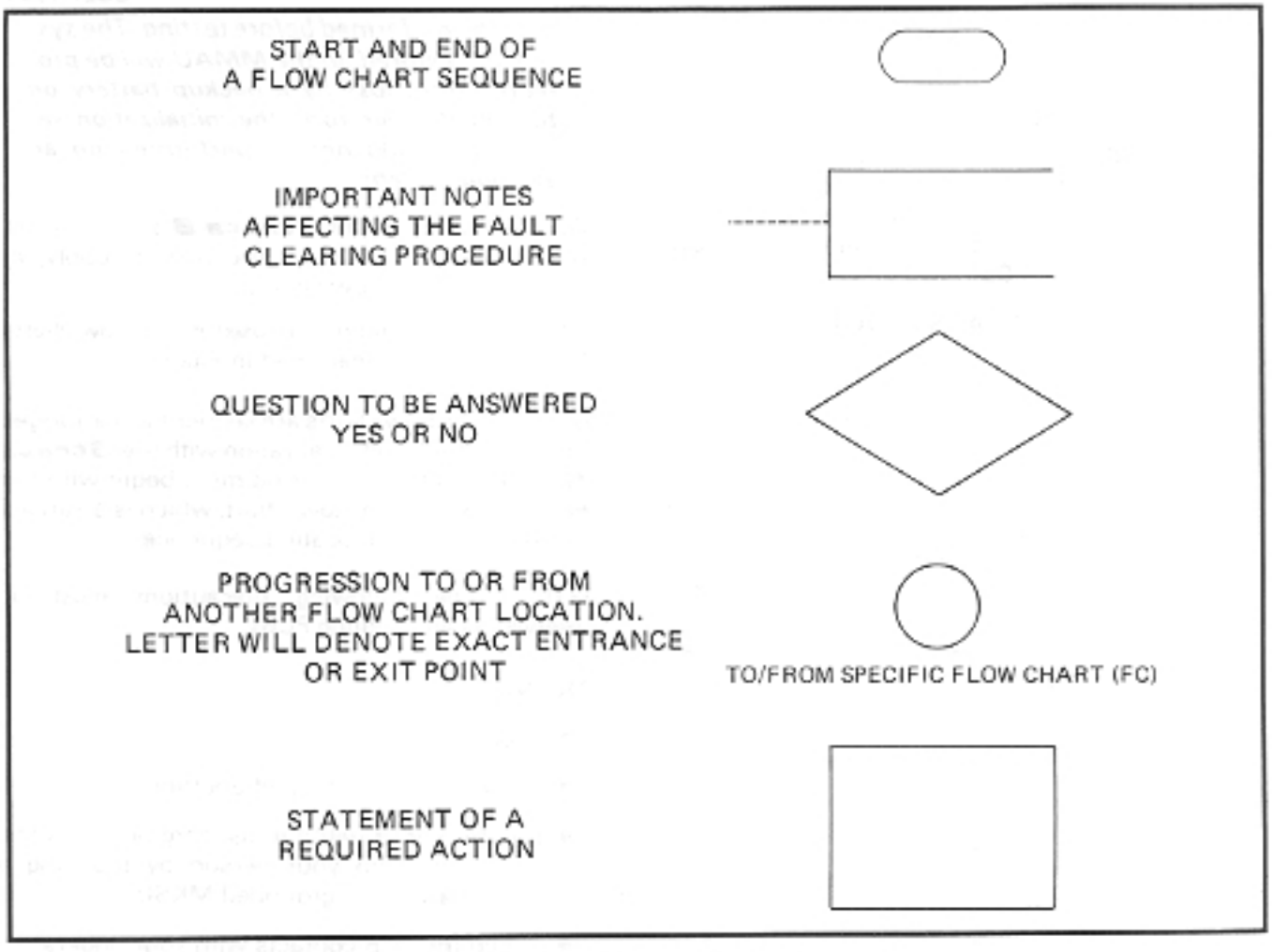

FIGURE 1—FLOW CHART SYMBOLS

04.03 If different and/or additional faults are created in the system by substituting a PCB, tag and return the substitute PCB as a defective unit.

05 FAULT IDENTIFICATION and ELIMINATION PROCEDURES

05.01 The MKSU may contain a "soft" fault due to static electricity. If it is found defective during the fault finding procedures, attempt to clear a soft fault prior to returning the MKSU for repair. The correct procedure to test for this fault is to reinitialize and reprogram (as necessary) the system. If the fault returns after these procedures are performed, tag the defective MKSU and return it for repair.

TABLE A

STATION CABLE CONTINUITY CHECK USING VOLTMETER

NOTE:
Perform the following:
Modular block – check all station cables
MDF – check cable from MKSU to MDF

1) Disconnect the EKT.

2) Using a DC voltmeter, measure between the wires of the two pairs to verify the presence of the following readings:

FROM			TO			VOLTAGE*
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	24
1	R	Red	2	T	Black	24
1	T	Green	2	R	Yellow	24
1	R	Red	2	R	Yellow	24
1	T	Green	1	R	Red	0
2	T	Black	2	R	Yellow	0

3) An improper reading indicates an open, crossed or shorted wire.

4) For the MDF-to-EKT cable, a more precise check is made using an ohmmeter per Table B.

**Nominal voltage—within the power supply limits of 23.2∿ 28.2 VDC while under AC power.*

TABLE B

STATION CABLE CONTINUITY CHECK USING OHMMETER

1) Disconnect the EKT at the wall.

2) At the MDF, remove the bridging clips.

3) Using an ohmmeter, measure the resistance between all combinations of the four wires at the modular block. All measurements should exceed 1 MOhm.

4) At the MDF, place shorting jumper wires between the T and R of pair #1 (green-red) and the T and R of pair #2 (black-yellow).

5) At the modular block, measure the resistance between all wire combinations. The proper readings are as follows:

FROM			TO			RESISTANCE
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	1 MOhm
1	R	Red	2	T	Black	1 MOhm
1	T	Green	2	R	Yellow	1 MOhm
1	R	Red	2	R	Yellow	1 MOhm
1	T	Green	1	R	Red	55 Ohms*
2	T	Black	2	R	Yellow	55 Ohms*

**NOTE:*
The green-red and black-yellow measurements should be within 10% of each other.

CHART NO. 1
FAULT CLASSIFICATION

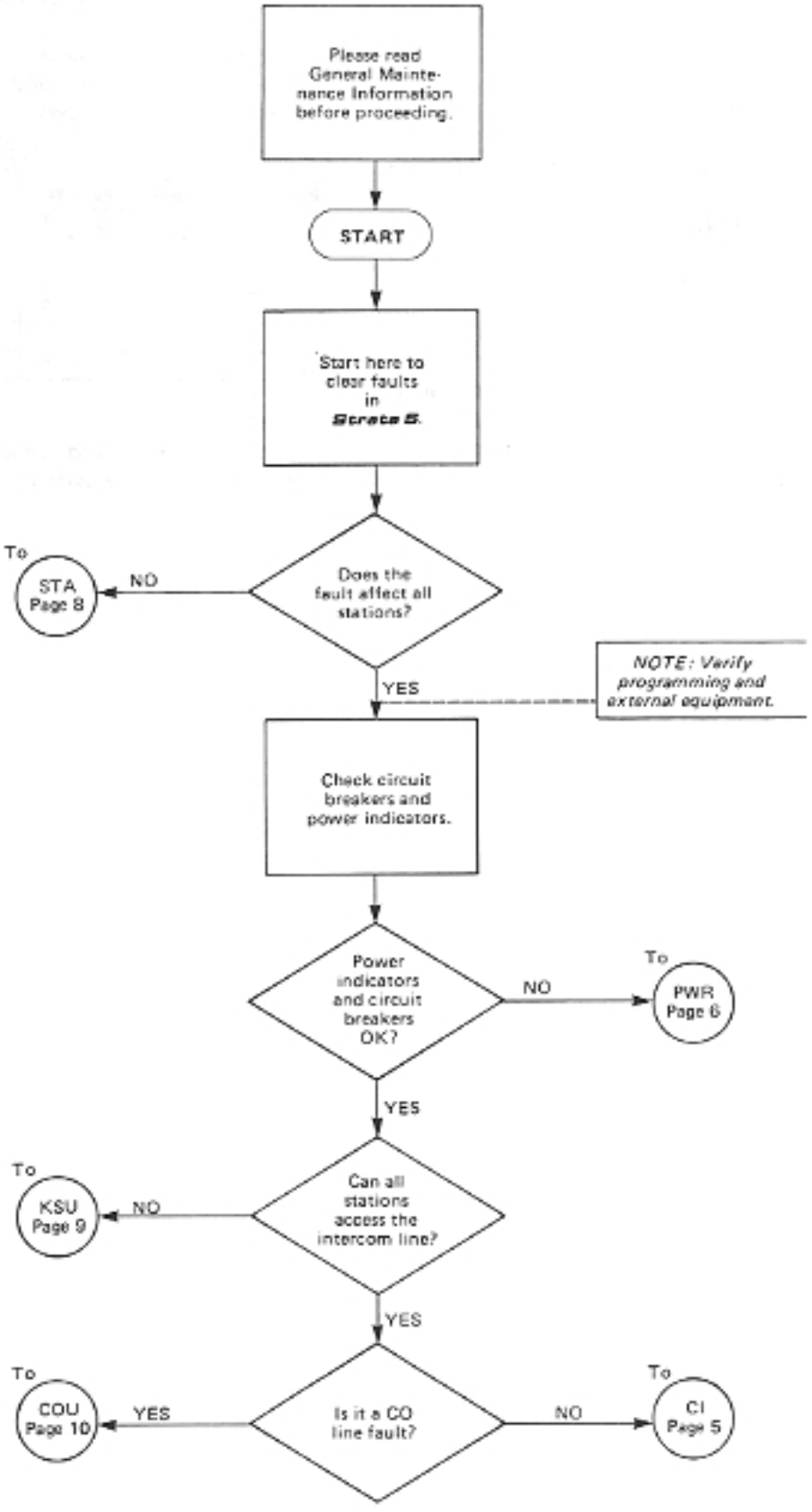

CHART NO. 1
FAULT CLASSIFICATION (con't)

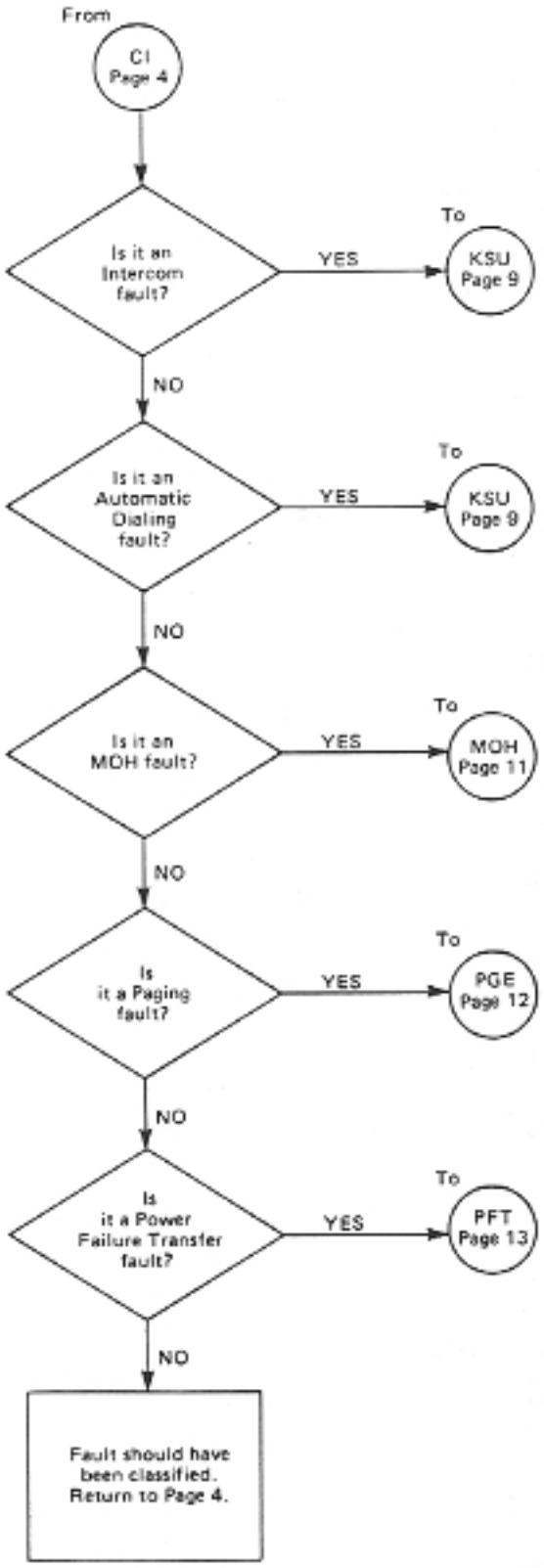

CHART NO. 2
POWER FAULTS

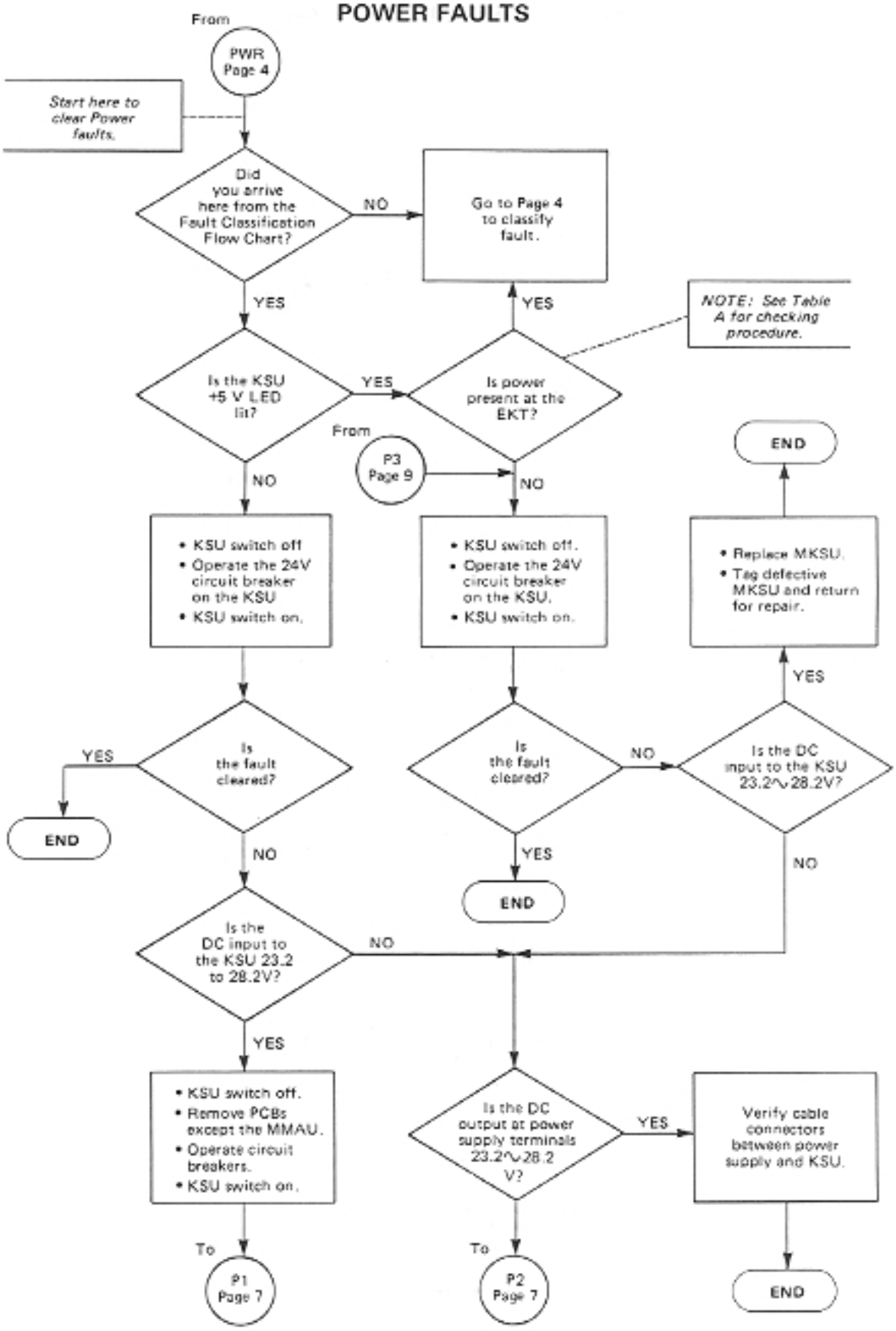

CHART NO. 2
POWER FAULTS (con't)

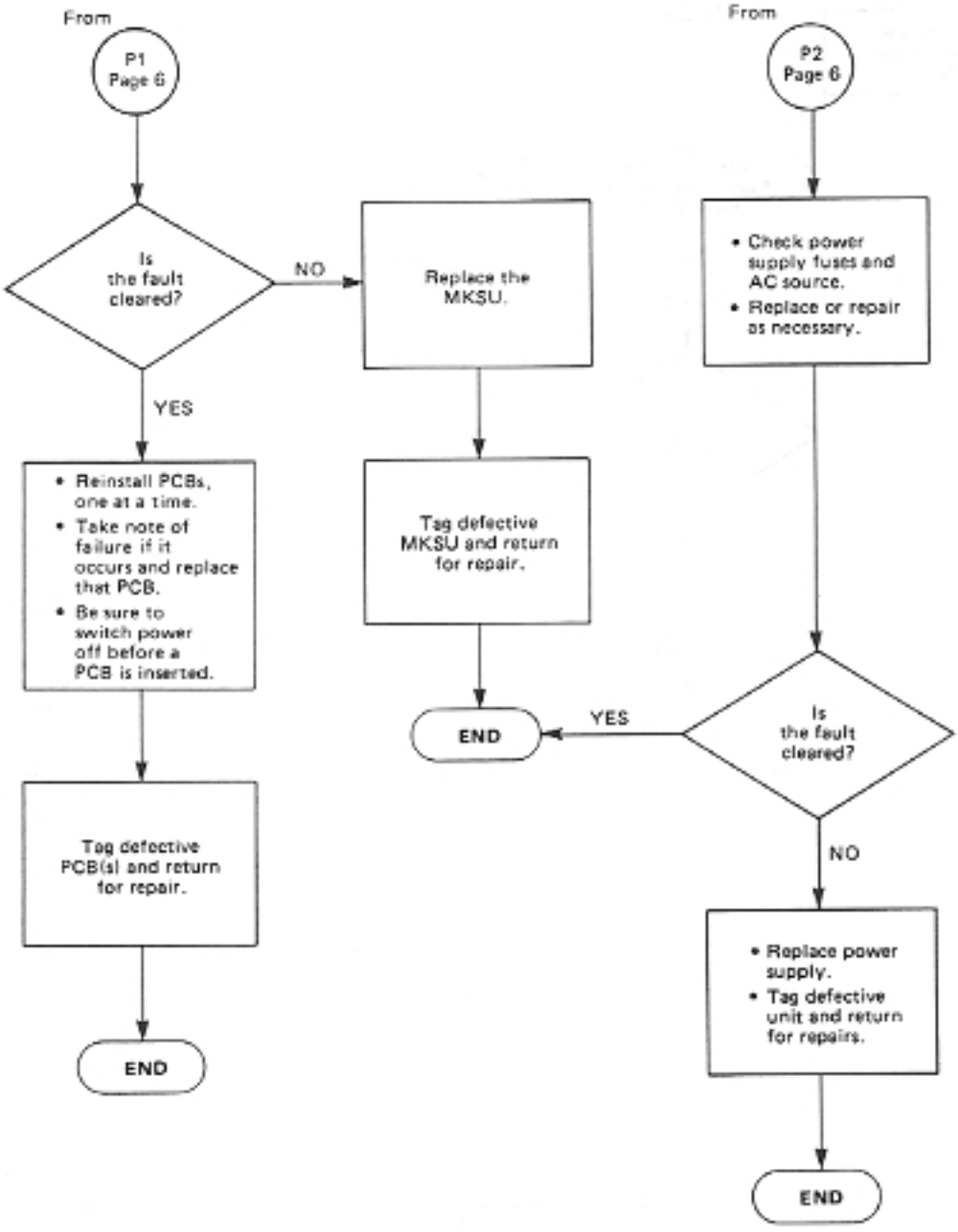

CHART NO. 3
STATION FAULTS

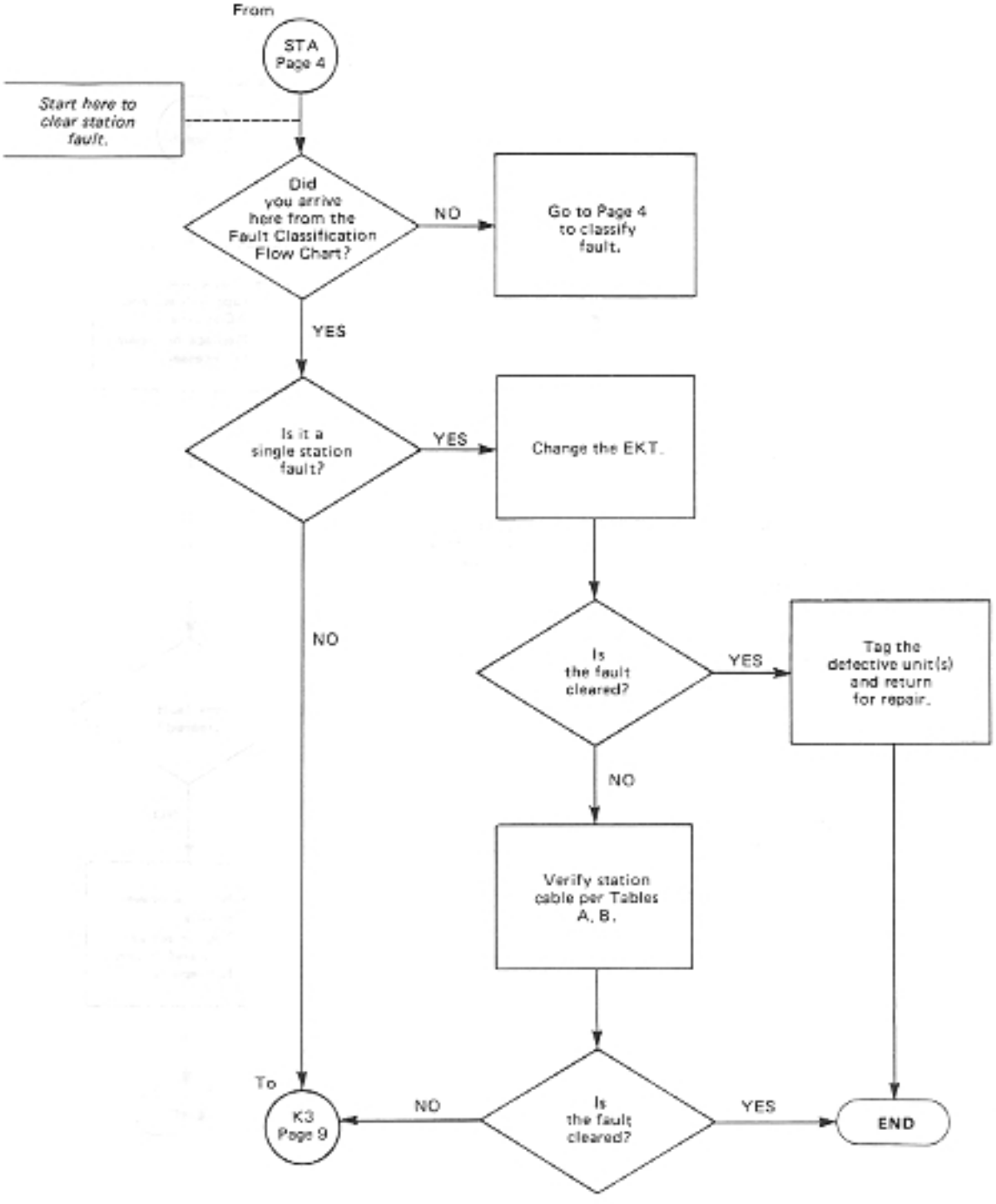

CHART NO. 4
MKSU FAULTS

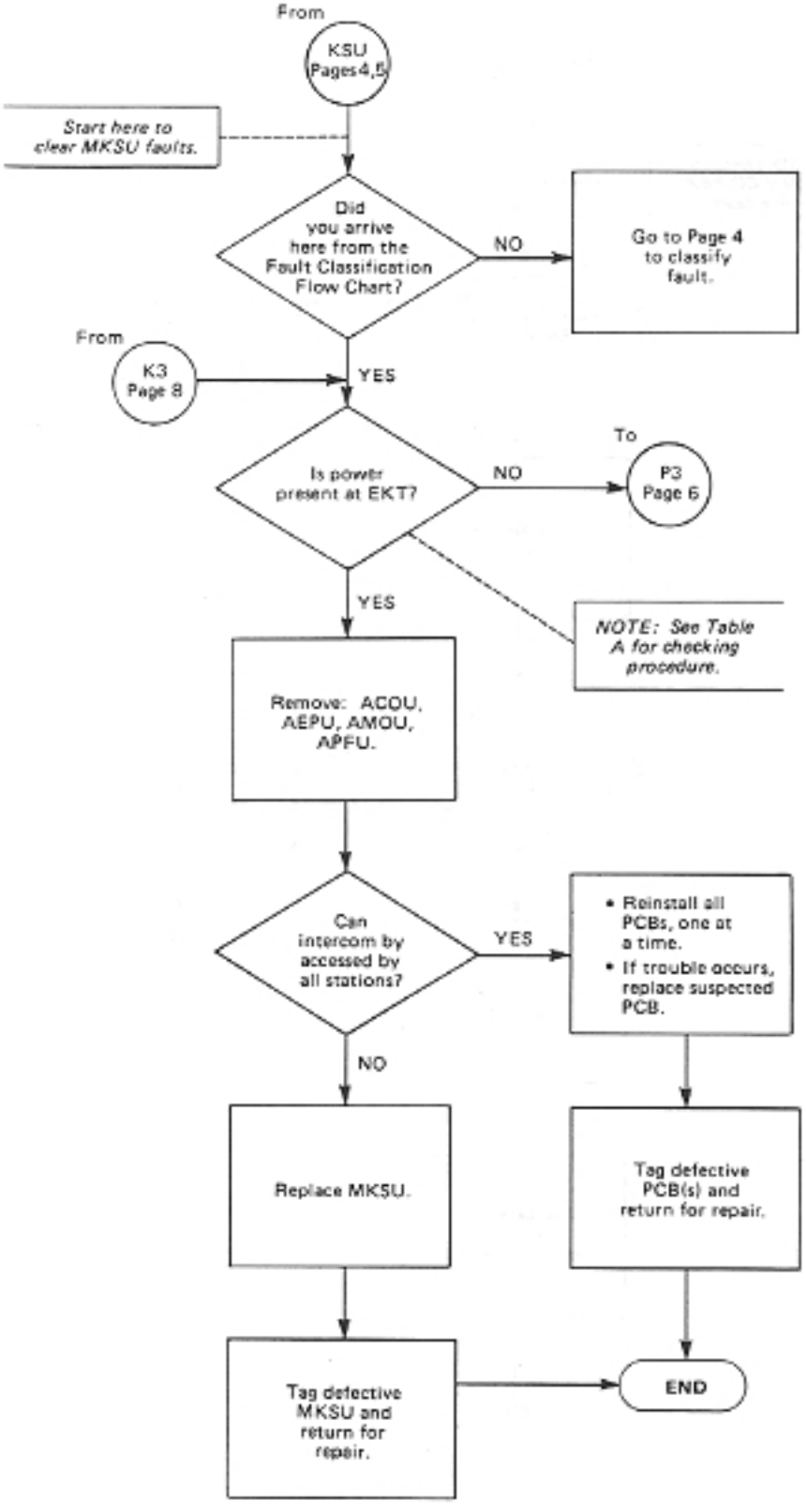

CHART NO. 5
CO LINE FAULTS

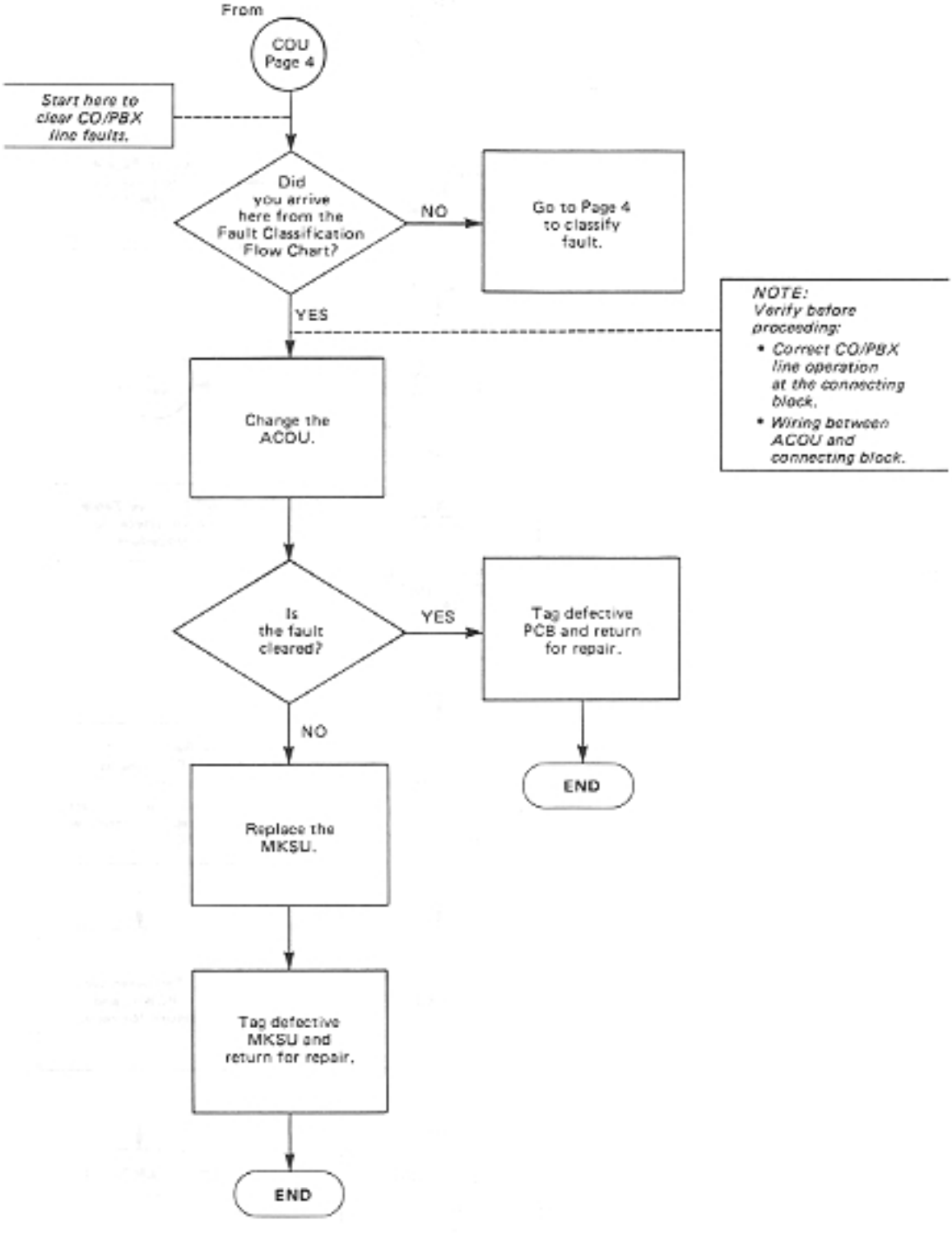

CHART NO. 6
MOH FAULTS

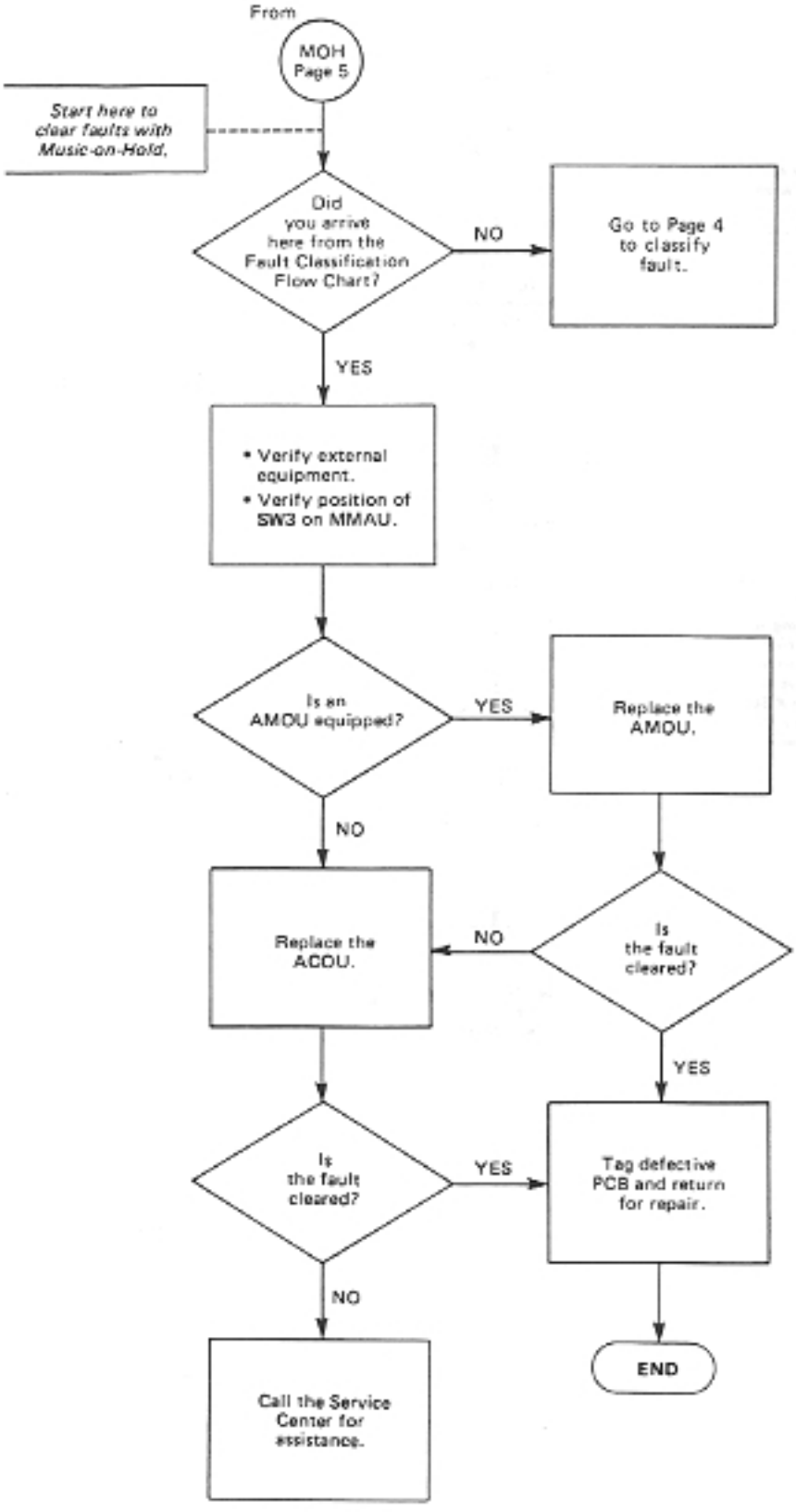

CHART NO. 7
PAGE FAULTS

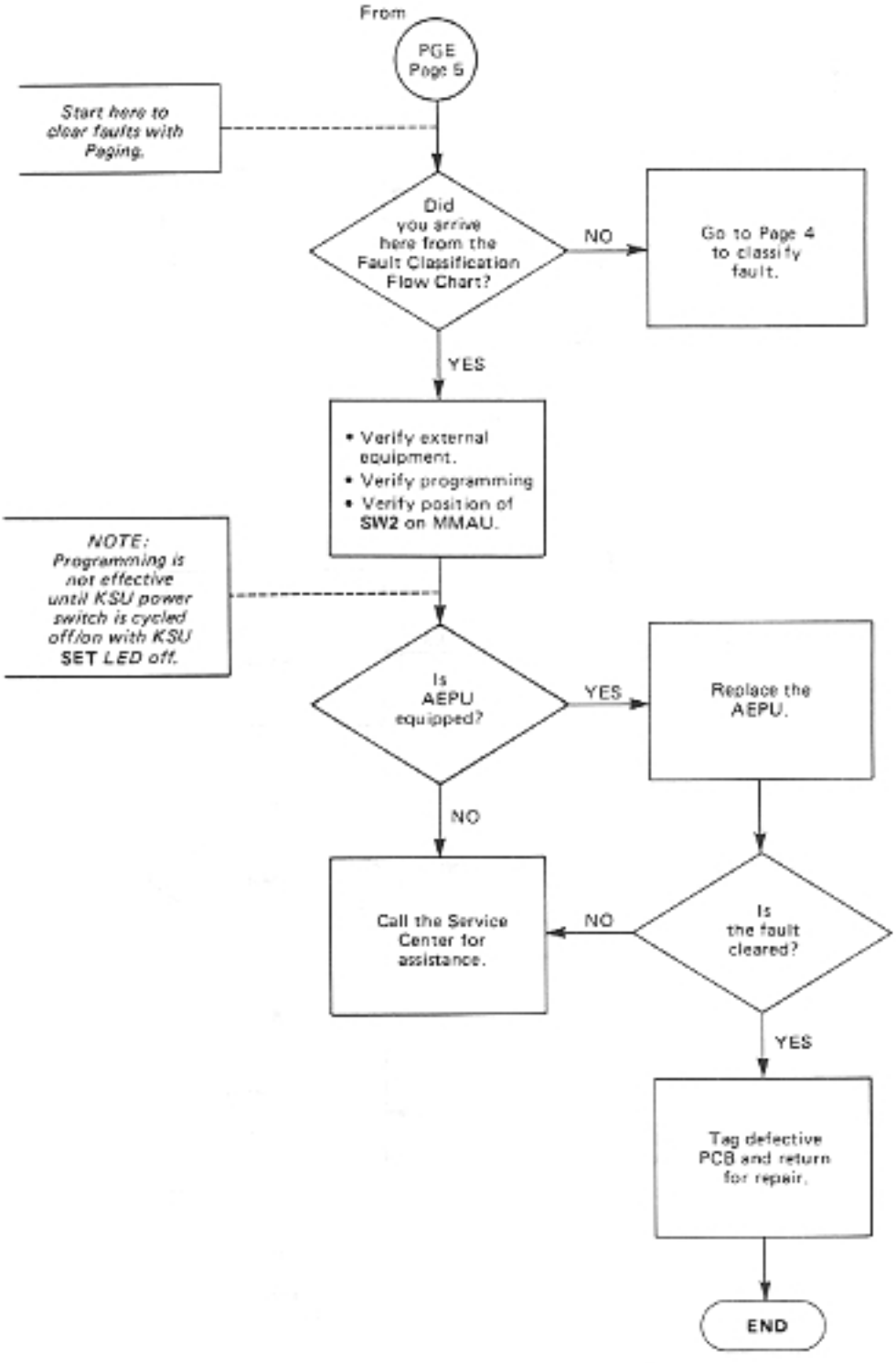

CHART NO. 8
POWER FAILURE TRANSFER FAULTS