TOSHIBA PUBLICATIONS
SECTION 300-020-000
JULY 1986

Strata® XII$_e$ & XX$_e$

ELECTRONIC KEY TELEPHONE SYSTEMS

INSTALLATION AND MAINTENANCE MANUAL

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FCC REGISTRATION

The ***Strata XII$_e$ & XX$_e$*** electronic key telephone systems are 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 XII$_e$ & XX$_e$*** electronic key telephone systems to be connected directly to the telephone network. A jack is provided locally—connectors for this type of customer-provided equipment will not be provided on party lines or coin lines.

Incidence of Harm

If ***Strata*** 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 changes affect the compatibility or use of a ***Strata*** system, the telephone company is required to give adequate notice of changes.

Notification of Telephone Company

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

A. Your telephone number
B. The FCC registration number (BF 287N-71954-KF-E)
C. The ringer equivalence number (0.5 B)
D. The USOC jack required (RJ-25C or RJ-11C)

Items B, C, and D are also indicated on the equipment label.

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

RADIO FREQUENCY INTERFERENCE

Warning:—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference; in which case, the user at his own expense will be required to take whatever measures may be required to correct the inter ference.

Strata® XII_e & XX_e

GENERAL DESCRIPTION

Strata XII$_e$ & XX$_e$

GENERAL DESCRIPTION

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01 GENERAL

01.00 Summary Description

01.01 ***Strata XII$_e$ & XX$_e$*** are electronic key telephone systems that provide a wide range of sophisticated, user-friendly features. These systems offer stored-program control, custom LSI circuitry, solid-state space division switching and reduced station cabling. Both systems are very similar and use the same printed circuit boards for station lines, CO lines and control. The difference is in the capacity of the two key service units (HKSUs) and their power supplies. ***Strata XII$_e$*** has a maximum of 12 CO lines and 32 stations, while ***Strata XX$_e$*** will accommodate up to 21 CO lines with a maximum of 56 stations. Both systems are housed in single cabinets.
4 ICM paths on XII up to 6 paths on XX

01.02 The ***Strata*** systems utilize 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 HKSU translate signals from the station dial pad into either DTMF or rotary dial signals, as required by the central office.

01.03 Both systems are electrically compatible with the public telephone network and are also designed to function in a "behind PBX" or Centrex environment.

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

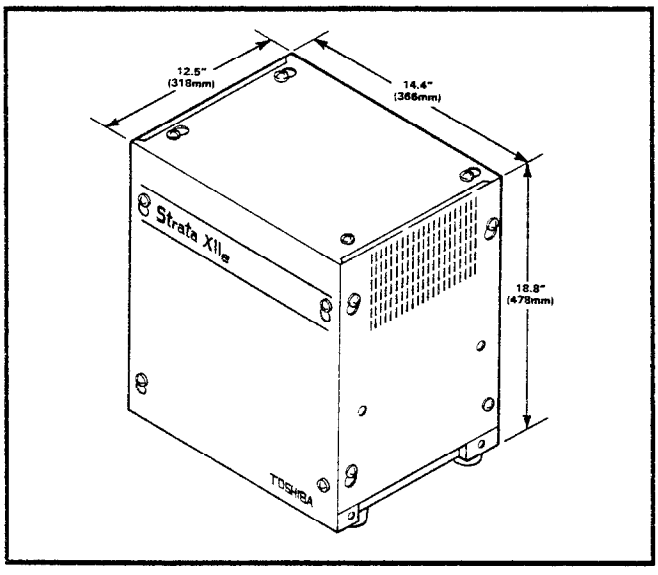

FIGURE 1 — ***Strata XII$_e$*** HKSU

02 PHYSICAL DESCRIPTIONS

02.00 Key Service Units

02.01 Each ***Strata*** HKSU consists of a single metal cabinet (Figures 1 and 2) with the following dimensions:

Strata XII$_e$
Height: 18.8" (478 mm)
Width: 14.4" (366 mm)
Depth: 12.5" (318 mm)
Weight: 44 lbs. (20 kg)

Strata XX$_e$
Height: 26.5" (673 mm)
Width: 14.5" (368 mm)
Depth: 12.3" (312 mm)
Weight: 61 lbs. (28 kg)

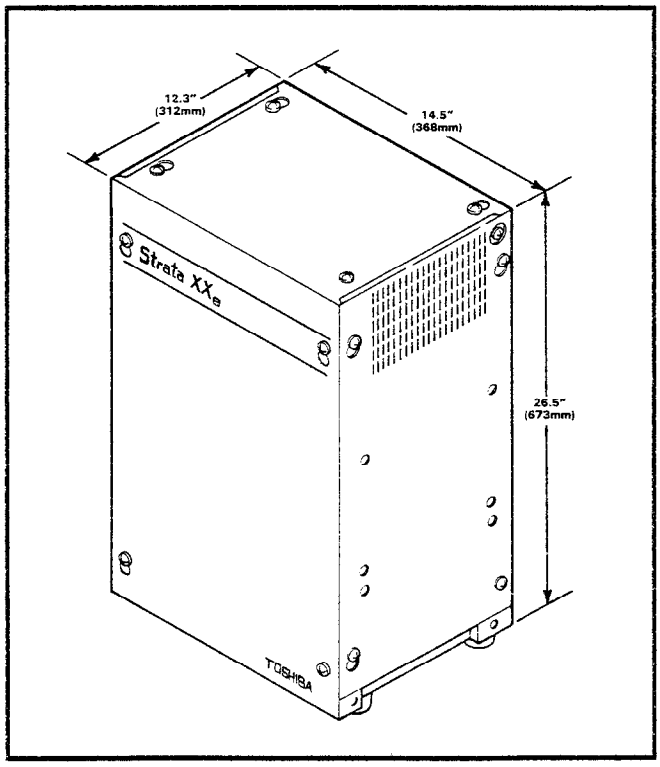

FIGURE 2 — ***Strata XX$_e$*** HKSU

Both cabinets are designed for table-top or wall mounting.

02.02 The ***Strata XII$_e$*** HKSU (Figure 3) contains two shelves with spaces to accommodate up to 11 printed circuit boards (PCBs) and one power supply (HPSU 8120). Two additional PCB slots are reserved for future use.

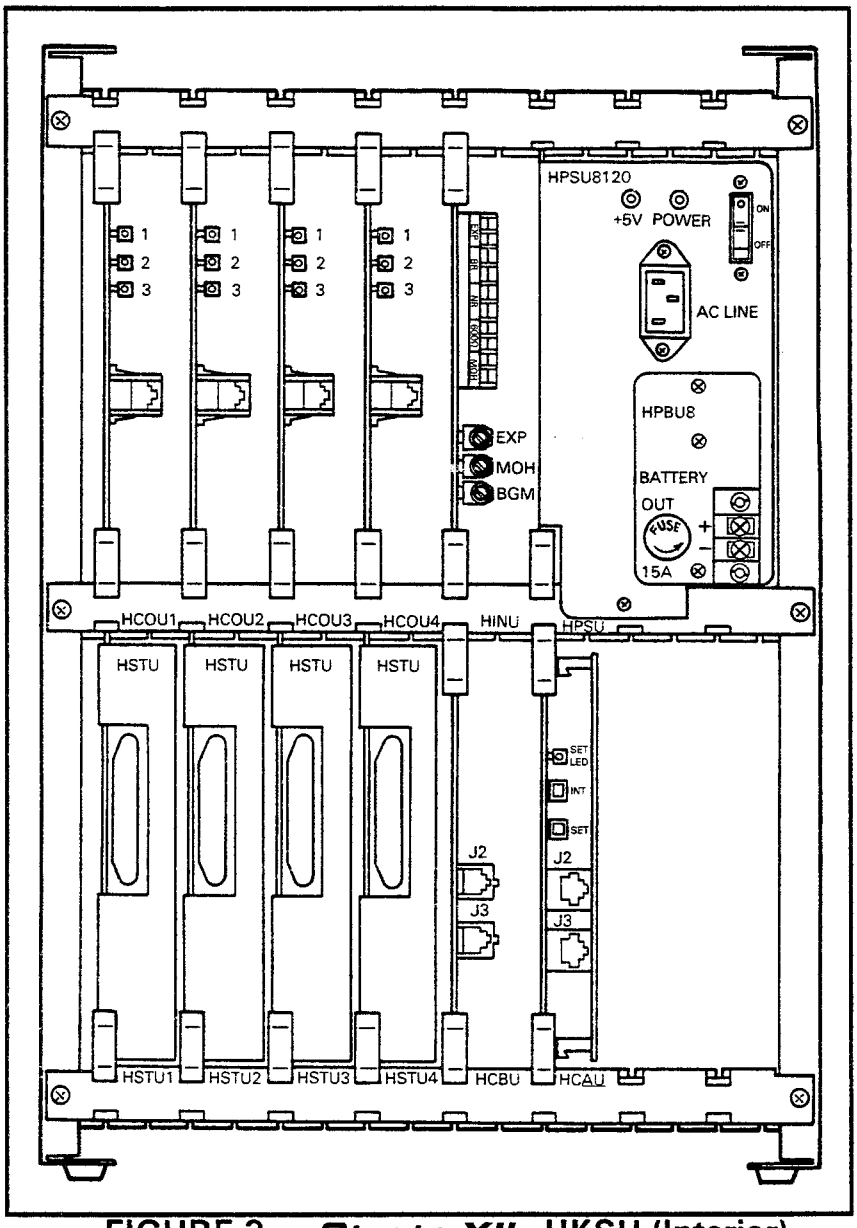

FIGURE 3 — *Strata XII$_e$* HKSU (Interior)

02.03 The ***Strata XX$_e$*** HKSU (Figure 4) contains three shelves with spaces to accommodate up to 18 PCBs and one power supply (HPSU 9120). Three additional PCB slots are reserved for future use.

NOTE:
*Several **Strata** PCBs utilize plug-in sub-assemblies that are mounted directly on the host PCB. These sub-assemblies may or may not be required for a particular system — see System Configuration for complete details.*

02.04 Each PCB measures 8.7 x 7.1" (220 x 180 mm) and is equipped with either a 64- or 100-pin connector. All external HKSU connections are made on the front panels of the various PCBs via cables with industry-standard connectors.

02.10 Electronic Key Telephones

02.11 Six different Electronic Key Telephones (EKTs) may be used in both systems. The 10-key EKT (Figure 5) is available as a speakerphone or with handsfree answerback (HFU) only. The two models, identical in appearance, are equipped with four permanently dedicated keys and 10 line/feature keys. The HFU model may be answered handsfree on intercom calls only. The 10-key BLF EKT with speakerphone (Figure 6) is similar in appearance to the 10-key, but with a Busy Lamp Field (BLF).

02.12 Three additional EKTs, similar in appearance to the 10-key, with 10 additional flexible keys, are also available. The 20-key EKT (Figure 7) is available as a speakerphone or handsfree answerback only. The two models, identical in appearance, are equipped with four permanently dedicated keys and 20 line/feature keys. A 20-key Liquid Crystal Display (LCD) EKT with speakerphone (Figure 8), which has a 32-character alphanumeric display, is also available.

02.13 All EKTs have the same dimensions:

Height: 3.63" (92.2 mm)
Width: 7.0" (178 mm)
Depth: 9.0" (229 mm)

02.14 Housed in an impact-resistant, off-white plastic case, each EKT comes with a brown faceplate (with wine, black or blue faceplates available as options). Each is equipped with four permanently dedicated feature keys and either 10 or 20 line/feature keys in addition to a push-button dial pad. Up to 9 or 19 (10- or 20-key, respectively) keys are utilized

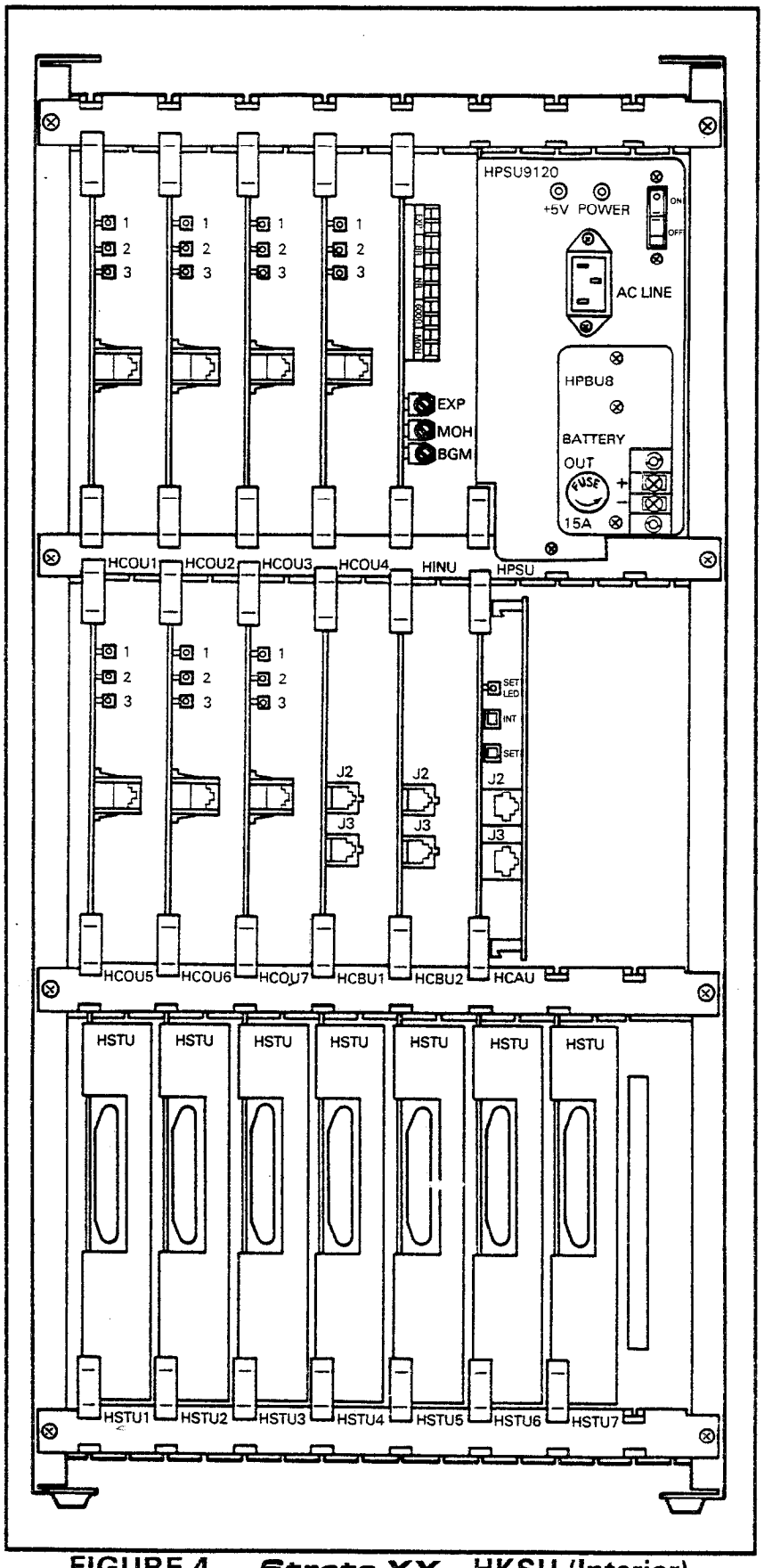

FIGURE 4 — ***Strata XX$_e$*** HKSU (Interior)

for CO/PBX lines and one for intercom access. All but the intercom key may be assigned via programming to features or CO/PBX line access.

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

02.20 Direct Station Selection Console

02.21 An optional Direct Station Selection (DSS) console (Figure 9) is available for systems in which the volume of incoming calls requires a dedicated call-answering position. The DSS is equipped with up to 56 station keys, an intercom key, an All Call Page key, Message Waiting/Flash key and a Night Transfer key (its dimensions are the same as the EKT). Both ***Strata*** systems may be equipped with one or two DSS consoles, which may operate simultaneously.

02.22 A 20-key EKT, which varies from the standard EKT only in different dedicated key functions and lacks an intercom key (key is on the DSS), must accompany each DSS.

02.23 In the ***Strata XX$_e$*** only, one or two additional DSS consoles may be optionally added to either system as Busy Lamp Field consoles. Their only function is to provide station status information.

03 ELECTRICAL CHARACTERISTICS

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

03.02 The HKSU operates from an internal 24 VDC power supply, which connects to a nominal 117 VAC, grounded wall outlet.

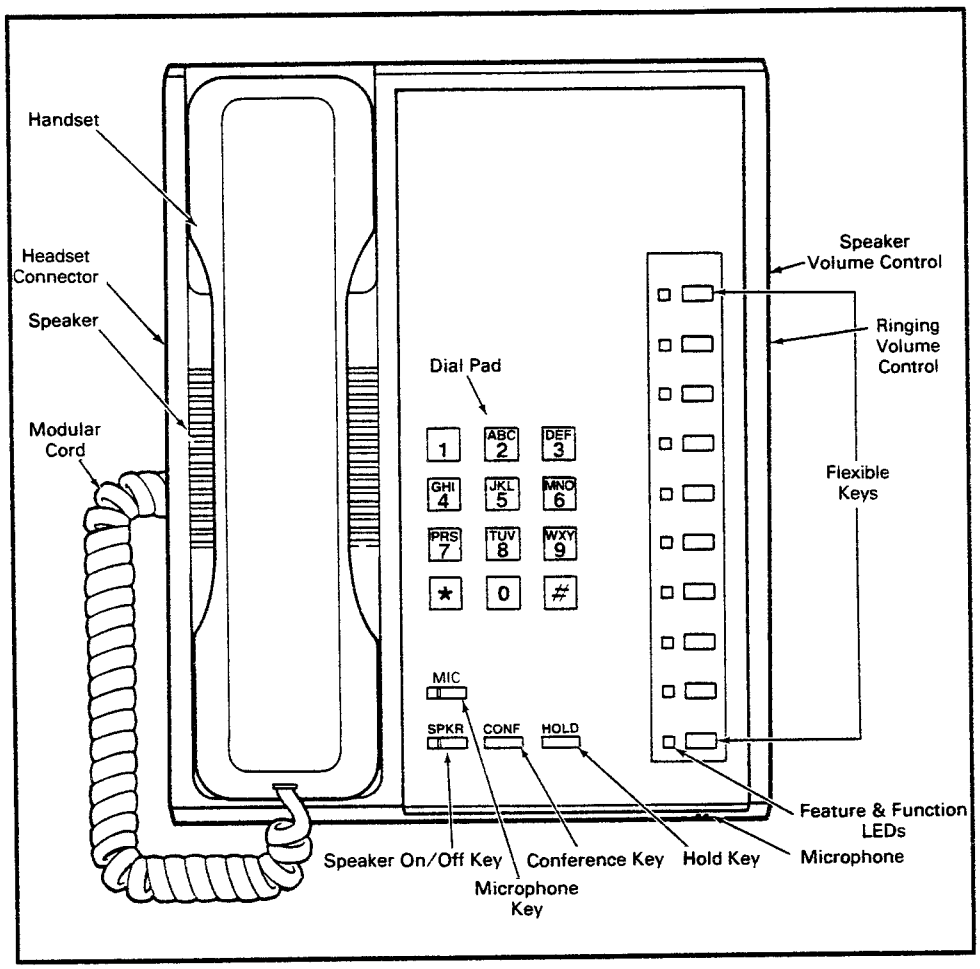

FIGURE 5—10-key ELECTRONIC KEY TELEPHONE

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.

NOTE:
The memory back-up battery is designed to maintain full memory protection for up to five years with no external power source applied.

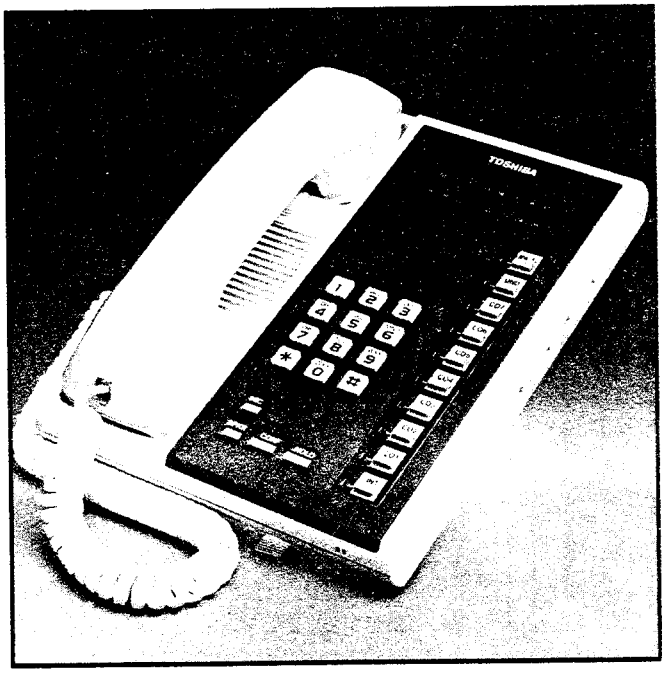

FIGURE 6—10-key BLF EKT

FIGURE 7—20-key EKT

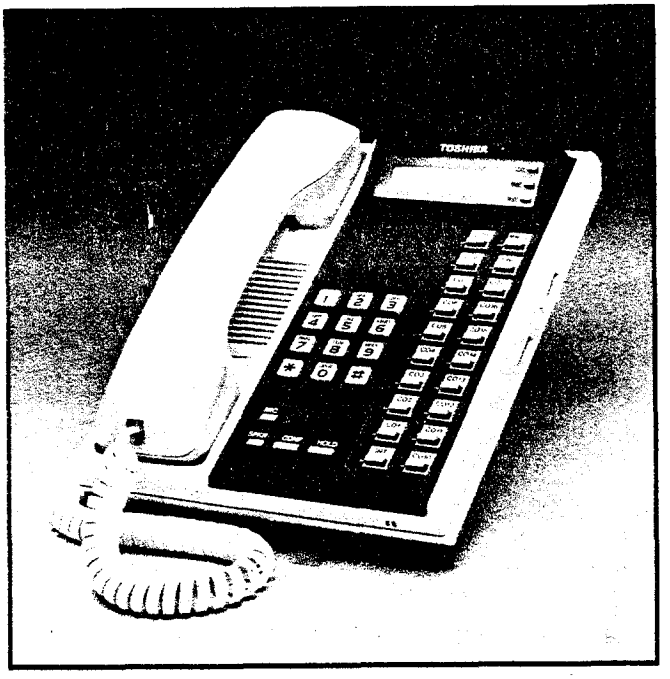

FIGURE 8 — 20-key LCD EKT

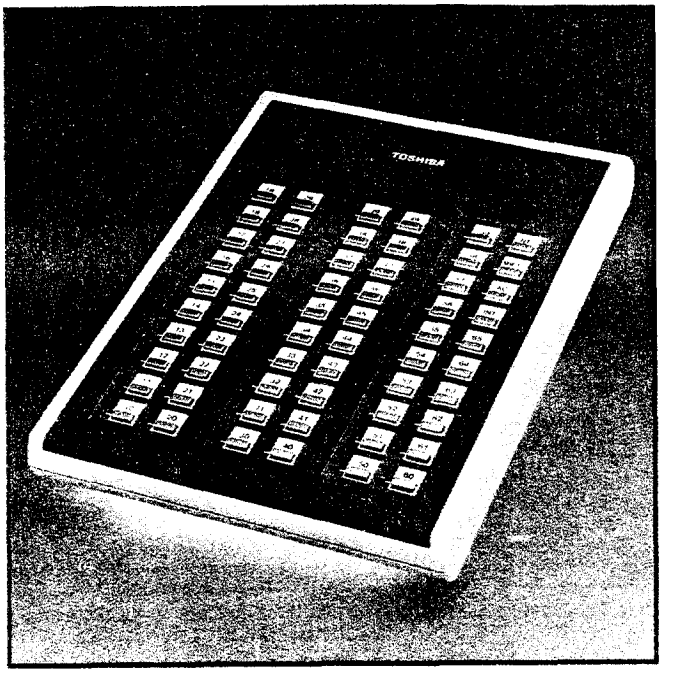

FIGURE 9 — DSS CONSOLE

TABLE A

SUMMARY OF ELECTRICAL CHARACTERISTICS

Loop Limits	
Station	1,000' (305 M), 24 AWG cable
DSS	500' (152.5 M), 24 AWG cable
HOXB	500 ohms (including telephone), 48 VDC
HOLB	17' (5.2 M), 24 AWG cable
HSMB	17' (5.2 M), 24 AWG cable
HTIB	17' (5.2 M), 24 AWG cable
Ringing Tones	
CO Line (idle)	600/800 Hz, modulated by 16 Hz, 1 second on — 3 seconds off
CO Line (busy)	2,400 Hz, modulated by 10 Hz, 1 second on — 3 seconds off
Intercom Line	600 Hz, 1 second on — 3 seconds off
Door Phone A & C Tones	870 Hz, 1 second/710 Hz, 2 1/2 seconds (5 rings)
Door Phone B Tone	870 Hz, 1/2-second/710 Hz, 2 1/2 seconds (5 rings)
Door Phone/Monitor Stations	1,000' (305 M), 24 AWG cable
Busy Override Tone	2,400 Hz, 1 second on — 3 seconds off
Dial Tone (Intercom)	400 Hz, continuous
Ringback Tone	400 Hz, 1 second on — 3 seconds off
Busy Tone	400 Hz, 1/4-second on — 1/4-second off
Do Not Disturb Tone	400 Hz, 1/8-second on — 1/8-second off
Voice Page Warning Tone	600 Hz, 1 second on only (via EKT speaker)
Executive Override Warning Tone	600 Hz, 1/2-second on only (via handset)

TABLE A

SUMMARY OF ELECTRICAL CHARACTERISTICS (continued)

Hold Recall Tone	2,400 Hz, modulated by 10 Hz, 1 second on — 1 second off
Dialing	Push-button; system-generated DTMF or dial pulse
Primary Power	117 VAC, 60 Hz
HPSU 8120	120 watts
HPSU 9120	200 watts
Environmental Specifications	
Operating Temperature	32 - 122° F (0 - 50° C)
Operating Humidity	20 - 80% relative humidity (without condensation)

04 FEATURES and SERVICES

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

TABLE B

STANDARD FEATURES

SYSTEM

- All Call Voice Page
- Alphanumeric Messaging with LCD
- Automatic Callback (Intercom)
- Automatic Dialing-System
- Automatic Hold Recall
- Automatic Release from Hold
- Busy Override
- Call Transfer with Camp-on
- CO Call Pick-up
- Conference (Amplified)
- Conference (Multi-station)*
- Conference (Multi-trunk)*
- Directed Call Pick-up
- Distinctive Ringing
- DTMF and Dial Pulse Compatible
- External Page Interface
- Flash Key (PBX Transfer or CO Dial Tone Recall)
- Flexible Key Assignment
- Flexible Line Ringing Assignment
- Group Paging
- Live System Programming
- Message Waiting
- MF Signal Time (160/80 ms)
- Mutiple Simultaneous Handsfree Intercom Paths
- Music-on-hold Interface
- Night Ring Answer Code
- Night Ringing Over External Page
- Night Transfer
- Non-blocking Dialing
- Outgoing Call Restriction
- PBX Compatible
- Privacy/Non-Privacy
- Private CO Lines
- Relay Service
- Repeat Last Number Dialed
- Station Hunting
- Store Flash Using Automatic Dialing
- Tenant Service
- Toll Restriction (6-digit)
- Toll Restriction Override Code
- Toll Restriction Override by System Automatic Dialing
- Trunk Queuing
- Trunk-to-Trunk Connection (Tandem Switching)
- Voice or Tone Signalling
- Wall Mountable HKSU

**Non-amplified*

TABLE B

STANDARD FEATURES (continued)

STATION

- Automatic Dialing-Station
- Automatic Line Preference
- Call Forward (Intercom)
- Direct Station Selection (DSS Key)
- Do Not Disturb
- Do Not Disturb Override
- DP/MF Mode Change (Tone Key)
- Exclusive Hold
- Executive Override (Break-In)
- Forced Account Code
- Handsfree Answerback
- I-called Illumination
- I-hold Illumination
- I-use Illumination
- Modular Handset and Line Cords
- On-hook Dialing
- Push-button Dialing
- Ringing Line Preference
- Saved Number Redial
- Station Security (MCO Key)
- Station-to-Station Message Waiting with LCD

TABLE C

OPTIONAL FEATURES

- Background Music with Station Control
- Direct Station Selection (DSS) Console
  - All Call Voice Page
  - Automatic Line Hold
  - Expanded Line Appearance
  - Multiple DSS Consoles
  - Night Transfer
  - Voice or Tone Signalling
- Door Phone/Monitor Stations
  - Alarm Key
  - Door Lock Key
- EKT Faceplates (black, blue, wine)
- External Page Amplifier
- MOH Source
- Off-Premise Extension (OPX)
  - Ring Generator Power Supply (MRGU)
- Off-Premise Line (OPL)
- Station Message Detail Recording (SMDR)
- System Battery Back-up
- 10-key EKT (HFU or speakerphone)
- 10-key Busy Lamp Field (BLF) EKT
- 20-key EKT (HFU or speakerphone)
- 20-key Liquid Crystal Display (LCD) EKT
- TIE Lines

05 SYSTEM OPERATION

05.00 General

05.01 The system (Figure 10) consists of an HKSU and up to 32 (***Strata XIIe***) or 56 (***Strata XXe***) stations, up to three door phones, and up to four option modules (HOLB, HOXB, HSMB and HTIB). All connections between the HKSU and EKTs are made via a customer-provided main distribution frame (MDF). Using modular line cords, the CO lines are connected between the HCOU PCBs and locally provided RJ-25C jacks. An external tuner (or equivalent) or an optional synthesized music PCB (SMOU) is required for music-on-hold. Background music requires an external music source (can be the same tuner used for music-on-hold).

05.02 Functional block diagrams of the systems are shown in Figures 11 (***Strata XIIe***) and 12 (***Strata XXe***). The systems, which are nearly identical, consist of: station interfaces, including the solid-state switching matrix (HSTU/STAU); CO/PBX line interface (HCOU); HOLB/HTIB interface (HPLU); intercom, paging and miscellaneous circuits (HINU); common control processor and memory with SMDR interface (HCAU/CAAU); and the station control and DSS interface (HCBU). ***Strata XXe*** uses two HCBUs if more than 32 stations or any BLF DSS consoles are desired. ***Strata XIIe*** uses only one HCBU. The following option modules are also available: HOXB for the off-premise extensions (OPX); HOLB for the off-premise line (OPL) interface; HSMB for the SMDR interface; and HTIB for the TIE line interface.

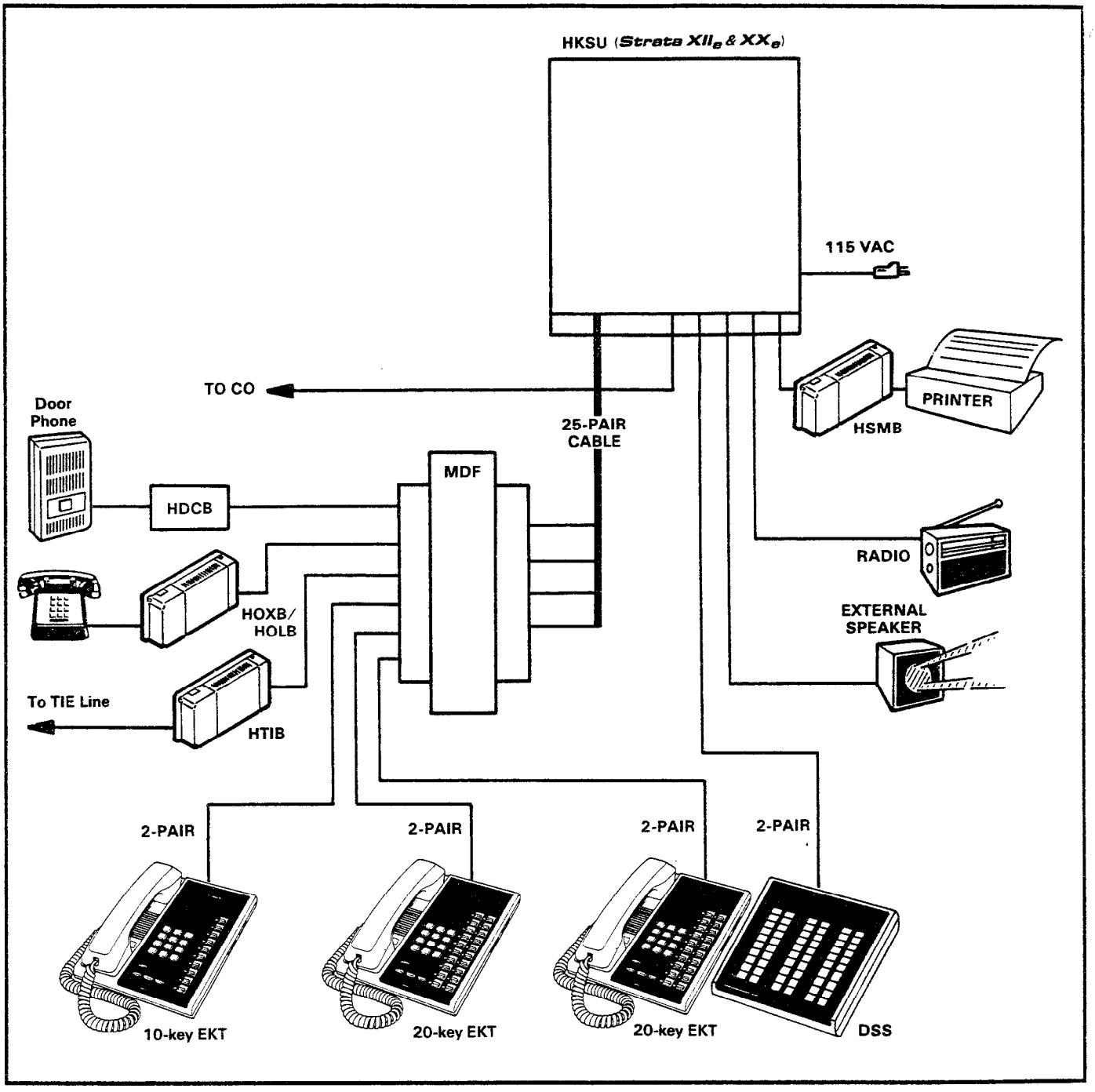

FIGURE 10 — SYSTEM DIAGRAM

05.03 Each system is controlled by a microprocessor, located (along with the system program and data memories) on the HCAU/CAAU PCBs. A second microprocessor on the HCBU exchanges data with the other PCBs.

06 SYSTEM CONFIGURATION

06.00 Key Service Units

06.01 The HKSU arrangements illustrated in Figures 3 and 4 (***Strata XIIe & XXe***, respectively) show the locations of the various PCBs and power supply. All PCBs slide in from the front of the cabinet and, although the rear panel of the HKSU is removable, rear access is usually not required.

06.02 A complete ***Strata*** system utilizes a power supply module, seven different printed circuit boards and various option modules. The

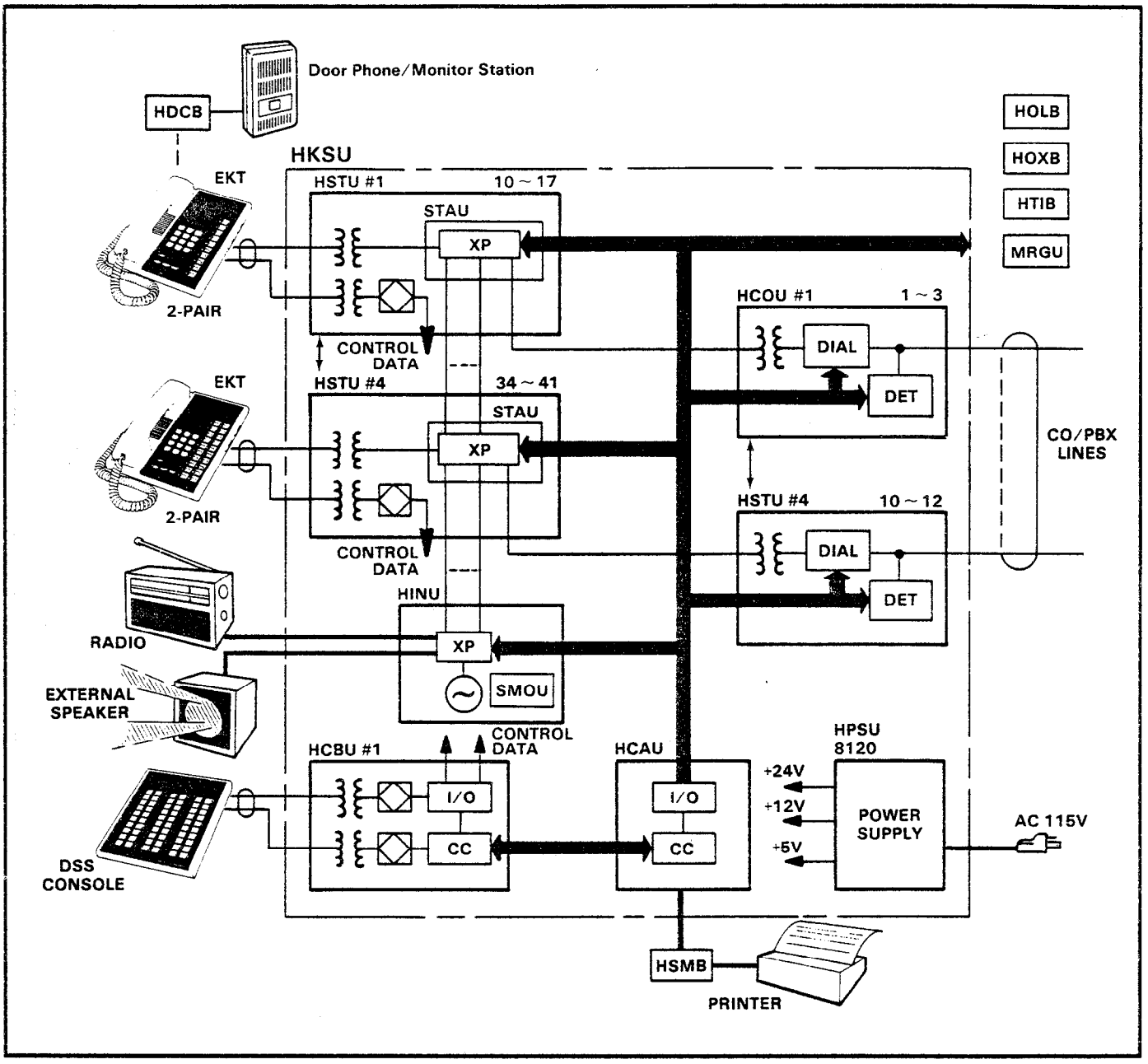

FIGURE 11 — *Strata XII$_e$* FUNCTIONAL BLOCK DIAGRAM

functions are as follows:

HPSU 8120: This is the system power supply, which provides 24 VDC operating voltage for ***Strata XII$_e$*** and connects to a 117 VAC, 60-Hz wall outlet.

HPSU 9120: This power supply provides the 24 VDC operating voltage for the ***Strata XX$_e$***.

HPBU-8: The same optional battery back-up unit is available for either power supply. It is a PCB that mounts onto the power supply housing and is connected to the recommended battery pack (which is customer-supplied, consisting of two 12 VDC, maintenance-free, automobile-type batteries — 80 amp/hour maximum rating). With the optional battery back-up assembly installed, all functions of the ***Strata*** 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 or from battery power.

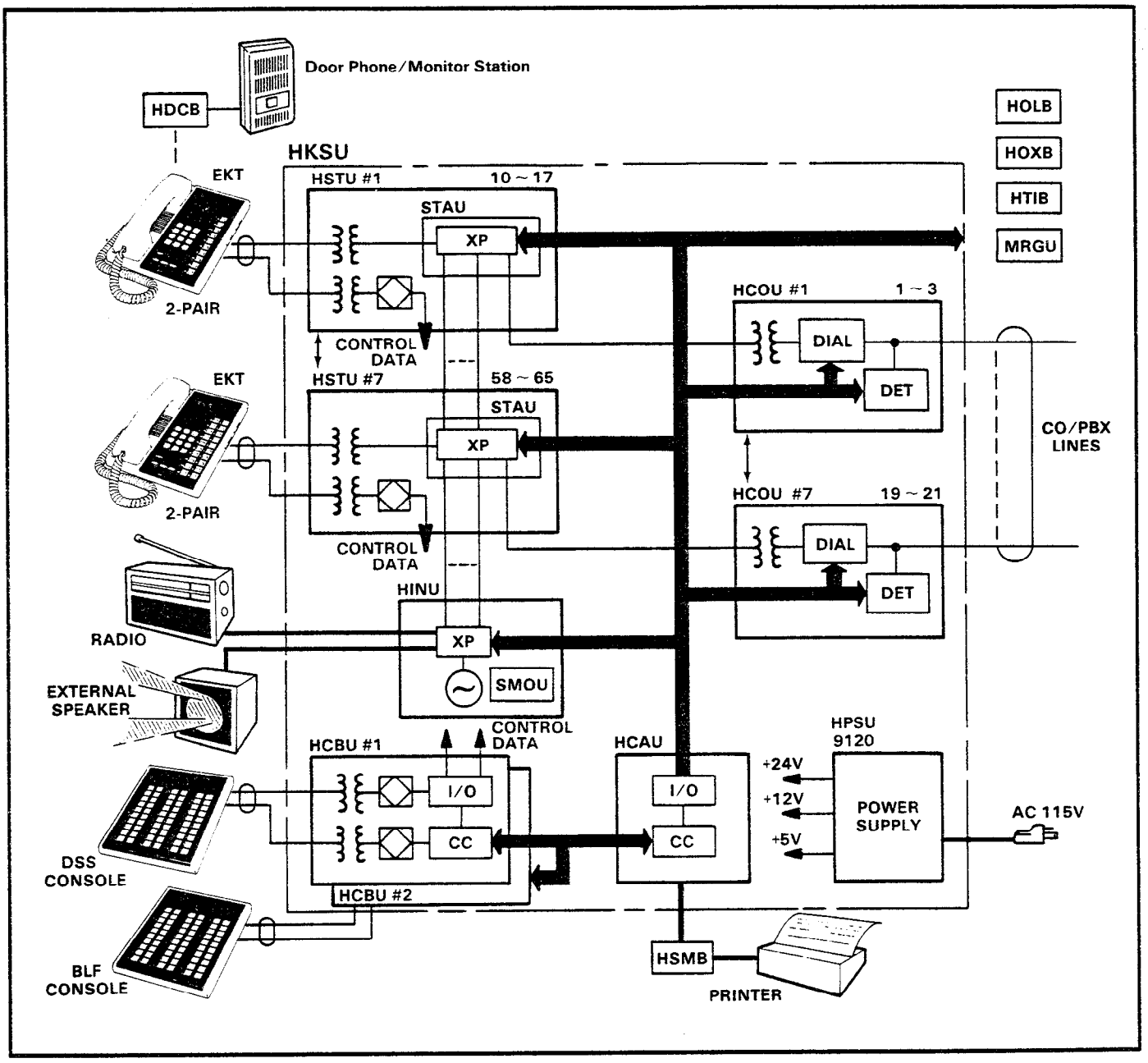

FIGURE 12 — *Strata XXe* FUNCTIONAL BLOCK DIAGRAM

HCOU: An interface between the HKSU and Central Office or PBX lines. Ring detection, hold and dial outpulsing are performed by this PCB. Depending upon local CO requirements, each CO/PBX line can be programmed for DTMF or rotary dial outpulsing. Each HCOU PCB serves up to three CO/PBX lines.

HPLU: An optional PCB that is required when using optional HOLB or HTIB modules. Each HPLU PCB interfaces one HOLB or HTIB module. The HPLU serves up to three CO/PBX lines and replaces the HCOU that would usually serve these lines.

HSTU/STAU: An interface between the HKSU and EKTs, which includes the system's solid-state space division matrix. Each HSTU/STAU PCB services up to eight EKTs. Two-pair wiring is required for each EKT; one pair carrying voice and the other pair carrying control data to and from the EKT.

- **STAU:** Contains the additional solid-state crosspoints required in a ***Strata XXe***. Each STAU PCB mounts directly on the HSTU, providing access to CO lines 13 - 21, plus two additional inter-

1ST CARD MUST GO IN SLOT 4 AND 2ND CARD IN SLOT 5

NEED 1 STAU ON EACH HSTU FOR THE 1ST 12 CO LINES OR THE NEW HSTU-2 CARD WHICH INCORPORATES THE STAU WITHIN THE CARD. THE 2ND STAU MOUNTS ON CARD FOR LINES

com paths for those eight stations.

HCAU/CAAU: The CAAU is required and mounts directly on the HCAU to form a single unit. All system control functions are performed by the single-chip microprocessor located on the HCAU. The system program stored in ROM, the RAM for system operations and the battery-protected RAM for system data storage are located on the CAAU.

HCBU: Contains a microprocessor and serves to off-load the main CPU by handling the routine and repetitive data transmission tasks to and from the peripheral equipment. It also provides the interface for two DSS consoles. One HCBU is used in ***Strata XIIe***, while two are required in any ***Strata XXe*** system that is equipped with more than 32 stations or that requires one or two BLF consoles. BLF consoles are not available for the ***Strata XIIe***.

HINU: Generates system tones and provides the switching matrix for the delivery of tones for both paging and intercom connections (one per system). Houses circuitry and connection points for the relay services, music-on-hold (MOH), and the external page amplifier. Also is a host PCB for the SMOU.

- **SMOU:** The SMOU is an optional music-on-hold source that provides electronic synthesized music. One of two musical tunes are available, selected via a switch on this PCB.

06.10 Option Modules

HOLB: An off-premise line module that allows the bridging of a CO/PBX line, which appears in the system, with a conventional telephone (supervision is provided). Each HOLB provides three circuits, all three of which may be directed to an answering machine (or similar device) attached to the HUNT connector. Requires a connection to an HPLU PCB (that has been installed instead of an HCOU) for each HOLB module desired.

HOXB: An optional module that serves as an interface between the HKSU and conventional, single-line telephones or off-premise extension (OPX) lines. Each HOXB module services two extensions. A maximum of two HOXBs can be installed in ***Strata XIIe*** and three in ***Strata XXe***. An HOXB will operate with either DTMF or rotary dial telephones. An auxiliary power/ringing supply (MRGU) is required for the HOXB.

HSMB: Serves as an interface between the HKSU and a printer or storage device used for the SMDR feature. The module is equipped with an RS-232C interface for the printer connection and connects to the HCAU/CAAU via two supplied 8-wire modular connectors (one per system).

HTIB: This is a TIE line module that allows connection to E & M TIE lines (2-wire). Each HTIB provides two TIE line circuits, and requires an HPLU PCB to be installed instead of an HCOU. Only one HTIB module may be installed in ***Strata XIIe*** and two in ***Strata XXe***. Each TIE line installed reduces the available OPX ports by two.

06.20 Station Equipment

06.21 Electronic Key Telephone features include full speakerphone or handsfree answerback only capability, and modular handset and line cords.

06.22 The principal components of the EKT are: handset, dial pad, speaker, ringing volume control, speakerphone volume control, four fixed feature keys, and 10 or 20 flexible CO/PBX/feature keys. LED indicators are provided for all keys except the HOLD and CONF keys. See Figures 13 and 14.

FIGURE 13 — 10-key EKT

FIGURE 14 — 20-key EKT

06.23 The 10-key Busy Lamp Field (BLF) EKT (Figure 15) with speakerphone may be assigned at any one of up to 16 positions (stations 10 - 25 only), and will indicate which of those stations are in a busy or DND condition.

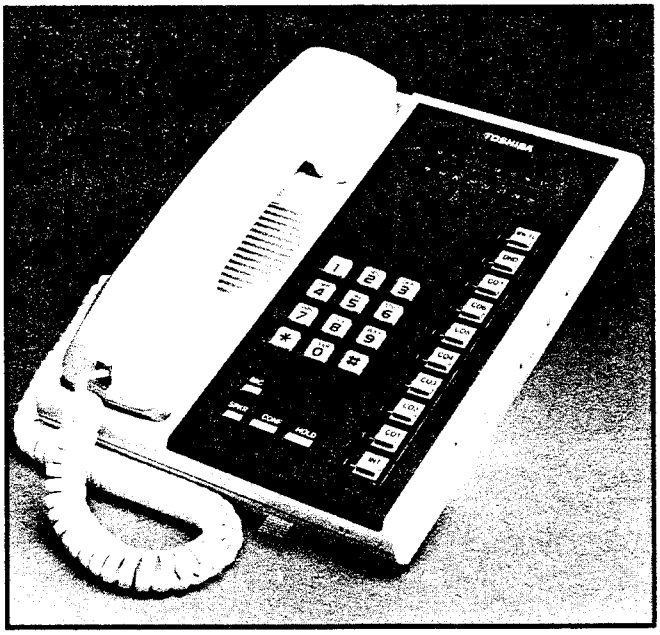

FIGURE 15 — 10-key BLF EKT

06.24 A 20-key Liquid Crystal Display (LCD) EKT (Figure 16) with speakerphone may be located at any or all stations in either system. The 32-character alphanumeric display provides an accurate clock/calendar in the idle state; or elapsed time, dialed number, calling station, CO line and other feature activation prompts are displayed depending upon use. System messages, personal messaging, and station-to-station messaging are also included.

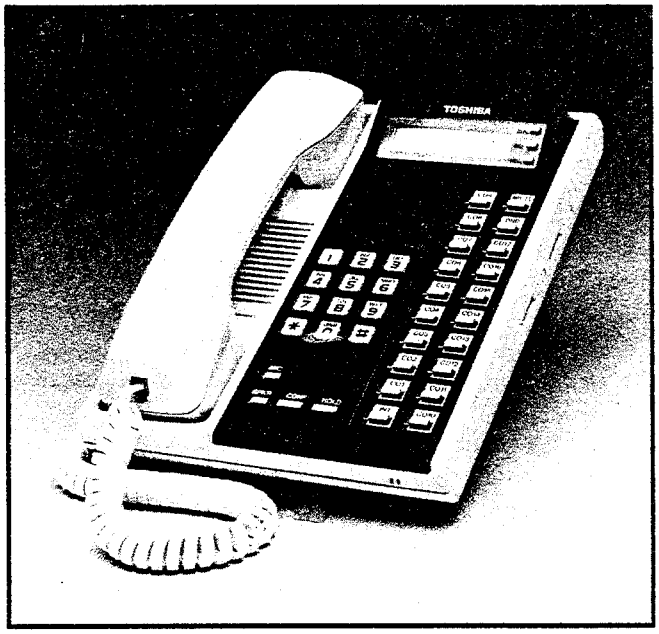

FIGURE 16 — 20-key LCD EKT

06.25 All EKTs feature modular handset cords and are also equipped with a second modular connector for headset connection.

06.26 All EKTs are connected to the system via 4-conductor modular line cords and are easily converted for wall mounting.

06.27 The optional door phone/monitor station (Figure 17) allows a door phone unit to distinctively ring pre-selected station(s). When a station dials an individual door phone, a circuit providing monitoring capabilities on intercom is established. This option requires station 13 or 14 to be replaced by a door phone control unit (HDCB) and up to three door phone units (MDFBs).

06.28 An optional Direct Station Selection (DSS) console (Figure 18) is available for both systems where the volume of incoming calls warrants a dedicated call forwarding location. The attendant's EKT key configuration varies from the standard EKT only in different dedicated key functions and lacks an intercom key (it is on the DSS). The DSS is equipped with up to 56 station keys, an intercom key, an All Call Page key, Message Waiting/Flash key and a Night Transfer key. Either system may be equipped with one or two fully functional DSS consoles.

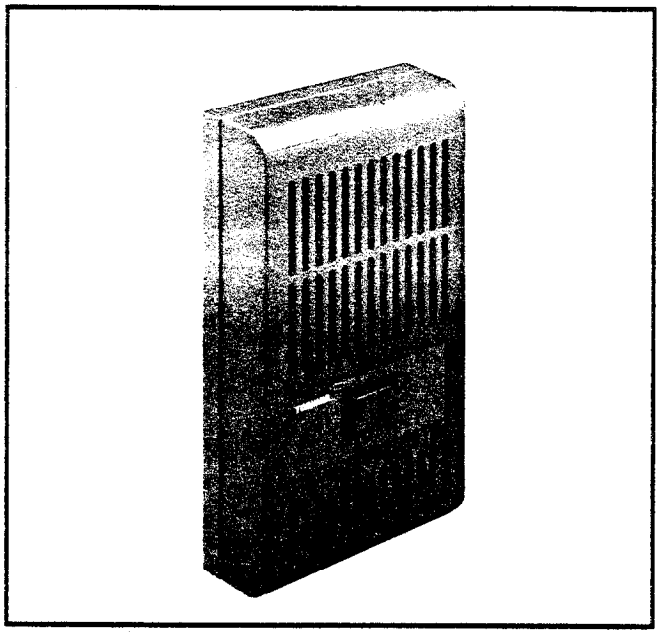

FIGURE 17 — DOOR PHONE

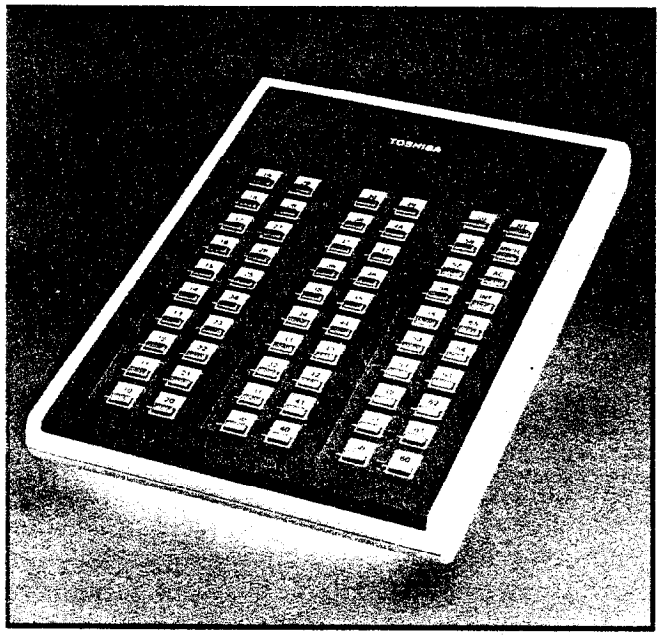

FIGURE 18 — DSS CONSOLE

06.29 In the ***Strata XXe*** only, one or two DSS consoles may be optionally added as BLF consoles. Their only function is to provide station status information using the LEDs. The DSS keys do not function when the DSS console is used as a BLF console.

06.30 Installation

06.31 The ***Strata*** HKSUs are arranged at the factory for table-top mounting, but can also be wall mounted.

06.32 All connections to HKSUs are made via the various printed circuit boards as follows:

- CO/PBX line connections are made to the front of each HCOU using one 3-pair modular cord for each PCB.
- Each group of eight EKTs is connected to the front of each HSTU with one standard 50-pin amphenol-type connector.
- DSS connections are made to the front of the HCBU PCB with one 2-pair modular cord for each DSS.
- Screw-terminal barrier strips are mounted on the front of the HINU to provide attachment points for the following connections:
  - Music-on-hold source input
  - External page output
  - Night relay service
  - External page relay service
- The HSMB option module used for SMDR is connected to the front of the HCAU/CAAU via two supplied 8-wire modular connectors. An RS-232C plug is provided on the HSMB for connecting the SMDR printer or data collecting device.
- Connections for OPX lines, external DC, and ringing power are made to the HOXB using screw-terminal barrier strips.
- OPL connections are made on the HOLB via 6- or 8-wire modular cords to the front of the HPLU. Two cords are required; one cord is connected to the CO jack and serves up to three CO/PBX line connections, as with an HCOU (the HPLU occupies an HCOU PCB position), the 8-wire cord connects to the OPL jack and serves the three OPL stations provided by the PCB.

06.40 Maintenance

06.41 Faults in both ***Strata*** systems are repaired by replacing any faulty component (PCB, sub-assembly, telephone, 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*** features listed earlier in

Tables B and C and some associated operating instructions. Detailed operating instructions can be found in the ***Strata XII$_E$ & XX$_E$*** EKT **USER GUIDE** or the *Installation and Maintenance* manual (Section **300-020-400**, *Operating Procedures*).

07.10 Standard Features

07.11 System

All Call Voice Page: Dialing a 2-digit access code permits a station user to page via all EKT speakers simultaneously. The system can also be programmed to include the External Page feature in an All Call Page.

Alphanumeric Messaging with LCD: Allows system and personal messages to be displayed on the 32-character LCD key. Messages may be up to 16 characters in length and are entered/changed via the station dial pad. A station enters one of 10 access codes that contain a system message. The station can personalize the message and then display it for any calling station.

Automatic Callback (Intercom): Permits a station user who encounters a busy station on intercom to request a callback by dialing a dedicated access code. The system then monitors the called station and signals the caller when that station becomes idle.

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. A different time period can be selected for each station.

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.

Call Transfer with Camp-on: Allows the transfer of an outside call to a station that can be either idle or busy.

CO Call Pick-up: Using a dial code, allows CO call pick-up from another station.

Conference (Amplified): A programmable feature that allows customer-supplied amplifiers to be used during a conference involving CO lines. The system automatically activates the amplifier upon establishing conferencing. This feature reduces the system total capacity by two EKTs.

Conference (Multi-station): Non-amplified conferencing is permitted to a maximum of four stations and one CO or intercom line.

Conference (Multi-trunk): Non-amplified conferencing of two CO lines and up to three stations is permitted.

Directed Call Pick-up: Intercom calls can be answered from any station by going off-hook, depressing the INT key and dialing 7 8 and then the number of the ringing station, or 8 8 if the ringing station's number is not known.

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

DTMF and Dial Pulse Compatible: DTMF or rotary dial pulse signalling can be sent to the CO/PBX line by system programming.

External Page Interface: Dialing a 2-digit code permits a station user access to a customer-provided external speaker via an internal 3-watt amplifier. As an option, a 2-way, 600-ohm voice path is available for use with a customer-supplied talkback speaker/amplifier.

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 on a CO line. Also see Message Waiting.

Flexible Key Assignment: Allows each EKT to be programmed for optimum use of its

CO/PBX or feature keys.

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 a maximum of eight stations.

Group Paging: Special 2-digit access codes (81, 82, 83 or 84) permit voice paging to one of four zones. Zone assignment is via software and is totally flexible. Paging is via the speakers of idle EKTs.

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. The called station cancels the LED by depressing the MW/FL key. Also see Flash Key and Station-to-Station Message Waiting with LCD.

MF Signal Time (160/80 ms): The standard MF dial signal time is 80 ms, but it may be extended to 160 ms, if required.

Multiple Simultaneous Handsfree Intercom Paths: Four intercom paths are available in a ***Strata XIIe*** system and up to six paths in a ***Strata XXe***. All intercom lines are able to carry handsfree conversation simultaneously.

Music-on-hold Interface: An interface is included for a customer-provided music source. CO lines placed on hold will be connected to this source. In addition, this music may also be broadcast from EKT speakers and external page when the background music options are selected.

Night Ring Answer Code: A night ringing call may be answered from any station via an access code.

Night Ringing Over External Page: As a programmable option, while the NITE mode is active, a system-generated ring tone will be transmitted via the external speaker whenever any line rings. Also see Tenant Service.

Night Transfer: On a programmable optional basis, the ***Strata*** systems can function with two or three ringing patterns. If the three-pattern mode is selected, the patterns are designated DAY, DAY 2, and NITE. If the two-pattern mode is selected, DAY and NITE designations are used. In both cases, the ringing mode is selected with the NT key on either the DSS console(s) or station 10. Also see Tenant Service.

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

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

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

Privacy/Non-Privacy: A private system prevents other stations from accessing the intercom or CO lines that are already in use. A non-private system provides conferencing on the CO and intercom lines.

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

Relay Service: The HINU PCB is equipped with two relays that provide the following signals for external equipment:

a) **External Page:** The relay is activated whenever the external page circuit is accessed. A dry "make" contact is provided for control of background music on external page. This is required only when an external page amplifier is used.

b) **Night Relay Service:** The relay provides a dry contact at the NR terminals on the front of the HINU PCB. A strap option on the HINU allows the NR relay to function in one of two modes:

1) **Answering Machine Control:** If the

strap remains intact, the relay is operated continuously when the system is in night service. This mode is intended for indirect control of an answering machine.

2) **Night Bell Control:** If the strap is cut, the relay pulses at a 1-second on/3-seconds off rate whenever the system is in night transfer mode and an incoming call is ringing the system. This mode is intended to be used for indirect control of an external night bell.

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. Also see Saved Number Redial.

Station Hunting: Hunting always starts with the called station number and ends with the last station number in the prearranged group; however, the call is completed to the first idle number. The hunting sequence can be either consecutive or nonconsecutive.

Store Flash Using Automatic Dialing: Allows storing a "flash" in an automatic dialing number via MW/FL or PAU keys.

Tenant Service: Variable CO/PBX line key assignments allow two tenants to be served from the same HKSU with each tenant's lines appearing in the correct sequence. When Tenant Service is used, Night Ringing Over External Page will apply to lines assigned to Tenant #1 only. Also, Night Transfer of Ringing for Tenant #1 and Tenant #2 lines will be independently controlled by DSS #1 (station 10) and DSS #2 (station 11), respectively.

Toll Restriction (6-digit): Selectively programmed on a per-station, per-line basis, the ***Strata*** systems perform toll restriction by analyzing the first 6 or 3 digits (area/office code) dialed. Simple restriction by rejecting the numbers 0 and 1 can be programmed on a per-station basis, if desired.

Toll Restriction Override Code: Two special codes may be defined to override toll restriction.

Toll Restriction Override by System Automatic Dialing: A programmable system feature that permits numbers stored in Automatic Dialing addresses 60 - 99 to be called by toll-restricted stations.

Trunk Queuing: Provides a means for station users to be "stacked" in a waiting queue for a busy outgoing trunk group. The station will then be called back when a trunk in the group becomes available. As a programmable option, the system may be equipped with one trunk group (dial 9) or four trunk groups (dial 91, 92, 93, 94).

Trunk-to-Trunk Connection (Tandem Switching): Allows the system to set up a CO line-to-CO line connection, leaving the controlling station free to make other calls. A maximum of six (simultaneous) trunk-to-trunk circuit paths can be established. Each path reduces system capacity by one EKT.

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 alternate method is selected by dialing 1 following the station number.

Wall Mountable HKSU: The HKSU is also designed for wall mounting.

07.12 Station

Automatic Dialing-Station: Provides a private automatic dialing list of 40 numbers for each station in the system.

Automatic Line Preference: Allows CO/PBX line access by merely lifting the handset; depressing a CO key is not required.

Call Forward (Intercom): Allows *all calls* destined for a station to be routed to another station (activating station may be used to originate calls while feature is activated).

Direct Station Selection (DSS): By depressing an assigned key, a station user causes the selected EKT to ring. A maximum of two DSS keys may be assigned per EKT.

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: 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.

DP/MF Mode Change (TONE Key): Allows a station to change DP/MF modes via a TONE key.

Exclusive Hold: Depressing the HOLD key twice holds that call securely for the station that placed it on hold.

Executive Override (Break-In): A station 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. After reaching a busy station, dial a 3 to override.

Forced Account Code: Requires selected station(s) to dial an account code prior to dialing a number.

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

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 placed on hold at the EKT. All other stations see a normal 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*** allows all calls to be dialed with the handset still on-hook. Call progress can be heard via the telephone speaker; no need to pick up the handset until the party answers.

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

Ringing Line Preference: A line ringing at a station can be answered by lifting the handset or depressing the SPKR key. The ringing line will be automatically selected.

Saved Number Redial: A programmable key (SAVE) that saves a dialed number for redial at a later time. May be used any time, and is exclusive of the Last Number Redial feature.

Station Security (MCO Key): Allows each station to be enabled or disabled individually for the handsfree answerback feature.

Station-to-Station Message Waiting with LCD: An EKT's station number may be sent to another station, indicating that the displayed station number has called. See 20-key Liquid Crystal Display EKT.

07.20 Optional Features

Background Music with Station Control: Music from the music-on-hold source can, at the station user's option, be heard via the EKT speaker. The same music may also be broadcast via the external page interface if an external speaker is installed.

Direct Station Selection (DSS) Console:

a) **All Call Voice Page:** A single dedicated key on the DSS console (AC) will allow the attendant to voice-page all of the EKT speakers in the system simultaneously. If External Page has been included in All Call Page, via system option selection, the AC key will operate that as well.

b) **Automatic Line Hold:** Each calling CO/PBX line is automatically placed on hold when the DSS operator activates a station key.

c) **Expanded Line Appearance:** Twenty CO/PBX line keys are available on the attendant's EKT (associated with the DSS console). The intercom and MW/FL keys for that EKT are located on the DSS console.

d) **Multiple DSS Consoles:** The ***Strata XIIe & XXe*** systems will each support two fully functional DSS consoles (which may operate simultaneously) as well as two additional consoles functioning only as Busy Lamp Field terminals.

e) **Night Transfer:** The NT key on the DSS console(s) or station 10 controls the system's ringing patterns.

f) **Voice or Tone Signalling:** The DSS may be programmed for tone or voice signalling preference independently of the remainder of the system. As with all stations, the operator can choose the alternate mode by dialing a **1** following the station number.

Door Phone/Monitor Stations: Allows optional door phone unit(s) to distinctively ring pre-selected EKTs. EKT dialing to an individual door phone unit provides monitoring capabilities on the intercom.

- **Alarm Key:** Turns off the alarm signal set in the system by a customer-supplied alarm system. The alarm signal is activated by a closure at the HDCB door phone C output from a customer-supplied alarm system. The alarm signal will be heard via all idle EKT speakers until the alarm key is depressed.
- **Door Lock Key:** Activates a dry contact relay closure for indirect control of a door lock or other device. When the key is depressed, the HDCB door phone B output will close for a period of 3 or 6 seconds.

EKT Faceplates(blue, black and wine): The standard brown faceplates can easily be changed on any EKT to coordinate with office decor.

External Page Amplifier: An external page 3-watt amplifier (SEPU PCB) that allows access to a customer-provided external 8-ohm speaker for paging.

Music-on-Hold Source: When installed, this electronic music source (SMOU PCB) eliminates the need for a customer-provided external music source and provides electronic-generated music to CO lines placed on hold.

Off-Premise Extension (OPX): Installing an HOXB option module, along with an auxiliary power and ringing supply (MRGU), allows the system to interface with conventional, single-line telephones or off-premise circuits. The HOXB serves two extensions and a maximum of two HOXBs may be installed in ***Strata XIIe*** and three in ***Strata XXe***. Each HOXB replaces two EKTs in the system.

Off-Premise Line (OPL): Installing an HOLB option module allows the bridging of a CO/PBX line (that appears in the system) with a conventional telephone. All incoming calls on the HOLB's three circuits may be directed to an answering machine (or similar device) attached to the HUNT connector. This is accomplished as a programming option via night service. The HOLB option requires an HPLU PCB to be installed in place of an HCOU PCB.

Station Message Detail Recording (SMDR): Adding the HSMB option module allows data to be collected for each outgoing and incoming CO line call. This data may be output to a printer or recording device via the RS-232C interface located on the HSMB.

System Battery Back-up: A module (HPBU-8) that can be installed in either power supply to provide automatic switching to standby battery power. During normal power conditions, the batteries are kept fully charged by the power supply.

10-key EKT (HFU or Speakerphone): A basic EKT with full speakerphone capability or handsfree answerback (HFU) only, depending upon the requirements. This EKT can be assigned to any station, have direct key appearances of up to nine CO/PBX lines, outgoing access by dial selection (see Trunk Queuing) to non-appearing lines and can receive transferred calls on other lines.

10-key Busy Lamp Field (BLF) EKT: A 10-key BLF EKT with full speakerphone capability and an LED panel showing the busy/idle status of certain stations (a station in the DND mode will show as busy). The BLF EKT may used at any station, but the BLF will display the status of stations 10 - 25 only.

20-key EKT (HFU or Speakerphone): A 20-key EKT with full speakerphone capability or handsfree answerback (HFU) only, depending upon the requirements, plus 10 additional flexible keys. It can be assigned to any station. This EKT can have direct key appearances of up to 19 CO/PBX lines, outgoing access by dial selection (see Trunk Queuing) to non-appearing lines and can receive transferred calls on other lines.

20-key Liquid Crystal Display (LCD) EKT:

This 20-key EKT features a 32-character alphanumeric LCD, full speakerphone capability, and the same key flexibility as the 20-key EKT. See Station-to-Station Message Waiting with LCD.

TIE Lines: The HTIB optional module allows two E & M TIE lines to be connected to the system. Each TIE line reduces the system capacity by one CO line; each HTIB reduces the system capacity by two OPX stations.

Strata® XII$_e$ & XX$_e$

INSTALLATION INSTRUCTIONS

Strata XIIe & XXe

INSTALLATION

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01 GENERAL

01.01 This section describes the installation procedures necessary to ensure proper operation of the ***Strata XIIe & XXe*** systems. The installation procedures for the two systems vary only in relation to size; all other factors are the same.

02 PACKING

02.01 When a ***Strata*** 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*** 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 the original 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.

02.04 When packing or storing an HCAU/CAAU, ensure the following:

- ***Do not*** use plastic or any type of conductive material for packing an HCAU/CAAU. ***Use*** plain paper.

CAUTION!
Conductive packing material may cause the internal back-up battery to discharge and damage the PCB.

02.05 Whenever storing or shipping an HCAU/CAAU, always ensure that the battery strap is in the **OFF** position (see Figure 1). The HCAU is a "host" board for the CAAU (which is required) and they are shipped as an assembled unit.

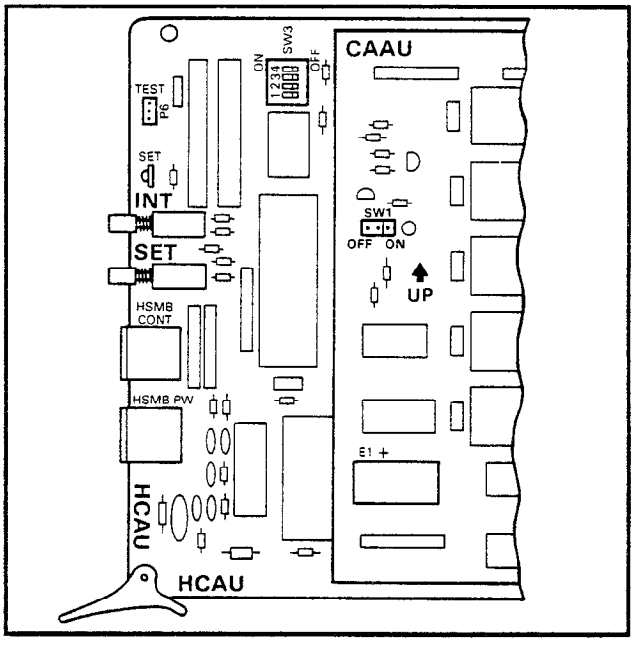

FIGURE 1 — CAAU BATTERY STRAP

NOTE:
*Always make sure the battery strap on the CAAU is in the **ON** position prior to installation. **If not, the SET LED on the HCAU cannot operate.***

02.06 The DIP switches (**SW3**) must all be set to **OFF** for operation in the continental United States.

03 HKSU REQUIREMENTS

03.00 Power Requirements

03.01 The ***Strata*** HKSU (both ***XIIe & XXe***) requires 24 VDC. This is provided by the power supply (HPSU), which in turn requires power from a grounded 117 VAC outlet. The outlet should be separately fused and rated at 15 amps.

03.02 The power supplies used with both ***Strata*** systems are very similar in appearance but provide different current levels:

- ***XIIe*** = HPSU 8120
- ***XXe*** = HPSU 9120

03.03 Both power supplies are equipped with a 10' AC power cord.

03.04 An optional battery backup unit (HPBU-8) is available that is compatible with either power supply. It is a printed circuit assembly attached to the power supply. The rec-

ommended battery pack (customer-supplied) consists of two maintenance-free, automobile-type 12 VDC batteries (maximum 80 amp/hour rating). With the optional HPBU-8 assembly installed, all functions of either ***Strata*** system will continue to operate for several hours after a loss of normal electrical power (the actual period of time is a direct ratio of line/trunk configuration to the type and size of batteries selected). Calls will not 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 HKSU.

03.20 Environmental Factors

03.21 Humidity at the HKSU 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). Exposure to dust and airborne chemicals should also be minimized.

03.30 Cabling Considerations

03.31 The HKSU must be located so that all stations are within 1,000 cable feet (305 M) of it. The DSS console must be located within 500 cable feet (152.5 M) of the HKSU. Acceptable cable is 22 or 24 AWG inside telephone station cable, jacketed but not shielded, having two or more twisted wire pairs.

04 HKSU MOUNTING

04.01 The HKSU is designed for either table or wall mounting, but is factory-configured for table mounting. For wall mounting instructions, refer to Paragraph **04.20**.

04.10 Table Mounting the HKSU

04.11 Since the HKSU is already configured for table mounting, the only requirement is to choose a suitable location.

04.20 Wall Mounting the HKSU

04.21 Choose a suitable location for the HKSU on a surface of sufficient strength to support its weight (according to local building and safety regulations). The fully equipped HKSUs approximately weigh:

Strata XIIe: 44 lbs. (20 kg)
Strata XXe: 61 lbs. (28 kg)

04.22 Refer to Figure 2 and perform the following steps:

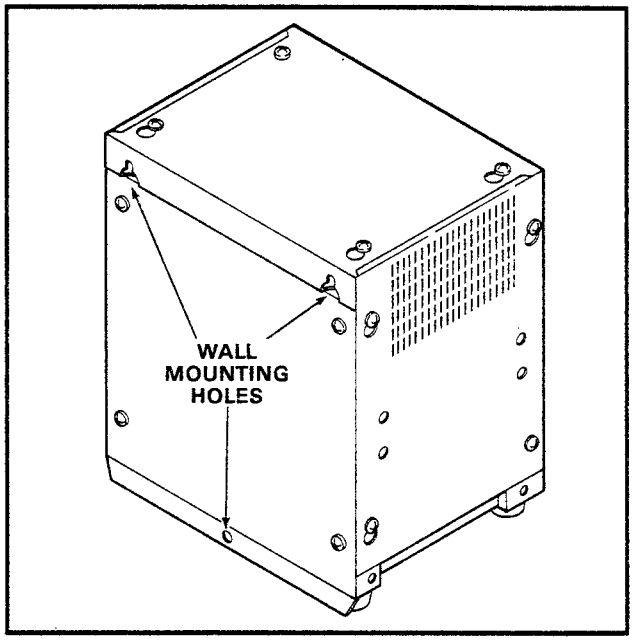

FIGURE 2 — HKSU WALL MOUNTING

NOTE:
Three fasteners, suitable for the type of wall surface chosen, must be supplied by the installer. The fasteners are used to secure the HKSU to the wall. (A typical fastener would be: 1/4" toggle bolt, 1/4" molly fastener or 1/4" lag screw.)

1) Mark the locations of the two upper fasteners (center-to-center of the modified keyholes: 12"), scribe a straight line between the holes and verify that it is level with a spirit level.

2) At both marked points, drill a hole suitable for the chosen fastener.

3) Insert two fasteners into the holes in the mounting surface that correspond to the keyholes in the back plate. Tighten them loosely so that approximately 3/8" gap remains between the head of the fastener and the mounting surface.

4) Install the HKSU by slipping the two keyholes over the fasteners installed in step 3. Allow the HKSU to hang on the two screws.

5) Install the lower fastener in the center of the back plate and tighten.

6) Tighten the top two screws in the back plate. If necessary, the HKSU top panel may be

removed for access to these screws.

04.30 Printed Circuit Board Functions

04.31 Complete with all available options, both ***Strata*** systems utilize eight different PCBs, with a maximum of 12 for ***Strata XIIe*** and 19 for ***Strata XXe***. They are:

NOTE:
Several optional features are now performed by external modules, see Paragraph **05** *for information on peripheral equipment.*

HCOU: An interface between the HKSU and the central office or PBX lines. Ring detection, hold and dial outpulsing are performed by this PCB. Depending upon local CO requirements, each CO/PBX line can be programmed for DTMF or rotary dial outpulsing. Each HCOU PCB serves up to three CO/PBX lines.

HPLU: An optional PCB that is required when using the optional HOLB or HTIB modules. Each HPLU PCB interfaces one HOLB or HTIB module. The HPLU serves up to three CO/PBX lines and replaces the HCOU that would usually serve these lines.

HSTU/STAU: An interface between the HKSU and EKTs, which includes the system's solid-state space division matrix. Each HSTU/STAU serves up to eight EKTs . Two-pair wiring is required for each EKT; one pair carrying voice and the other pair carrying control data to and from the EKT.

- **STAU:** Contains the additional solid-state crosspoints required in a ***Strata XXe*** system. Each STAU mounts directly on the HSTU, providing access to CO lines 13 - 21, plus two additional intercom paths for those eight stations.

HCAU/CAAU: The CAAU is required and mounts directly on the HCAU to form a single unit. All system control functions are performed by the single-chip microprocessor located on the HCAU. The system program stored in ROM, the RAM for system operations and the battery-protected RAM for system data storage are located on the CAAU.

HCBU: Contains a microprocessor that serves to off-load the main CPU by handling the routine and repetitive data transmission tasks to and from peripheral equipment. It also provides the interface for two DSS consoles. One HCBU is used in ***Strata XIIe***, while two are required in any ***Strata XXe*** system that is equipped with more than 32 stations or that requires one or two BLF consoles. BLF consoles are not available for the ***Strata XIIe***.

HINU: Generates system tones and provides the switching matrix for the delivery of tones for both paging and intercom connections (one per system). Houses circuitry and connection points for the relay services, music-on-hold and external page amplifier. Also is a host PCB for the SMOU.

- **SMOU:** The SMOU is an optional music-on-hold source that provides electronic synthesized music. One of two musical tunes are available, selected via a switch on this PCB.

04.40 Power Supply

04.41 The system requires 24 VDC, which is provided by the internal power supply:
XIIe = HPSU 8120 ***XXe*** = HPSU 9120

HPSU requires 117 VAC, 60 Hz, with a permissible AC input voltage range of 90 - 130 VAC.

CAUTION!
In accordance with all applicable electrical codes and Article 480, National Electrical Code, the HPSU, HPBU, battery, battery rack and interconnecting wiring must be installed and serviced by only qualified installers. Carefully read the "Installation Instructions" enclosed with each item.

04.42 An optional battery back-up unit (HPBU-8) is available. It is a PCB that mounts inside the power supply housing (Figure 3) and is connected to the female 3-prong connector inside the power supply's case. Secure the HPBU with the two provided screws.

04.43 The HPBU is then connected via the terminal block to the recommended battery pack (which is customer-supplied, consisting of two 12 VDC, maintenance-free, automobile-type batteries — 80 amp/hour maximum rating). With the optional battery back-up assembly installed, all functions of the system

will continue to operate for several hours (the actual time period is in direct ratio to the type and size of batteries selected).

04.44 A Toshiba ***Strata*** electronic key telephone system requires a solid earth ground. 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*** requirements. However, in a small percentage of installations, this ground may be installed incorrectly. Therefore, prior to installing a system, the third wire ground must be tested for continuity by either measuring the resistance between the third 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 **04.45** should be performed.

WARNING!
Hazardous voltage is exposed during the following test. Use great care when working with AC powerline voltage.

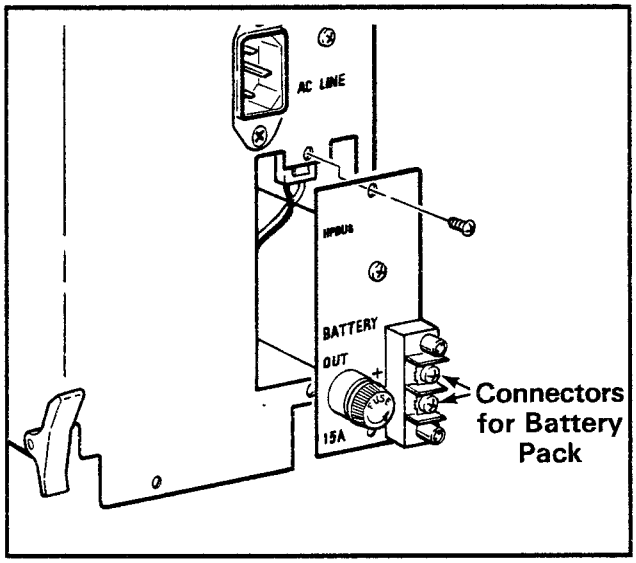

FIGURE 3 — HPBU INSTALLATION

04.45 The test procedures are as follows:

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 third 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 second voltage terminal. If a reading of 0V is obtained on both voltage terminals, the outlet ***is not*** properly grounded. Omit Steps 5 and 6 and proceed directly to Step 7.

5) 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.

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

7) If the above tests show 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*** system is connected.

04.50 Power Supply Installation

04.51 Before installing the power supply (HPSU) in the HKSU, it should be bench tested.

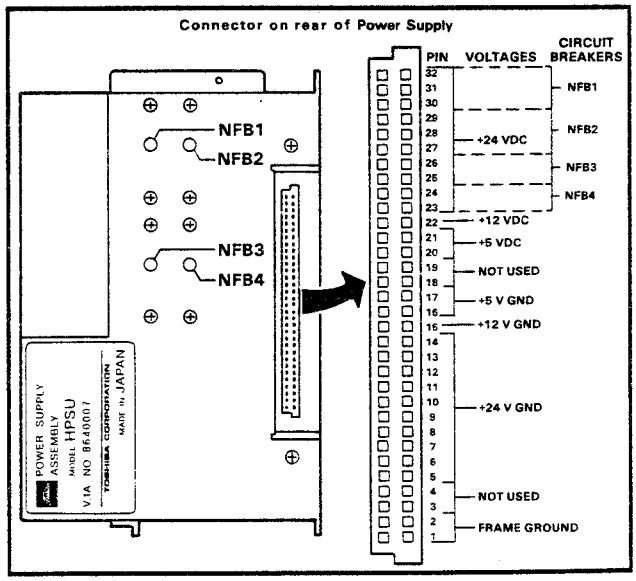

FIGURE 4 — HPSU VOLTAGE CHECKS

The voltage outputs and checks are the same for the HPSU 8120 and HPSU 9120. Figure 4 shows the connector on the back of the HPSU, which is not marked. Therefore, it is necessary to reference Figure 4 to locate the appropriate pins and voltages. The left-hand column of pins are bridged to the right-hand column and should also be checked.

04.52 Plug the HPSU into the facility power and turn the power switch **ON**. Using a digital voltmeter (DVM) adjusted to the appropriate range, measure between the corresponding ground pins and the various voltage output pins. Verify that the voltages are within the following ranges (VDC):

Nominal	Range
+24	+23 - +29
+12	+10.8 - +13.2
+5	+4.75 - +5.25

If any failures are noted, replace the HPSU.

NOTE:
Ensure that the NFB1 - 4 circuit breakers are not tripped for the +24VDC.

04.53 Turn the power switch **OFF**, then unplug the power supply. Install the HPSU in the HKSU and secure it with the two provided screws. Plug the power supply back into the facility power.

04.60 PCB Installation

04.61 Install the HCAU/CAAU and HCBU PCBs in their correct HKSU positions (see Figures 5 and 6).

04.62 Install the HINU in the correct HKSU position (see Figures 5 and 6).

04.63 Install the appropriate number of STAU PCBs on the HSTU PCB. HSTU PCBs are factory-equipped with one STAU PCB. A ***Strata XXe*** requires a second STAU whenever access to CO lines 13 - 21 and intercoms 5 and 6 are desired.

04.64 Follow the position arrangements indicated in Figures 5 and 6, and install the required HSTU PCBs.

a) ***Strata XIIe & XXe***:
#1 HSTU serves stations 10 - 17
#2 HSTU serves stations 18 - 25

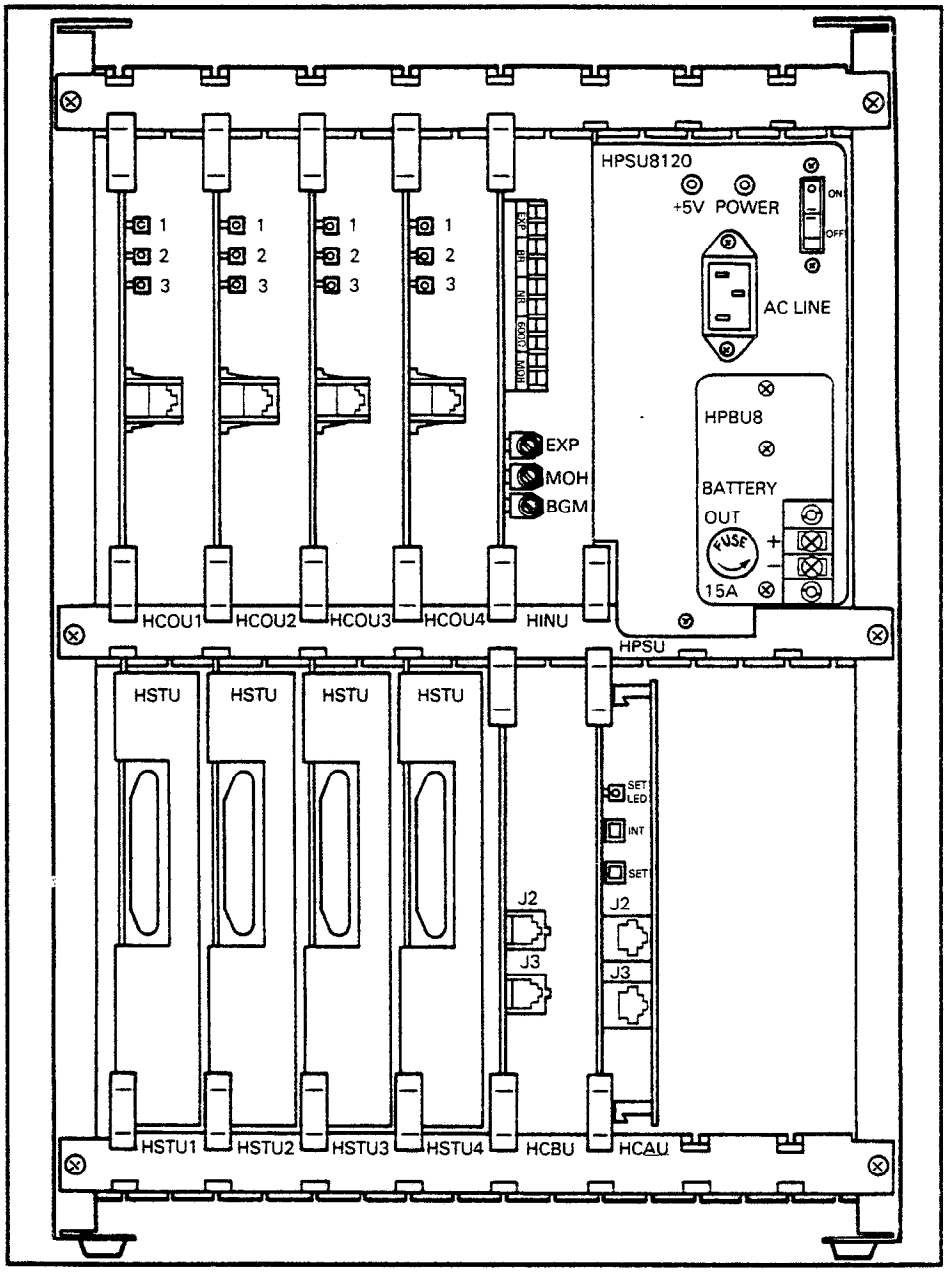

FIGURE 5 — *Strata XIIe* PCB LOCATIONS

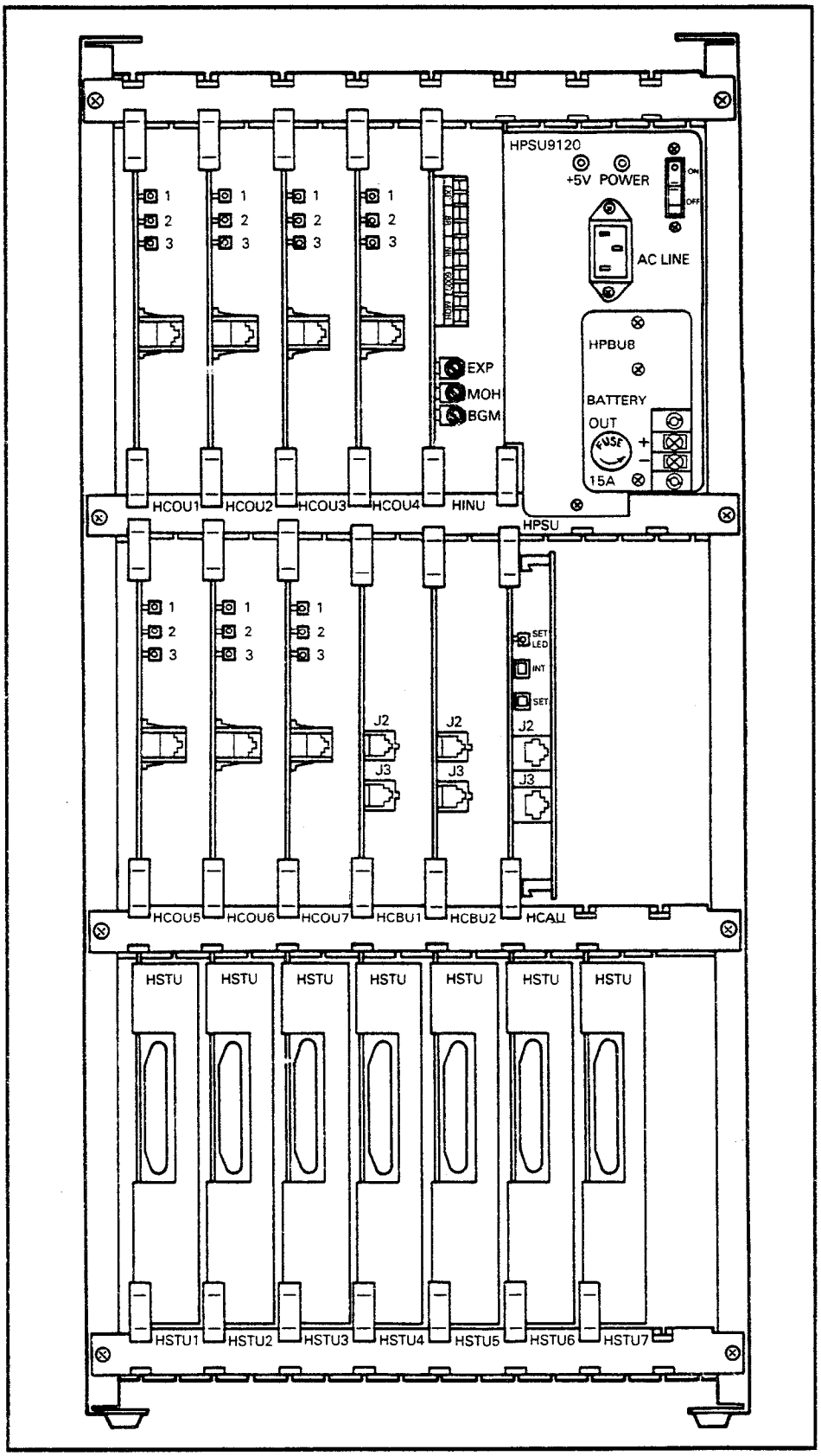

FIGURE 6 — *Strata XX$_e$* PCB LOCATIONS

#3 HSTU serves stations 26 - 33
#4 HSTU serves stations 34 - 41

b) ***Strata XX$_e$***:
#5 HSTU serves stations 42 - 49
#6 HSTU serves stations 50 - 57
#7 HSTU serves stations 58 - 65

04.65 Install the required number of HCOU (HPLU) PCBs in the positions shown in Figures 5 and 6. The single type of HCOU (HPLU) PCB operates with either DTMF tone or dial pulse CO lines. Signalling mode is controlled by software.

a) ***Strata XII$_e$ & XX$_e$***:
#1 HCOU serves CO lines 1 - 3
#2 HCOU serves CO lines 4 - 6
#3 HCOU serves CO lines 7 - 9
#4 HCOU serves CO lines 10 - 12

b) ***Strata XX$_e$***:
#5 HCOU serves CO lines 13 - 15
#6 HCOU serves CO lines 16 - 18
#7 HCOU serves CO lines 19 - 21

05 PERIPHERAL EQUIPMENT INSTALLATION

05.00 General

05.01 Several system features are provided by external option modules. Five of these are:

a) **HSMB:** Provides Station Message Detail Recording (SMDR) features.

b) **HOXB:** Provides Off-Premise Extensions for single-line telephones.

c) **HOLB:** Provides Off-Premise Line features for the system — requires HPLU(s).

d) **HDCB:** Provides Door Phone/Monitor Stations, Door Lock and Alarm features.

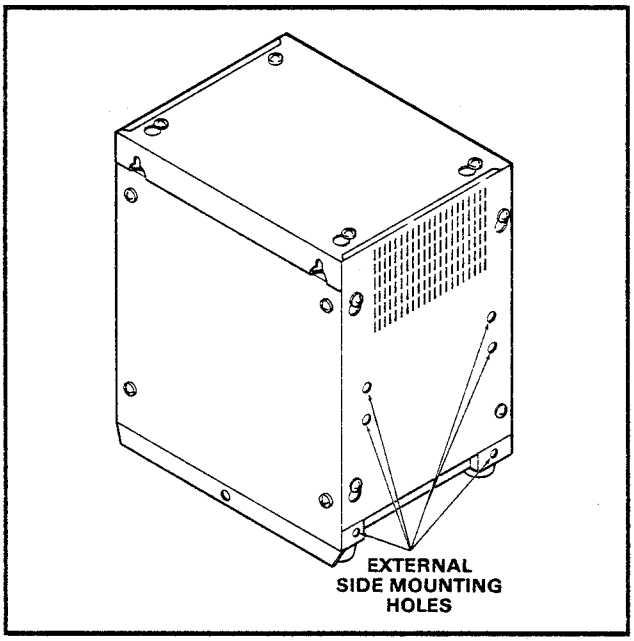

FIGURE 7 — MOUNTING EXTERNAL MODULE ON HKSU

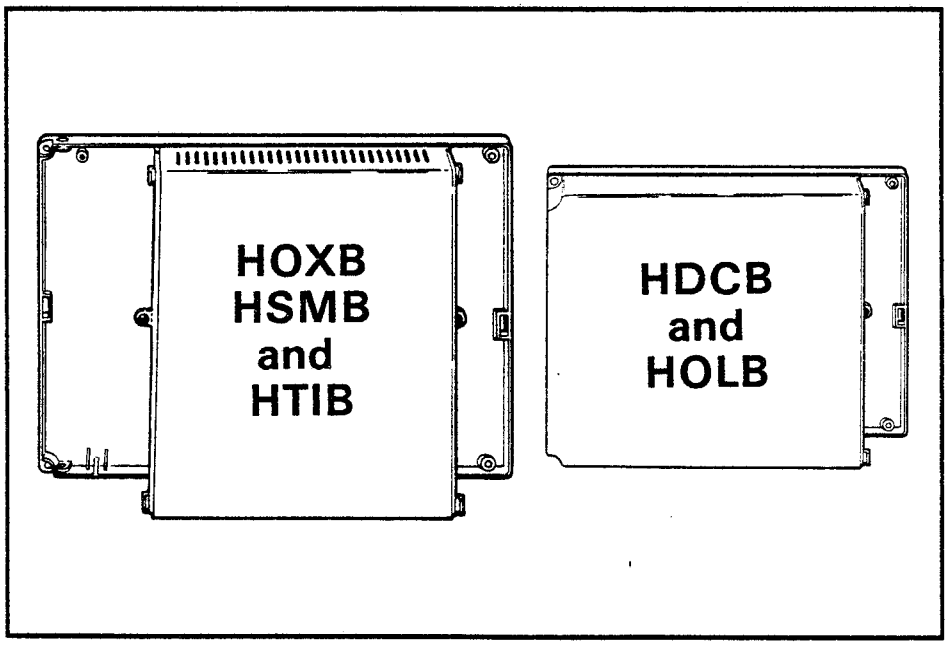

FIGURE 8 — EXTERNAL MODULE WALL MOUNTING

e) **HTIB:** Provides TIE Line features for the system — requires HPLU(s).

05.02 Although different in size, all five external modules are mounted in the same manner (HOXB, HSMB and HTIB may be mounted to the sides of the HKSU or on a wall; HDCB and HOLB mount on the wall only). The ***Strata XX$_e$*** HKSU can accommodate up to two external modules mounted on each side, while the ***Strata XII$_e$*** HKSU can have two external modules on one side and one on the other. Refer to Figures 7 and 8 and perform the following:

1) Locate the mounting holes on side cover(s).

2) Properly position the module on or adjacent to the HKSU with regards to wiring needs.

3) Secure the module to the mounting surface with the provided screws.

05.03 Refer to the paragraphs for installing the HSMB, HOXB, HTIB, HOLB and HDCB, respectively. Cabling instructions are in Paragraph **06**.

05.10 HSMB Installation

05.11 To equip the system with Station Message Detail Recording (SMDR), install an HSMB option module.

05.12 The HSMB must be installed within 17' of the HKSU (a 7' cord is provided with the module), and connected by two 8-wire cables. Connect one module cable from **J1** (CONT) on the HSMB to the **CONT** connector on the HCAU PCB. Connect the other module cable from **J2** (PW) on the HSMB to the **PW** connector on the HCAU PCB. The RS-232C printer connector is installed at **J3** on the HSMB.

05.13 Remove the HSMB cover and locate the **SW8** battery strap (Figure 9) on the HSMB and connect the mem-

ory back-up battery. To connect the battery, install the strapping plug so that it bridges the center pin with the pin labeled **ON**.

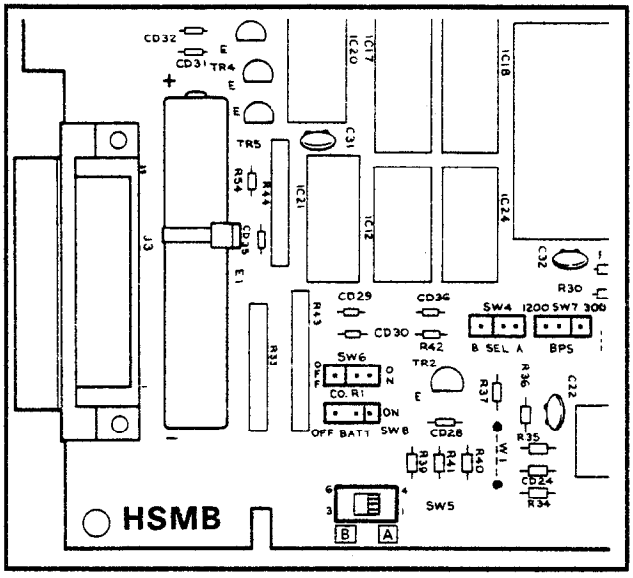

FIGURE 9

HSMB STRAPS and SWITCHES

05.14 Select the data output speed using the **SW7** strap. The speed may be set at 300 or 1,200 BPS by installing the strapping plug so that it bridges the center pin with the terminal labeled "300" or "1200".

05.15 Two other switches (**SW4** and **SW5**) located on the HSMB are normally set at position A. In position B, the HSMB can accommodate other printer types. See Table A to determine the RS-232C pin connections for positions A and B.

Table A — RS-232C Pin Connections

Position A		Position B	
3	RD	2	RD
20	DTR	3	STATUS
6	DSR	6	DSR
7	SG	7	SG
8	CD	8	CD

05.16 The SMDR feature prints out records of both incoming and outgoing calls or only outgoing calls. This option is selected by using the **SW6** strap. Installing the strapping plug so that it bridges the center pin with the terminal labeled **OFF** causes both incoming and outgoing calls to be recorded. Bridging the center pin with the terminal labeled "ON" causes only outgoing calls to be recorded.

05.20 HOXB Installation

05.21 To equip the system with conventional telephones or Off-Premise Extensions, install an HOXB external module. The MRGU 12-A, a ring generator and -48 VDC battery supply, is also required. Refer to Paragraph **06** for additional information regarding the MRGU.

05.22 Remove the HOXB cover and locate the two operational mode straps on the HOXU PCB (mounted to the HOXB base). As shown in Figure 10, the straps are located in the center of the PCB: **SW1** controls the operation of OPX telephone #1; **SW2** controls OPX telephone #2. Set each switch to ON for dial pulse (DP) or OFF for DTMF (MF) tone output, as required. After setting the straps, reinstall the cover and secure it to the base. The MF position does not allow Toll Restriction for the OPX station.

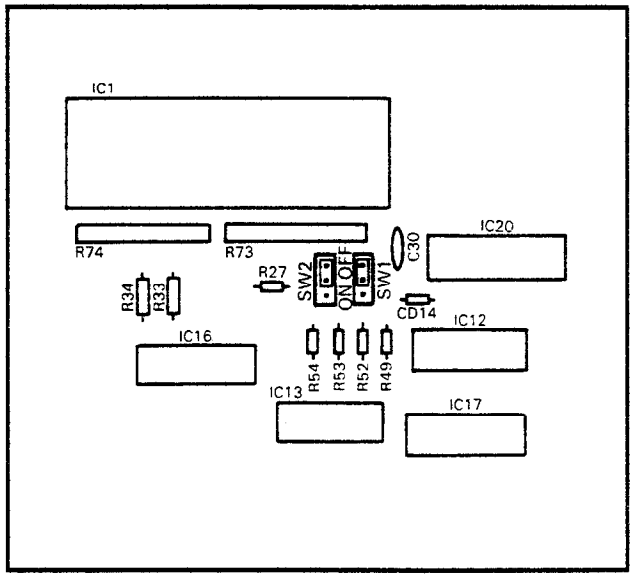

FIGURE 10

HOXB CONNECTION STRAPS

05.23 For correct cabling information, refer to Paragraph **06**.

05.30 HTIB Installation

05.31 To equip the system with E & M TIE Lines, install the HTIB option module. The MRGU 12-A, a -48 VDC battery supply and HPLU PCB is also required. Refer to Paragraph **06** for additional information regarding MRGU.

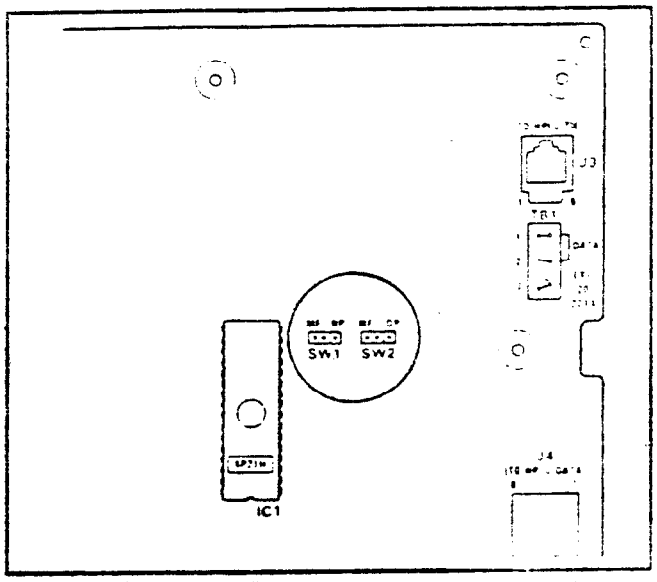

FIGURE 11 — HTIB INSTALLATION

05.32 Remove the HTIB cover and locate the two operational mode straps on the HTIB PCB (mounted to the HTIB base). As shown in Figure 11, the straps are located in the right center of the PCB: **SW1** controls the operation of TIE line circuit #1; **SW2** controls TIE line circuit #2. Set each switch to the dial pulse (DP) or DTMF tone (MF) signalling position as required. The MF position does not allow Toll Restriction to be used on TIE lines

05.33 For correct cabling information, refer to Paragraph 06.

05.40 HOLB Installation

05.41 To equip the system with the Off-Premise Line option, install the HOLB option module. Internal HOLB strapping is not required.

05.42 For correct cabling information, refer to Paragraph 06.

05.50 HDCB Installation

05.51 To equip the system with up to three Door Phone/Monitor Stations or the Door Lock and Alarm features, install the HDCB external module. HDCB outputs B and C, respectively, may also function as door lock control and alarm signal inputs.

05.52 Remove the HDCB cover and locate (per Figure 12) **SW2** and **SW1** in the upper left corner (**SW1** controls output C, **SW2** controls output B).

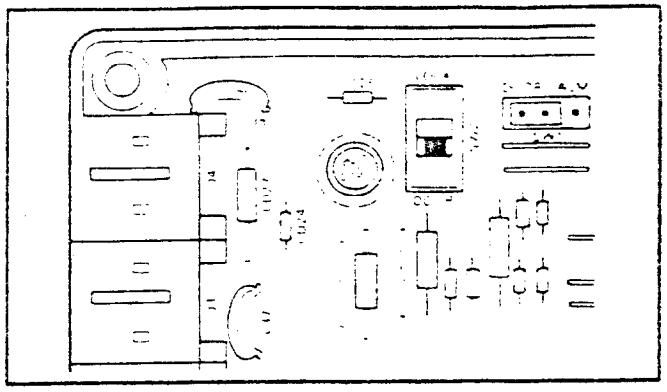

FIGURE 12
HDCB CONNECTION STRAPS

a) When **SW1** is in the "DOOR" position, output C connects to a Door Phone Monitor Station. When strapped in the "ALM" position, output C will detect a closure across its two leads (a short) and provide an alarm signal to all idle stations. The signal may be turned off with the ALARM key on an EKT

b) When **SW2** is in the "DOOR" position, output B connects to a Door Phone Monitor Station. When strapped in the "LOCK" position, output B will provide a dry contact (maximum 1 amp) closure for indirect control of a door lock or other device. The closure will be for a period of 3 or 6 seconds (programmable) when an EKT's door lock (DRLK) key is depressed

05.53 For correct cabling information, refer to Paragraph 06

06 CABLE CONNECTIONS

06.00 Main Distribution Frame Configuration

06.01 Use one split connection block for each group of eight stations; 66M150 split connection blocks are recommended as the main distribution frame (MDF).

06.02 A 25-pair, male-amphenol-ended cable is connected directly to the front of each HSTU and fastened with the provided metal bracket (Figure 13).

06.03 Secure the cables to the bottom of the HKSU shelf with the provided plastic cable clamps. Route the cables into the slots on either side of the HKSU and out the bottom as shown in Figure 13

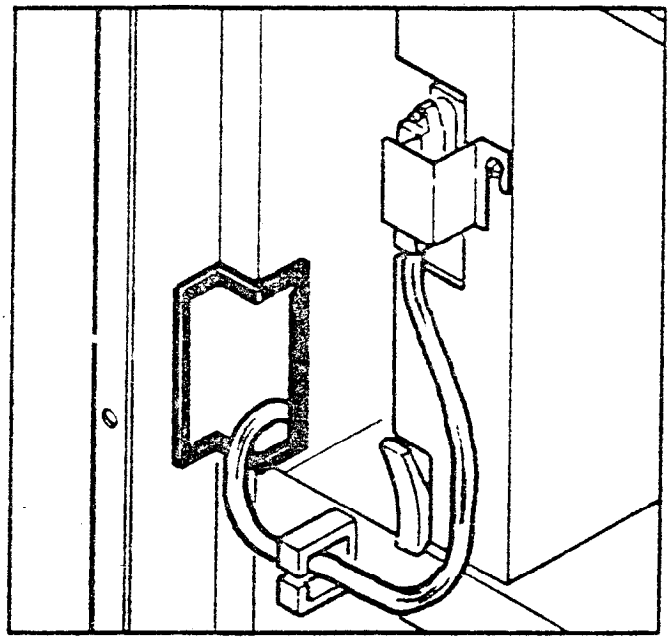

FIGURE 13 — HKSU

CABLE CLAMPING and ROUTING

06.04 Refer to Figure 14, and route the cable from #1 HSTU (stations 10 - 17) to Block 1 and the cable from #2 HSTU (stations 18 - 25) to Block 2, etc.

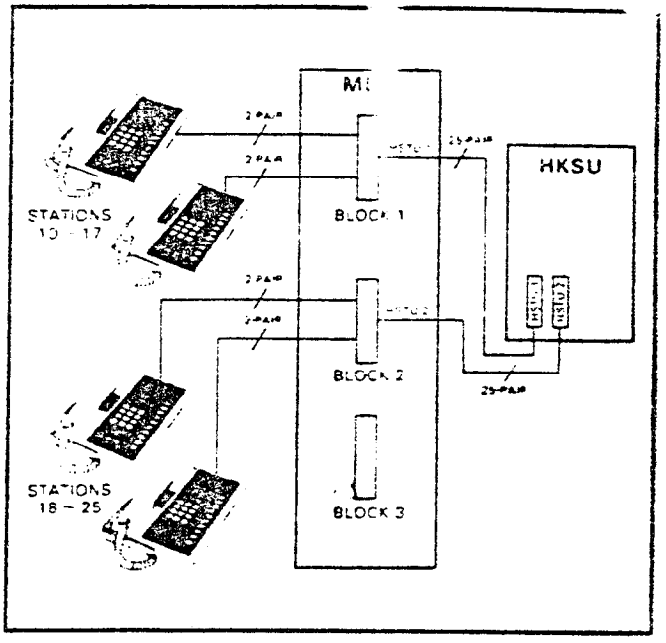

FIGURE 14 — HSTU-TO-MDF WIRING

06.05 Use the industry-standard color code sequence and terminate the cables on MDF blocks as shown in Figure 15. (Use one side of each block for each cable.) Figure 15 is generic, in that it shows the basic diagram for each HSTU. Use Tables C and D for correct cross-connect data for all stations in both systems.

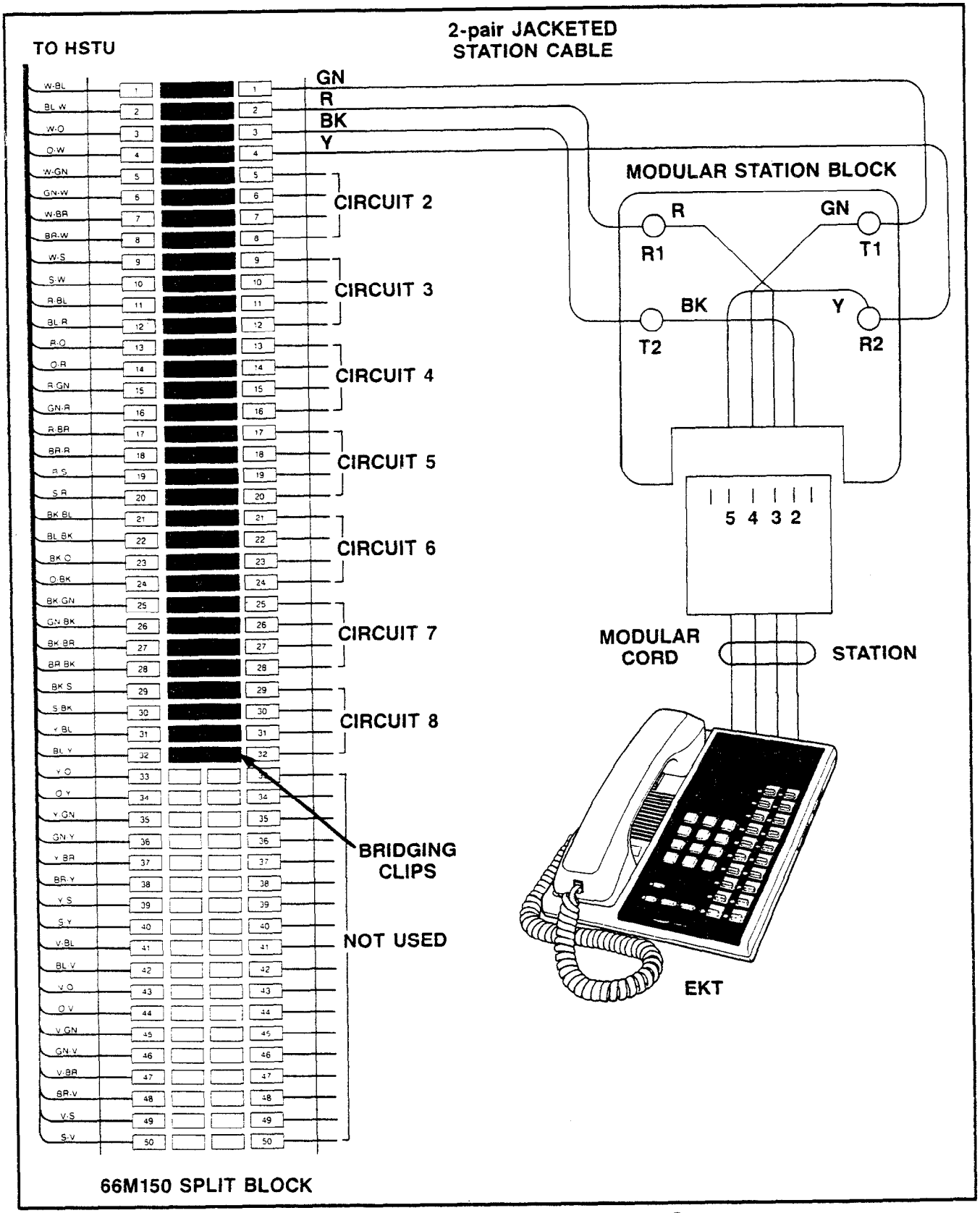

FIGURE 15 — MDF/EKT WIRING

TABLE B

Strata XIIe & XXe CROSS-CONNECT REFERENCE DATA

Color Code	Designation	Station Numbers HSTU #1	HSTU #2	HSTU #3	HSTU #4
W-Bl	T	10	18	26	34
Bl-W	R				
W-Or	DT				
Or-W	DR				
W-Gr	T	11	19	27	35
Gr-W	R				
W-Br	DT				
Br-W	DR				
W-S	T	12	20	28	36
S-W	R				
R-Bl	DT				
Bl-R	DR				
R-Or	T	13	21	29	37
Or-R	R				
R-Gr	DT				
Gr-R	DR				
R-Br	T	14	22	30	38
Br-R	R				
R-S	DT				
S-R	DR				
Bk-Bl	T	15	23	31	39
Bl-Bk	R				
Bk-Or	DT				
Or-Bk	DR				
Bk-Gr	T	16	24	32	40
Gr-Bk	R				
Bk-Br	DT				
Br-Bk	DR				
Bk-S	T	17	25	33	41
S-Bk	R				
Y-Bl	DT				
Bl-Y	DR				

NOTE:
The remaining portion of the split block is not used.

06.10 Station Cable Connections

06.11 Terminate the individual 2-pair station cables consecutively on each MDF block, and attach them to the side opposite the HSTU cable. Use bridging clips to connect the HSTU cable pairs to the station cable pairs.

06.12 The cables used for station wiring should be twisted pair.

06.13 The overall length of the cable run must not exceed 1,000' (305 M).

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

06.14 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', while the maximum allowed length is 25'.

06.15 See Figure 15 for EKT wiring arrangement.

06.16 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 15. Verify the configuration of your modular blocks before connecting the station cables.

TABLE C

Strata XX$_e$ CROSS-CONNECT REFERENCE DATA

Color Code	Designation	Station Numbers HSTU #5	HSTU #6	HSTU #7
W-Bl	T	42	50	58
Bl-W	R			
W-Or	DT			
Or-W	DR			
W-Gr	T	43	51	59
Gr-W	R			
W-Br	DT			
Br-W	DR			
W-S	T	44	52	60
S-W	R			
R-Bl	DT			
Bl-R	DR			
R-Or	T	45	53	61
Or-R	R			
R-Gr	DT			
Gr-R	DR			
R-Br	T	46	54	62
Br-R	R			
R-S	DT			
S-R	DR			
Bk-Bl	T	47	55	63
Bl-Bk	R			
Bk-Or	DT			
Or-Bk	DR			
Bk-Gr	T	48	56	64
Gr-Bk	R			
Bk-Br	DT			
Br-Bk	DR			
Bk-S	T	49	57	65
S-Bk	R			
Y-Bl	DT			
Bl-Y	DR			

NOTE:
The remaining portion of the split block is not used.

06.20 Door Phone/Monitor Stations Connections

06.21 The Door Phone Control Unit (HDCB) is connected to the MDF, via a standard EKT modular connector, at the HSTU #1 station block. At the MDF, cross-connect the HDCB wires with either EKT 13 or 14 (program

controlled). Use the standard EKT cross-connect scheme.

06.22 Each Door Phone/Monitor Station (MDFB) is connected to the HDCB via a 2-wire modular connector at the HDCB, and a split ring connector at the doorphone, using screw terminals 1 and 2 (L1 and L2 are not used).

06.23 When using Output B or C for door lock/alarm features, respectively, an appropriate modular connector must be used to interface the HDCB to the door lock/alarm devices.

06.24 Figure 16 shows the HDCB wiring arrangement.

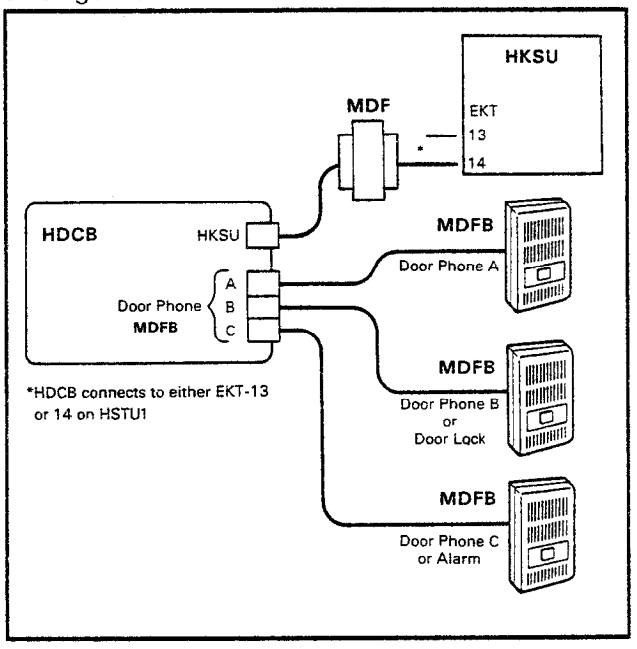

FIGURE 16 — HDCB CONNECTION

06.30 Intercom Code Assignment

06.31 Intercom codes are assigned permanently to specific HSTU cable appearances in ***Strata***. Make sure the station cables are connected to the proper terminals (refer to Table B).

06.40 CO Line Connection

06.41 The CO/PBX lines are introduced into the ***Strata*** system via 6-wire modular line cords (no longer than 25') connected directly to a jack on the HCOU PCB. Each modular cord contains three lines. The opposite end of each cord then terminates directly into an RJ-25C jack, which is then connected to up to three incoming CO/PBX lines (Figure 17).

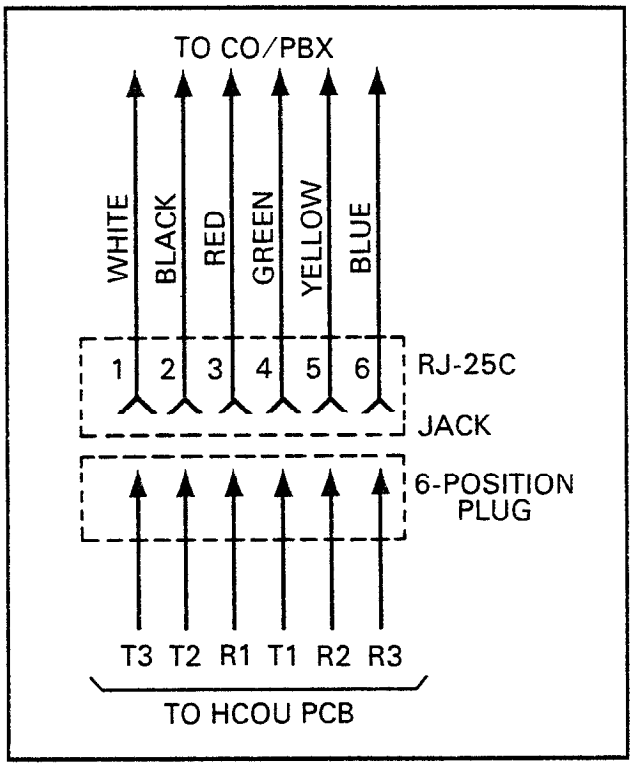

FIGURE 17

CO/PBX LINE (RJ-25C) WIRING

a) ***Strata XIIe & XXe***:
#1 HCOU serves CO lines 1 - 3
#2 HCOU serves CO lines 4 - 6
#3 HCOU serves CO lines 7 - 9
#4 HCOU serves CO lines 10 - 12

b) ***Strata XXe***:
#5 HCOU serves CO lines 13 - 15
#6 HCOU serves CO lines 16 - 18
#7 HCOU serves CO lines 19 - 21

06.42 The modular cords from the HCOU, HCBU and HINU PCBs are routed through the left side slot and out the bottom of the HKSU.

06.43 To install the modular cords, proceed as follows:

a) Loosen the four screws securing the HKSU left side cover, removing one.

b) Slide the cover slightly until the screws clear the keyholes, and remove it.

c) Plug each cord into the proper PCB, and secure it with the cable clamps located on the shelf immediately below each PCB.

d) Route the cords into the left side slot of the

HKSU and out through the bottom to the appropriate connector or MDF block.

06.50 DSS/BLF Connection

06.51 The DSS/BLF consoles are connected

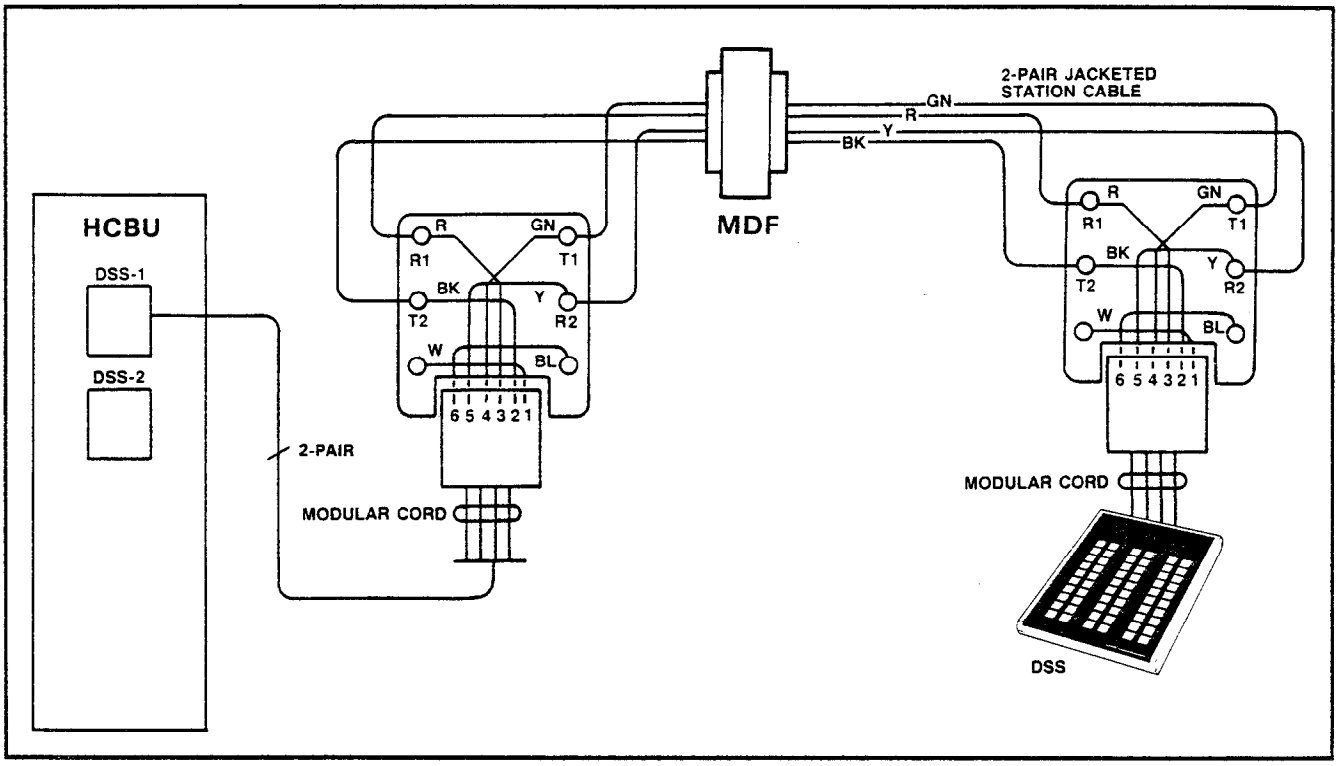

FIGURE 18 — DSS/BLF CONSOLE WIRING

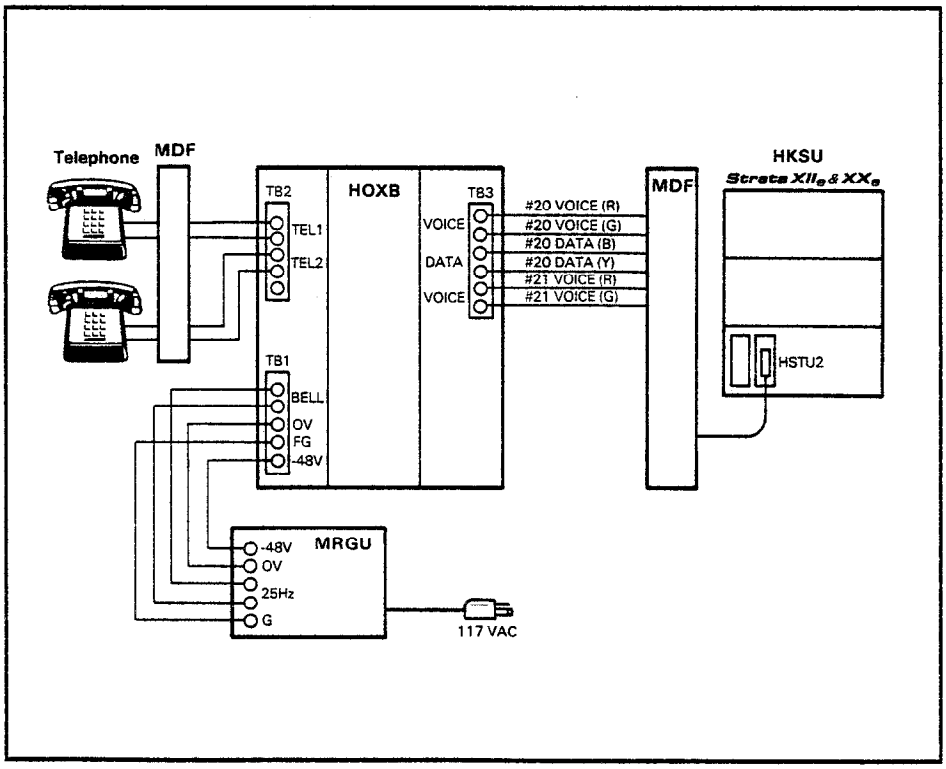

FIGURE 19 — HOXB WIRING

to jacks on the HCBU PCB via modular cords (Figure 18). A separate 4-wire cord is used for each console (the HCBU connectors are marked **DSS1** and **DSS2**).

- **DSS1** functions with station 10.
- **DSS2** functions with station 11.
- **DSS1** and **DSS2** (on second HCBU PCB) may be used with any station for BLF console operation.

06.52 Route modular cord out of the HKSU as in Paragraph **06.43**.

06.53 The cable used for DSS console wiring should be twisted pair.

06.54 Overall length

of the cable run must not exceed 500' (152.5 M).

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

06.60 Off-Premise Extension/Conventional Telephone Connections

06.61 Three types of wiring arrangements are necessary for off-premise extension/conventional, single-line telephone (OPX) connections: HOXB-to-HKSU, HOXB-to-MRGU and HOXB-to-conventional, single-line telephones. See Figure 19.

06.62 A maximum of two HOXBs are allowed in ***Strata XII$_e$***, while three HOXBs are allowed in ***Strata XX$_e$***. Figure 19 shows the connections for the first HOXB to stations 20 and 21. A second HOXB may be installed for stations 22 and 23. Also, a third HOXB may be installed in ***Strata XX$_e$*** only for stations 24 and 25. The second and third HOXBs are connected in the same manner illustrated in Figure 19.

1) HOXB-to-HKSU connections are made via single wires from the MDF station block to the HOXB terminal strip (TB3) voice and control data terminals. The first four wires are cross-connected with station 20 voice and data circuits. A station 21 voice-only connection is required if a second OPX circuit is desired.

2) HOXB-to-MRGU connections are made from the MRGU output terminal strip to the HOXB terminal strip (TB1).
   a) Connect 80 VAC, 25 Hz output on the MRGU to the "BELL" input on HOXB.
   b) Connect the -48 VDC and 0V battery terminals on both units, observing the correct polarity (see Figure 19).
   c) Connect "FG" on the HOXB to "G" on the MRGU.

IMPORTANT FCC INFORMATION:
The HOXB and MRGU are FCC registered with a facility interface code of OL13A. If an alternate DC supply/ring generator is to be used, contact your Toshiba supplier for details.

3) HOXB-to-conventional, single-line telephone connections are made from the telephone to the HOXB terminal strip (TB2) with industry-standard 2-, 4- or 6-wire cable. An RJ-11C jack for each OPX telephone is required at the HOXB. Run two single wires from the jack to the appropriate terminals on TB2.

NOTE:
The HOXB requires a negative DC voltage; therefore, the main HKSU power cannot be used (it is +24 volts).

06.70 Off-Premise Line Connection

06.71 When using the HOLB unit, the CO lines are connected to the CO1, CO2, CO3 connectors (J2, J3, and J4) on the HOLB unit (Figure 20). Then, a 6-wire cable from the CO1, 2, 3 OUT (J1) connector on the HOLB is connected to the J2 modular connector on an HPLU PCB (that has been installed in place of an HCOU). This HOLB/HPLU connection is required for each HOLB module installed. Connect the provided 8-wire modular cable from the OPL (J5) connector on the HOLB to the OPL Data (J6) connector on the HPLU PCB (see Figure 20). Connect the provided green ground wire between TB1 (FG) on the HOLB and the steel bar across the bottom of the HKSU.

06.72 The HPLU is also a fully functional CO line PCB that is similar in operation to the HCOU. The HPLU serves both the HOLB and HTIB external modules; for HOLB operations, switches **SW1 - SW5** must be set to the OPL positions (see Figure 21).

06.73 TEL1 (J6), TEL2 (J7) and TEL3 (J8) connectors on the HOLB connect to standard single-line telephones or other tip-and-ring devices that serve as off-premise lines (see Figure 20). The HUNT (J9) connector connects to a standard telephone, answering machine or other device to which OPL calls hunt (see **Program 0#9**, OPL Hunting).

06.80 Station Message Detail Recording Connections

06.81 If the system is to be equipped with Station Message Detail Recording (SMDR), an HSMB option module must be connected to the system (via two factory-provided 8-wire cables) from the HSMB's **CONT** and **PW** connectors. The HSMB is equipped with RS-232C connector to permit attachment of a printer or

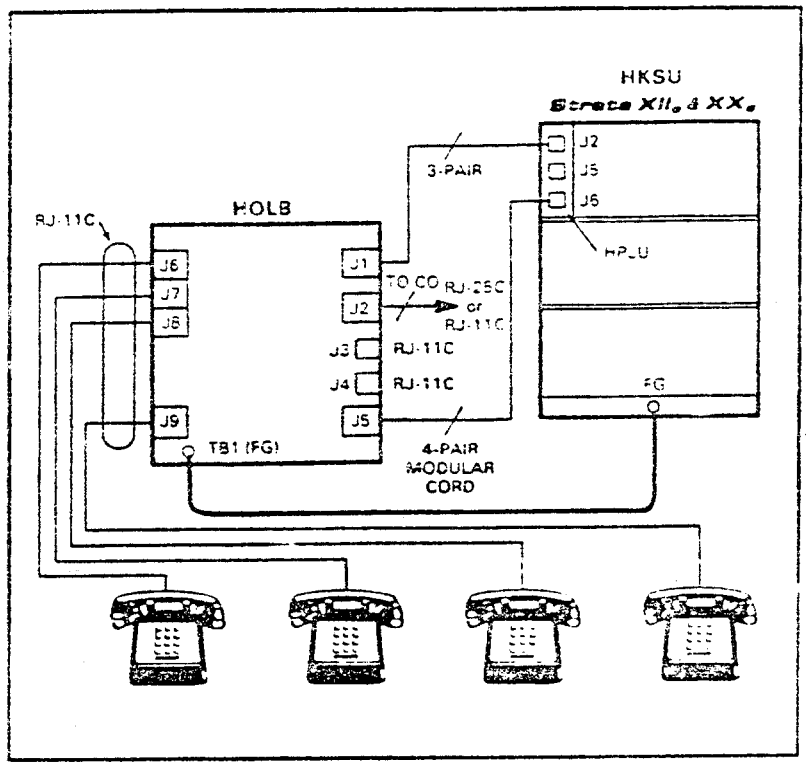

FIGURE 20 — HOLB CABLING

one stop bit. The pin assignments on the HSMB RS-232C connector are as follows:

Pin No.	Function
1	FG (frame ground)
3	RD (receive data)
6*	DSR (data set ready)
7	SG (signal ground)
8*	CD (carrier detect)
20**	DTR (data terminal ready)

**Held to EIA "ON" by HSMB.*
***Input to HSMB from printer.*

06.83 Figure 22 shows the detailed connections for the printers listed above.

06.84 Verify that the RS-232C output cable is connected to the PCB with the proper pin-out connections (as per Paragraph 06.40), the battery strap is ON, and the data speed and incoming/outgoing call options are selected per Paragraph 05.10

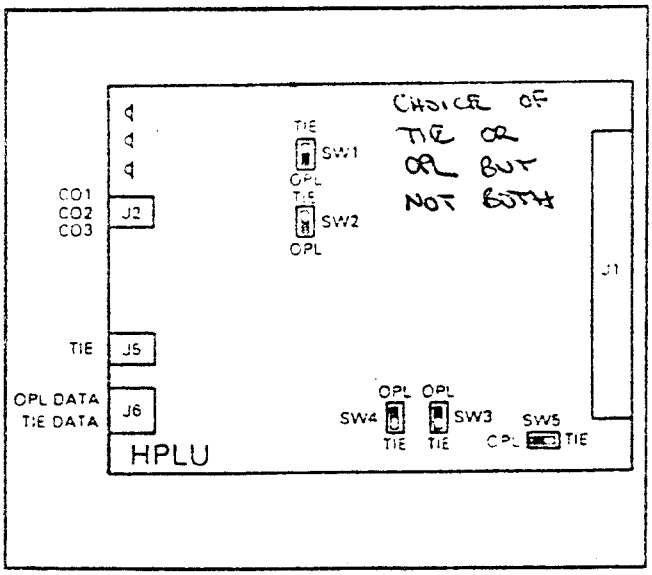

FIGURE 21—HPLU SWITCHES

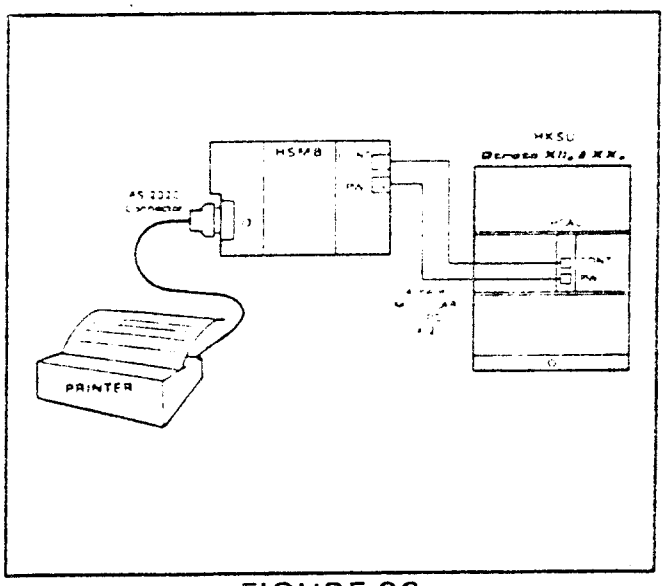

FIGURE 22
HSMB/PRINTER CABLING

other recording device. An 80-column printer with an EIA RS-232C interface operating at 300 or 1200 BPS is required. Printer types known to be compatible with this system are:

Texas Instruments Model 743/745
OKI Data Model 82A

06.82 Data output is in 7-bit ASCII code with one start bit, one parity bit (even parity) and

06.90 TIE Line Connections

06.91 The HTIB option module interfaces TIE lines to the ***Strata XII & XX*** HKSU. Each HTIB supports up to two TIE lines. (A maximum of four TIE lines or two HTIBs can be installed in a ***Strata XX***. ***Strata XII*** supports two TIE lines or one HTIB.) Switches

SW1 and SW2 must be set on the HTIB for TIE line signalling operation (refer to Figure 11). An HPLU PCB (installed in an HCOU PCB slot) is required for each HTIB. Each TIE line requires one dedicated CO line circuit on the HPLU. Each HTIB requires **two** dedicated station circuits on an HSTU PCB. Note that these are the same circuits required for OPX (HOXB) operation. The HTIB requires a connection to only the data circuit of the first dedicated station circuit. Each HTIB also requires connection to an MRGU to provide power for E & M line operation. Figure 23 shows all HTIB connections.

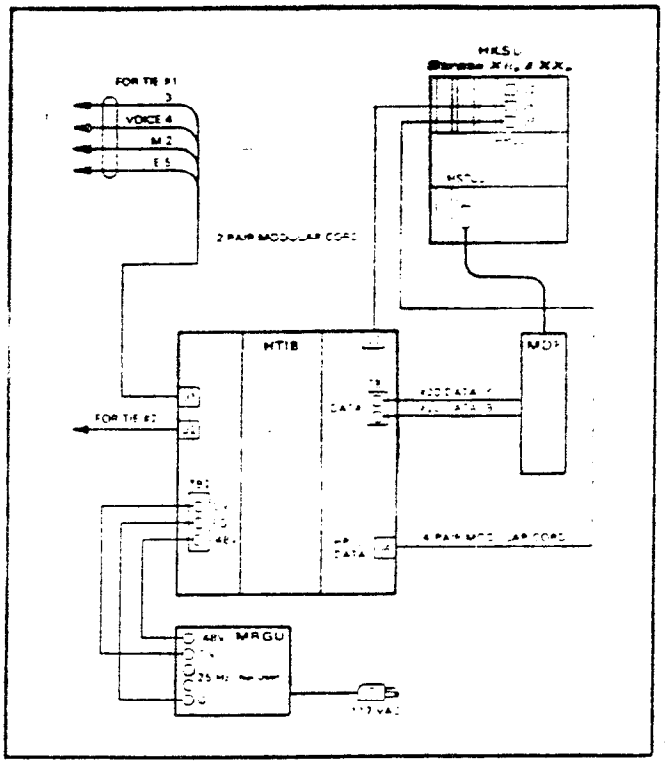

FIGURE 23 — HTIB CABLING

06.92 The HPLU is also a fully functional CO line PCB that is similar in operation to the HCOU. The first TIE line requires CO line circuit 1 on the HPLU and the second TIE line requires CO line circuit 2 (SW1 - SW5 to "TIE" — see Figure 21). CO line circuit 3 is always available to support incoming CO line operation. If only one TIE line is installed at the HTIB supported by the HPLU, CO line circuit 2 is also available for CO line operation (SW1, 3, 4 and 5 to "TIE", SW2 to "OPL" — see Figure 21). Incoming CO lines are connected to the CO1, CO2, CO3 (J2) connector on the HPLU by a 6-wire modular cable.

06.93 Connect the first TIE line to the TIE1 (J1) connector on the HTIB with a 4-wire modular cable. Connect the second TIE line to the TIE2 (J2) connector. Connect a 4-wire modular cable between the HPLU TIE (J3) connector on the HTIB to the TIE (J5) connector on the HPLU PCB. Connect an 8-wire modular cable between the HPLU DATA (J4) connector on the HTIB and the TIE DATA (J6) connector on the HPLU.

06.94 Station circuits 20 - 23 on HSTU #2 are used for TIE line and OPX operation. (They can also be used for EKT circuits if OPXs and TIE lines are not installed.) Connect single wires from terminal block TB1 on the HTIB to an RJ-25C jack. Connect a 2-wire cable between the jack and station block 2 on the MDF. Cross-connect the TIE line leads with the data leads of the first dedicated station circuit as shown in Figure 23.

06.95 Connect the MRGU (which should be mounted directly below or to the left of the HTIB) to terminal block TB2 on the HTIB. Connect -48V to -48V, 0V to 0V, and FG to G observing the correct polarity (see Figure 23).

NOTE:
Jumper W1 on the HTIB straps FG to 0V.

07 EKT INFORMATION

07.00 General

07.01 Six different Electronic Key Telephones (EKTs) may be used in either system.

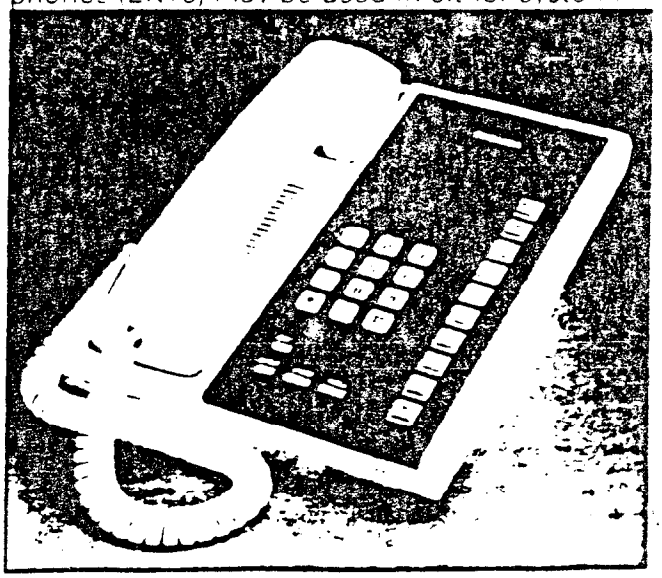

FIGURE 24 — 10-key EKT

- 10-key EKT (Figure 24), available as speakerphone or handsfree answerback (HFU) on intercom calls only.
- 10-key BLF EKT (Figure 25), available as speakerphone only, with a Busy Lamp Field showing the busy/idle status of stations 10 - 25 only.

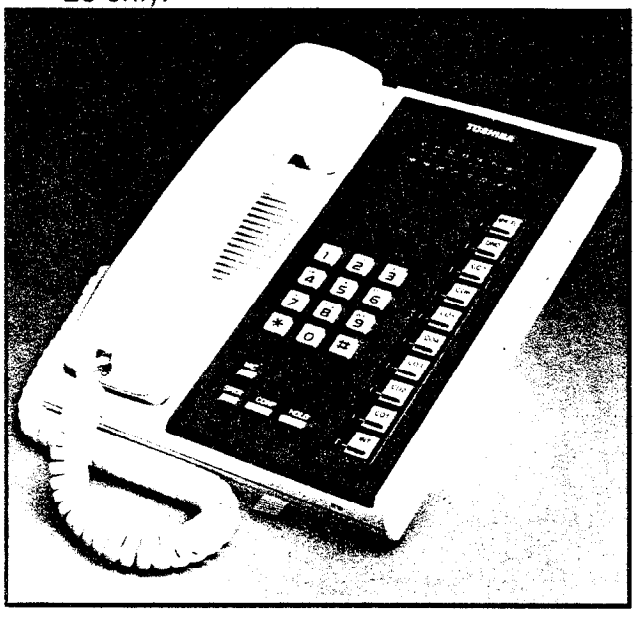

FIGURE 25 — 10-key BLF EKT

- 20-key EKT (Figure 26), available as speakerphone or HFU.

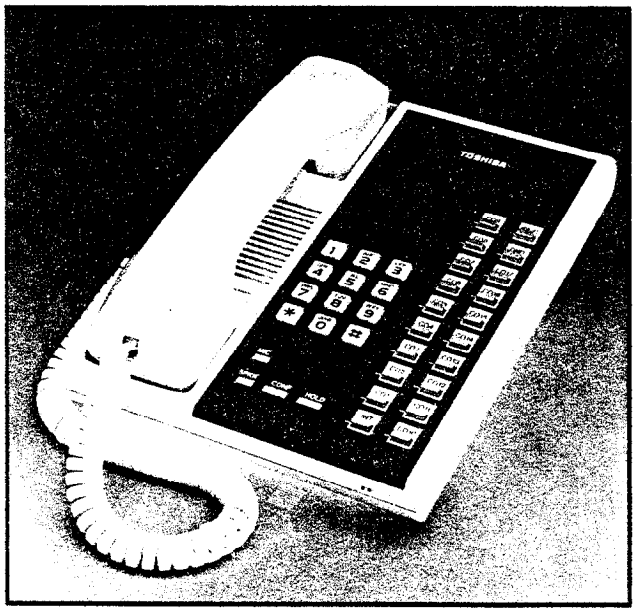

FIGURE 26 — 20-key EKT

- 20-key LCD EKT (Figure 27), available as speakerphone only with a 32-character alphanumeric Liquid Crystal Display.

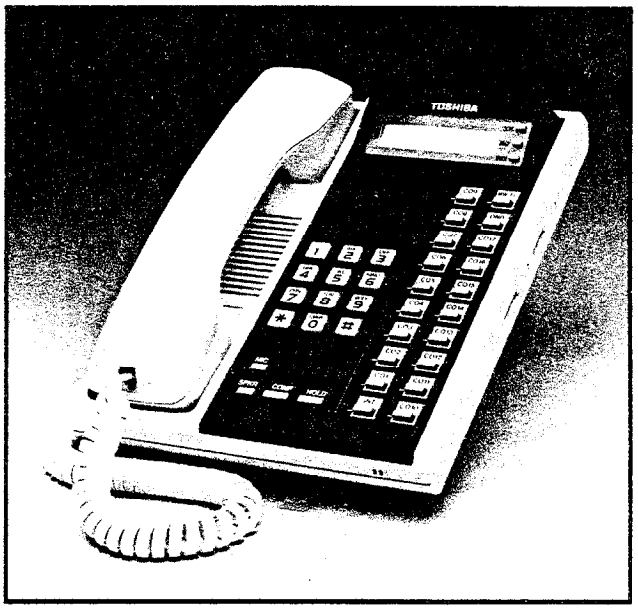

FIGURE 27 — 20-key LCD EKT

NOTE:
If more EKT information is required, see General Description, *Section* **300-020-100.**

07.02 All EKTs share the same dimensions:

Height: 3.87" (98.5 mm)
Width: 7.0" (178 mm)
Depth: 9.0" (229 mm)

07.03 All EKTs feature modular handset cords and are connected to the system via 4-conductor modular line cords. In addition, each EKT model (with the BLF limitation already noted) may be used at any or all stations.

07.10 EKT Wall Mounting

07.11 All 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's weight and the additional stresses to which the mounting will be subjected.

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

07.13 Locking tabs secure the EKT's base.

The direction in which the base is attached to the EKT determines whether it is 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 28), and then rotate the base 180° and insert it into the lower four locking slots.

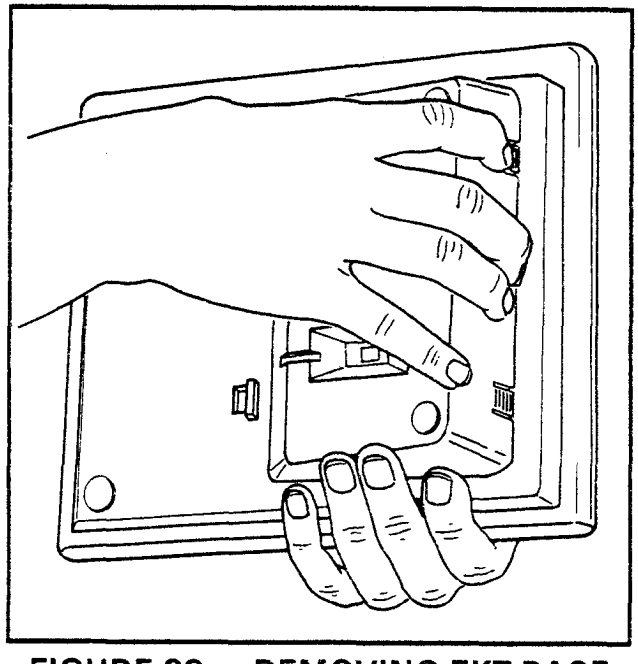

FIGURE 28 — REMOVING EKT BASE

07.14 Refer to Figure 29, choose which of the knockouts are appropriate for the tail cord route, and then cut them out.

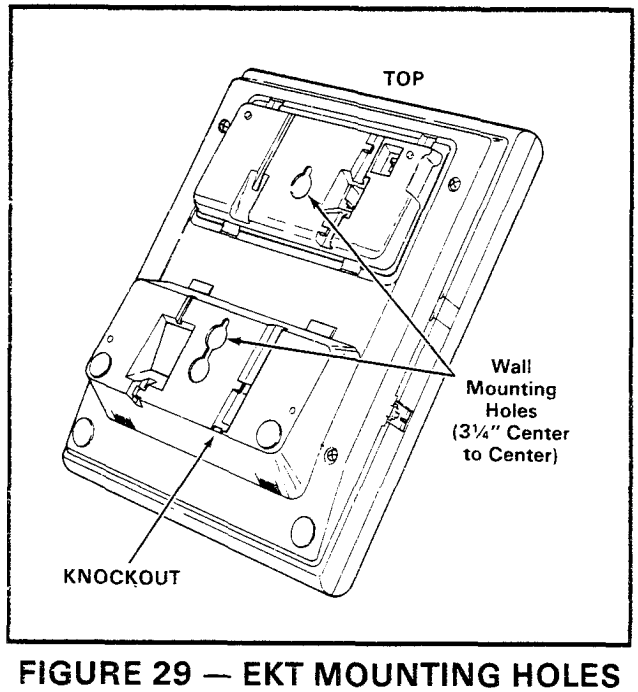

FIGURE 29 — EKT MOUNTING HOLES

07.15 Secure the unit to the desired wall site. (Use dimensions shown in Figure 29 to position the unit.)

07.16 Route the tail cord through the holes in the base and secure the EKT (Figure 30).

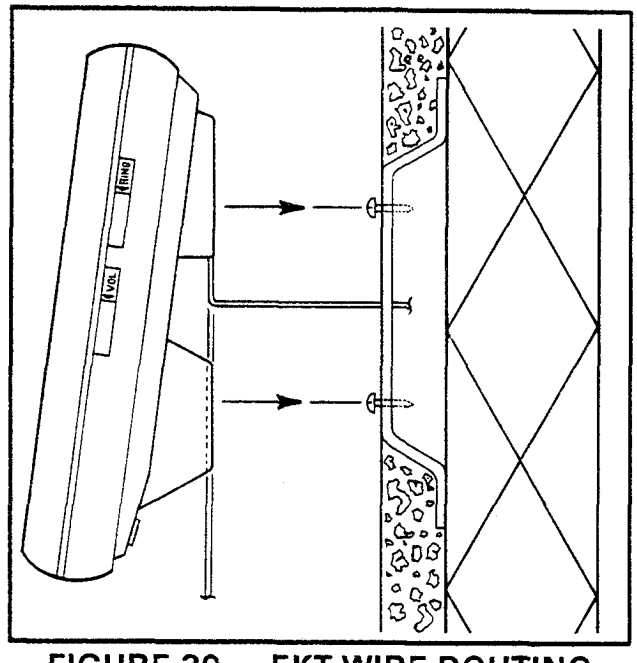

FIGURE 30 — EKT WIRE ROUTING

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

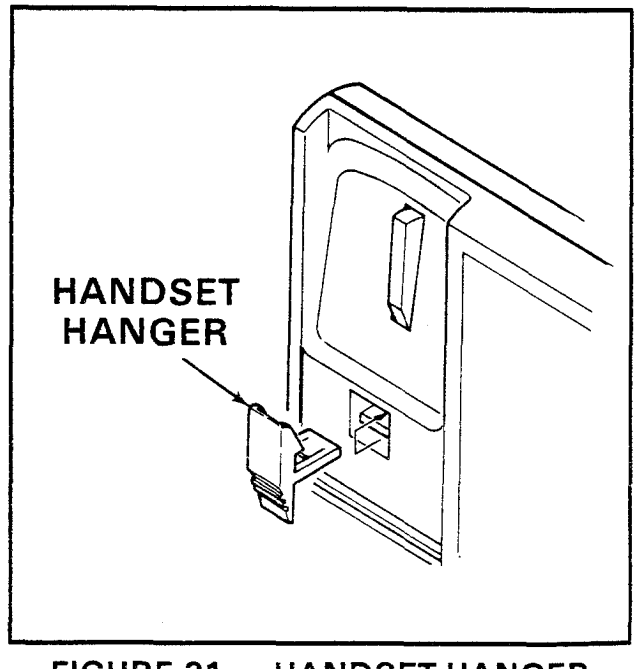

FIGURE 31 — HANDSET HANGER

07.18 Remove the handset hanger and insert it in the upper hole as shown in Figure 31 (the hanger fits in the notch in the handset).

07.20 EKT Connections

07.21 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 **09**.

08 SYSTEM POWER-UP INITIALIZE

08.00 General

08.01 ***Strata*** 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 or whenever the HCAU PCB is changed. This allows the system to be tested and any faults to be corrected before time is spent on programming.

NOTE:
Do not initialize if using a preprogrammed, battery-protected CAAU.

08.02 As shown in Figure 32, verify that the battery on the CAAU is connected to ensure that data changes entered after initialization will not be lost due to power failure.

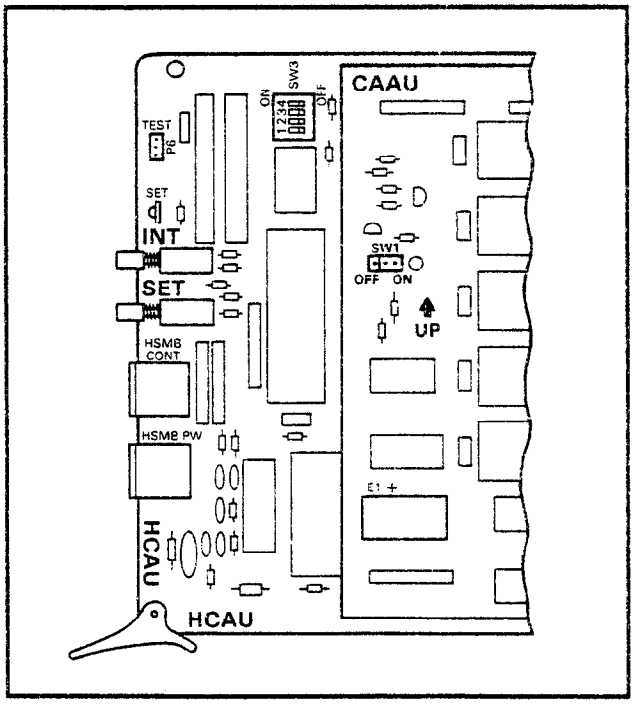

FIGURE 32 — CAAU SWITCHES

NOTE:
The SET LED cannot function if the CAAU battery is not connected.

08.03 To initialize the system data memory, refer to Figure 32 and perform the following:

1) Place the system power switch in the **ON** position.

2) Depress the **INT** switch on the HCAU, and hold it in.

3) Depress the **SET** switch and allow it to lock.
- SET LED goes on.
- Station 17: All LEDs except **SPKR** and **MIC** flash continuously.

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

5) Release the **INT** switch.

6) Cycle the power switch **OFF** (the HPSU +5V and power LEDs must go out) and **ON**.

08.10 Clearing Automatic Dialing

08.11 The Automatic Dialing memory contains random numbers when the system is powered up initially. The memory, therefore, must be cleared to prevent meaningless numbers from being dialed.

IMPORTANT!
Station 17 may be equipped with either a 10-key or a 20-key EKT. Prior to performing the procedure that follows, refer to Paragraph 02.30, Programming Procedures, Section 300-020-300, for instructions on using a 10-key EKT for programming.

08.12 To clear the Automatic Dialing (-System and -Station) memory (up to 40 numbers), proceed as follows:

1) Lock in the **SET** switch on the HCAU.
- Station 17: MW/FL LED lights steadily.

2) Depress the **SPKR** key on station 17.
- SPKR LED lights steadily.

3) Dial **# # #** on the dial pad.
- SPKR LED flashes continuously.

4) DIAL 3 DEPRESS CO3,CO7,CO11,CO15 TO CLEAR SYSTEM SPEED DIAL

5) DIAL 1 DEPRESS CO1,CO5,CO9,CO13 TO CLEAR STATION SPEED DIAL

6) INITIALIZE MSG (5 PREPROGRAMMED) BY DOING THE FOLLOWING AT STATION 17 WITH SET SWITCH IN: #*4 INT,CO5,CO8,CO12,HOLD,

respectively.
- The corresponding LEDs light.

5) Depress the **HOLD** key.
- All station 17 LEDs (except MW/FL) go off.

6) Release the **SET** switch on the HCAU:
- The SET LED and MW/FL LED on station 17 go off.

08.20 SMDR Real-Time Clock Adjustment

08.21 One of the functions of the HSMB is to provide a calendar and clock for showing time, date and duration of recorded calls. This clock and calendar must be set when the system is first placed into service.

08.22 The HSMB is equipped with a battery to protect the clock and calendar settings in event of a power failure. Ensure that the HSMB battery strap is in the **ON** position.

08.23 The HSMB automatically adjusts for 30- and 28-day months and leap year.

08.24 The HSMB is equipped with three switches and two LED displays (Figure 32). Looking from top to bottom; the functions of the switches are as follows:

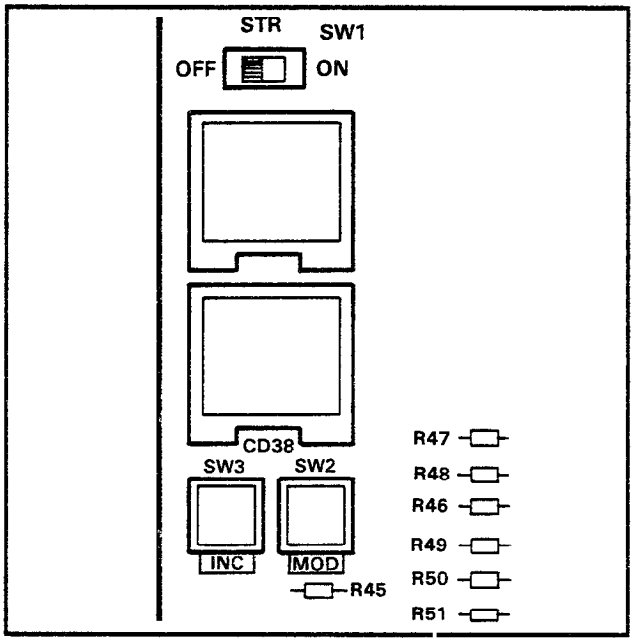

FIGURE 33 — HSMB SWITCHES

STR: Writes data into memory once it is properly displayed.

MOD: Selects items to be adjusted. Multiple depressions of the **MOD** switch cause item numbers to be displayed sequentially by LED #1. The possible displays are:

Off
1 = year
2 = month
3 = day
4 = hour
5 = minute
6 = start

INC: Selects the data (hour, minute, day, etc.) for the item number selected by the **MOD** switch and displayed by LED #1. LED #2 displays data selected by the **INC** switch.
- Depressing the **INC** switch once increments data by 1.
- Depressing and holding the **INC** switch causes data to increase continuously until the **INC** switch is released.

08.25 To set clock and calendar:

1) Verify that the battery strap is connected on the HSMB (see Figure 9).

2) Depress the **MOD** switch once.
- LED #1 displays 1 (year).
- LED #2 displays current data.

3) Use the **INC** switch to correct data in LED #2 display.

4) Depress the **MOD** switch once.
- LED #1 displays 2 (month).
- LED #2 displays current data.

5) Use the **INC** switch to correct data in LED #2 display.

6) Depress the **MOD** switch once.
- LED #1 displays 3 (day).
- LED #2 displays current data.

7) Use the **INC** switch to correct data in LED #2 display.

8) Depress the **MOD** switch once.
- LED #1 displays 4 (hour).
- LED #2 displays current data.

9) Use the **INC** switch to correct data in LED #2 display.

10) Depress the **MOD** switch once.
- LED #1 displays 5 (minute).
- LED #2 displays current data.

11) Use the **INC** switch to correct data in LED #2 display.

12) Depress the **MOD** switch once.
- LED #1 displays 6 (start).
- LED #2 has no display.

13) Slide the **STR** switch to **ON** and then back to **OFF**.
- LEDs go off.
- Data is transferred to working memory and time keeping starts.

NOTE:
If LED #1 is changed to OFF before **STR** *is operated, existing data will not be changed regardless of adjustments made in previous steps.*

08.30 Program Listing

08.31 The HSMB has the capability to retrieve current customer data from memory and output it to the SMDR printer.

08.32 See Section **300-020-300**, *Programming Procedures*, for printout method and format.

09 SYSTEM TEST PROCEDURES

09.00 EKT Functional Check

09.01 In order to verify basic system functions, and confirm the proper functioning of the EKT itself, perform the following test procedures at each station. Begin with the lowest numbered station, and continue through all stations.

09.02 With handset on-hook:

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

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

c) Depress the CO1 key.
- CO1 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 stops.

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

f) Continue to depress each CO key in order on every EKT; the following should occur:
- CO 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 cannot be heard but the LED is still functional.*

g) When CO testing is complete on each EKT, continue the EKT test by depressing the SPKR key.
- SPKR & MIC LEDs: off.
- EKT speaker off.

h) Depress the DND key.
- DND LED: on.

i) Depress the DND key.
- DND LED: off.

j) Depress the CO1 key.
- CO1 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

k) Depress the HOLD key.
- CO1 LED: I-hold flash.
- Speaker off (no dial tone).
- SPKR & MIC LEDs: off.

l) Depress the CO1 key.
- CO1 LED: I-use flash.
- SPKR & MIC LEDs: on steady.
- Listen for CO/PBX dial tone via the EKT speaker.

m) Depress the CONF key.
- CO1 LED: Conference call flash rate.
- Dial tone continues.

n) Depress the CO1 and SPKR keys.
- CO1 LED: off.
- SPKR & MIC LEDs: off.
- Dial tone: off.

o) Call the EKT that is being tested from another station.

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

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

q) Adjust tone signalling volume with volume control on the right side of the EKT being tested.

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

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

t) Call another station and talk into the handset transmitter.
- Verify that your voice can be heard via the called EKT's speaker.

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

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

w) Depress the MIC key while tapping the microphone and verify that the sound cannot be heard via called the EKT's speaker.
- MIC LED: off while MIC key is depressed.

x) Depress the SPKR key.
- INT LED: off.
- SPKR & MIC LEDs: off.

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

09.10 Off-Premise Extension/Conventional Telephone Functional Check

09.11 Perform the following test procedures at each Off-Premise Extension/Conventional Telephone (OPX) location:

a) Lift the OPX handset and listen for intercom dial tone.

b) Dial the number of another station.
- Dial tone stops when the first digit is dialed.
- Ringing or voice paging can be heard at the called station.

c) Lift the handset at the called station.
- Ringing stops.

d) Verify that a 2-way voice connection exists between the OPX and the called station.

e) Go on-hook at both stations.

f) Lift the OPX handset and listen for intercom dial tone.

g) Dial 9.
- An idle line, from the group defined by **Program 09**, is seized.
- Listen for CO dial tone.

h) Dial a test call.
- Verify that a 2-way voice connection is established.

i) Flash the hookswitch on the OPX and listen for intercom dial tone.

j) Dial the number of another station.
- Dial tone stops when the first digit is dialed.
- Ringing or voice page can be heard at the called station.

k) Lift the handset at the called station.
- Ringing stops.

l) Verify that a 2-way voice connection exists between the OPX and the called station.

m) Flash the hookswitch on the OPX.

n) Verify that a 3-way conference is established.

o) Go on-hook at the OPX.

p) Verify that the CO line and called station are connected.

q) Go on-hook at the called station.

09.20 OPL Circuit Functional Check

09.21 Perform the following test procedures on each OPL/CO line pair:

a) Lift the OPL telephone handset and listen for CO dial tone.

b) Verify that the corresponding CO line LED lights on the system EKTs.

c) Dial a test call from the OPL telephone.
- Verify that a 2-way voice connection is established.

d) Depress the corresponding line key on an EKT.
- Verify that the privacy feature prevents access.

e) Go on-hook at OPL telephone.

f) Depress the OPL CO line key on an EKT and listen for CO dial tone.

g) Dial a test call from the EKT.
- Verify that a 2-way voice connection is established.

h) Lift the OPL telephone handset.
- Verify that a 3-way voice connection is established.

i) Go on-hook at both stations.

j) Make an incoming call to the OPL CO line.
- Ringing can be heard at the OPL telephone.*
- Appropriate EKT(s) ring.
- Appropriate EKT LED(s) flash.

**NOTE:*
If OPL hunting is programmed for the line being tested, the call always rings OPL station #1 if it is idle.

k) Lift the OPL telephone handset to answer the call.
- EKT LED(s) light steadily.
- Verify that a 2-way voice connection is established.

l) Depress OPL **CO** key on an EKT.
- Verify that the privacy feature prevents access.

m) Go on-hook at the OPL telephone.

n) Make another incoming call to the OPL CO line.

o) Answer the call using an EKT.
- Verify that a 2-way voice connection is established.

p) Lift the OPL telephone handset.
- Verify that a 3-way voice connection is established.

q) Go on-hook at both stations.

09.30 SMDR Functional Check

09.31 Perform the following test to verify the proper functioning of the SMDR feature:

a) Connect printer to the HSMB.

b) Set data speed and select type of calls to be recorded per Paragraph **05.14**.

c) Make an outgoing call from any EKT.

d) Enter an account code as follows:
- Dial the access code (*** 5 0**).
- Dial the account code (6 digits).

e) Hang up after the call has been active for at least 10 seconds (calls of less than 10 seconds duration are not recorded).
- The call record is output to the printer in the format shown in Figure 34.

f) Take the printer "off-line" (DTR signal "off").

g) Make an outgoing call.

h) Hang up after the call has been active for at least 10 seconds.
- Call record is not output.

```
MM/DD/YY

 01   10   HH:MM   00:30;51          7305000
02   14   HH:MM   00:02;39          8531212   123456789012345
04   18   HH:MM   00:01;37       12135551212   765432101234567
03   15   HH:MM   00:04;51       18002436161
07   19   HH:MM   00:02;25          2731750
```

FIGURE 34 — SMDR PRINTOUT EXAMPLE (Outgoing Call)

```
MM/DD/YY

 01    10    HH:MM    00:01;13    00;02
02    14    HH:MM    00:02;30    00;04
03    11    HH:MM    00:03;36    00;10          765432101234567
```

FIGURE 35 — SMDR PRINTOUT EXAMPLE (Incoming Call)

i) Put the printer "on-line" (DTR signal "on").
- Call record is output.

j) Make an incoming call to the system and delay answering it for several rings.

k) Answer the call.

l) Enter an account code as in step d.

m) Hang up.
- Call record is output to the printer in the format shown in Figure 35.

09.40 Feature Check

09.41 Verify that all system features function properly per Section **300-020-400**, *Operating Procedures*.

10 MISCELLANEOUS EQUIPMENT CONNECTIONS

10.00 Wiring Connections

10.01 All connections to miscellaneous equipment, except Amplified Conference (see Paragraph **10.90**), are made via the terminal strip mounted on the HINU PCB (TB1 as shown in Figure 36).

10.10 MOH/BGM Source

10.11 Music-on- Hold requires either the SMOU PCB, which generates electronic melodies, or a customer-provided external music source, such as an FM radio. If the SMOU is used, it must be mounted on the HINU PCB at **P1** connector and the **SW1** switch on the HINU must be set to "MOU" (as shown in Figure 36).

10.12 If an external music source is used for Music-on-Hold, its output leads must be connected to the MOH terminals on the HINU PCB and **SW1** must be set to "MOH".

10.13 Adjust the MOH volume with the

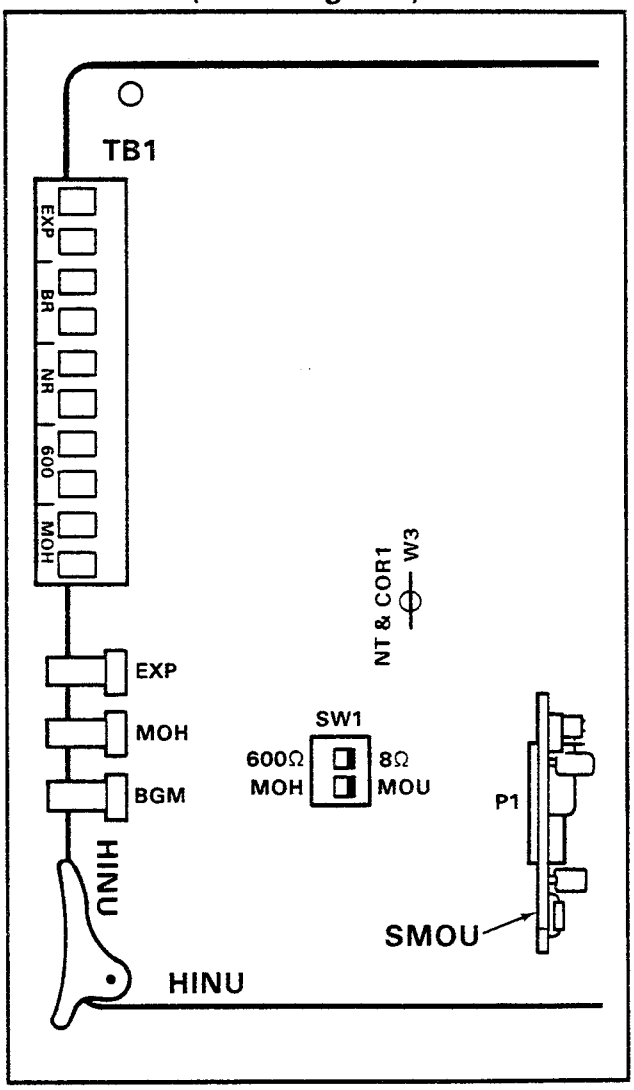

FIGURE 36 — HINU PCB

MOH volume control on the HINU. Maximum volume is limited by internal circuits in order to comply with FCC regulations. See Paragraph **10.70** for the correct volume setting sequence.

10.14 Background music is provided via the same source as music-on-hold. Either the

SMOU or an external source may be used (see Paragraph **10.10**).

10.20 External Paging Connections

10.21 ***Strata*** provides access to an external paging speaker. This speaker can also be used for background music if programmed. The connection is made via the EXP or 600 terminals on the HINU, and can be used in one of three ways:

a) To operate a customer-provided speaker directly via an internal 3-watt amplifier located on the HINU PCB (EXP terminal).

b) If more than 3 watts are required, an external customer-provided amplifier can be connected to operate the external speaker (600 terminal).

c) If talkback capability is required, a customer-provided talkback amplifier/speaker can be connected (600 terminal).

10.30 Direct External Speaker Connection

10.31 The exact number of speakers that may be connected to the 8-ohm, 3-watt output is dependent on the type of speaker used, conductor resistance, and desired volume.

10.32 The 8-ohm output impedance must be selected with the **SW1** switch on the HINU (Figure 36). The switch must be on the side labeled 8 Ω whenever the EXP terminal is used.

10.33 Connect the external speaker to the EXP terminal on the HINU.

10.34 Adjust the speaker volume with the **EXP** volume control on the HINU according to Paragraph **10.70.**

10.40 External Amplifier Connection

10.41 If more than 3 watts of power is required, a customer-provided external amplifier may be connected to the 600 terminal on the HINU (connect external speakers to the external amplifier).

10.42 The 600-ohm output impedance must be selected with the **SW1** switch on the HINU (Figure 36). The switch must be on the side labeled 600 Ω whenever the 600 terminal is used.

10.43 The level is fixed and input must be controlled by the external amplifier. The HINU amplifier is not used for the 600-ohm mode. See Paragraph **10.70** for the correct volume setting sequence.

10.50 Talkback Amplifier

10.51 A customer-provided talkback amplifier/speaker may be connected to the 600 terminal on the HINU.

10.52 For talkback operation, use the same procedure as External Amplifier Connection, Paragraph **10.40**.

10.60 Background Music

10.61 Background music (BGM) can be provided in two ways through the ***Strata*** system:

a) Internal to the system using the MOH source (SMOU or external music source).

b) External to the system when an external amplifier is used on the External Page feature.

10.62 Internal BGM uses the music-on-hold program source that is selected by **SW1** ("MOH" or "MOU") on the HINU. It is broadcast through all EKT speakers (under the individual control of each station user) and can be heard if the **SPKR** key is operated with the handset on-hook and no line selected.

10.63 As a programmable option, BGM from the MOH source can be heard via the external speaker (see Section **300-020-300**, *Programming Procedures*).

10.64 BGM is automatically pre-empted when a page or ringing signal must be output from an EKT speaker or the external paging connections.

10.65 Overall system BGM volume is set with the **BGM** volume control on the HINU (see Paragraph **10.70** for the correct volume setting sequence). The volume at individual stations is set with volume control on the right-hand side of the EKTs.

10.66 If BGM is connected via an external amplifier on the external page, it can be heard from the external speaker only. ***Strata***, if required, can provide a dry contact control signal for muting the external BGM when a page

is in progress.

10.67 To provide external BGM control, connect the BR terminals on the HINU to the control terminals (mute, mike switch, etc.) on the amplifier (see Figure 37).

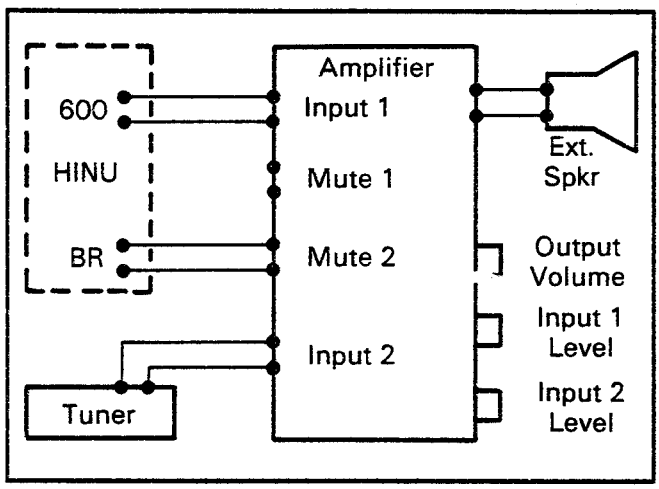

FIGURE 37

EXTERNAL AMPLIFIER HOOK-UP

10.70 Volume Setting Sequence

10.71 Refer to Figure 36 and adjust the volume for MOH, BGM and External Page in the sequence outlined in Paragraph **10.72**.

10.72 Adjust the MOH level first using the following procedures:

1) Set the **MOH** volume control to its lowest level (counterclockwise).

2) Lift the handset on one station and call another station using two CO/PBX lines.

3) At the called station, put the incoming call on hold, and listen on the handset (not the speaker) of the calling EKT.

4) Using the volume control on the MOH source, adjust MOH to the most comfortable level without distortion.

5) If a higher level is needed than can be provided by the MOH source, turn the **MOH** volume control slowly clockwise to achieve the most comfortable level without distortion.

6) Release the connection between the two CO lines.

7) No further changes should be made using the **MOH** control or the MOH source volume control.

10.73 If an external speaker is to be used in the system, adjust the external page and BGM levels as follows:

1) Adjustments should be made while an actual external page test is in progress. Adjust the voice volume to a comfortable level. The procedure varies depending on the paging system configuration and the setting of the 8/600-ohm switch (**SW1**):

a) 8 ohms with no external amplifier — adjust output level using the **EXP** volume control on the HINU.

b) 8 ohms with external amplifier — adjust output level using the **EXP** volume control along with the controls on the external amplifier.

c) 600 ohms — the volume level through ***Strata*** is fixed in this mode; adjustments must be made using the external amplifier controls.

2) If background music is to be heard over the external speaker:

a) Adjust voice page level per above procedure.

b) With music playing over the speaker, adjust the volume to a comfortable level using only the **BGM** control on the HINU. Do not tamper with the **EXP** control, external amplifier adjustments or MOH adjustments.

c) If background music is connected directly to the external amplifier instead of through the system, all adjustments must be made on the external amplifier.

10.74 If no external speaker is to be used in the system, adjust the BGM level as follows:

1) Using an EKT in speakerphone mode, make a call on a CO line, and adjust the EKT speaker volume to a comfortable level.

NOTE:
This should be done in an area that has background noise that is about average for that particular installation.

2) Using the **SPKR** key, disconnect the CO call and activate BGM at the EKT.

3) Using only the **BGM** volume control, adjust the BGM to a comfortable level. Do not use the EKT volume control.

10.80 Night Relay Service

10.81 As an option, ***Strata*** can provide a dry contact for the purpose of controlling an external loud ringing bell (or similar device) or an answering machine when the system is in the "NITE" mode.

10.82 To provide this service, connect the external device to the **NR** contacts on the HINU (refer to Figure 36).

IMPORTANT!

The NR and BR relay contacts are rated at 24 VDC/1 amp and are not intended to operate high power devices directly. If the power required for the device being controlled exceeds the contact ratings, an external slave relay must be used.

10.83 The **W3** (refer to Figure 36) strap option on the HINU allows the NR relay to function in one of two modes:

a) Answering Machine Control — if the **W3** strap remains intact, the relay is operated continuously when the system is in night service. This mode is intended for indirect control of an answering machine.

b) Night Bell Control — if the **W3** strap is cut, the relay pulses at a 1-second on, 3-second off rate when the system is in night service and an incoming call is ringing the system. This mode is intended to be used for indirect control of an external night bell.

10.90 Amplified Conference

10.91 A single Amplified Conference feature may be installed in the system, which requires a customer-supplied two-way amplifier. The Lorain VFR 5050 (R-TEC Systems) is known to be compatible.

10.92 Refer to the amplifier's installation procedures from the manufacturer and connect the amplifier between the voice leads (T and R) of stations 18 and 19. Ensure that these stations have been programmed for amplified conference (**Program 02**).

10.93 The amplifier is automatically connected once the conference is established. Amplification exists between any two outside CO lines used as well as between the second CO line selected and the station (no amplification between the first CO line and the station). If Trunk-to-Trunk connections are allowed in the system (**Program 02**), the CO line-to-CO line connection will be amplified. There is one Amplified Conference available that is established on a first-come/first-served basis only.

Strata XII_e & XX_e

PROGRAMMING PROCEDURES

Strata XII$_e$ & XX$_e$

PROGRAMMING PROCEDURES

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Strata XII$_e$ & XX$_e$

PROGRAMMING PROCEDURES

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01 INTRODUCTION

01.01 The data governing overall system operation and feature execution for ***Strata XIIe & XXe*** systems are 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, are stored in random-access memory (RAM) and can easily be changed according to individual installation requirements.

01.02 All ***Strata*** 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), which may be equipped with either a 10-key or a 20-key EKT (although a 20-key LCD EKT is strongly recommended). 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 system may still be used in the usual fashion.

01.04 Internal battery power is provided to prevent loss of system data memory in the event of a power failure.

NOTE:
Whenever a system is installed for the first time or the HCAU is changed, the system must be initialized. See Paragraph **02.80**.

02 PROGRAMMING PROCEDURES

02.00 General

02.01 The ***Strata*** system must be 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.

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

IMPORTANT!
Station 17 may be equipped with either a 10- or 20-key EKT (a 20-key LCD EKT is strongly recommended). However, in all tables and procedures that follow, a single 20-key designation is given.

- In the majority of programs (Type 1), the various keys are used to change "bits" of system data. The LEDs associated with the keys show the status of that "bit" before and after key depression. Each key/LED has 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 and selected CO LEDs, verifies the entered data by displaying it in binary format. An LCD EKT also displays the data, if equipped.

02.03 The programming mode is activated by locking in the **SET** switch on the HCAU 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 responds as follows:

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

Type 2 program: CO10 LED on station 17 flashes continuously. Actual data can be reviewed without alteration by multiple depressions 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 program: 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 program: Data is entered via the dial pad. The LEDs display the data in binary format. An LCD EKT also displays the data.

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 in one of two ways:

1) If the system is not in service, release the **SET** switch on the HCAU, and cycle (rock) the system power switch **OFF** (HPSU +5V and power LEDs must go off) and **ON** to transfer all data into the main data memory. Note: all calls are dropped when this occurs.

2) If the system is in service and no calls should be dropped, depress the following keys, in the order given here, on station 17: SPKR # * 9 INT CO1 CO4 CO5 CO8 CO9 CO12 CO13 HOLD. This code secures the data in working memory without cancelling any calls. Release the **SET** switch.

02.10 Programming CO18 - 21

02.11 Some Type 1 programs use the CO key/LEDs to represent themselves. The EKT at station 17 has a maximum of 17 CO line keys in a ***Strata XXe*** system. In order to program CO18 - 21, it is necessary to dial * after the first digit of the program number. CO key/LEDs 1 - 4 will then function as CO18 - 21. For example:

For **Program 04:** Dial 0 * 4
For **Program 7XX:** Dial 7 * X X

02.20 Multiple Station Programming

02.21 **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 or groups of stations simultaneously.

02.22 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 - 17
0 2: Stations 18 - 25
0 3: Stations 26 - 33
0 4: Stations 34 - 41
0 5: Stations 42 - 49
0 6: Stations 50 - 57
0 7: Stations 58 - 65

02.23 When the multiple station group code is entered, the LEDs display existing data as follows:

Steady LED: Data is the same for all stations in the dialed group.

Flashing LED: Data is selected for at least one, but not all stations in that group.

02.24 The state of an LED is altered by depressing its associated key. LEDs that are flashing can be cycled through three states (flashing, on, off) by multiple key depressions. Other LEDs cycle between on and off states only. Select data as follows:

LED ON: Selects LED "ON" for all the stations in the group.

LED OFF: Selects LED "OFF" for all the stations in the group.

LED flash: No change to any station in the group.

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

02.30 Using 10-key EKT for Programming

02.31 If station 17 is equipped with a 10-key EKT, the system must be so informed by setting the CO7 LED to "ON" in **Program 01**. This change is effective immediately upon depressing the HOLD key, making it easy to switch between EKTs.

02.32 Once the system recognizes a 10-key EKT, the handset hookswitch is used as a shift signal to make the 10-key LEDs compatible with the 20-key programming format.

02.33 As shown in Figure 1, when in the programming mode, the key/LEDs represent INT, CO1 - CO9 when the handset is on-hook and CO10 - CO17, DND and MW/FL when the handset is off-hook. It is possible to switch back and forth an unlimited number of times without disturbing the data.

Programming Mode

Normal Mode	Handset On-hook	Handset Off-hook
MW/FL	CO9	MW/FL
DND	CO8	DND
CO7	CO7	CO17
CO6	CO6	CO16
CO5	CO5	CO15
CO4	CO4	CO14
CO3	CO3	CO13
CO2	CO2	CO12
CO1	CO1	CO11
INT	INT	CO10

FIGURE 1 — 10-key EKT KEY FORMAT

NOTE:
This procedure is for programming purposes only! For normal operation, the station 17 EKT must be set using **Program 4XX.**

02.40 Preparation

02.41 Before ***Strata*** system data can be programmed, option selections must be made and then indicated on the System Record Sheet (see Appendix 1). The record sheet, one of which accompanies each HKSU, serves as a programming guide and installation record.

02.42 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 (Basic)
- **02:** System Assignments (Options)
- **0#2:** Account Code Digit Length and TIE Line/OPX Selection
- **03:** System Assignments (Options)
- **04:** CO Outpulsing Selection
- **05:** Automatic Recall From Hold Timing
- **0#5:** Camp-on Timeout

B) **CO Line Options**
- **06:** Automatic Release On Hold Enable
- **0#6:** Trunk-to-Trunk Connection Enable
- **07:** Automatic Release On Hold Timing
- **08:** Tenant Service Selection
- **0#8:** Night Ring Over External Page
- **09:** Single CO (Dial 9) Group Selection
- **09X:** Four CO Line (Dial 91, 92, 93, 94) Groups Selection
- **0#9:** Off-Premise Line Hunting
- **100:** Toll Restriction System Parameters
- **101:** Toll Restriction Disable
- **102:** Forced Account Code Check
- **103:** OCC or Equal Access #1
- **104:** OCC Authorization Code Length #1
- **105:** OCC or Equal Access #2
- **106:** OCC Authorization Code Length #2
- **108:** Toll Restriction Override Code #1
- **109:** Toll Restriction Override Code #2
- **1X0:** Toll Restriction Class Parameters
- **1XY:** Toll Restriction Class Area Code Entry
- **1XZ:** Toll Restriction Class Office Code Entry
- **1X1:** Toll Restriction Class Area/Office Code Exception Table Selection
- **2XY:** Toll Restriction Area/Office Code Exception Table
- **190:** PBX Backup
- **19X:** PBX Access Codes

C) **Station Options**
- **3XX:** Station CO Line Access
- **4XX:** Station Type Assignment
- **4#XX:** Station Flexible Key Assignments
- **5XX:** Station Class of Service #1
- **5#XX:** Station Class of Service #2
- **6XX:** Station Toll Restriction Classification
- **6#XX:** Station-to-Station Hunting
- **7XX:** Station Outgoing Call Restriction
- **8XX:** CO Ringing Assignments-DAY
- **8#XX:** CO Ringing Assignments-DAY 2
- **9XX:** CO Ringing Assignments-NITE

02.43 The System Record Sheet is used to record the assignment of features for each program. 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.

02.44 Make the system option selections per the following instructions, and record the various choices in the System Record Sheet. Use tables 5 through 46 for detailed programming instructions.

02.50 System Options:

01 Program — System Assignments (Basic)

Fourteen options are selected with this program, using the various keys to change the status of their respective LEDs. For the options selected, mark an X as indicated.

1) Transfer Privacy — mark an X next to CO17 if privacy is to be in effect on a transferred call. Leave blank if Alternate Point Answer of a transferred call is to be permitted.

2) Automatic Dial Override Toll Restriction — mark an X next to CO16 if System Automatic Dialing (addresses 60 - 99) is to override Toll Restriction. Leave blank if Toll Restriction is to remain in effect.

3) CO Line Groups — mark an X next to CO15 if four CO line groups (dial 91, 92, 93, and 94) are required. Leave blank if one group (dial 9) is sufficient.

4) Two CO Line Conference — mark an X next to CO14 to inhibit two CO line conference. Leave blank if two CO line conferencing is to be permitted.

5) DP Make Ratio — mark an X next to CO12 if a 33% make/break timing ratio is required. Leave blank if 40% (usual setting) is sufficient.

6) MF Signal Time — mark an X next to CO11 if 160 ms MF signal time is required. Leave blank if signal time is to remain 80 ms.

7) Non-Privacy/Privacy — mark an X next to CO9 if the system is to be non-private. Leave blank if the system is to be private.

8) Station 17 10/20-key EKT — mark an X next to CO7 if station 17 is equipped with a 10-key EKT for programming purposes. Leave blank if a 20-key EKT is used.

9) Incoming Call Abandon Timeout — mark an X next to CO6 if the system should wait for 8 seconds after the last ring to consider an incoming call abandoned. Leave blank if 6 seconds is sufficient.

10) Pause Timing (After Flash) — mark an X next to CO5 if a 3-second pause (for dial tone delay) is required after a flash. Leave blank if a 1.5-second pause is sufficient.

11) Pause After Flash — mark an X next to CO4 if the system is to insert a pause (defined by CO5, this program) between a flash and an automaitcally dialed number. Leave blank if a pause is not required.

12) Pause Timing (MW/FL key) — mark an X next to CO3 if a 3-second pause (for dial tone delay) is required. Leave blank if a 1.5-second pause is sufficient.

13) Flash Time — mark an X next to CO2 if the line-open interval produced by the MW/FL key is to be 0.5 second. Leave blank if the 2-second pause for dial tone recall is required.

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

02 Program — System Assignments (Options)

Fourteen options are selected with this program, using the various keys to change the status of their respective LEDs. For the options selected, mark an X as indicated.

1) Trunk-to-Trunk Connection/Station 33 — mark an X next to CO17 if circuit for station 33 is to be dedicated to trunk-to-trunk connection. Leave blank if station 33 is to be an EKT.

2) Trunk-to-Trunk Connection/Station 32 — mark an X next to CO16 if the circuit for station 32 is to be dedicated to trunk-to-trunk connection. Leave blank if station 32 is to be an EKT.

3) Trunk-to-Trunk Connection/Station 31 — mark an X next to CO15 if circuit for station 31 is to be dedicated to trunk-to-trunk connection. Leave blank if station 31 is to be an EKT.

4) Trunk-to-Trunk Connection/Station 30 — mark an X next to CO14 if the circuit for station 30 is to be dedicated to trunk-to-trunk connection. Leave blank if station 30 is to be an EKT.

5) Trunk-to-Trunk Connection/Station 29 — mark an X next to CO13 if circuit for station 29 is to be dedicated to trunk-to-trunk connection. Leave blank if station 29 is to be an EKT.

6) Trunk-to-Trunk Connection/Station 28 — mark an X next to CO12 if the circuit for station 28 is to be dedicated to trunk-to-trunk connection. Leave blank if station 28 is to be an EKT.

NOTE:
See **Program 0#6** *to select CO lines for Trunk-to-Trunk Connection.*

7) Amplified Conference/Stations 18 and 19 — mark an X next to CO11 if the circuits for stations 18 and 19 are to be dedicated to Amplified Conference. Leave blank if stations 18 and 19 are to be EKTs.

NOTE:
Requires customer-supplied amplifier. One Amplified Conference per system (first-come/first-served basis); also used for trunk-to-trunk connections.

8) Station 25 OPX Busy-out — mark an X next to CO10 if the system is to "busy-out" OPX station 25 (not installed). Leave blank if the station is not to present a busy signal. (Has no meaning if HOXB is not installed.)

9) Station 23 OPX Busy-out — mark an X next to CO9 if the system is to "busy-out" OPX station 23 (not installed). Leave blank if the station is not to present a busy signal. (Has no meaning if an OPX is not installed at station 23.)

10) Station 21 OPX Busy-out — mark an X next to CO8 if the system is to "busy-out" OPX station 21 (not installed). Leave blank if the station is not to present a busy signal. (Has no meaning if an OPX is not installed at station 21.)

11) LCD Timer — mark an X next to CO4 if the Dialed Number display on the LCD EKTs is indicated for 1 minute before changing to Elapsed Time. Leave blank if 15 seconds are sufficient.

12) Night Ring Over External Page — mark an X next to CO2 if Night Ringing Over External Page is required. Leave blank if no ringing is to be heard over External Page. Note: **Program 0#8** selects which individual CO(s) will ring.

13) Background Music (BGM) Over External Page — mark an X next to CO1 if BGM is to be heard over the External Page circuit. Leave blank if BGM is not to be heard over the External Page circuit.

14) External Page with All Call Page — mark an X next to INT if the External Page circuit is to be included in an All Call Page. Leave blank if All Call Page is not to be heard over the External Page circuit.

0#2 Program — Account Code Digit Length and TIE Line/OPX Selection

This program has two sections. The first defines the number of digits required in an account code (Forced Account Code feature). Enter the number of digits to be used (4 - 15). The second section is only required for TIE line operation; it assigns TIE line class of service and dedicated station circuits for use with an HTIB module (one HTIB requires two stations).

1) TIE Line Class of Service — mark an X next to CO11 if incoming TIE line calls are to be allowed handsfree answerback to stations and access to paging. Leave blank if not allowed.

2) TIE Line Assignment — mark an X next to CO9 if stations 22 and 23 are to be used for TIE line operation. Leave blank if these stations are to be used for off-premise extensions or EKTs.

3) TIE Line Assignment — mark an X next to CO8 if stations 20 and 21 are to be used for TIE line operation. Leave blank if these stations are to be used for off-premise extensions or EKTs.

03 Program — System Assignments (Options)

Seventeen options are selected with this program, using the various keys to change the status of their respective LEDs. For the options selected, mark an X as indicated.

1) Door Lock Timeout — mark an X next to CO17 if the door lock is to operate for 6 seconds. Leave blank if 3 seconds is sufficient.

2) Door Phone Alarm — mark an X next to CO16 if door phone C is to be a door alarm. Leave blank if it is to be a door phone.

3) Door Phone Lock — mark an X next to CO15 if door phone B is to be a door lock. Leave blank if it is to be a door phone.

4) Door Phone C Busy — mark an X next to CO14 if the system is to busy-out door phone C. Leave blank if it is not to show busy.

5) Door Phone B Busy — mark an X next to CO13 if the system is to busy-out door phone B. Leave blank if it is not to show busy.

6) Station 14 Door Phone/EKT — mark an X next to CO12 if station 14 is to be a door

phone output. Leave blank if an EKT is to be used at this station.

7) Station 13 Door Phone/EKT — mark an X next to CO11 if station 13 is to be a door phone output. Leave blank if an EKT is to be used at this station.

NOTE:
If both CO11 and CO12 LEDs are on, station 13 will be a Door Phone and station 14 will be an EKT.

8) Station 10 ALRM Key — mark an X next to CO10 if the CO10 key on station 10 is to be an alarm key. Leave blank if CO10 key is required.

9) Station 10 DND/NITE Key — mark an X next to CO9 if the DND key on station 10 is to be a DND key. Leave blank if a NT key is required.

NOTE:
The NT key at station 10 is for a system without DSS #1.

10) Ringing Modes — mark an X next to CO8 if three ringing modes (Day, Day 2, Night) are used. Leave blank if two ringing modes (Day, Night) are required.

11) Tenant Service — mark an X next to CO7 if the system is to be equipped with Tenant Service.

12) DSS Console — mark an X next to CO6 if calls from a DSS console are to be preceded by a tone. Leave blank if a DSS console call is to be voice first.

13) Message Center-Station 12 — mark an X next to CO4 if station 12 is to be the message center.

14) Message Center-Station 11 — mark an X next to CO3 if station 11 is to be the message center.

15) Message Center-Station 10 — mark an X next to CO2 if station 10 is to be the message center.

NOTE:
Only one message center is permitted; if more than one station is chosen as a message center, the lowest numbered station will be registered.

16) DSS 2 — mark an X next to CO1 if the system is to be equipped with DSS 2.

17) DSS 1 — mark an X next to INT if the system is to be equipped with DSS 1.

04 Program — CO Outpulsing Selection

Selects DTMF tone (MF) or rotary dial pulse (DP) outpulsing.

- Mark an X next to the appropriate CO line if DP is required. Leave blank if MF is required.

05 Program — Automatic Recall from Hold Timing

Sets the timing for the Automatic Recall from Hold feature. (Used only if CO10, CO11 and CO12 LEDs are OFF in **Program 5#XX**.)

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

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

0#5 Program — Camp-on Timeout

Sets the timing for the originating station to be recalled by a CO line that was camped on to a busy station and remains unanswered.

- Select a period of time (16 - 64 seconds) and mark an X next to the appropriate key/LED on the System Record Sheet. The times **are not** accumulative — only one key/LED can be selected.

02.60 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. This feature will also release trunk-to-trunk connections if enabled in **Programs 02** and **0#6.**

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

0#6 Program — Trunk-to-Trunk Connection Enable

Selects the CO lines to be used for trunk-to-trunk connections. The CO line/keys represent themselves.

- Mark an X next to CO lines to be used for trunk-to-trunk connections.

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. (Has no meaning if AROH was rejected in **Program 06**.)

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

08 Program — Tenant Service Selection

Informs the system of the CO lines that are assigned to each tenant. Night ringing transfer of lines assigned to Tenants #1 and #2 are controlled by DSS 1 (station 10) and DSS 2 (station 11), respectively. Ringing CO lines assigned to Tenant #1 may be picked up with CPU1 key and Tenant #2 CO lines may be picked up with CPU2 key.

Each CO key represents itself. (Has no meaning if Tenant Service was not selected in **Program 03**.)

- Mark an X next to each CO line that is to belong to Tenant #2. Leave blank if the line is to belong to Tenant #1.

0#8 Program — Night Ring Over External Page

Selects whether or not a CO line rings over external page. (Has no meaning if CO2 LED was not ON in **Program 02**.)

- Mark an X next to the CO lines that **ring** over external page.

09 Program — Single CO (Dial 9) Group Selection

Informs the system of the CO lines that should be considered for selection when a station dials 9. Each CO key represents itself. (Used only if the CO15 LED in **Program 01** is OFF.)

- Mark an X next to each CO line that **is** to be **included** in the "Dial 9" group.

09X Program — Four CO Line (Dial 91, 92, 93, 94) Groups Selection

Informs the system of the CO lines that should be considered for selection when a station dials 91, 92, 93 or 94. Each CO key/LED represents itself. (Used only if the CO15 LED in **Program 01** is ON.)

1) Mark an X next to each CO key/LED that **is** to be **included** in the 91 group.

2) Mark an X next to each CO key/LED that **is** to be **included** in the 92 group.

3) Mark an X next to each CO key/LED that **is** to be **included** in the 93 group.

4) Mark an X next to each CO key/LED that **is** to be **included** in the 94 group.

0#9 Program — Off-Premise Line Hunting

Selects which CO lines ring the device connected to the "HUNT" output on the HOLB option module. The "TEL" output always rings.

The first incoming CO line connected to the HOLB (i.e., 1, 4, 7, etc.) rings the "HUNT" output in the DAY and NIGHT mode if the associated CO line is not marked. Mark an X next to the CO line if hunting is desired in the NIGHT mode only.

All other incoming CO lines connected to the HOLB mark an X next to the CO line that is to ring the "HUNT" output in the NIGHT mode. Leave blank if no night hunting is desired. These CO lines do not hunt in the DAY mode.

100 Program — Toll Restriction System Parameters

An entry in this program is required only if 3- or 6-digit toll restriction is desired. Informs the system of the dialing plan in the system home area code. Three types of dialing plans are available. Mark an X next to the LED that indicates the dialing plan area of the installation location.

CO2*: 1 + AC + NNX (long-distance dialing outside home area code)
NNX (toll dialing within home area code)

CO1: 1 + AC + NNX (long-distance dialing outside home area code)
1 + NNX (toll dialing within home area code)

INT: AC + NNX (long-distance dialing outside home area code)
1 + NNX (toll dialing within home area code)

AC = Area Code
NNX/NXX = Office Code
N = 2 - 9
X = 0 - 9

**NOTE:*
This dialing plan is required when the dialing plan area code has interchangeable office codes (NXX). (There are office codes that follow the area code format due to the unavailability of standard office codes.)

101 Program — Toll Restriction Disable

Assigns Toll Restriction to CO lines. The CO key/LEDs represent themselves.

- Mark an X next to each CO line to which Toll Restriction **will not** apply.

102 Program — Forced Account Code Check

This program applies forced account codes to CO lines. Stations accessing these lines are then forced to enter account codes if required by their class of service registrations. See **Program 5#XX**, CO14 key/LED. (Note: Has no meaning if EKTs are not selected for Forced Account Code in **Program 5#XX**.)

- Mark an X next to the CO lines that **are to force** an account code for the EKTs selected in **Program 5#XX**.

103 Program — Equal Access (10XXX) or Other Common Carrier (OCC) #1

Informs the system of the first 5-digit code (Equal Access or OCC) that is ignored for Toll Restriction purposes. Enter the actual Equal Access or OCC digits to be recognized and ignored.

104 Program — OCC Authorization Code Length #1

Informs the system of the number of digits in the first OCC Authorization Code. These digits are also ignored for Toll Restriction purposes when an outgoing call is placed over an OCC. Enter the number of digits in the authorization code.

105 Program — Equal Access (10XXX) or Other Common Carrier (OCC) #2

Informs the system of the second 5-digit code (Equal Access or OCC) that is ignored for Toll Restriction purposes. Enter the actual Equal Access or OCC digits to be recognized and ignored.

106 Program — OCC Authorization Code Length #2

Informs the system of the number of digits in the second OCC Authorization Code. These digits are also ignored for Toll Restriction purposes when an outgoing call is made over an OCC. Enter the number of digits in the authorization code.

108 Program — Toll Restriction Override Code #1

Registers the first of two codes that override toll restriction on outgoing calls. Enter the four digits of the first toll restriction override code.

109 Program — Toll Restriction Override Code #2

Registers the second of two codes that override toll restriction on outgoing calls. Enter the four digits of the second toll restriction override code.

1X0 Program — Toll Restriction Class Parameters (X = 1 - 4)

This program defines parameters for each class of toll restriction (X = 1 - 4). There are four classes of toll restriction available on a station-by-station basis. (See **Program 6XX** to select the station class of toll restriction.) This program is required only if 3- or 6-digit toll restriction is desired.

- Mark an X next to the LED for each parameter of each toll restriction class used.

CO2: All restricted area codes plus the office code of 555 are allowed, including out-of-area directory assistance calls (e.g., 213+555+1212).

CO1: Overseas operator or unassisted overseas calls are to be restricted (01/011).

INT: Operator or operator-assisted calls are used to be restricted (0).

1XY Program — Toll Restriction Class Area Code Entry (X = Class 1 - 4) [Y = allow (2), deny (3) or display (4)]

This program defines the area codes allowed or denied for each toll restriction class. This program is required only if 3- or 6-digit toll restriction is desired. Each class area code table can be defined as an allow (2) or deny (3) table. Initialized data allows all area codes for each class. All allowed area codes can be displayed (4) for each class. For Toll Restriction Class 1, enter all allowed area codes in the upper section of the record sheet and all denied area codes in the lower section. Make additional copies of the record sheet for Toll Restriction Classes 2, 3 and 4.

1XZ Program — Toll Restriction Class Office Code Entry (X = Class 1 - 4) [Z = allow (6), deny (7) or display (8)]

This program defines the office codes allowed or denied for each toll restriction class within the home area code. Entry to this program is required only if 3- or 6-digit toll restriction is desired. Each class office code table can be defined as an allow (6) or deny (7) table. Initialized data allows all office codes in the home area code for each class. All allowed office codes can be displayed (8) for each class. See the detailed programming chart for office code entry procedures.

1X1 Program — Toll Restriction Class Area/Office Code Exception Table Selection (X = Class 1 - 4)

Entry to this program is required only if 6-digit (area/office code) toll restriction is desired. There are eight area/office code exception tables available. These exception tables are shared by all four classes of toll restriction. Each class may use any one or all exception code tables. When an exception code table is selected for a toll restriction class, the dialed area code and office code in that table will be an exception to the normal restriction of that area code. See examples following **Program 2XY**.

- Mark an X next to the LED of each area/office code exception table (1 - 8/INT - CO7) to be selected for each toll restriction class.

2XY Program — Toll Restriction Area/Office Code Exception Table

Entry to this program is required only if 6-digit (area/office code) toll restriction is desired. There are eight area/office code exception tables available that are defined by X (1 - 8). Each table may have one area code and up to 800 office codes entered. The area code is entered when Y = 1 for each table, while office codes are added (Y = 2) or deleted (Y = 3) for each table. All office codes in the table are displayed when Y = 4. Each area/office exception table selected with **Program 1X1** will be an exception (opposite) to the allow (**Program 1X2**) or deny (**Program 1X3**) area code table for each toll restriction class. See the detailed programming chart for area code and office code entry procedures. The examples below are provided for additional information.

1) Normal restriction (allow all office codes within an area code) for stations in Class 1.

- **Program 1XY** is programmed to allow (**112**) area code 213. Class 1 stations are allowed to dial all office codes in area code 213.

2) Area/office code exception (allow all office codes within an area code except one) for stations in Class 1.

- **Program 1XY** remains the same (**112**).
- **Program 1X1** has area/office code exception Table 1 (INT) selected (**111**).
- **Program 2XY** (**211** and **212**) are programmed for area code 213 (**212**) and office code 635 also (**211**). Class 1 stations are allowed to dial all office codes in area code 213 *except* 635.

190 Program — PBX Backup

Assigns CO lines to Behind-PBX operation. The system recognizes PBX access codes on selected lines.

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

19X Program — PBX Access Codes

Assigns codes that are used to access CO lines connected to a PBX as determined in **Program 190**. ***Strata*** recognizes the access codes and reacts appropriately for Toll Restriction, Automatic Dialing and Repeat Last Number Dialed.

- Enter the actual one- or two-digit 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.*

02.70 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 does not have key or LED functions for that CO line and cannot access that line by dial code.

- Selections must be repeated for all stations — mark an X next to each CO key/LED that **is** to be **accessed** by the station in question.

4XX Program — Station Type Assignment

Informs the system of the type of EKT being used at each station and the order of CO line appearances. The selections listed below must be repeated for each station. In all cases, mark an X where required.

1) Mark an X next to CO16 if you want the first CO line number to be CO19 (location depends on the selection at CO9).

2) Mark an X next to CO15 if you want the first CO line number to be CO16 (location depends on the selection at CO9).

3) Mark an X next to CO14 if you want the first CO line number to be CO13 (location depends on the selection at CO9).

4) Mark an X next to CO13 if you want the first CO line number to be CO10 (location depends on the selection at CO9).

5) Mark an X next to CO12 if you want the first CO line number to be CO7 (location depends on the selection at CO9).

6) Mark an X next to CO11 if you want the first CO line number to be CO4 (location depends on the selection at CO9).

7) Mark an X next to CO10 if you want the first CO line number to be CO1 (location depends on the selection at CO9).

8) Mark an X next to CO9 if the CO lines are to be assigned from top to bottom (descending order). If CO9 is left blank, CO lines are assigned bottom to top (ascending order).

9) Mark an X next to CO7 if 20-key pattern C is desired (see Figure 2).

10) Mark an X next to CO6 if 20-key pattern B is desired (see Figure 2).

11) Mark an X next to CO5 if 20-key pattern A is desired (see Figure 2).

12) Mark an X next to CO1 if a 10-key EKT is equipped (see Figure 2).

13) Mark an X next to INT if a 20-key EKT is equipped.

10-key	20-key A	20-key B	20-key C
	MW/FL	MW/FL	MW/FL
	DND	DND	DND
	CO17	AD5	REP
	CO16	AD4	RDL
	CO15	AD3	PAU
	CO14	AD2	AD6
	CO13	AD1	AD5
	CO12	CO12	AD4
	CO11	CO11	AD3
	CO10	CO10	AD2
MW/FL	CO9	CO9	AD1
DND	CO8	CO8	CO8
CO7	CO7	CO7	CO7
CO6	CO6	CO6	CO6
CO5	CO5	CO5	CO5
CO4	CO4	CO4	CO4
CO3	CO3	CO3	CO3
CO2	CO2	CO2	CO2
CO1	CO1	CO1	CO1
INT	INT	INT	INT

FIGURE 2 — EKT KEY PATTERNS

4#XX Program — Station Flexible Key Assignments

Informs the system of the features that are assigned to the flexible keys at each station.

Any key (except INT) may be assigned a feature code (Figure 3). All assigned feature codes have priority over **Program 4XX** assignments. For all keys, write in the code for the feature to be assigned on each station.

NOTE:
Except for Automatic Dialing (ADL) keys, a feature will be rejected if you try to enter it at another key once its code has been entered. Rejected assignments will default to ADL keys.

CODE	FEATURE	CODE	FEATURE
01	CO1	*	Automatic dialing starting from bottom key assigned (ADL)
02	CO2	**81**	Alphanumeric Messaging (MSG)
03	CO3	**82**	Pick up (Tenant 2) ringing CO in Night Service (CPU2)
04	CO4	**83**	Pick up (Tenant 1) ringing CO in Night Service (CPU1)
05	CO5	**84**	Pick up (Tenants 1 and 2) ringing CO in Night Service (CPU)
06	CO6	**85**	Save number dialed (SAVE)
07	CO7	**86**	Door lock (DRLK)
08	CO8	**87**	Call forward (CFD)
09	CO9	**88**	Microphone cutoff (MCO)
10	CO10	**90**	LED ON: DTMF tones on CO/LED OFF: DP (TONE)
11	CO11	**91XX**	DSS to station XX (DSS1)
12	CO12	**92XX**	DSS to station XX (DSS2)
13	CO13	**93**	Privacy (PRV)
14	CO14	**94**	Automatic callback (ACB)
15	CO15	**95**	Pause (PAU)
16	CO16	**96**	Automatic redial — REP must be assigned also (RDL)
17	CO17	**97**	Repertory dial — RDL must be assigned also (REP)
18	CO18	**98**	Do not disturb (DND)
19	CO19	**99**	Message waiting/flash (MW/FL)
20	CO20		
21	CO21		

FIGURE 3 — FEATURE KEY ASSIGNMENTS

5XX Program — Station Class of Service #1

Sixteen options are selected with this program, using the various 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 required.

1) Privacy Override — mark an X next to CO17 if the station **is allowed** the Privacy Override feature. Allows an override (break-in) when a CO key is depressed with the CO LED on steady. Both parties can hear an override tone.

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 are allowed to use this feature; the others are ignored.

2) DND Override — mark an X next to CO16 if the station **is allowed** the DND Override feature.

3) Executive Override (Dial 3) — mark an X next to CO15 for stations that **are allowed** the Executive Override feature. (No limit to the number of stations.)

4) Door Phone C Ring — mark an X next to CO12 if the door phone unit connected to the Door Phone Control Box output C **is to ring** at this EKT. Leave blank if this EKT is not to ring.

5) Door Phone B Ring — mark an X next to CO11 if the door phone unit connected to the Door Phone Control Box output B **is to ring** at this EKT. Leave blank if this EKT is not to ring.

6) Door Phone A Ring — mark an X next to CO10 if the door phone unit connected to the Door Phone Control Box output A **is to ring** at this EKT. Leave blank if this EKT is not to ring.

7) Group Page 4 — mark an X next to CO9 if the station **is included** in Group Page 4.

8) Group Page 3 — mark an X next to CO8 if the station **is included** in Group Page 3.

9) Group Page 2 — mark an X next to CO7 if the station **is included** in Group Page 2.

10) Group Page 1 — mark an X next to CO6 if the station **is included** in Group Page 1.

11) All Call Page — mark an X next to CO5 if the station **is included** in an All Call Page.

12) Room Monitor/Warning Tone — mark an X next to CO4 if no warning tone will be heard when dialing a room monitor (door phone) from this EKT. Leave blank if a warning tone will be heard at the room monitor.

13) Handsfree Answerback Disabled — mark an X next to CO3 if Handsfree Answerback is to be disabled at the station. Leave blank if it is not to be disabled (see MCO key feature).

14) MIC ON — mark an X next to CO2 if the microphone and LED is to be ON at the start of a call. CO1 LED (MIC key lock) must be on for this feature to function. Leave blank if the microphone on the EKT is to be OFF.

15) MIC Key Lock — mark an X next to CO1 if the MIC key is to be operated in the push-on/push-off mode. Leave blank if momentary operation is required.

16) Speakerphone Enable — mark an X next to INT if the station **is allowed** to use the Speakerphone feature.

5#XX Program — Station Class of Service #2

Twelve additional Class of Service features are selected with this program, using the various 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 required.

1) 6000 LCD/2000 LCD — mark an X next to CO17 if an alphanumeric (6000 series) LCD EKT is used. Leave blank if using a non-alphanumeric (2000 series) LCD EKT.

2) Station-to-Station Message Waiting with LCD Display — mark an X next to CO16 if the station **is allowed** the Station-to-Station Message Waiting with LCD feature.

3) Forced Account Code — mark an X next to CO14 if this station **is required** to use an account code on CO lines programmed to forced account codes (see **Program 102**).

4) Hold Recall Time — referring to Table 1, mark an X next to the combination of CO12, CO11 and CO10 that corresponds to the recall time desired for each station. If all locations are left blank, the timing for that station will default to that set in **Program 05**.

TABLE 1
HOLD RECALL TIME CODE

KEY/LED	16 sec.	32 sec.	48 sec.	64 sec.	96 sec.	128 sec.	160 sec.
CO12				X	X	X	X
CO11		X	X			X	X
CO10	X		X		X		X

5) Automatic Off-Hook Selection — mark an X next to CO7 if automatic off-hook selection is to be CO line Group 94 (defaults to 9 if Single CO Line Group was selected in **Program 01**).

6) Mark an X next to CO6 if automatic off-hook selection is to be CO line Group 93 (defaults to 9 if Single CO Line Group was selected in **Program 01**).

7) Mark an X next to CO5 if automatic off-hook selection is to be CO line Group 92 (defaults to 9 if Single CO Line Group was selected in **Program 01**).

8) Mark an X next to CO4 if automatic off-hook selection is to be CO line Group 91 (defaults to 9 is Single CO Line Group was selected in **Program 01**).

9) Mark an X next to CO3 if automatic off-hook selection is to be the CO line assigned to the CO1 position.

10) Mark an X next to CO2 if automatic off-hook selection is to be INT.

NOTE:
In **Program 01**, *if CO15 is left blank, items 5, 6, 7 and 8 above will default to Dial 9. Item 9 has priority over items 5, 6, 7 and 8; item 10 has priority over items 5, 6, 7, 8 and 9.*

11) Ringing Line Preference — mark an X next to CO1 if the station is allowed the Ringing Line Preference feature.

12) Automatic Dialing Allowed — mark an X next to INT if the station is allowed the Automatic Dialing feature.

6XX Program — Station Toll Restriction Classification

Defines Toll Restriction for individual stations. Selections must be made for each station, as follows:

1) Mark an X next to CO6 if Toll Restriction Class 4 **is in effect** at this station.

2) Mark an X next to CO5 if Toll Restriction Class 3 **is in effect** at this station.

3) Mark an X next to CO4 if Toll Restriction Class 2 **is in effect** at this station.

4) Mark an X next to CO3 if Toll Restriction Class 1 **is in effect** at this station.

NOTE:
Programs 100, 1X1, 1XY, 1XZ *and* **2XY** *define and modify Toll Restriction Classes and operation.*

5) Mark an X next to CO2 if this station **will be restricted** from dialing 0 or 1 as the first or second digit. This entry overrides any Toll Restriction Class assigned to this station.

6) Mark an X next to CO1 if the station **will be allowed** to dial 1 + 7-digit number. This entry overrides any Toll Restriction Class assigned to this station.

7) Mark an X next to INT if this station will **not** be **restricted**. This entry overrides all other Toll Restriction programming.

6#XX Program — Station-to-Station Hunting

Defines the station hunt destination if the called station is busy. Enter the station number of the hunt destination next to the station number (called).

7XX Program — Station Outgoing Call Restriction

Restricts a station from outgoing access to any number of CO lines, but leaves 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 each station.

8XX Program — CO Ringing Assignments-DAY

Selects which CO lines ring at a given station when the system is in the DAY mode. This program assigns DAY ringing if Three-Ring Mode operation was assigned in **Program 03** (CO8 LED ON). Selections must be made for each station.

- Mark an X next to each CO line that **is to ring** at the station during DAY mode.

NOTE:
Each line can ring on only eight stations. If more than eight are programmed, only the eight stations with the lowest station numbers will ring.

8#XX Program — CO Ringing Assignments-DAY 2

Selects which CO lines ring at a given station when the system is in the DAY 2 mode. This program is applicable only when Three-Ring Mode operation was selected in **Program 03** (CO8 LED ON). Selections must be made for each station.

- Mark an X next to each CO line that **is to ring** at the station during DAY2 mode.

9XX Program — CO Ringing Assignments-NITE

Selects which CO lines 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 during NITE mode.

NOTE:
Each line can ring on only eight stations. If more than eight are programmed, only the eight stations with the lowest station numbers will ring.

02.80 Initialization

02.81 ***Strata*** has a list of standard system data assignments stored in ROM that can be entered any time by initializing the system. The system must be initialized when it is first installed or whenever the HCAU is changed. This allows the system to be tested and any faults corrected before time is spent on programming. Standard data assignments are listed in Table 2 in Paragraph **02.90**. (However, if a system is initialized after user-programmed data has been stored, all user data will be lost.)

02.82 To initialize a ***Strata*** system:

a) Make sure the system power switch is in the **ON** position.

b) Verify that the battery on the HCAU is connected to ensure that data entered after system initialization is not lost due to power failure. (The SET LED cannot function if the battery is not connected.)

c) Depress and hold in the **INT** switch on the HCAU.

d) Depress the **SET** switch and allow it to lock.
- The SET LED lights.
- All LEDs on station 17 (except SPKR and MIC) begin blinking.

e) Depress and release the **SET** switch again.
- SET LED goes off.
- Station 17 LEDs stop flashing.

IMPORTANT!
Verify that ALL proper LEDs begin blinking and go off as indicated in steps d) and e) before proceeding.

f) Release the **INT** switch.

g) Cycle the power switch **OFF** (HPSU +5V and power LEDs must go off) and **ON**. The system is now initialized.

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

02.84 The Automatic Dialing-System memory is cleared as follows:

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

b) Depress the **SPKR** key on station 17.
- SPKR LED lights steadily.

c) Dial **# * *** on the dial pad.
- The SPKR LED flashes continuously.

d) Depress the **INT** **CO4** **CO8** and **CO12** keys.
- Corresponding LEDs light steadily.

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

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

The Automatic Dialing-System memory is now clear.

02.90 System Data Entry

02.91 System data is entered and/or changed via station 17 while the system is in the programming mode.

02.92 The system is placed in the programming mode and data is entered as follows:

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

b) Refer to the System Record Sheet (Appendix 1) for data to be entered and/or changes that must be made.

c) Select the required program number.

d) Refer to the proper programming table for detailed procedures for using each different program.

NOTE:
Each program should be accomplished sequentially until all necessary changes are made.

TABLE 2

INITIALIZED DATA

SYSTEM OPTIONS

01 Program
System Assignments (Basic)

Alternate Point Answer of Transferred CO Line = Allowed
System Speed Dial Override of Toll Restriction = Not allowed
CO Line Groups = 1 (dial 9)
Two-CO Line Conference = Allowed
DP Make Ratio = 40%
MF Signal Time = 80 ms
Privacy/Non-Privacy = Privacy
Station 17 = 20-key EKT
Incoming Call Abandon = 6 seconds
Pause Timing After Flash = 1.5 seconds
Pause After Flash = None
Pause Timing After PBX Access Code = 1.5 seconds
Flash Key Timing = 2 seconds
Intercom Signalling = Voice first

02 Program
System Assignments (Options)

Tandem Switching = EKT 13 selected
Stations 18/19 Amplified Conference = No amplified conference
OPU #1/OPX #21 = Not busy
OPU #2/OPX #23 = Not busy
OPU #3/OPX #25 = Not busy
Display Dialed Number Timeout = 15 seconds
Night Ringing = Excluded from External Page
Background Music = Excluded from External Page
External Page = Not included in All Call Page

0#2 Program — Account Code Digit Length and TIE Line/OPX Selection

6 Digits
OPU #2 TIE Line = OPU
OPU #1 TIE Line = OPU

03 Program
System Assignments (Options)

Door Phone #68 Alarm = Door Phone
Door Phone #67 Door Lock = Door Phone
Door Phone #68 Busy = Not busy
Door Phone #67 Busy = Not busy
Station 14 Door Phone/EKT = EKT
Station 13 Door Phone/EKT = EKT
Station 10 Alarm Key = CO10
Station 10 DND/NT (night) key = NT key
Ringing Modes = 2
Tenant Service = Not equipped
Message Center — station 12 = Not equipped
Message Center — station 11 = Not equipped
Message Center — station 10 = Equipped
DSS 2 Station 11 = Not equipped
DSS 2 Station 10 = Not equipped
Door Lock Time = 3 seconds

04 Program
CO Outpulsing Selection

DTMF = Equipped

05 Program
Automatic Recall From Hold Timing

32 Seconds

0#5 Program
Camp-on Timeout

32 Seconds

TABLE 2 — INITIALIZED DATA (continued)

CO LINE OPTIONS

06 Program
Automatic Release On Hold Enable

Disabled = All CO lines

0#6 Program
Trunk-to-Trunk Connection Enable

CO Tandem Switching = Disabled

07 Program
Automatic Release On Hold Timing

ESS Timing = All CO lines

08 Program
Tenant Service Selection

Tenant #1 = All CO lines

0#8 Program
Night Ring Over External Page

No Ring

09, 09X Program
CO Line Group Selection

Dial 9 Group = All CO lines

0#9 Program
Off-Premise Line Hunting

No Hunting Assigned

100 Program
Toll Restriction System Parameters

AC + NNX 1 + O/C selected

101 Program
Toll Restriction Disable

No Restriction = All CO lines

102 Program
Forced Account Code Check

No Check = All CO lines

103 Program
OCC or Equal Access #1

Blank

104 Program
OCC Authorization Code Length #1

Blank

105 Program
OCC or Equal Access #2

Blank

106 Program
OCC Authorization Code Length #2

Blank

108 Program
Toll Restriction Override Code #1

Blank

109 Program
Toll Restriction Override Code #2

Blank

1X0 Program
Toll Restriction Class Parameters

01 or 011 = Allowed
0 + = Allowed
AC + 555 = Not allowed
Used in conjunction with exception code tables.

1XY Program
Toll Restriction Class Area Code Entry

Blank

1XZ Program
Toll Restriction Class Office Code Entry

Blank

1X1 Program — Toll Restriction Class Area/Office Code Exception Table Selection

None Selected

2XY Program — Toll Restriction Area/Office Code Exception Table

Blank

190 Program
PBX Backup

CO Operation = All CO lines

19X Program
PBX Access Codes

No Codes Assigned

TABLE 2 — INITIALIZED DATA (continued)

STATION OPTIONS

3XX Program
Station CO Line Access

Access Allowed = All lines, all stations

4XX Program
Station Type Assignment

20-key "A" Assigned = All stations
CO1 Start = All stations

4#XX Program
Station Flexible Key Assignments

Assignment = Basic keystrip

5XX Program
Station Class of Service #1

Privacy Override = Not allowed, all stations
DND Override = Not allowed, all stations
Executive Override= Not allowed, all stations
Door Phone Ring A, B, C = Not selected, all stations
Group Page 84 = Not included
Group Page 83 = Not included
Group Page 82 = Not included
Group Page 81 = Not included
All Call Page = Allowed, all stations
Room Monitor = Warning tone, all stations
Handsfree Answerback = Not allowed, all stations
MIC ON/Idle Mode = OFF, all stations
MIC Key Lock = Momentary, all stations
Speakerphone = Allowed, all stations

5#XX Program
Station Class of Service #2

6000 LCD/2000 LCD = 6000 LCD EKT
Station-to-Station Message Waiting with LCD = Allowed, all stations
Forced Account Code = Not required, all stations
Hold Recall Time = Per **Program 05**
Automatic Off-Hook Selection = No selection, all stations
Ringing Line Preference = Selected, all stations
Automatic Dial = Allowed, all stations

6XX Program
Station Toll Restriction Classification

No Restriction = All stations

6#XX Program
Station-to-Station Hunting

No Selection = All stations

7XX Program
Station Outgoing Call Restriction

No Restriction = All stations

8XX Program
CO Ringing Assignments-DAY

All Lines Ring Station 10

8#XX Program
CO Ringing Assignments-DAY 2

No CO Ringing Assigned

9XX Program
CO Ringing Assignments-NITE

All Lines Ring Station 11

02.94 The table and page numbers for the various programs follow.

TABLE LIST

Table	Title	Program	Page
3	System Data Printout Selection Codes	—	20
4	Automatic Dialing Memory Printout Selection Codes	—	20
5	System Assignments (Basic)	01	27
6	System Assignments (Options)	02	28
7	Account Code Digit Length and TIE Line/OPX Selection	0#2	29
8	System Assignments (Options)	03	30
9	CO Outpulsing Selection	04	31
10	Automatic Recall From Hold Timing	05	32
11	Camp-on Timeout	0#5	33
12	Automatic Release On Hold Enable	06	34
13	Trunk-to-Trunk Connection Enable	0#6	35
14	Automatic Release On Hold Timing	07	36
15	Tenant Service Selection	08	37
16	Night Ring Over External Page	0#8	38
17	Single CO Line (Dial 9) Group Selection	09	39
18	Four CO Line (Dial 91, 92, 93, 94) Groups Selection	09X	40
19	Off-Premise Line Hunting	0#9	41
20	Toll Restriction System Parameters	100	42
21	Toll Restriction Disable	101	43
22	Forced Account Code Check	102	44
23	Other Common Carrier (OCC) or Equal Access #1	103	45
24	OCC Authorization Code Length #1	104	46
25	Other Common Carrier or Equal Access #2	105	47
26	OCC Authorization Code Length #2	106	48
27	Toll Restriction Override Code #1	108	49
28	Toll Restriction Override Code #2	109	50
29	Toll Restriction Class Parameters	1X0	51
30	Toll Restriction Class Area Code Entry	1XY	52
31	Toll Restriction Class Office Code Entry	1XZ	53
32	Toll Restriction Class AOC Exception Table Selection	1X1	54
33	Toll Restriction Area/Office Code Exception Table	2XY	55
34	PBX Backup	190	56
35	PBX Access Codes	19X	57
36	Station CO Line Access	3XX	58
37	Station Type Assignment	4XX	59
38	Station Flexible Key Assignments	4#XX	60
39	Station Class of Service #1	5XX	61
40	Station Class of Service #2	5#XX	62
41	Station Toll Restriction Classification	6XX	63
42	Station-to-Station Hunting	6#XX	64
43	Station Outgoing Call Restriction	7XX	65
44	CO Ringing Assignments — DAY	8XX	66
45	CO Ringing Assignments — DAY 2	8#XX	67
46	CO Ringing Assignments — NITE	9XX	68

03 SYSTEM DATA PRINTOUT

03.00 System Data Printout Via SMDR

03.01 If the ***Strata*** system is equipped with Station Message Detail Recording (SMDR), it is possible to obtain a printout of the system data and speed dialing memory via a printer that is connected to the SMDR output port (HSMB module).

03.02 The data should be printed during a low traffic period since this procedure interferes with normal SMDR output. Any call records generated during a printout will be lost.

03.03 Commands to print system data are entered by station 17 while it is in the programming mode. It is possible to print out all or parts of the system data and speed dial memory. The possible choices are:

System Data:

- All data
- **Programs 01 - 0#9**
- **Programs 100 - 1X1; 190 & 19X**
- **Program 2XY**
- **Program 3XX**
- **Program 4XX**
- **Program 4#XX**
- **Program 5XX**
- **Program 5#XX**
- **Program 6XX**
- **Program 6#XX**
- **Program 7XX**
- **Program 8XX**
- **Program 8#XX**
- **Program 9XX**

Automatic Dialing Memory:

- All data
- System list
- Any individual station list

03.04 To request a printout:

a) Depress the **SET** switch on the HCAU.
- SET LED goes on.
- Station 17 MW/FL LED goes on.

b) Depress the SPKR key on station 17.
- SPKR LED goes on.

c) Dial # #.
- The SPKR LED begins to flash.

d) The INT and CO1 - 8 LEDs switch on and off in response to operation of the associated keys. Refer to Tables 3 and 4 and set the appropriate LEDs to the proper pattern for the printout required.

e) Depress the HOLD key.
- All station 17 LEDs (except MW/FL) go off.
- Printout begins (see Figures 4 - 9 for examples of the printout format).

f) Normal SMDR operation resumes when the printout is complete.

g) Repeat from step b) until all desired printouts are completed.

h) Release the **SET** switch on the HCAU.

03.05 To stop a printout before it is completed:

a) Depress the SPKR key on station 17.
- SPKR LED goes on.

b) Dial # #.
- SPKR LED stays on.
- The INT and CO1 - CO8 LEDs light.

c) Depress the appropriate keys necessary to extinguish all LEDs but that of the SPKR.

d) Depress the HOLD key.
- The SPKR LED goes off.
- After a short delay, the printout stops.

e) Normal SMDR functions resume.

TABLE 3

SYSTEM DATA PRINTOUT SELECTION CODES

PROGRAM NUMBER

LED	01 — 0#9	100 — 19X	2XY	3XX	4XX	5XX	6XX	7XX	8XX	8#XX	9XX	4#XX	5#XX	6#XX	Print Out All
CO8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CO7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CO6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CO5	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CO4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CO3	O	O	O	O	O	O	O	O	X	X	X	X	X	X	X
CO2	O	O	O	O	X	X	X	X	O	O	O	O	X	X	X
CO1	O	O	X	X	O	O	X	X	O	X	O	X	O	X	X
INT	O	X	O	X	O	X	O	X	O	O	X	X	O	O	X

LED on = X LED off = O

TABLE 4

AUTOMATIC DIALING MEMORY PRINTOUT SELECTION CODES

AUTO DIAL LISTS (System & Stations 10 ~ 19)

LED	SYS	10	11	12	13	14	15	16	17	18	19
CO8	X	X	X	X	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O	O	O	O	O
CO6	X	O	O	O	O	O	O	O	O	O	O
CO5	X	O	O	O	O	O	O	O	O	O	O
CO4	X	X	X	X	X	X	X	X	X	X	X
CO3	O	O	O	O	O	O	O	O	O	X	X
CO2	O	O	O	O	O	X	X	X	X	O	O
CO1	O	O	O	X	X	O	O	X	X	O	O
INT	O	O	X	O	X	O	X	O	X	O	X

AUTO DIAL LISTS (Stations 20 ~ 29)

LED	20	21	22	23	24	25	26	27	28	29
CO8	X	X	X	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O	O	O	O
CO6	O	O	O	O	O	O	O	O	O	O
CO5	X	X	X	X	X	X	X	X	X	X
CO4	O	O	O	O	O	O	O	O	O	O
CO3	O	O	O	O	O	O	O	O	X	X
CO2	O	O	O	O	X	X	X	X	O	O
CO1	O	O	X	X	O	O	X	X	O	O
INT	O	X	O	X	O	X	O	X	O	X

AUTO DIAL LISTS (Stations 30 ~ 39)

LED	30	31	32	33	34	35	36	37	38	39
CO8	X	X	X	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O	O	O	O
CO6	O	O	O	O	O	O	O	O	O	O
CO5	X	X	X	X	X	X	X	X	X	X
CO4	X	X	X	X	X	X	X	X	X	X
CO3	O	O	O	O	O	O	O	O	X	X
CO2	O	O	O	O	X	X	X	X	O	O
CO1	O	O	X	X	O	O	X	X	O	O
INT	O	X	O	X	O	X	O	X	O	X

TABLE 4

AUTOMATIC DIALING MEMORY PRINTOUT SELECTION CODES (continued)

AUTO DIAL LISTS (Stations 40 ~ 49)

LED	40	41	42	43	44	45	46	47	48	49
CO8	X	X	X	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O	O	O	O
CO6	X	X	X	X	X	X	X	X	X	X
CO5	O	O	O	O	O	O	O	O	O	O
CO4	O	O	O	O	O	O	O	O	O	O
CO3	O	O	O	O	O	O	O	O	X	X
CO2	O	O	O	O	X	X	X	X	O	O
CO1	O	O	X	X	O	O	X	X	O	O
INT	O	X	O	X	O	X	O	X	O	X

AUTO DIAL LISTS (Stations 50 ~ 59)

LED	50	51	52	53	54	55	56	57	58	59
CO8	X	X	X	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O	O	O	O
CO6	X	X	X	X	X	X	X	X	X	X
CO5	O	O	O	O	O	O	O	O	O	O
CO4	X	X	X	X	X	X	X	X	X	X
CO3	O	O	O	O	O	O	O	O	X	X
CO2	O	O	O	O	X	X	X	X	O	O
CO1	O	O	X	X	O	O	X	X	O	O
INT	O	X	O	X	O	X	O	X	O	X

AUTO DIAL LISTS (Stations 60 ~ 65)

LED	60	61	62	63	64	65	All Output
CO8	X	X	X	X	X	X	X
CO7	O	O	O	O	O	O	O
CO6	X	X	X	X	X	X	X
CO5	X	X	X	X	X	X	X
CO4	O	O	O	O	O	O	X
CO3	O	O	O	O	O	O	X
CO2	O	O	O	O	X	X	X
CO1	O	O	X	X	O	O	X
INT	O	X	O	X	O	X	X

LED on = X LED off = O

```
##  SYSTEM PROGRAMMING     ##

                                                  1:SELECT(LED ON)
            21   16    15      8  7     1INT
0      1    000000     00000000  00000000
0      2    000000     00000000  00000000
0     #2    000000     00001000  00000110
0      3    000000     00010000  00000101
0      4    000000     00000000  01110000
0      5    000000     00000000  00000100
0     #5    000000     00000000  00000010
0      6    000000     00000000  00000000
0     #6    000000     00000000  00000000
0      7    000000     00000000  00000000
0      8    000000     00000000  00000000
0     #8    111111     11111111  11111110
0      9    111111     11111111  11111110
0     91    111111     11111111  11111110
0     92    000000     00000000  00000000
0     93    000000     00000000  00000000
0     94    000000     00000000  00000000
0     #9    000000     00000000  00000000

##  END OF PRINT           ##
```

FIGURE 4—SAMPLE PRINTOUT OF PROGRAMS 01 ~ 0#9

```
##  SYSTEM PROGRAMMING     ##

                                                  1:SELECT(LED ON)
              21   16    15      8  7     1INT
1     00       000000     00000000  00000001
1     01       000000     00000000  00000000
1     02       000000     00000000  00000000

                     (DATA = DIAL NUMBER)
1     03        10515
1     04           12
1     05        10736
1     06            9
1     08         5555
1     09         3621

                                                  1:SELECT(LED ON)
              21   16    15      8  7     1INT
1     10       000000     00000000  00000000
1     11       000000     00000000  00000000

1     14     000 ~ 999
1     18     000 ~ 999

.      .       .            .            .
.      .       .            .            .
.      .       .            .            .
                                                  1:SELECT(LED ON)
             21   16     15      8  7     1INT
1     90     000000       00000000  00000000

                     (DATA = DIAL NUMBER)
1     91       81
1     92       82
1     93       83
1     94       84
1     95       *8
1     96
1     97
1     98
##  END OF PRINT           ##
```

FIGURE 5—SAMPLE PRINTOUT OF PROGRAMS 100 ~ 19X

```
##   SYSTEM PROGRAMMING     ##

                        (DATA = DIAL NUMBER)

2      11          212

2      14                        472
                                 495
                                 669
                        (DATA = DIAL NUMBER)
2      21          317
2      24                        628
                                 629
.       .           .            .
.       .           .            .
.       .           .            .
                        (DATA = DIAL NUMBER)
2      81
2      84

##   END OF PRINT             ##
```

FIGURE 6—SAMPLE PRINTOUT OF PROGRAM 2XY

```
##   SYSTEM PROGRAMMING     ##

                                                  1:SELECT(LED ON)
              21    16     15       8  7      1INT
3      10     111111      11111111   11111110
3      11     111111      11111111   11111110
3      12     111111      11111111   11111110
3      13     111111      11111111   11111110
3      14     111111      11111111   11111110
3      15     111111      11111111   11111110
3      16     111111      11111111   11111110
3      17     111111      11111111   11111110
3      18     111111      11111111   11111110
3      19     111111      11111111   11111110
3      20     111111      11111111   11111110
.       .       .           .              .
.       .       .           .              .
.       .       .           .              .
3      65     111111      11111111   11111110

##   END OF PRINT             ##
```

FIGURE 7—SAMPLE PRINTOUT OF PROGRAM 3XX (IDENTICAL TO 4XX, 5XX, 5#XX, 6XX, 6#XX, 7XX, 8XX, 8#XX, 9XX)

```
##   SYSTEM PROGRAMMING   ##

4#      10      10          20          CO10   CO20
                09          19           CO9   CO19
                08          18           CO8   CO18
                07          17           CO7   CO17
                06          16           CO6   CO16
                05          15           CO5   CO15
                04          14           CO4   CO14
                03          13           CO3   CO13
                02          12           CO2   CO12
                01          11           CO1   CO11
 .       .       .           .           .       .
 .       .       .           .           .       .
 .       .       .           .           .       .
4#      65       *          99           AD3   MW/FL
                 *          98           AD2   DND
                 *          97           AD1   REP
                06          96           CO6   RDL
                05          95           CO5   PAU
                04          94           CO4   ACB
                03          93           CO3   PRV
                02         *88           CO2   MCO
                01         *87           CO1   CFD
                00         *85           INT   SAVE

 ##   END OF PRINT   ##
```

NOTE:
Columns 1 and 2 give the code for the feature assigned to each key; columns 3 and 4 give the actual features assigned (corresponding to the codes in columns 1 and 2).

FIGURE 8—SAMPLE PRINTOUT OF PROGRAM 4#XX

```
##  REPERTORY DIAL     ##

#00    *60         17147305000
#00    *61         19142731750
#00    *62         12135551212
#00    *63         17148531212
#00    *64         17145551212
#00    *65         17147305000
#00    *66         19142731750
#00    *67         12135551212
#00    *68         17148531212
#00    *69         17145551212
#00    *70         17147305000
#00    *71         19142731750
#00    *72         12135551212
#00    *73         17148531212
#00    *74         17145551212
#00    *75         17147305000
#00    *76         19142731750
#00    *77         12135551212
#00    *78         17148531212
#00    *79         17145551212
#00    *80         17147305000
#00    *81         19142731750
#00    *82         12135551212
#00    *83         17148531212
#00    *84         17145551212
#00    *85         17147305000
#00    *86         19142731750
#00    *87         12135551212
#00    *88         17148531212
#00    *89         17145551212
#00    *90         17147305000
#00    *91         19142731750
#00    *92         12135551212
#00    *93         17148531212
#00    *94         17145551212
#00    *95         17147305000
#00    *96         19142731750
#00    *97         12135551212
#00    *98         17148531212
#00    *99         17145551212
##  END OF PRINT   ##
```

FIGURE 9—SAMPLE PRINTOUT OF SPEED DIAL—SYSTEM

TABLE 5

PROGRAM 01
SYSTEM ASSIGNMENTS (BASIC)

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. The various LEDs (see below) will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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.

KEY/LED	LED ON	LED OFF
CO17	Transfer Privacy	Alternate point answer of transferred CO line
CO16	System Speed Dial Override of Toll Restriction	No override
CO15*	Four CO Line Groups (91 ~ 94)	One CO Line Group (9)
CO14	Two CO Conferencing—Inhibit	Allowed
CO12	DP Make Ratio 33%	40%
CO11	MF Signal Time 160ms	80ms
CO9	Non-Privacy	Privacy
CO7	Station 17/10-key EKT	20-key EKT
CO6	Incoming Call Abandon/8 seconds	6 seconds
CO5	3-second Pause After Flash	1.5-second Pause
CO4	Insert Pause After Flash	No Pause
CO3	3-second Pause (**MW/FL** key)	1.5-second Pause
CO2	0.5-second Flash	2-second Flash
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.

If the CO15 LED is off in this program, see* **Program 09; *if CO15 LED is on, see* **Program 09X**.

TABLE 6

PROGRAM 02
SYSTEM ASSIGNMENTS (OPTIONS)

1) Lock in the **SET** switch on the HCAU.	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 2 on the dial pad.	SPKR LED flashes continuously. The various LEDs (see below) will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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.

KEY/LED	LED ON	LED OFF
CO17	Station 33 assigned to trunk-to-trunk connection	Station 33 is EKT
CO16	Station 32 assigned to trunk-to-trunk connection	Station 32 is EKT
CO15	Station 31 assigned to trunk-to-trunk connection	Station 31 is EKT
CO14	Station 30 assigned to trunk-to-trunk connection	Station 30 is EKT
CO13	Station 29 assigned to trunk-to-trunk connection	Station 29 is EKT
CO12	Station 28 assigned to trunk-to-trunk connection	Station 28 is EKT
CO11	Stations 18 and 19 assigned to Amplified Conference	Not Amplified
CO10	OPX 25 Busy-out	Not Busy
CO9	OPX 23 Busy-out	Not Busy
CO8	OPX 21 Busy-out	Not Busy
CO4	Display dialed number—1 minute	15 seconds
CO2*	Night Ring over External Page Allowed	Not Allowed
CO1	BGM over External Page Allowed	Not Allowed
INT	External Page Included with All Call Page	Not Allowed

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.

***Program 0#8** *selects which individual CO(s) will ring.*

TABLE 7

PROGRAM 0#2
ACCOUNT CODE DIGIT LENGTH and TIE LINE/OPX SELECTION

1) Lock in the **SET** switch on the HCAU.	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 # 2 on the dial pad.	SPKR LED flashes continuously. The various LEDs (see below) will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the associated LEDs on or off, as required. The detailed meaning of each key/LED is shown below. This program also defines the length of the SMDR account code. Enter a number from 4 to 15 via the dial pad.	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 for CO8 & CO9. For account code length, as each digit is entered, the entry is verified by LEDs as shown below for INT & CO1 ~ CO4.

NOTE:
1. *Depressing the # key displays the data without changing it.*
2. *To clear existing data without entering a new number, depress the * key two times.*
3. *Data: 6 digits.*

KEY/LED	LED ON	LED OFF
CO11	Incoming TIE lines allowed EKT handsfree answerback and paging access	Not allowed
CO9	OPX 22/23 TIE Line	OPX 22/23 OPX
CO8	OPX 20/21 TIE Line	OPX 20/21 OPX

X = LED on
All LEDs off = no data

Digit Length	4	5	6	7	8	9	10	11	12	13	14	15
CO4							X	X	X	X	X	X
CO3					X	X						
CO2	X	X	X	X							X	X
CO1			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) 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 stored, previous data erased.

TABLE 8

PROGRAM 03
SYSTEM ASSIGNMENTS (OPTIONS)

1) Lock in the **SET** switch on the HCAU.	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** **3** on the dial pad.	SPKR LED flashes continuously. CO and INT LEDs will be on according to present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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.

KEY/LED	LED ON	LED OFF
CO17	Door Lock Time—6 seconds	3 seconds
CO16	Door Phone C—Alarm	Door Phone
CO15	Door Phone B—Door Lock	Door Phone
CO14	Door Phone C Busy-out	Door Phone
CO13	Door Phone B Busy-out	Door Phone
CO12	Station 14 is a Door Phone	Station 14 is an EKT
CO11	Station 13 is a Door Phone	Station 13 is an EKT
CO10	Station 10-Alarm key	CO10 key
CO9	Station 10-DND key	Station 10-NT key
CO8	Three-Ring Modes	Two-Ring Modes
CO7	Tenant Service	Non-tenant
CO6	Tone First (DSS)	Voice First (DSS)
CO4	Message Waiting Station 12	Not Equipped
CO3	Message Waiting Station 11	Not Equipped
CO2	Message Waiting Station 10	Not Equipped
CO1	DSS 2	Not Equipped
INT	DSS 1	Not Equipped

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 9

PROGRAM 04
CO OUTPULSING SELECTION

1) Lock in the **SET** switch on the HCAU.	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 4 on the dial pad.	SPKR LED flashes continuously. CO LEDs go on according to present data.
4) Refer to the System Record Sheet. Each CO line represents itself: • LED OFF = DTMF Tone operation • LED ON = Dial Pulse (DP) operation	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) 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 10

PROGRAM 05
AUTOMATIC RECALL FROM HOLD TIMING

(This program is used only if CO10, CO11 and CO12 LEDs are ALL off in Program 5#XX.)

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. An INT or CO LED will be on according to present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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 the LED is permitted to be on, depressing another key will turn that LED on and turn off the previous LED.

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

KEY/LED	LED ON
CO7	160 seconds
CO6	128 seconds
CO5	96 seconds
CO4	64 seconds
CO3	48 seconds
CO2	32 seconds
CO1	16 seconds
INT	No Recall

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 11

PROGRAM 0#5
CAMP-ON TIMEOUT

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. The INT or CO LED will be on according to present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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 the LED is permitted to be on, depressing another key will turn that LED on and turn off the previous LED.

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

KEY/LED	LED ON
CO3	64 seconds
CO2	48 seconds
CO1	32 seconds
INT	16 seconds

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 12

PROGRAM 06
AUTOMATIC RELEASE ON HOLD ENABLE

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will have AROH during normal operation. If CO1 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) 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:
This program is also used to release Trunk-to-Trunk connections if enabled with **Program 0#6**.

TABLE 13

PROGRAM 0#6
TRUNK-to-TRUNK CONNECTION ENABLE

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will be allowed trunk-to-trunk connection. If CO1 LED is off, trunk-to-trunk connection will not be allowed 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) 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:
The AROH feature is used to release trunk-to-trunk connections if enabled with **Program 06.**

TABLE 14

PROGRAM 07
AUTOMATIC RELEASE ON HOLD TIMING

1) Lock in the **SET** switch on the HCAU.	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 the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will have XB (crossbar) timing for AROH. If CO1 LED is off, CO1 will have ESS (electronic) timing.	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) 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:
This program affects only those CO lines enabled via **Program 06** *(AROH and Trunk-to-Trunk connections).*

TABLE 15

PROGRAM 08
TENANT SERVICE SELECTION

1) Lock in the **SET** switch on the HCAU.	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 8 on the dial pad. *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20.***	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will belong to tenant #2. If CO1 LED is off, CO1 will belong to tenant #1.	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) 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:
This program will have no meaning unless Tenant Service was selected in **Program 03.**

TABLE 16

PROGRAM 0#8
NIGHT RING OVER EXTERNAL PAGE

1) Lock in the **SET** switch on the HCAU.	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 # 8 on the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, when the system is in night operation, incoming calls over that CO line will ring over the external page; if CO1 LED is off, incoming calls over that CO line will not ring in night operation.	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) 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:
Use this program only if CO2 LED is on in **Program 02**.

TABLE 17

PROGRAM 09
SINGLE CO LINE (DIAL 9) GROUP SELECTION

1) Lock in the **SET** switch on the HCAU.	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 9 on the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will be included in the "Dial 9" group for random selection by a single line (OPX) extension or by any station using Trunk Queuing. If CO1 LED is off, CO1 can be accessed only by dialing 7 0 1 at the OPX station or by the CO1 key on an EKT.	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) 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:
Use this program only if CO15 LED is off in **Program 01**.

TABLE 18

PROGRAM 09X
FOUR CO LINE (DIAL 91, 92, 93, 94) GROUPS SELECTION

1) Lock in the **SET** switch on the HCAU.	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 9 X on the dial pad. (X = 1, 2, 3 or 4 depending upon the group being defined.) Dial 0 9 1 for "Dial 91" group; 0 9 2 for "Dial 92" group, etc.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, CO1 will be included in the "Dial 9X" group for random selection by a single line (OPX) extension or by any station using Trunk Queuing. If CO1 LED is off, CO1 can be accessed only by dialing 7 0 1 at the OPX station or by the CO1 key on an EKT.	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) 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:
Use this program only if CO15 LED is off in **Program 01**.

TABLE 19

PROGRAM 0#9
OFF-PREMISE LINE HUNTING

1) Lock in the **SET** switch on the HCAU.	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 # 9 on the dial pad.	SPKR LED flashes continuously. CO LEDs go 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. The first incoming CO line connected to the HOLB (i.e., 1, 4, 7, etc.) will ring the HUNT output in the day and night mode if the associated LED is off. If the LED is on, the HUNT will only occur in the night mode. All other incoming CO lines will ring the HUNT output only in the night mode if the associated LED is on. If the LED is off, no hunting will occur.	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) 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 20

PROGRAM 100
TOLL RESTRICTION SYSTEM PARAMETERS
(DIALING PLAN)

1) Lock in the **SET** switch on the HCAU.	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 0 on the dial pad.	SPKR LED flashes continuously. CO LEDs go on according to present data.
4) Refer to the System Record Sheet. Turn the associated LED on for the dialing plan of the home Area Code. Only one LED may be on at one time.	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) 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 21

PROGRAM 101
TOLL RESTRICTION DISABLE

1) Lock in the **SET** switch on the HCAU.	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 1** on the dial pad.	SPKR LED flashes continuously. CO LEDs go on according to present data.
4) Refer to the System Record Sheet. Each CO key/LED represents itself—that is, if CO1 LED is on, toll restriction is not applied to that CO line; if CO1 LED is off, toll restriction is applied to that CO 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) 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 22

PROGRAM 102
FORCED ACCOUNT CODE CHECK

1) Lock in the **SET** switch on the HCAU.	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 2 on the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 = Forced Account Codes are checked. • Each CO key/LED represents itself—that is, if the CO1 LED is on, stations calling out over CO1 will be forced to enter an account code (if required by **Program 5#XX**).	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) 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 23

PROGRAM 103
OCC or EQUAL ACCESS #1

1) Lock in the **SET** switch on the HCAU.	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 3 on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program registers the first equal access (OCC) number used by the system. This five-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit
CO12					Steady	Steady
CO11			Steady	Steady		
CO10	Flash	Steady		Steady		Steady

X = LED on
All LEDs off = no data

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	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. New data is stored, previous data is erased.
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.

TABLE 24

PROGRAM 104
OCC AUTHORIZATION CODE LENGTH #1

1) Lock in the **SET** switch on the HCAU.	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 4** on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program defines the length of the authorization code for OCC #1. This two-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit
CO11			Steady
CO10	Flash	Steady	

X = LED on

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	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. New data is stored, previous data is erased.
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.

TABLE 25

PROGRAM 105
OCC or EQUAL ACCESS #2

1) Lock in the **SET** switch on the HCAU.	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 5** on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program registers the second equal access (OCC) number used by the system. This five-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit
CO12					Steady	Steady
CO11			Steady	Steady		
CO10	Flash	Steady		Steady		Steady

X = LED on
All LEDs off = no data

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	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. New data is stored, previous data is erased.
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.

TABLE 26

PROGRAM 106
OCC AUTHORIZATION CODE LENGTH #2

1) Lock in the **SET** switch on the HCAU.	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 6 on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program defines the length of the authorization code for OCC #2. This two-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit
CO11			Steady
CO10	Flash	Steady	

X = LED on

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	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. New data is stored, previous data is erased.
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.

TABLE 27

PROGRAM 108
TOLL RESTRICTION OVERRIDE CODE #1

1) Lock in the **SET** switch on the HKSU.	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 8** on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program registers the first Toll Restriction override code. This four-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit	3rd Digit	4th Digit
CO12					Steady
CO11			Steady	Steady	
CO10	Flash	Steady		Steady	

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	X		X		X		X		X	

X = LED on
All LEDs off = no data

5) Depress the **HOLD** key to place new data in memory.	All station 17 LEDs (except MW/FL) go off. New data is stored, previous data is erased.
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.

TABLE 28

PROGRAM 109
TOLL RESTRICTION OVERRIDE CODE #2

1) Lock in the **SET** switch on the HKSU.	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 9** on the dial pad.	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program registers the first Toll Restriction override code. This four-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit	3rd Digit	4th Digit
AD3					Steady
AD2			Steady	Steady	
AD1	Flash	Steady		Steady	

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	X		X		X		X		X	

X = LED on
All LEDs off = no data

5) Depress the **HOLD** key to place new data in memory.	All station 17 LEDs (except MW/FL) go off. New data is stored, previous data is erased.
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.

TABLE 29

PROGRAM 1X0
TOLL RESTRICTION CLASS PARAMETERS

1) Lock in the **SET** switch on the HCAU.	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** **0** on the dial pad.	SPKR LED flashes continuously. CO and INT LEDs will be on according to present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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.

KEY/LED	LED ON	LED OFF
CO2	Area code + 555 + XXXX Allowed	Not Allowed
CO1	01 or 011 Overseas Restricted	Allowed
INT	0 + Restricted	Allowed

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 30

PROGRAM 1XY
TOLL RESTRICTION CLASS AREA CODE ENTRY
(LCD TELEPHONE REQUIRED)

1) Lock in the **SET** switch on the HCAU.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17. LCD is blank.
2) Depress the SPKR key on station 17.	SPKR LED steady on. LCD is blank.
3) Dial 1 X 2 (Allow), 1 X 3 (Deny) or 1 X 4 (Display) as required. (X = Restriction class 1 ~ 4)	SPKR LED flashes continuously. LCD displays dialed number.
4) Press # key.	1X2 = LCD is blank. 1X3 = LCD is blank. 1X4 = LCD displays all allowed codes.
5) Enter first area code in range sequence (start).	LCD displays code entered.
6) Depress * key.*	LCD shifts left to provide space for next code.
7) Enter final area code in range sequence (stop).*	LCD displays code entered.
8) Depress # key.	LCD is blank.
9) Return to step 5 to enter additional area codes.	
10) Depress the HOLD key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
11A) Go to Step 2 in another program table . . . or . . . 11B) 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.

**Skip steps 6 and 7 if only one area code in sequence is being entered.*

TABLE 31

PROGRAM 1XZ
TOLL RESTRICTION CLASS OFFICE CODE ENTRY
(LCD TELEPHONE REQUIRED)

1) Lock in the **SET** switch on the HCAU.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17. LCD is blank.
2) Depress the SPKR key on station 17.	SPKR LED steady on. LCD is blank.
3) Dial 1 X 6 (Allow), 1 X 7 (Deny) or 1 X 8 (Display) as required. (X = Restriction class 1 ~ 4)	SPKR LED flashes continuously. LCD displays dialed number.
4) Press # key.	1X6 = LCD is blank. 1X7 = LCD is blank. 1X8 = LCD displays all allowed codes.
5) Enter first area code in range sequence (start).	LCD displays code entered.
6) Depress * key.*	LCD shifts left to provide space for next code.
7) Enter final area code in range sequence (stop).*	LCD displays code entered.
8) Depress # key.	LCD is blank.
9) Return to step 5 to enter additional area codes.	
10) Depress the HOLD key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
11A) Go to Step 2 in another program table . . . or . . . 11B) 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.

**Skip steps 6 and 7 if only one area code in sequence is being entered.*

TABLE 32

PROGRAM 1X1
TOLL RESTRICTION CLASS AREA/OFFICE CODE EXCEPTION TABLE SELECTION

1) Lock in the **SET** switch on the HCAU.	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** **1** on the dial pad. (X = Restriction class 1 ~ 4)	SPKR LED flashes continuously. The various LEDs (see below) will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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.

KEY/LED	LED ON	LED OFF
CO7	Area/Office Code Table 8 Selected	Not Selected
CO6	Area/Office Code Table 7 Selected	Not Selected
CO5	Area/Office Code Table 6 Selected	Not Selected
CO4	Area/Office Code Table 5 Selected	Not Selected
CO3	Area/Office Code Table 4 Selected	Not Selected
CO2	Area/Office Code Table 3 Selected	Not Selected
CO1	Area/Office Code Table 3 Selected	Not Selected
INT	Area/Office Code Table 1 Selected	Not Selected

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 33

PROGRAM 2XY
TOLL RESTRICTION AREA/OFFICE CODE EXCEPTION TABLE
(LCD TELEPHONE REQUIRED)

1) Lock in the **SET** switch on the HCAU.	SET LED on. Station 17 MW/FL LED on. System is in program mode. Normal functions halt on station 17. LCD is blank.
2) Depress the SPKR key on station 17.	SPKR LED steady on. LCD is blank.
3) Dial 2 X 1 on the dial pad. (X = Table 1 ~ 8)	LCD displays dialed number, then shifts left to provide space for entry of area code (or displays current area code).
4) Enter area code on the dial pad.	LCD clears and displays area code entered. Binary data is shown on INT, CO1, CO2, CO3 keys/LEDs.
5) Depress the HOLD key.	LCD is blank.
6) Depress the SPKR key.	SPKR LED steady on. LCD is blank.
7) Dial 2 X 2 (Allow), 2 X 3 (Delete) or 2 X 4 (Display). (X = Table 1 ~ 8)	SPKR LED flashes continuously. LED displays dialed number.
8) Depress # key.	2 X 2 = LCD is blank. 2 X 3 = LCD is blank. 2 X 4 = LCD displays all currently programmed office codes.
9) Enter first area code in range sequence (start).	LCD displays code entered.
10) Depress * key.*	LCD shifts left to provide space for next code.
11) Enter final area code in range sequence (stop).*	LCD displays code entered.
12) Depress # key.	LCD is blank.
13) Return to step 5 to enter additional area codes.	
14) Depress the HOLD key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
15A) Return to Step 2 in order to continue with this program . . . or . . . 15B) Go to Step 2 in another program table . . . or . . . 15C) 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.

**Skip steps 10 and 11 if only one office code in sequence is being entered.*

TABLE 34

PROGRAM 190
PBX BACKUP

1) Lock in the **SET** switch on the HCAU.	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 9 0 on the dial pad.	SPKR LED flashes continuously. CO LEDs go 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 CO1 LED is on, the system assumes that the CO1 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) 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 35

PROGRAM 19X
PBX ACCESS CODES

1) Lock in the **SET** switch on the HCAU.	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 9 X on the dial pad. X = 1 ~ 8 (corresponding to the access code being programmed). Dial 1 9 1 (X = 1) to program first access code, 1 9 2 (X = 2) to program second access code, etc.	SPKR LED flashes continuously. INT, CO1, CO2, CO3 LEDs indicate present data.
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 (= "D" on Record Sheet) for the second digit.	INT, CO1, 2 & 3 LEDs will light to display data in binary format. CO10 or CO11 LED will light steadily to indicate which digit is being displayed.

KEY	START	1st Digit	2nd Digit
CO11			Steady
CO10	Flash	Steady	
CO3		Binary Data	Binary Data
CO2		Binary Data	Binary Data
CO1		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
CO3								X	X	X	X
CO2				X	X	X	X				X
CO1		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 36

PROGRAM 3XX
STATION CO LINE ACCESS

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph **02.20**.*	SPKR LED flashes continuously. The various LEDs will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the 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 CO1, 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 37

PROGRAM 4XX
STATION TYPE ASSIGNMENT

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph **02.20**.*	SPKR LED flashes continuously. The various LEDs will indicate present data.
4) Refer to the System Record Sheet. Using the various keys, turn the associated LEDs on or off, as required.	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 38

PROGRAM 4#XX
STATION FLEXIBLE KEY ASSIGNMENTS
(LCD TELEPHONE RECOMMENDED)

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously.
4) Refer to the System Record Sheet. Depress the key to be programmed. ***IMPORTANT!*** ***A 20-key LCD EKT is highly recommended for this procedure.***	The feature currently assigned to code number for that key will be displayed by the LCD (see table below).
5) Dial in the new feature's number. The meaning of each feature code is shown below.	The new feature's number will be displayed on the LCD (see table below).
6) Continue to return to Step 4 until all desired features for chosen station are programmed.	
7) Depress HOLD key to place new data in memory.	All station 17 LEDs (except MW/FL) go off.
8A) Return to Step 2 in order to continue with this program for additional station(s) . . . or . . . 8B) Go to Step 2 in another program table . . . or . . . 8C) 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:
All codes can only be assigned once per EKT. If assigned more than once, keys become ADL keys.
XX = Direct Station Selection (DSS) EKT distinction.

CODE	DESCRIPTION	CODE	DESCRIPTION	CODE	DESCRIPTION
01	CO1	14	CO14	85	SAVE
02	CO2	15	CO15	86	DRLK
03	CO3	16	CO16	87	CFD
04	CO4	17	CO17	88	MCO
05	CO5	18	CO18	90	TONE
06	CO6	19	CO19	91XX	DSS1
07	CO7	20	CO20	92XX	DSS2
08	CO8	21	CO21	93	PRV
09	CO9	*	ADL	94	ACB
10	CO10	81	MSG	95	PAU
11	CO11	82	CPU2	96	RDL
12	CO12	83	CPU1	97	REP
13	CO13	84	CPU	98	DND
				99	MW/FL

TABLE 39

PROGRAM 5XX
STATION CLASS OF SERVICE #1

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. INT and CO LEDs go 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.	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 40

PROGRAM 5#XX
STATION CLASS OF SERVICE #2

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. INT and CO LEDs go 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.	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 41

PROGRAM 6XX
STATION TOLL RESTRICTION CLASSIFICATION

1). Lock in **SET** switch on the HCAU.	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 6 X X on the dial pad. (XX = the number of the station to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. INT, CO LEDs go 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.	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	FEATURE	LED ON	LED OFF
CO6	Class 4*	Selected	None
CO5	Class 3*	Selected	None
CO4	Class 2*	Selected	None
CO3	Class 1*	Selected	None
CO2	Restrict **0** or **1** as 1st and 2nd Digit	Selected	None
CO1	Allow **1** + Office Code Only	Selected	None
INT	No Restriction	Selected	None

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.

See Toll Restriction;* **Programs 100, 1X1, 1XY, 1XZ *and* **2XY.**

TABLE 42

PROGRAM 6#XX
STATION-TO-STATION HUNTING

1) Lock in the **SET** switch on the HCAU.	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 6 # X X on the dial pad. (XX = the number of the station to be programed.)	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. This program defines the station hunt destination. This two-digit number is entered via the dial pad.	As each digit is entered, the entry is verified by LEDs as shown below.

KEY	START	1st Digit	2nd Digit
CO11			Steady
CO10	Flash	Steady	

X = LED on

Binary Numbers:	1	2	3	4	5	6	7	8	9	0
CO3								X	X	X
CO2				X	X	X	X			
CO1		X	X			X	X			X
INT	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. New data is stored, previous data is erased.
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.

TABLE 43

PROGRAM 7XX
STATION OUTGOING CALL RESTRICTION

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph **02.20**.*	SPKR LED flashes continuously. CO LEDs indicate present data.
4) Refer to the System Record Sheet. Using the CO keys, turn the associated LEDs on or off, as required. • LED on = Restricted outgoing calls. • Each CO key/LED represents itself—that is, if the CO1 LED is on, then the station being programmed (XX) is restricted from outgoing calls on CO1, 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 44

PROGRAM 8XX
CO RINGING ASSIGNMENTS-DAY

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. CO LEDs indicate present data.
NOTES: *1) Any station(s) designated to ring on a CO line must be allowed access to that line via* **Program 3XX**. *2) A maximum of eight stations may be assigned to ring for any given CO line. If more are assigned, the lowest eight station numbers will ring—the others will be ignored.*	
4) Refer to the System Record Sheet. Using the CO keys, turn the associated LEDs on or off, as required. • LED on = Restricted outgoing calls. • Each CO key/LED represents itself—that is, if the CO1 LED is on, then the station being programmed (XX) will ring on CO1 in the 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.

TABLE 45

PROGRAM 8#XX
CO RINGING ASSIGNMENTS-DAY 2

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. CO LEDs indicate present data.
NOTES: *1) Any station(s) designated to ring on a CO line must be allowed access to that line via* **Program 3XX**. *2) A maximum of eight stations may be assigned to ring for any given CO line. If more are assigned, the lowest eight station numbers will ring—the others will be ignored.*	
4) Refer to the System Record Sheet. Using the CO keys, turn the associated LEDs on or off, as required. • LED on = Ring in DAY 2 mode. • Each CO key/LED represents itself—that is, if the CO1 LED is on, then the station being programmed (XX) will ring for CO1 in the DAY 2 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:
This program is used only if the CO8 LED was turned on in **Program 03**.

TABLE 46

PROGRAM 9XX
CO RINGING ASSIGNMENTS-NITE

1) Lock in the **SET** switch on the HCAU.	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 to be programmed.) *NOTE:* *For multiple station programming, refer to Paragraph* ***02.20***.	SPKR LED flashes continuously. CO LEDs indicate present data.
NOTES: *1) Any station(s) designated to ring on a CO line must be allowed access to that line via* **Program 3XX**. *2) A maximum of eight stations may be assigned to ring for any given CO line. If more are assigned, the lowest eight station numbers will ring—the others will be ignored.*	
4) Refer to the System Record Sheet. Using the CO keys, turn the associated LEDs on or off, as required. • LED on = Ring in NITE mode. • Each CO key/LED represents itself—that is, if the CO1 LED is on, then the station being programmed (XX) will ring for CO1 in the 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.

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SYSTEM RECORD

APPENDIX 1

TSD 86-06-06

PROGRAM 01-SYSTEM ASSIGNMENTS (Basic)

KEY/LED	X	LED ON	LED OFF
CO17		Transfer Privacy	Alternate point answer of transferred CO line
CO16		System Speed Dial Override of Toll Restriction	Restricted
CO15		Four CO Line Groups (91 ~ 94)	One CO Line Group (9)
CO14		Two CO Conferencing—Inhibit	Allowed
CO12		DP Make Ratio 33%	40%
CO11		MF Signal Time 160ms	80ms
CO9		Non-Privacy	Privacy
CO7		Station 17/10-key EKT	Station 17/20-key EKT
CO6		Incoming Call Abandon/8 seconds	6 seconds
CO5		3-sec. Pause After Flash	1.5-sec. Pause
CO4		Insert Pause After Flash	No Pause
CO3		3-sec. Pause (MW/FL key)	1.5 sec. Pause
CO 2		0.5-sec. Flash Timing	2-sec. Flash
INT		Tone First	Voice First

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

PROGRAM 02—SYSTEM ASSIGNMENTS (Options)

KEY/LED	X	LED ON	LED OFF
CO17		Station 33 assigned to trunk-to-trunk connection	Station 33 is EKT
CO16		Station 32 assigned to trunk-to-trunk connection	Station 32 is EKT
CO15		Station 31 assigned to trunk-to-trunk connection	Station 31 is EKT
CO14		Station 30 assigned to trunk-to-trunk connection	Station 30 is EKT
CO13		Station 29 assigned to trunk-to-trunk connection	Station 29 is EKT
CO12		Station 28 assigned to trunk-to-trunk connection	Station 28 is EKT
CO11		Stations 18 and 19 assigned to Amplified Conference	Not Amplified
CO10		OPX 25 Busy-out	No Busy Signal
CO9		OPX 23 Busy-out	No Busy Signal
CO8		OPX 21 Busy-out	No Busy Signal
CO4		Display the dialed number -1 minute	15 seconds
CO2		Night Ring over External Page Allowed	Not Allowed
CO1		BGM over External Page Allowed	Not Allowed
INT		External Page Included with All Call Page	Not Included

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

PROGRAM 0#2—ACCOUNT CODE DIGIT LENGTH (4 to 15 digit length)

Initialized Data: 6 digits

PROGRAM 0#2—TIE LINE/OPX SELECTION

KEY/LED	X	LED ON	LED OFF
CO11		Incoming TIE lines allowed EKT handsfree answerback and paging access	Not Allowed
CO9		OPX 22/23 TIE Line	OPX 22/23 OPX
CO8		OPX 20/21 TIE Line	OPX 20/21 OPX

Initialized Data: All LEDs off

PROGRAM 03-SYSTEM ASSIGNMENTS (Options)

KEY/LED	X	LED ON	LED OFF
CO17		Door Lock Time (6 seconds)	3 seconds
CO16		Door Phone C/Alarm	Door Phone
CO15		Door Phone B/Door Lock	Door Phone
CO14		Door Phone C Busy-out	No Busy Signal
CO13		Door Phone B Busy-out	No Busy Signal
CO12		Station 14 is Door Phone	Station 14 is EKT
CO11		Station 13 is Door Phone	Station 13 is EKT
CO10		Station 10 Alarm Key	CO10 Key
CO9		Station 10 DND Key	Nite Key
CO8		3-Ring Mode	2-Ring Mode
CO7		Tenant Service with DSS	Non-tenant
CO6		Tone First (DSS)	Voice First (DSS)
CO4		Message Waiting Station 12	Not Equipped
CO3		Message Waiting Station 11	Not Equipped
CO2		Message Waiting Station 10	Not Equipped
CO1		DSS 2	Not Equipped
INT		DSS 1	Not Equipped

Initialized Data: INT & CO2 LEDs on; all other LEDs off

NOTE:
Only one message center is permitted; Station 10 will have priority over any other extension chosen. If any key/LED is not shown, it is not used.

PROGRAM 04
CO OUTPULSING SELECTION

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = DP (LED ON)
Blank = MF
Initialized Data: All LEDs off

PROGRAM 05
AUTOMATIC RECALL FROM HOLD TIMING

KEY/LED	X	TIME
CO7		160 seconds
CO6		128 seconds
CO5		96 seconds
CO4		64 seconds
CO3		48 seconds
CO2		32 seconds
CO1		16 seconds
INT		No Recall

X = Select (LED on) Initialized Data: CO2 LED on

NOTE:
Used only if CO10, CO11 & CO12 LEDs in ***Program 5#XX*** *are all off.*

PROGRAM 0#5
CAMP-ON TIMEOUT

KEY/LED	X	TIME
CO3		64 seconds
CO2		48 seconds
CO1		32 seconds
INT		16 seconds

X = Select (LED on) Initialized Data: CO 1 LED on

PROGRAM 06
AUTO RELEASE ON HOLD ENABLE

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

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

PROGRAM 0#6
TRUNK-to-TRUNK CONNECTION ENABLE

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

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

PROGRAM 07
AUTO RELEASE ON HOLD TIMING

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

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

PROGRAM 08
TENANT SERVICE SELECTION

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = Belongs to 2nd tenant
Blank = Belongs to 1st tenant
Initialized Data: All LEDs off

PROGRAM 0#8
NIGHT RING OVER EXTERNAL PAGE

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = Ring (LED on)
Blank = No Ring
Initialized Data: All LEDs off

NOTE:
Used only if CO2 LED is on in ***Program 02****.*

PROGRAM 09
SINGLE CO LINE (DIAL 9)
GROUP SELECTION

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = Include in "Dial 9" group (LED on)
Initialized Data: All LEDs off

NOTE:
Used only if CO15 LED is off in ***Program 01*** *(Single CO Line Group).*

PROGRAM 09X
FOUR CO LINE GROUPS SELECTION
(Dial 91, 92, 93, 94)

CO LINE	GROUP			
	091	092	093	094
CO21				
CO20				
CO19				
CO18				
CO17				
CO16				
CO15				
CO14				
CO13				
CO12				
CO11				
CO10				
CO9				
CO8				
CO7				
CO6				
CO5				
CO4				
CO3				
CO2				
CO1				

X = Include in group (LED on)
Initialized Data: 091—All LEDs on
092 ~ 094—All LEDs off

NOTE:
*Used **only** if CO15 LED is on in **Program 01** (Four CO Line Groups).*

PROGRAM 0#9
OPL LINE HUNTING

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = Hunting
Initialized Data: All LEDs on

PROGRAM 100—TOLL RESTRICTION SYSTEM PARAMETERS
(Dialing Plan)

KEY/LED	X	LED ON	LED OFF
CO2		1 + A/C + NNX and NNX	Not Assigned
CO1		1 + A/C + NNX and 1 + NNX	Not Assigned
INT		A/C + NNX and 1 + NNX	Not Assigned

X = Select (LED on) Initialized Data: INT LED on

PROGRAM 101
TOLL RESTRICTION DISABLE

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

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

PROGRAM 102
FORCED ACCOUNT CODE CHECK

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

X = Check (LED on)
Blank = No Check
Initialized Data: All LEDs off

NOTE:
***Program 0#2** defines number of digits in account code.*

PROGRAMS 103, 104, 105 & 106
EQUAL ACCESS NUMBERS (1 & 2)
OCC AUTHORIZATION CODE LENGTHS (1 & 2)

PROGRAM	ITEM	ENTRY
103	Equal Access Number 1*	
104	OCC Authorization Code Digit Length #1**	
105	Equal Access Number 2*	
106	OCC Authorization Code Digit Length #2**	

X = 0 ~ 9

*Enter the equal access code or Other Common Carrier directory number (five digits: 10XXX, X = 0 ~ 9).

**Enter the number of digits in the OCC Authorization Code (00 ~ 16).

PROGRAM 108
TOLL RESTRICTION OVERRIDE CODE #1

☐☐☐☐

PROGRAM 109
TOLL RESTRICTION OVERRIDE CODE #2

☐☐☐☐

PROGRAM 1X0—TOLL RESTRICTION CLASS PARAMETERS
X = class 1 ~ 4

KEY/LED	X	LED ON	LED OFF
CO2		Area Code + 555 + XXXX Allowed	Not Allowed
CO1		01 or 011 Overseas Restricted	Allowed
INT		0 + Restricted	Allowed

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

PROGRAM 1XY—TOLL RESTRICTION CLASS AREA CODE ENTRY

X = Class 1 ~ 4
Y = 2 (allow)
3 (deny)
4 (display)

PROGRAM 1X2 ALLOW

CLASS	AREA CODES						

PROGRAM 1X3 DENY

CLASS	AREA CODES					

Initialized Data: Allow 000-999

NOTE:
Use multiple sheets as required. *Sheet* _____ *of* _____.

PROGRAM 1XZ—TOLL RESTRICTION CLASS OFFICE CODE ENTRY*

X = Class 1 ~ 4
Z = 6 (allow)
7 (deny)
8 (display)

PROGRAM 1X6 ALLOW

CLASS	OFFICE CODES						

PROGRAM 1X7 DENY

CLASS	OFFICE CODES					

*This table will be used for office code restriction within home area code only.
Initialized Data: Allow 000-999

NOTE:
Use multiple sheets as required. *Sheet _____ of _____.*

PROGRAM 1X1—TOLL RESTRICTION CLASS AREA/OFFICE CODE EXCEPTION TABLE SELECTION

X = class 1 ~ 4

KEY/LED	X	LED ON	LED OFF
CO7		Area/Office Code Table 8 Selected	Not Selected
CO6		Area/Office Code Table 7 Selected	Not Selected
CO5		Area/Office Code Table 6 Selected	Not Selected
CO4		Area/Office Code Table 5 Selected	Not Selected
CO3		Area/Office Code Table 4 Selected	Not Selected
CO2		Area/Office Code Table 3 Selected	Not Selected
CO1		Area/Office Code Table 2 Selected	Not Selected
INT		Area/Office Code Table 1 Selected	Not Selected

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

NOTE: Use multiple sheets as required. *Sheet* _____ *of* _____ .

PROGRAM 2XY—TOLL RESTRICTION AREA/OFFICE CODE EXCEPTION TABLE

Table _____
(1 ~ 8)

Area Code _____

X = table 1 ~ 8
Y = 1 (area code)
2 (office codes added)
3 (office codes deleted)
4 (display)

OFFICE CODES				

PROGRAM 190
PBX BACKUP

KEY/LED	X
CO12	
CO11	
CO10	
CO9	
CO8	
CO7	
CO6	
CO5	
CO4	
CO3	
CO2	
CO1	

KEY/LED	X
CO21	
CO20	
CO19	
CO18	
CO17	
CO16	
CO15	
CO14	
CO13	

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

PROGRAM 19X
PBX ACCESS CODES

CODES	1st DIGIT	2nd DIGIT
#1 (191)		
#2 (192)		
#3 (193)		
#4 (194)		
#5 (195)		
#6 (196)		
#7 (197)		
#8 (198)		

Enter the 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 1st digit are to be considered access codes (e.g., 91, 92, 93, etc.), enter "D" (don't care) in the 2nd column.*

PROGRAM 3XX—STATION CO LINE ACCESS

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO21	Allow Access	
CO20	Allow Access	
CO19	Allow Access	
CO18	Allow Access	
CO17	Allow Access	
CO16	Allow Access	
CO15	Allow Access	
CO14	Allow Access	
CO13	Allow Access	
CO12	Allow Access	
CO11	Allow Access	
CO10	Allow Access	
CO9	Allow Access	
CO8	Allow Access	
CO7	Allow Access	
CO6	Allow Access	
CO5	Allow Access	
CO4	Allow Access	
CO3	Allow Access	
CO2	Allow Access	
CO1	Allow Access	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO21	Allow Access	
CO20	Allow Access	
CO19	Allow Access	
CO18	Allow Access	
CO17	Allow Access	
CO16	Allow Access	
CO15	Allow Access	
CO14	Allow Access	
CO13	Allow Access	
CO12	Allow Access	
CO11	Allow Access	
CO10	Allow Access	
CO9	Allow Access	
CO8	Allow Access	
CO7	Allow Access	
CO6	Allow Access	
CO5	Allow Access	
CO4	Allow Access	
CO3	Allow Access	
CO2	Allow Access	
CO1	Allow Access	

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

PROGRAM 4XX—STATION TYPE ASSIGNMENT

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO16	Start at CO19	
CO15	Start at CO16	
CO14	Start at CO13	
CO13	Start at CO10	
CO12	Start at CO7	
CO11	Start at CO4	
CO10	Start at CO1	
CO9	Top to Bottom	
CO7	20-key pattern C	
CO6	20-key pattern B	
CO5	20-key pattern A	
CO3	Single line EKT	
CO1	10-key	
INT	20-key	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO16	Start at CO19	
CO15	Start at CO16	
CO14	Start at CO13	
CO13	Start at CO10	
CO12	Start at CO7	
CO11	Start at CO4	
CO10	Start at CO1	
CO9	Top to Bottom	
CO7	20-key pattern C	
CO6	20-key pattern B	
CO5	20-key pattern A	
CO3	Single line EKT	
CO1	10-key	
INT	20-key	

XX = Station number

Initialized Data: INT, CO5, CO10 LEDs on; all other LEDs off

PROGRAM 4#XX—STATION FLEXIBLE KEY ASSIGNMENTS (HSTU# _____)

STATION KEY								
19								
18								
17								
16								
15								
14								
13								
12								
11								
10								
9								
8								
7								
6								
5								
4								
3								
2								
1								
0	INT	INT	INT	INT	INT	INT	INT	INT

NOTES:

1. *Each code (except * for ADL) can only be assigned once per EKT. If assigned more than once, keys become ADL keys. Refer to Table 38 for feature codes.*
2. *Use multiple sheets as required (one sheet per HSTU PCB).* *Sheet _____ of _____.*

PROGRAM 5XX—STATION CLASS OF SERVICE #1

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO17	Privacy Override Allowed	
CO16	DND Override Allowed [2]	
CO15	Executive Override Allowed [3]	
CO12	Door Phone C ring	
CO11	Door Phone B ring	
CO10	Door Phone A ring	
CO9	Group Page 4	
CO8	Group Page 3	
CO7	Group Page 2	
CO6	Group Page 1	
CO5	All Call Page Allowed	
CO4	Room Monitor without Warning Tone	
CO3	Handsfree Answerback Disabled	
CO2	MIC on at start of call	
CO1	MIC key lock	
INT	Speakerphone Enable	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO17	Privacy Override Allowed	
CO16	DND Override Allowed [2]	
CO15	Executive Override Allowed [3]	
CO12	Door Phone C ring	
CO11	Door Phone B ring	
CO10	Door Phone A ring	
CO9	Group Page 4	
CO8	Group Page 3	
CO7	Group Page 2	
CO6	Group Page 1	
CO5	All Call Page Allowed	
CO4	Room Monitor without Warning Tone	
CO3	Handsfree Answerback Disabled	
CO2	MIC on at start of call	
CO1	MIC key lock	
INT	Speakerphone Enable	

Initialized Data: INT and CO5 LEDs on; all other LEDs off

PROGRAM 5#XX—STATION CLASS OF SERVICE #2

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO17	Alphanumeric LCD used	
CO16	Station-to-Station Message Waiting with LCD allowed	
CO14	Forced Account Code required	
CO12	Hold Recall Time Code*	
CO11	Hold Recall Time Code*	
CO10	Hold Recall Time Code*	
CO7	Automatic Off-Hook Selection; Group 94 or 9 (see NOTE)	
CO6	Automatic Off-Hook Selection; Group 93 or 9 (see NOTE)	
CO5	Automatic Off-Hook Selection; Group 92 or 9 (see NOTE)	
CO4	Automatic Off-Hook Selection; Group 91 or 9 (see NOTE)	
CO3	Automatic Off-Hook Selection; CO1 Position (see NOTE)	
CO2	Automatic Off-Hook Selection; INT (see NOTE)	
CO1	Ringing Line Preference	
INT	Automatic Dialing allowed	

Initialized Data: CO16, CO1, INT LEDs on; all other LEDs off

NOTE:
Only one selection possible per station; lowest selection has priority.

***Hold Recall Time Code**

KEY/LED	Prog. 05	16 Sec.	32 Sec.	48 Sec.	64 Sec.	96 Sec.	128 Sec.	160 Sec.
CO12					X	X	X	X
CO11			X	X			X	X
CO10		X		X		X		X

(continued)

PROGRAM 5#XX—STATION CLASS OF SERVICE #2 (continued)

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO17	Alphanumeric LCD used	
CO16	Station-to-Station Message Waiting with LCD allowed	
CO14	Forced Account Code required	
CO12	Hold Recall Time Code*	
CO11	Hold Recall Time Code*	
CO10	Hold Recall Time Code*	
CO7	Automatic Off-Hook Selection; Group 94 or 9 (see NOTE)	
CO6	Automatic Off-Hook Selection; Group 93 or 9 (see NOTE)	
CO5	Automatic Off-Hook Selection; Group 92 or 9 (see NOTE)	
CO4	Automatic Off-Hook Selection; Group 91 or 9 (see NOTE)	
CO3	Automatic Off-Hook Selection; CO1 Position (see NOTE)	
CO2	Automatic Off-Hook Selection; INT (see NOTE)	
CO1	Ringing Line Preference	
INT	Automatic Dialing allowed	

Initialized Data: CO16, CO1, INT LEDs on; all other LEDs off

NOTE:
Only one selection possible per station; lowest selection has priority.

***Hold Recall Time Code**

KEY/LED	Prog. 05	16 Sec.	32 Sec.	48 Sec.	64 Sec.	96 Sec.	128 Sec.	160 Sec.
CO12					X	X	X	X
CO11			X	X			X	X
CO10		X		X		X		X

PROGRAM 6XX—STATION TOLL RESTRICTION CLASSIFICATION

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO6	Class 4*	
CO5	Class 3*	
CO4	Class 2*	
CO3	Class 1*	
CO2	Restrict 0 or 1 as 1st or 2nd Digit	
CO1	Allow 1 + O/C Only	
INT	No Restriction	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO6	Class 4*	
CO5	Class 3*	
CO4	Class 2*	
CO3	Class 1*	
CO2	Restrict 0 or 1 as 1st or 2nd Digit	
CO1	Allow 1 + O/C only	
INT	No Restriction	

Initialized Data: INT LED on; all other LEDs off

* See Toll Restriction **Programs 100, 1X1, 1XY, 1XZ** and **2XY.**

PROGRAM 6#XX—STATION-to-STATION HUNTING

	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
Station Hunt Destination	

	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
Station Hunt Destination	

PROGRAM 7XX—STATION OUTGOING CALL RESTRICTION

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO21	Restricted	
CO20	Restricted	
CO19	Restricted	
CO18	Restricted	
CO17	Restricted	
CO16	Restricted	
CO15	Restricted	
CO14	Restricted	
CO13	Restricted	
CO12	Restricted	
CO11	Restricted	
CO10	Restricted	
CO9	Restricted	
CO8	Restricted	
CO7	Restricted	
CO6	Restricted	
CO5	Restricted	
CO4	Restricted	
CO3	Restricted	
CO2	Restricted	
CO1	Restricted	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO21	Restricted	
CO20	Restricted	
CO19	Restricted	
CO18	Restricted	
CO17	Restricted	
CO16	Restricted	
CO15	Restricted	
CO14	Restricted	
CO13	Restricted	
CO12	Restricted	
CO11	Restricted	
CO10	Restricted	
CO9	Restricted	
CO8	Restricted	
CO7	Restricted	
CO6	Restricted	
CO5	Restricted	
CO4	Restricted	
CO3	Restricted	
CO2	Restricted	
CO1	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 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO21	Ring in DAY	
CO20	Ring in DAY	
CO19	Ring in DAY	
CO18	Ring in DAY	
CO17	Ring in DAY	
CO16	Ring in DAY	
CO15	Ring in DAY	
CO14	Ring in DAY	
CO13	Ring in DAY	
CO12	Ring in DAY	
CO11	Ring in DAY	
CO10	Ring in DAY	
CO9	Ring in DAY	
CO8	Ring in DAY	
CO7	Ring in DAY	
CO6	Ring in DAY	
CO5	Ring in DAY	
CO4	Ring in DAY	
CO3	Ring in DAY	
CO2	Ring in DAY	
CO1	Ring in DAY	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO21	Ring in DAY	
CO20	Ring in DAY	
CO19	Ring in DAY	
CO18	Ring in DAY	
CO17	Ring in DAY	
CO16	Ring in DAY	
CO15	Ring in DAY	
CO14	Ring in DAY	
CO13	Ring in DAY	
CO12	Ring in DAY	
CO11	Ring in DAY	
CO10	Ring in DAY	
CO9	Ring in DAY	
CO8	Ring in DAY	
CO7	Ring in DAY	
CO6	Ring in DAY	
CO5	Ring in DAY	
CO4	Ring in DAY	
CO3	Ring in DAY	
CO2	Ring in DAY	
CO1	Ring in DAY	

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

NOTE:
Each line can ring on only eight stations. If more than eight are programmed, only the eight stations with the lowest station numbers will ring.

PROGRAM 8#XX—CO RINGING ASSIGNMENTS-DAY 2

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO21	Ring in DAY 2	
CO20	Ring in DAY 2	
CO19	Ring in DAY 2	
CO18	Ring in DAY 2	
CO17	Ring in DAY 2	
CO16	Ring in DAY 2	
CO15	Ring in DAY 2	
CO14	Ring in DAY 2	
CO13	Ring in DAY 2	
CO12	Ring in DAY 2	
CO11	Ring in DAY 2	
CO10	Ring in DAY 2	
CO9	Ring in DAY 2	
CO8	Ring in DAY 2	
CO7	Ring in DAY 2	
CO6	Ring in DAY 2	
CO5	Ring in DAY 2	
CO4	Ring in DAY 2	
CO3	Ring in DAY 2	
CO2	Ring in DAY 2	
CO1	Ring in DAY 2	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO21	Ring in DAY 2	
CO20	Ring in DAY 2	
CO19	Ring in DAY 2	
CO18	Ring in DAY 2	
CO17	Ring in DAY 2	
CO16	Ring in DAY 2	
CO15	Ring in DAY 2	
CO14	Ring in DAY 2	
CO13	Ring in DAY 2	
CO12	Ring in DAY 2	
CO11	Ring in DAY 2	
CO10	Ring in DAY 2	
CO9	Ring in DAY 2	
CO8	Ring in DAY 2	
CO7	Ring in DAY 2	
CO6	Ring in DAY 2	
CO5	Ring in DAY 2	
CO4	Ring in DAY 2	
CO3	Ring in DAY 2	
CO2	Ring in DAY 2	
CO1	Ring in DAY 2	

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

NOTE:
Each line can ring on only eight stations. If more than eight are programmed, only the eight stations with the lowest station numbers will ring. This program is used only if the CO8 LED was turned on in ***Program 03****.*

PROGRAM 9XX—CO RINGING ASSIGNMENTS-NITE

KEY/LED	FEATURE	STATION NUMBERS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
CO21	Ring in NITE	
CO20	Ring in NITE	
CO19	Ring in NITE	
CO18	Ring in NITE	
CO17	Ring in NITE	
CO16	Ring in NITE	
CO15	Ring in NITE	
CO14	Ring in NITE	
CO13	Ring in NITE	
CO12	Ring in NITE	
CO11	Ring in NITE	
CO10	Ring in NITE	
CO9	Ring in NITE	
CO8	Ring in NITE	
CO7	Ring in NITE	
CO6	Ring in NITE	
CO5	Ring in NITE	
CO4	Ring in NITE	
CO3	Ring in NITE	
CO2	Ring in NITE	
CO1	Ring in NITE	

KEY/LED	FEATURE	STATION NUMBERS 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
CO21	Ring in NITE	
CO20	Ring in NITE	
CO19	Ring in NITE	
CO18	Ring in NITE	
CO17	Ring in NITE	
CO16	Ring in NITE	
CO15	Ring in NITE	
CO14	Ring in NITE	
CO13	Ring in NITE	
CO12	Ring in NITE	
CO11	Ring in NITE	
CO10	Ring in NITE	
CO9	Ring in NITE	
CO8	Ring in NITE	
CO7	Ring in NITE	
CO6	Ring in NITE	
CO5	Ring in NITE	
CO4	Ring in NITE	
CO3	Ring in NITE	
CO2	Ring in NITE	
CO1	Ring in NITE	

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

NOTE:
Each line can ring on only eight stations. If more than eight are programmed, only the eight stations with the lowest station numbers will ring.

FAULT FINDING
SECTION 300-020-500
DECEMBER 1986

Strata XII_e & XX_e

FAULT FINDING PROCEDURES

STRATA XII_e & XX_e

FAULT FINDING

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ILLUSTRATION LIST

FIGURE	TITLE	PAGE
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01 GENERAL

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

02 FAULT CLASSIFICATION

02.01 A Fault Classification Flowchart is provided to ensure that fault clearing is pursued in a logical sequence (Chart No. 1).

02.02 An assumption is made in the flowcharts 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 flowcharts in Table A are organized into the following categories:

Table A—Flowcharts

Flowchart	Title
1	Fault Classification
2	Power Faults
3	Station Faults
4	HKSU Faults
5	CO Line Faults
6	Intercom Faults
7	DSS Faults
8	Automatic Dialing Faults
9	MOH, BGM, Page and Relay Service Faults
10	SMDR Faults
11	OPX Faults
12	OPL Faults
13	Door Phone Faults
14	TIE Line (HTIB) Faults

03 FAULT CLEARING PROCEDURES

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

IMPORTANT!

Many system features are assigned, enabled or disabled using software entries as described in Programming Procedures. ***Further, with the exception of*** **Programs 5XX ~ 9XX, *programming changes are not effective until the new data has been secured in working memory (see Paragraph*** 02.06 ***of*** Programming Procedures***). It is important to verify that the system programming is correct and functional before troubleshooting the hardware.***

03.02 In new systems, or when the HCAU/CAAU PCB has been changed, the initialization procedure must be performed before testing. The system data stored on the original HCAU/CAAU will be protected from loss by the backup battery on that PCB. Therefore, the initialization sequence *should not* be performed if the original PCB is reinstalled.

03.03 Faults in the system are cleared by replacing PCBs, EKTs or the power supply, as instructed in the flowcharts.

03.04 Five symbols are used in the flowcharts, which are identified in Figure 1.

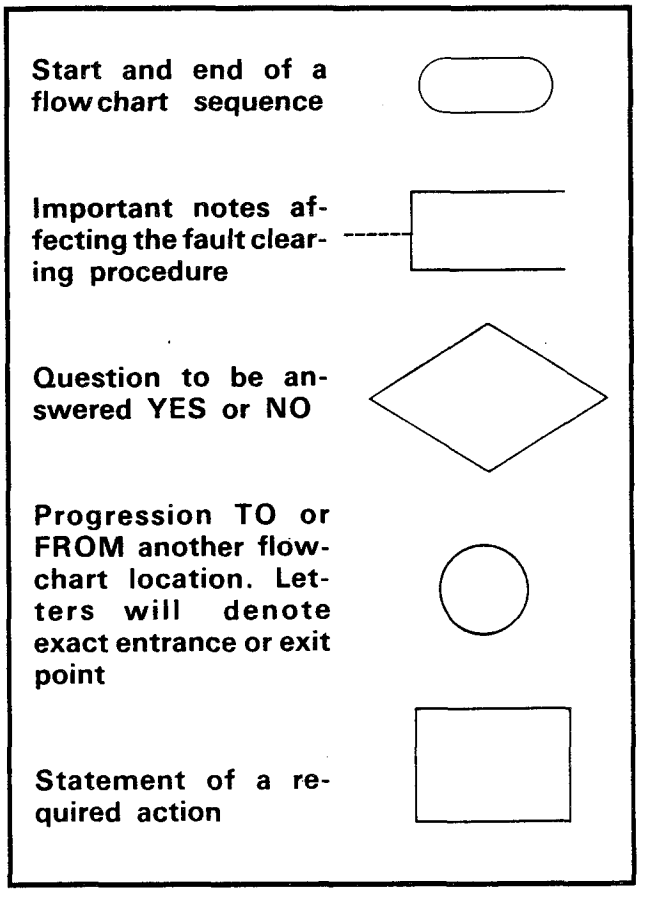

FIGURE 1—FLOWCHART SYMBOLS

03.05 The flowcharts are sequentially arranged to permit rapid fault localization within the system. *All fault clearing must begin with the*

Fault Classification Flowchart, which is arranged in the correct fault locating sequence.

03.06 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 the grounded HKSU.
- Touch PCB contacts with your fingers.

IMPORTANT!
If the fault is not cleared by substituting a PCB, the original PCB must be reinstalled in the HKSU* before *trying another PCB.

04
DEFECTIVE APPARATUS RETURNS

04.01 When a defective system apparatus is shipped for repair, the apparatus must be packed in a suitable container (the original box is highly recommended), as follows:

a) Paper container for the HCAU/CAAU PCB.

b) Anti-static containers for all other PCBs.

c) Plastic bags for EKTs, HKSU, etc.

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

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 HCAU/CAAU PCB 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 HCAU/CAAU PCB for repair. The correct procedure for this is to reinstall the HCAU/CAAU, perform the initialization procedure, and then reprogram the system as necessary to test for the fault. If the fault returns after these procedures are performed, tag the defective HCAU/CAAU PCB and return it for repair.

06 POWER SUPPLY

06.01 If a power supply fault is suspected, the power supply (HPSU 8120/9120) should be removed from the HKSU. Figure 2 shows the locations of the voltage checks on the rear of the HPSU. Voltages should fall within the following ranges:

Nominal	Range
+24	+23.0 ~ 29.0
+12	+10.8 ~ 13.2
+5	+4.75 ~ 5.25

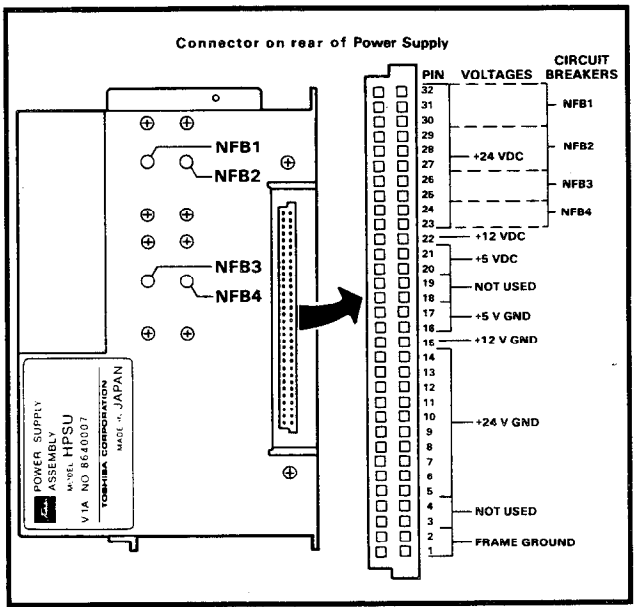

FIGURE 2—HPSU VOLTAGE CHECKS

06.02 If voltage checks indicate a power supply fault, replace the HPSU with a correctly operating unit. Refer to the *Installation* section of this manual for HPSU installation procedures.

07
STATION CABLE CONTINUITY CHECK

07.01 Voltmeter Test

07.02 The continuity of the cable run between the HKSU and the EKT is checked with a voltmeter as follows:

NOTE:
Perform the following at the locations indicated:
1. Modular block: Check all station cables.
2. MDF: Check cable from HKSU to MDF.

1) Disconnect the EKT.

2) Using a DC voltmeter, measure between the wires of the two pairs to verify the readings shown in Table B.

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.

TABLE B

STATION CABLE CONTINUITY CHECK USING VOLTMETER

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

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

07.10 Ohmmeter Test

07.11 The continuity of the cable run between the HKSU and the EKT is checked with an ohmmeter as follows:

1) Disconnect the EKT.

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 M ohm.

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 shown in Table C.

TABLE C

STATION CABLE CONTINUITY CHECK USING OHMMETER

FROM			TO			RESISTANCE
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	1M ohm
1	R	Red	2	T	Black	1M ohm
1	T	Green	2	R	Yellow	1M ohm
1	R	Red	2	R	Yellow	1M ohm
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

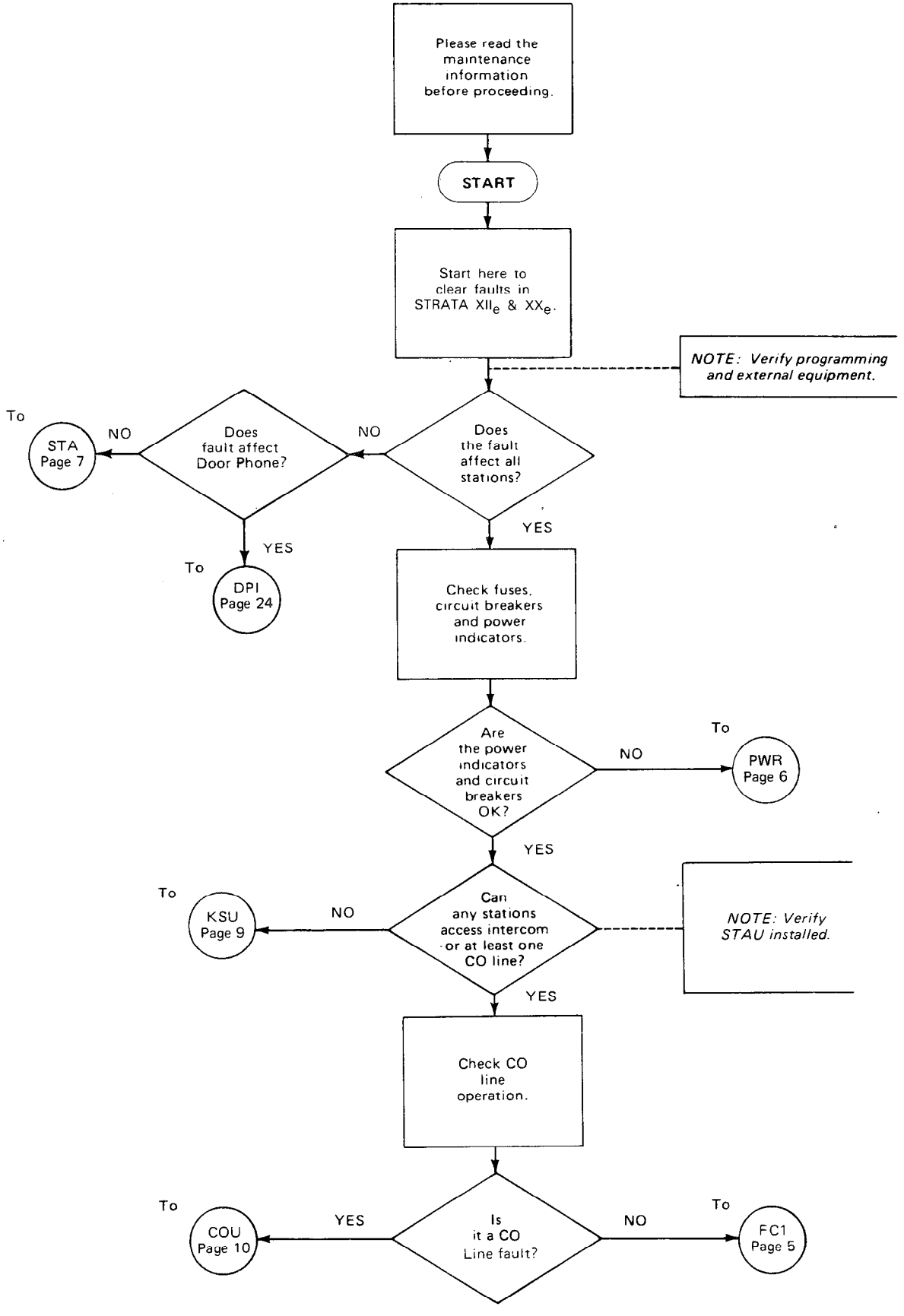

CHART NO. 1
FAULT CLASSIFICATION (cont.)

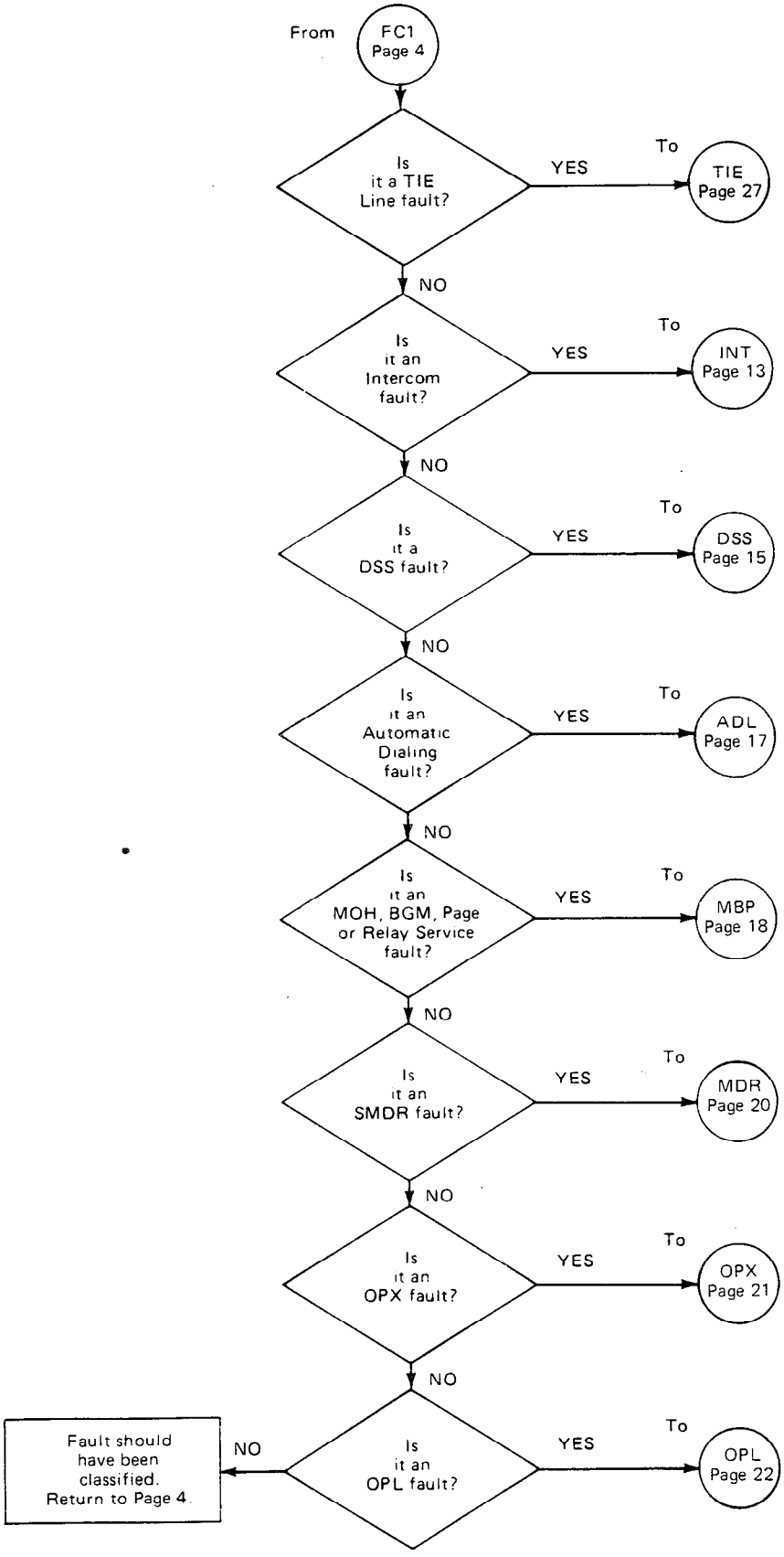

CHART NO. 2
POWER FAULTS

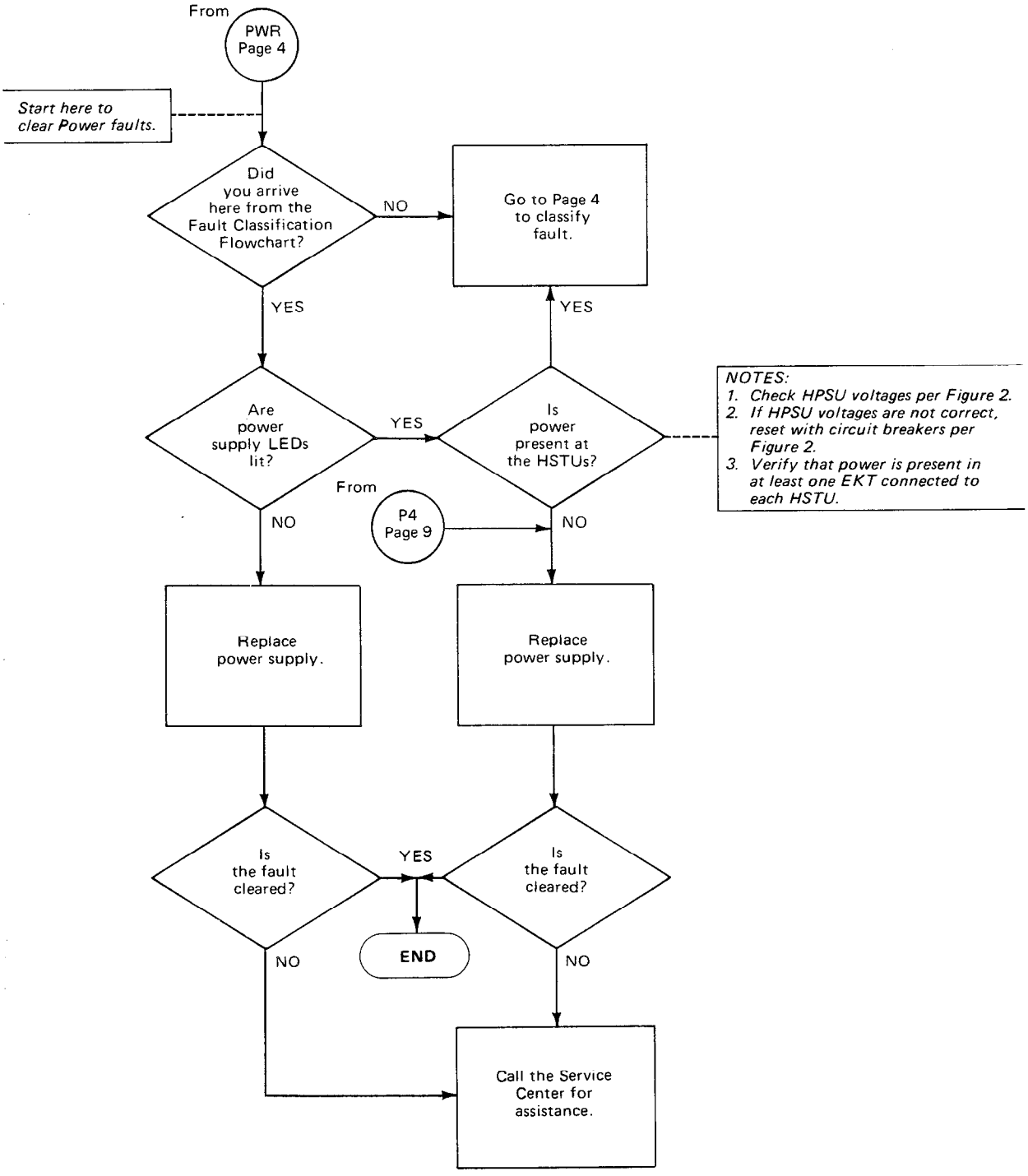

CHART NO. 3
STATION FAULTS

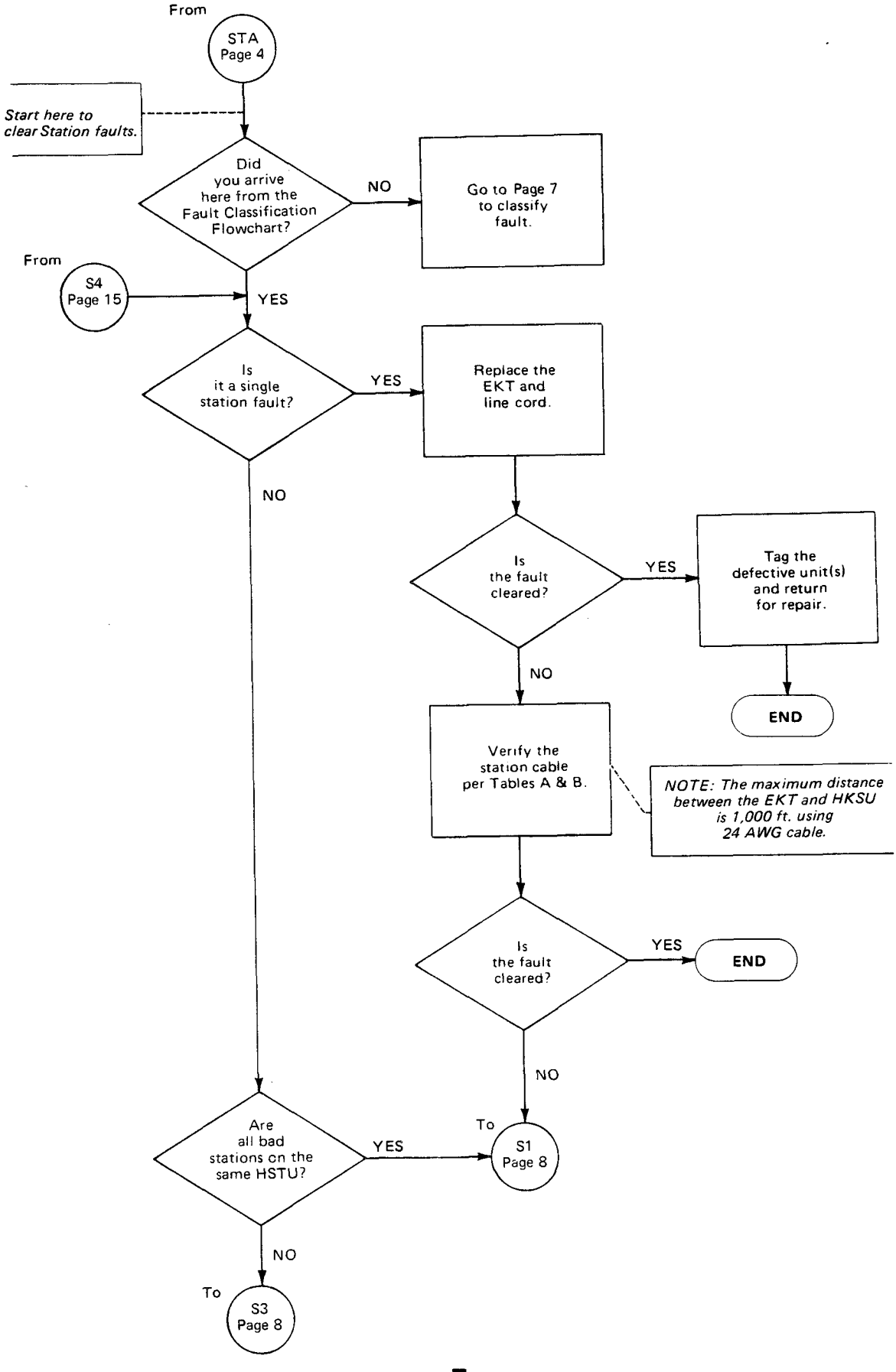

CHART NO. 3
STATION FAULTS (cont.)

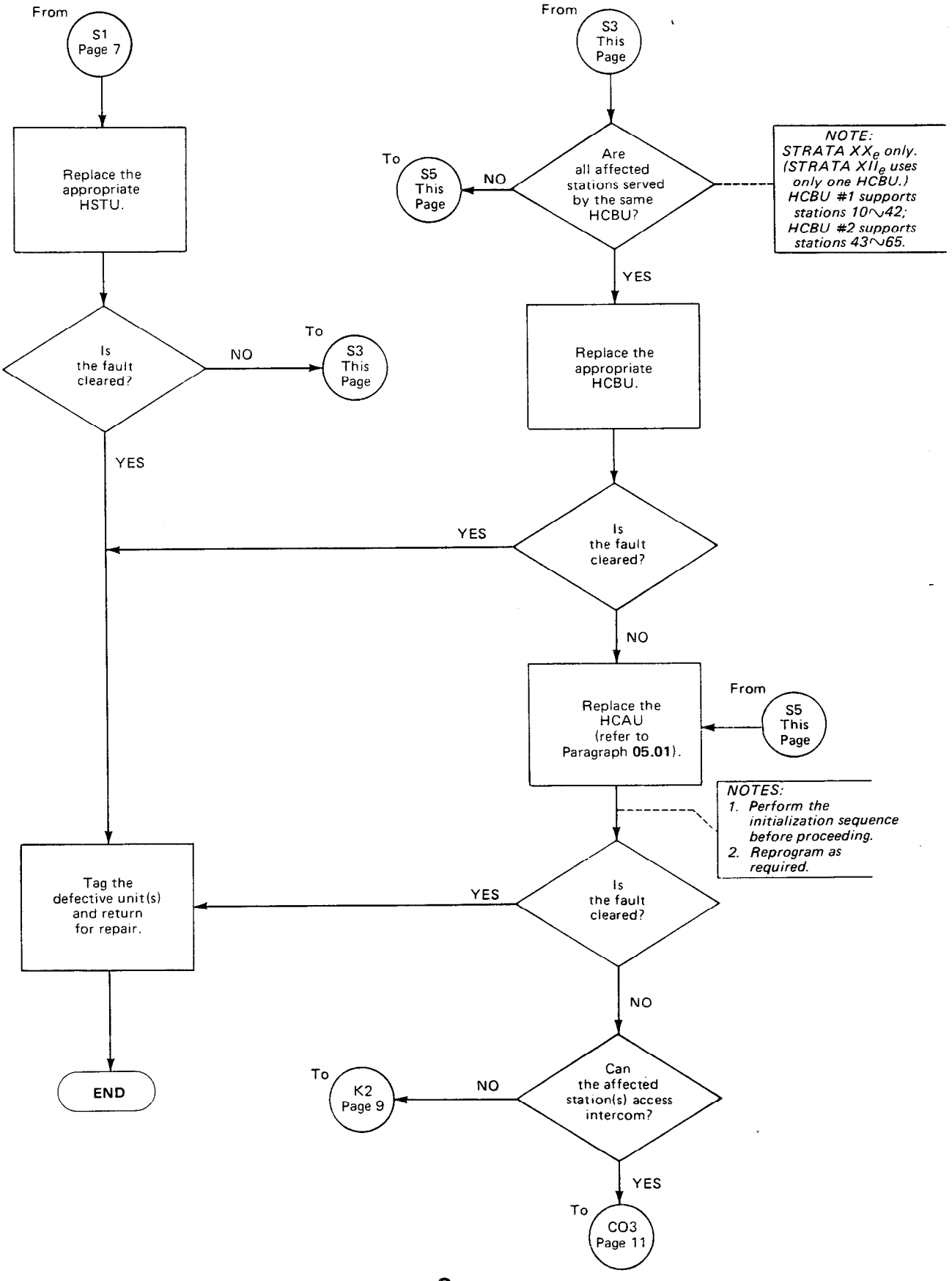

CHART NO. 4
HKSU FAULTS

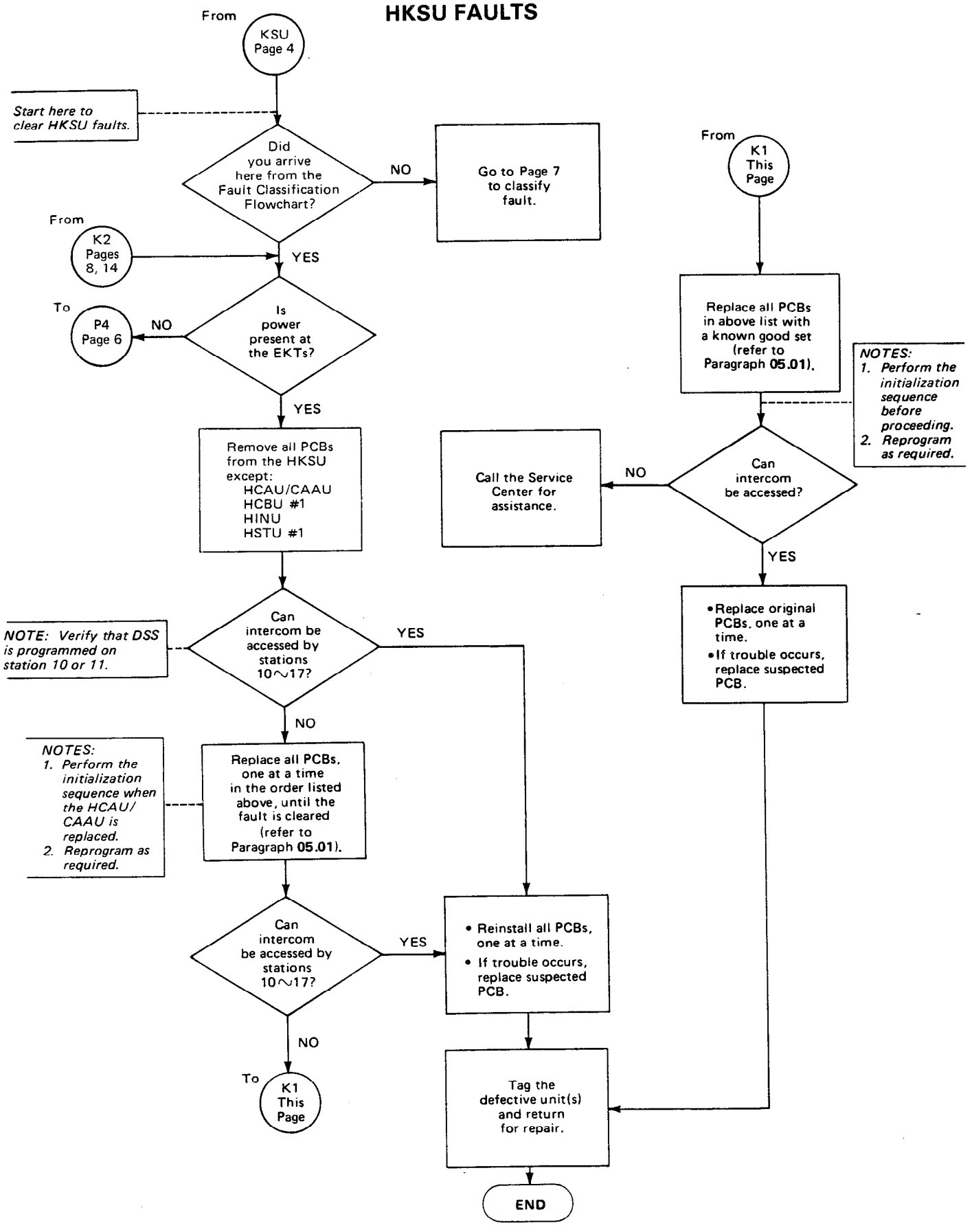

CHART NO. 5
CO LINE FAULTS

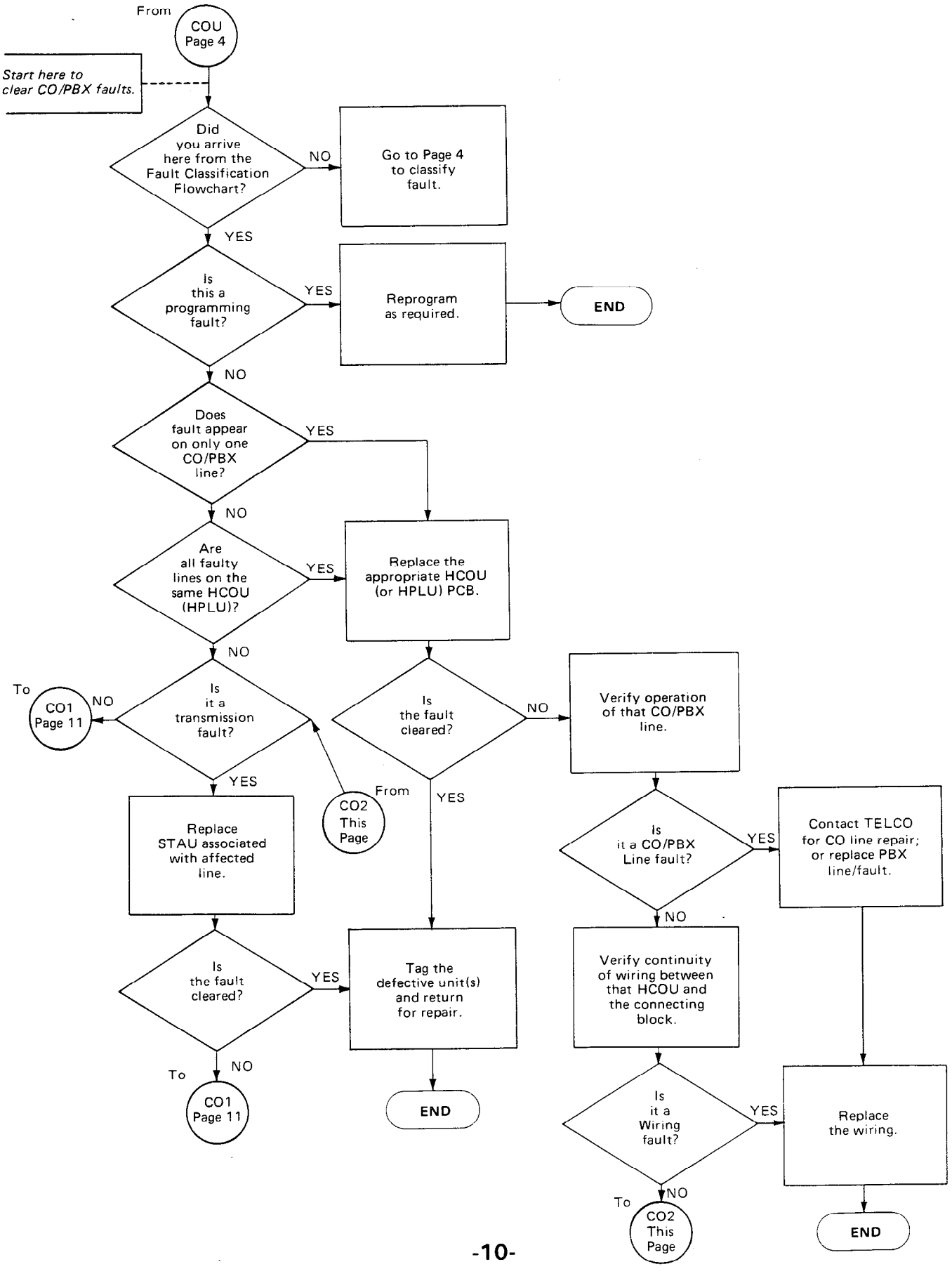

CHART NO. 5
CO LINE FAULTS (cont.)

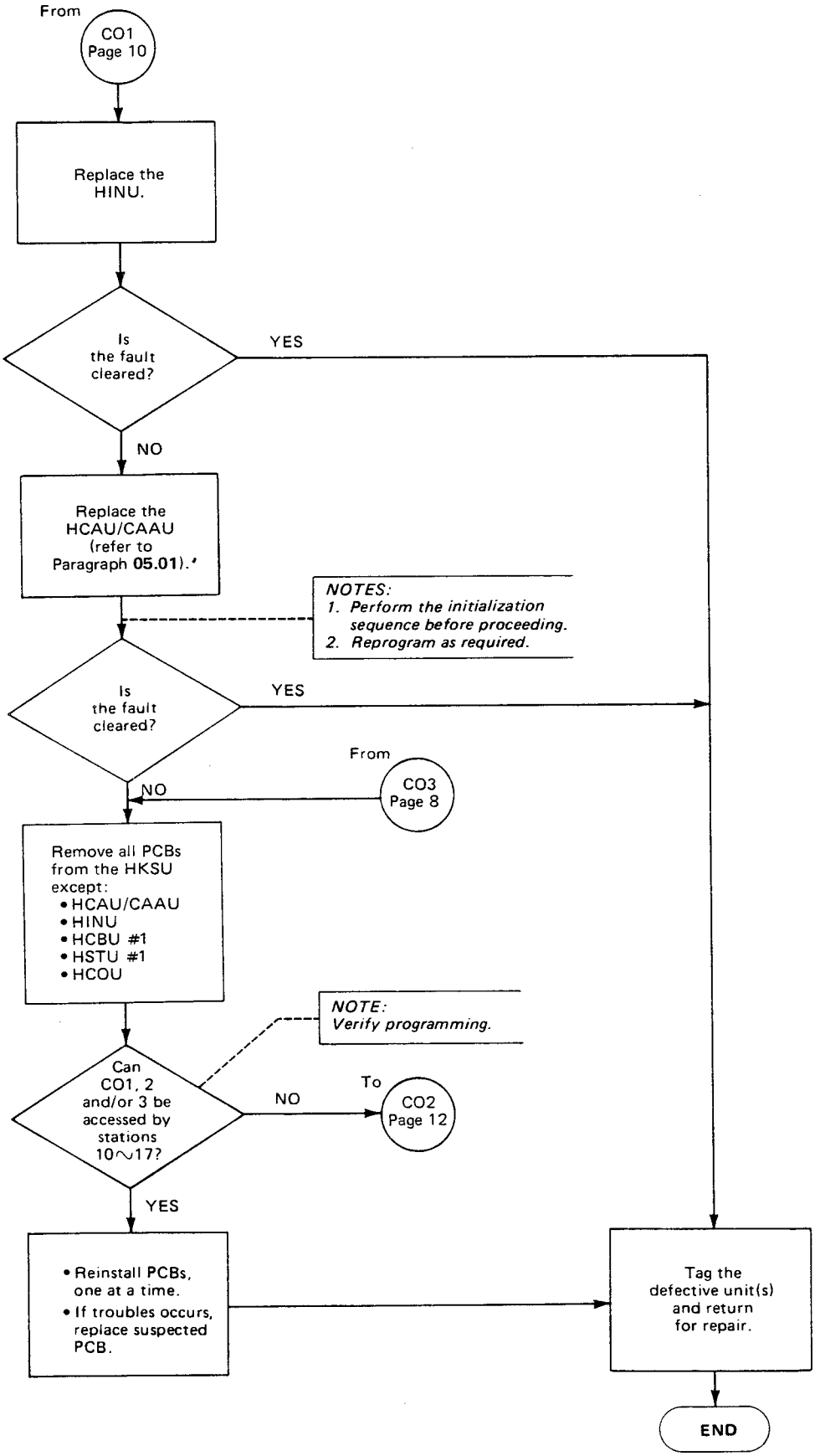

CHART NO. 5
CO LINE FAULTS (cont.)

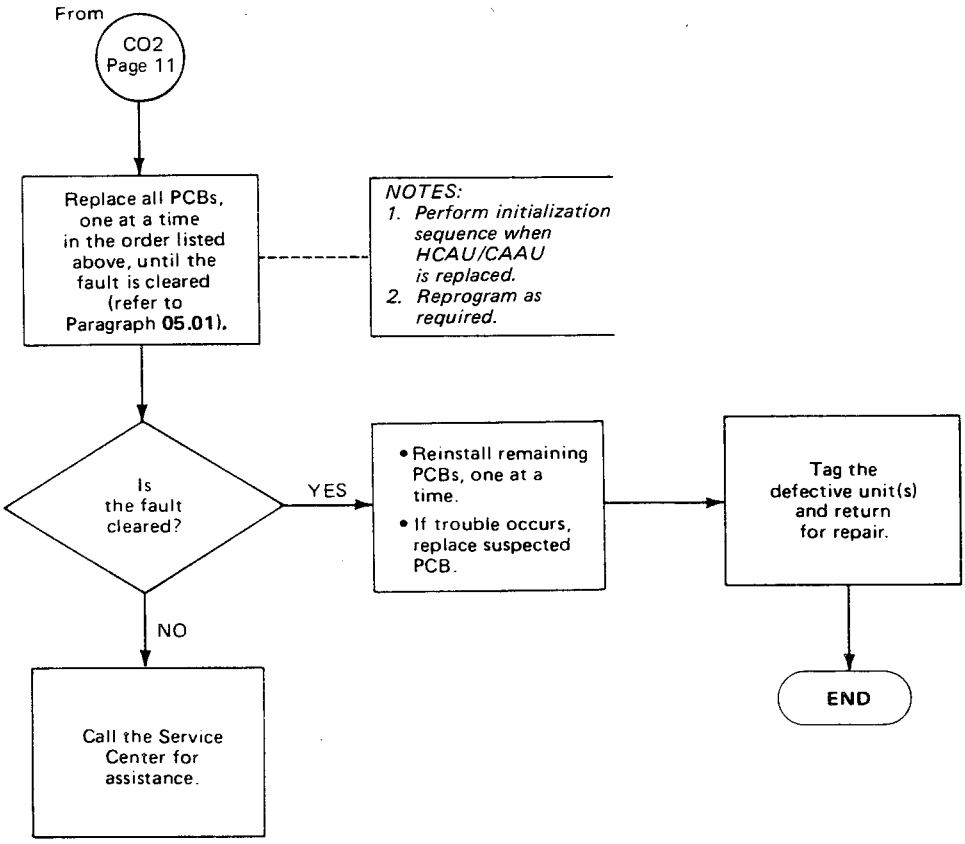

CHART NO. 6
INTERCOM FAULTS

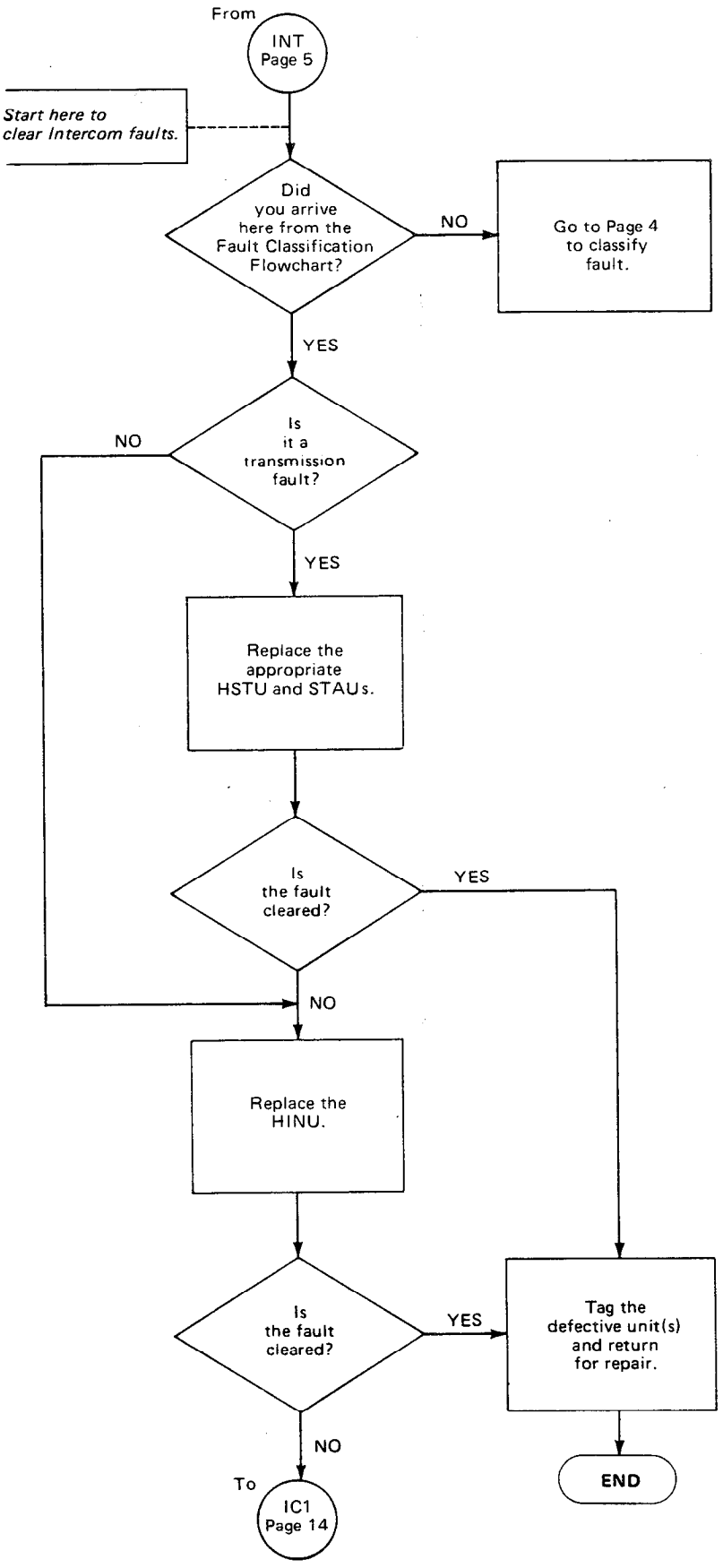

CHART NO. 6
INTERCOM FAULTS (cont.)

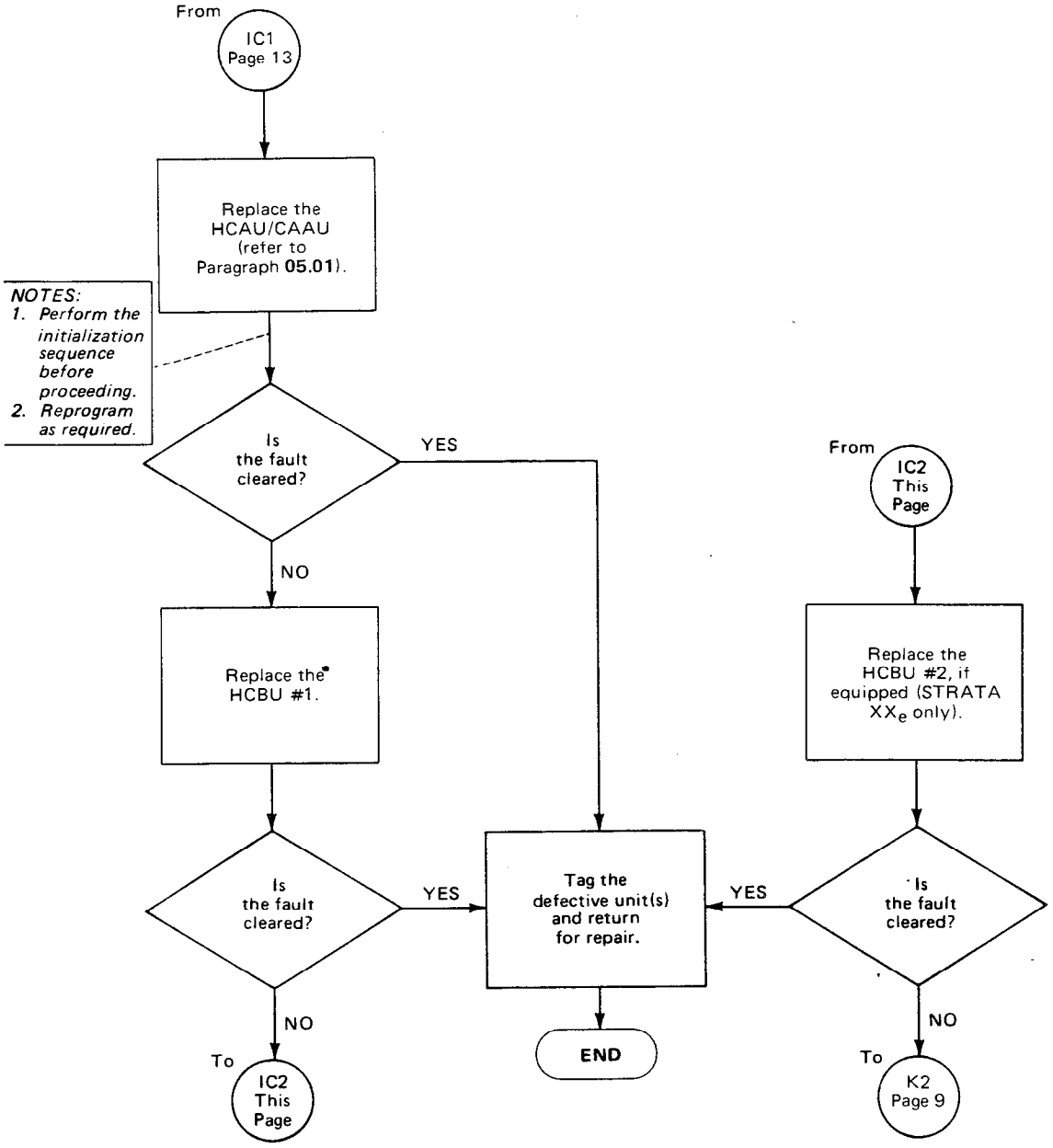

CHART NO. 7
DSS FAULTS

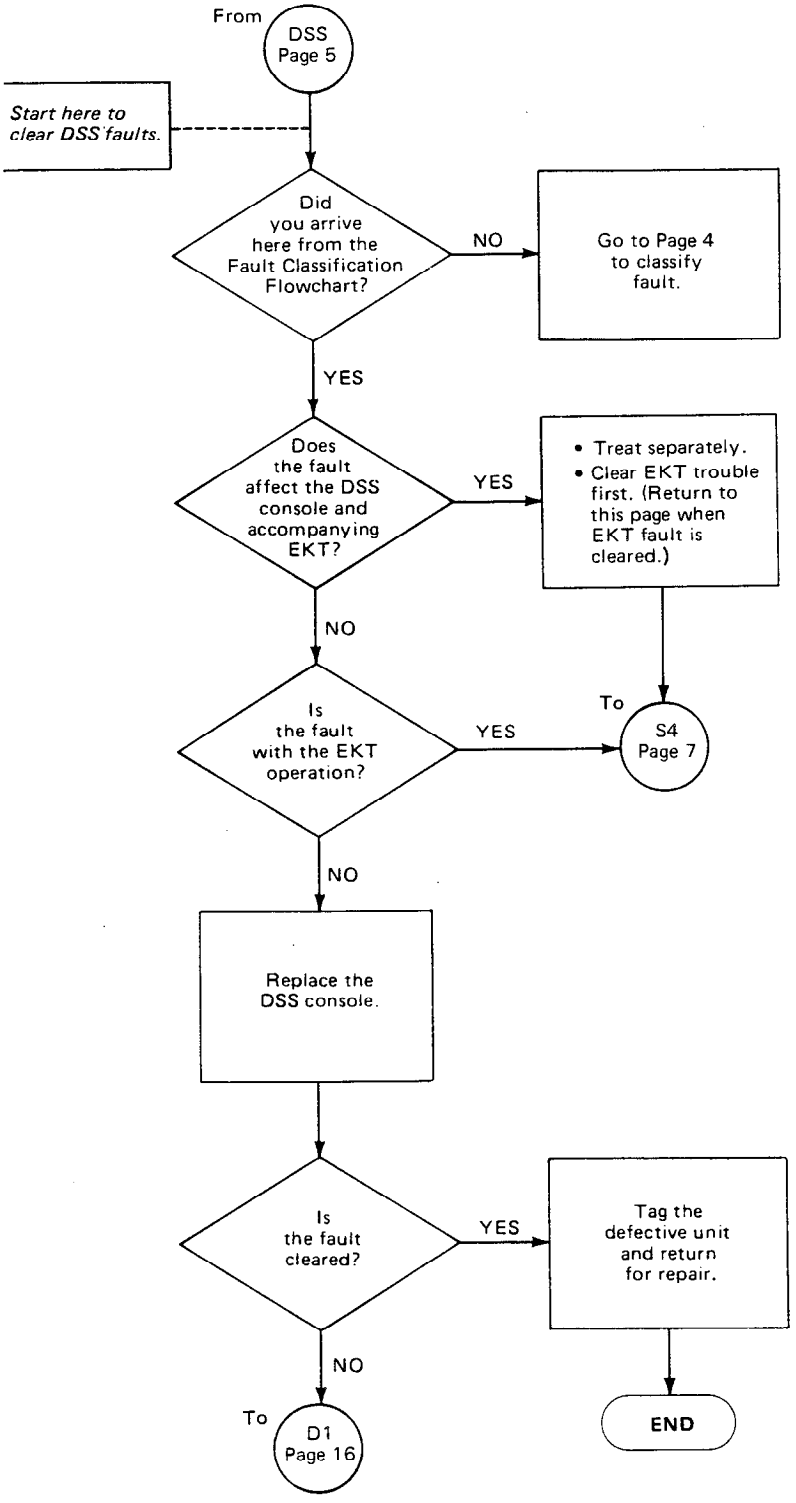

CHART NO. 7
DSS FAULTS (cont.)

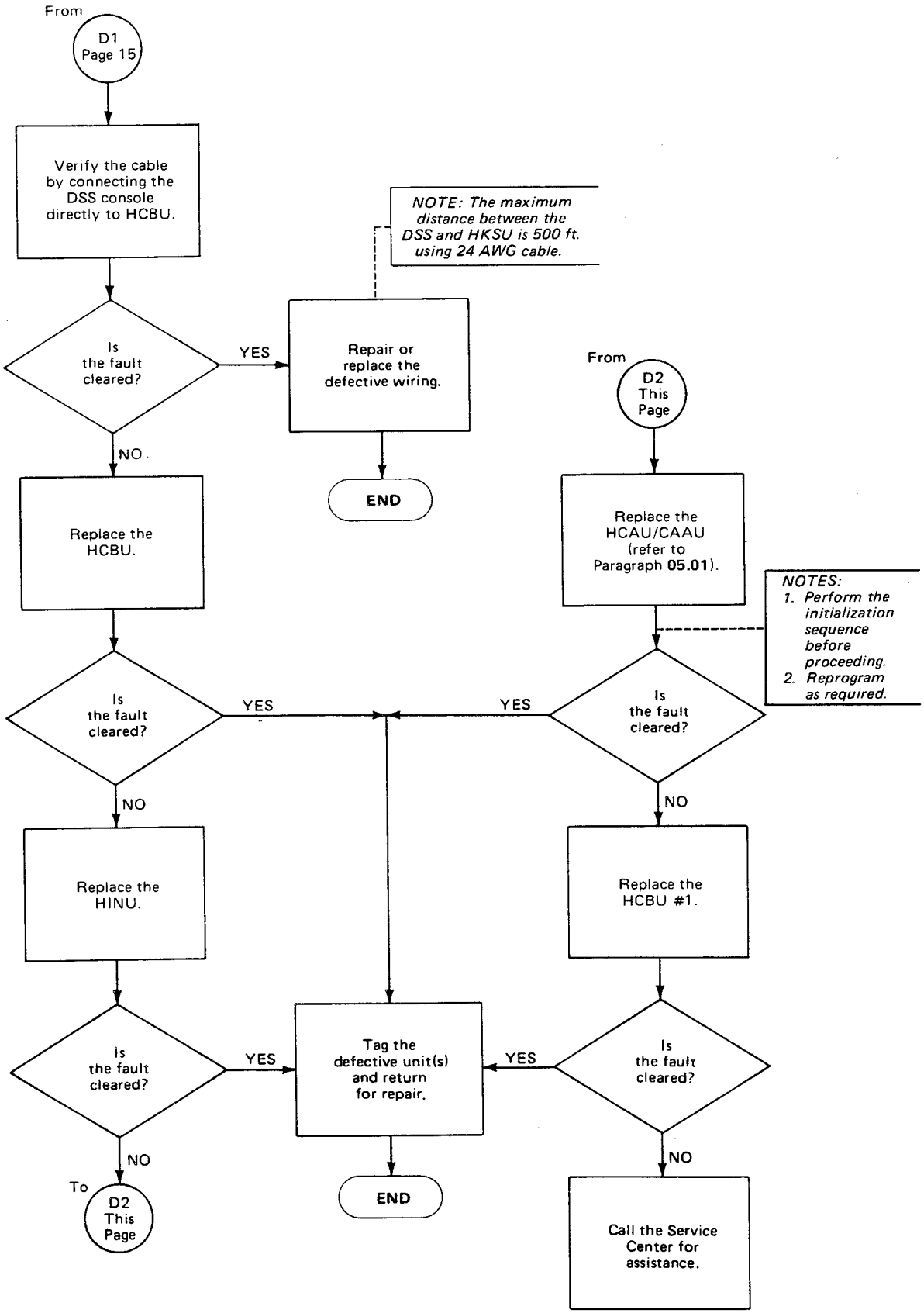

CHART NO. 8
AUTOMATIC DIALING FAULTS

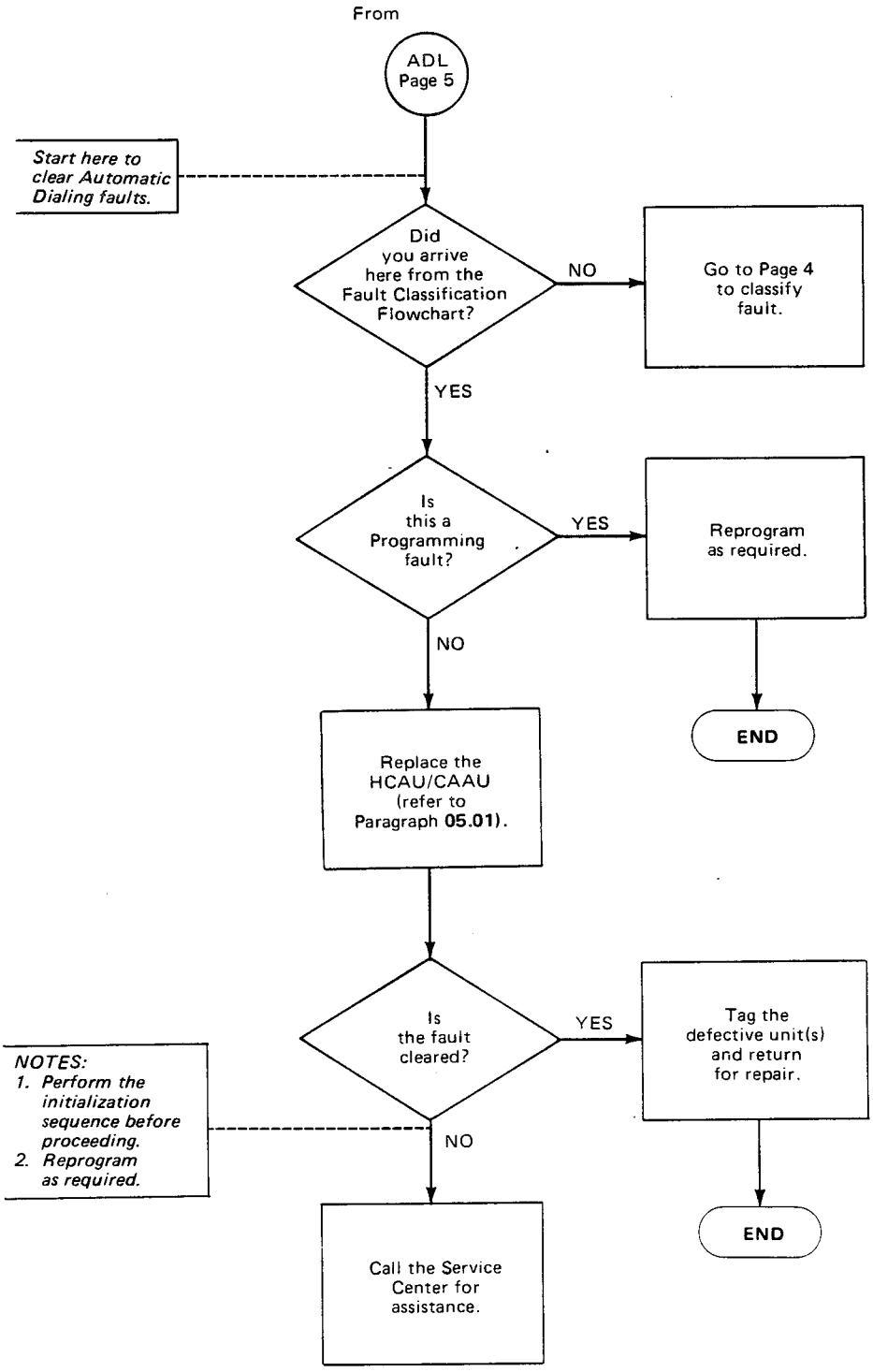

CHART NO. 9
MOH, BGM, PAGE & RELAY SERVICE FAULTS

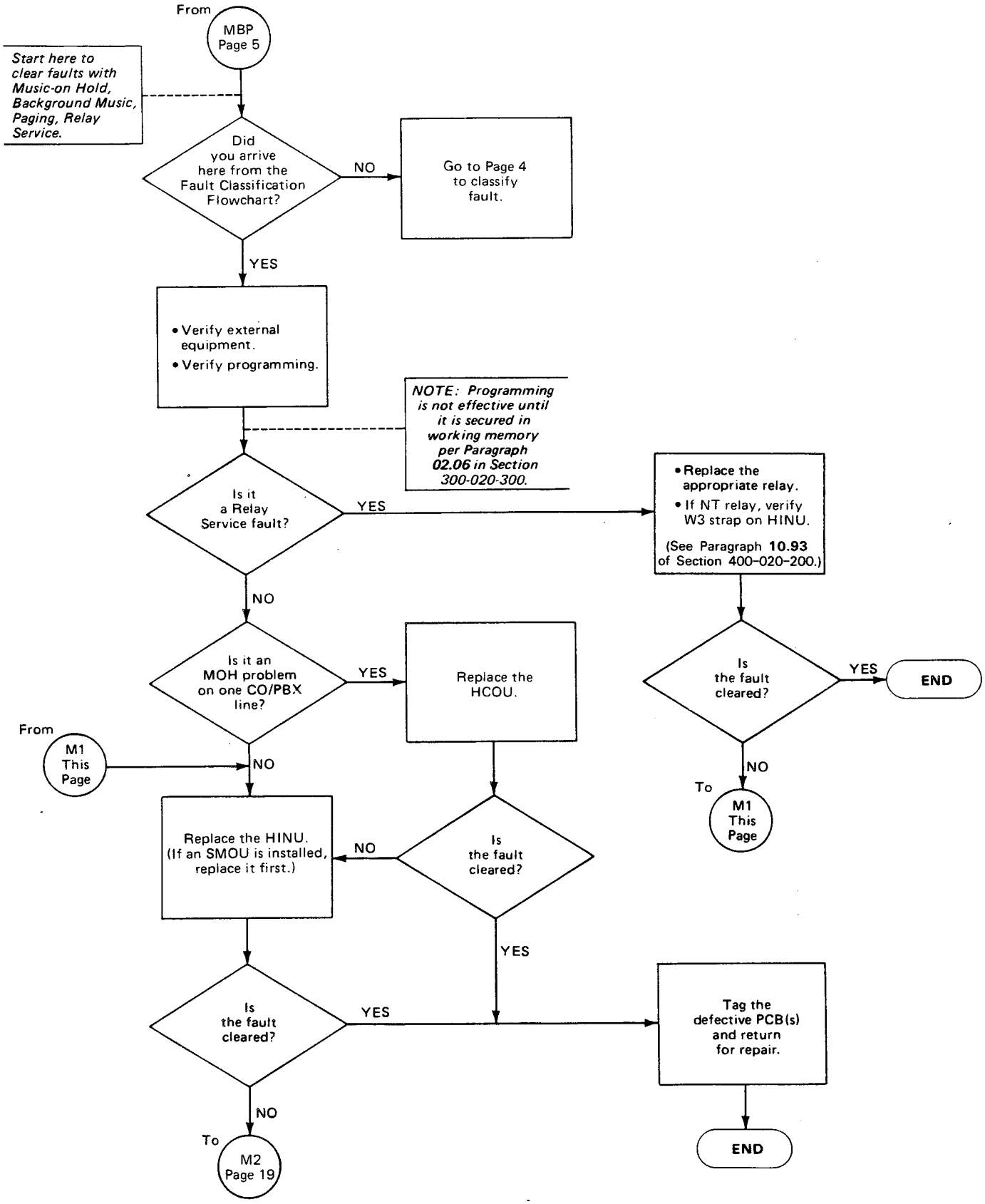

CHART NO. 9
MOH, BGM, PAGE & RELAY SERVICE FAULTS (cont.)

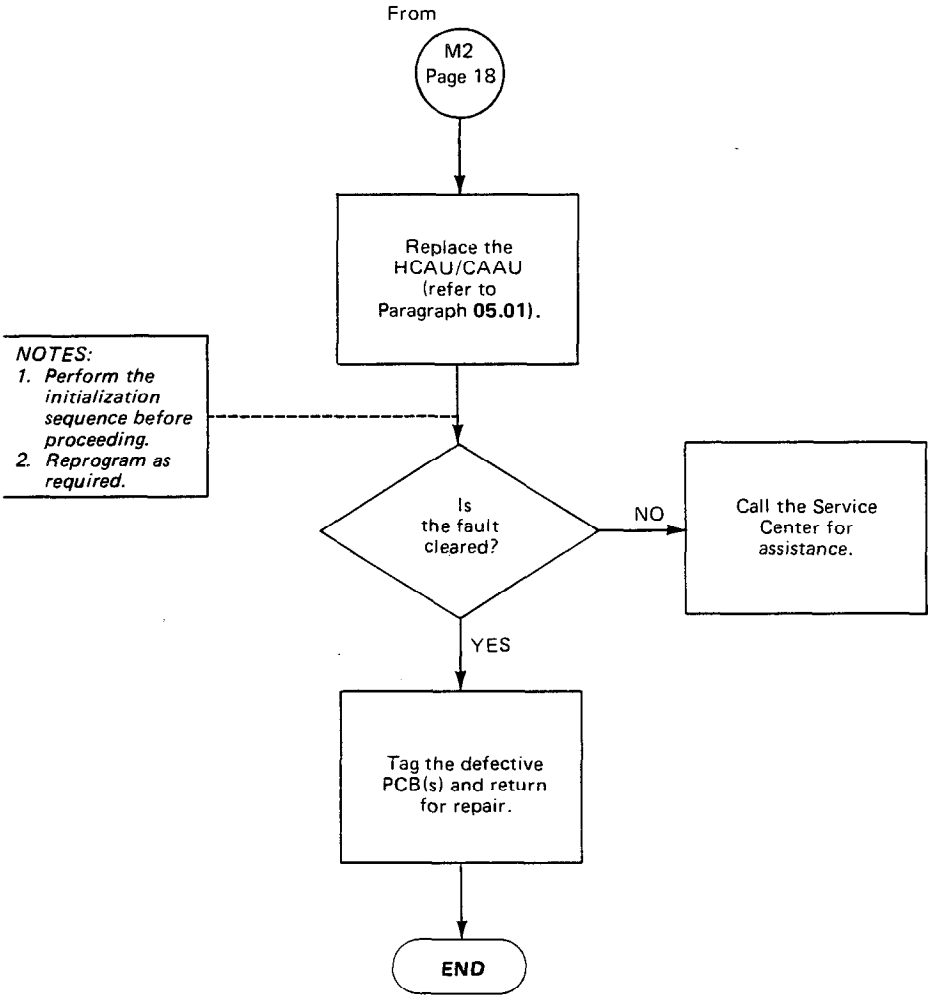

CHART NO. 10
SMDR FAULTS

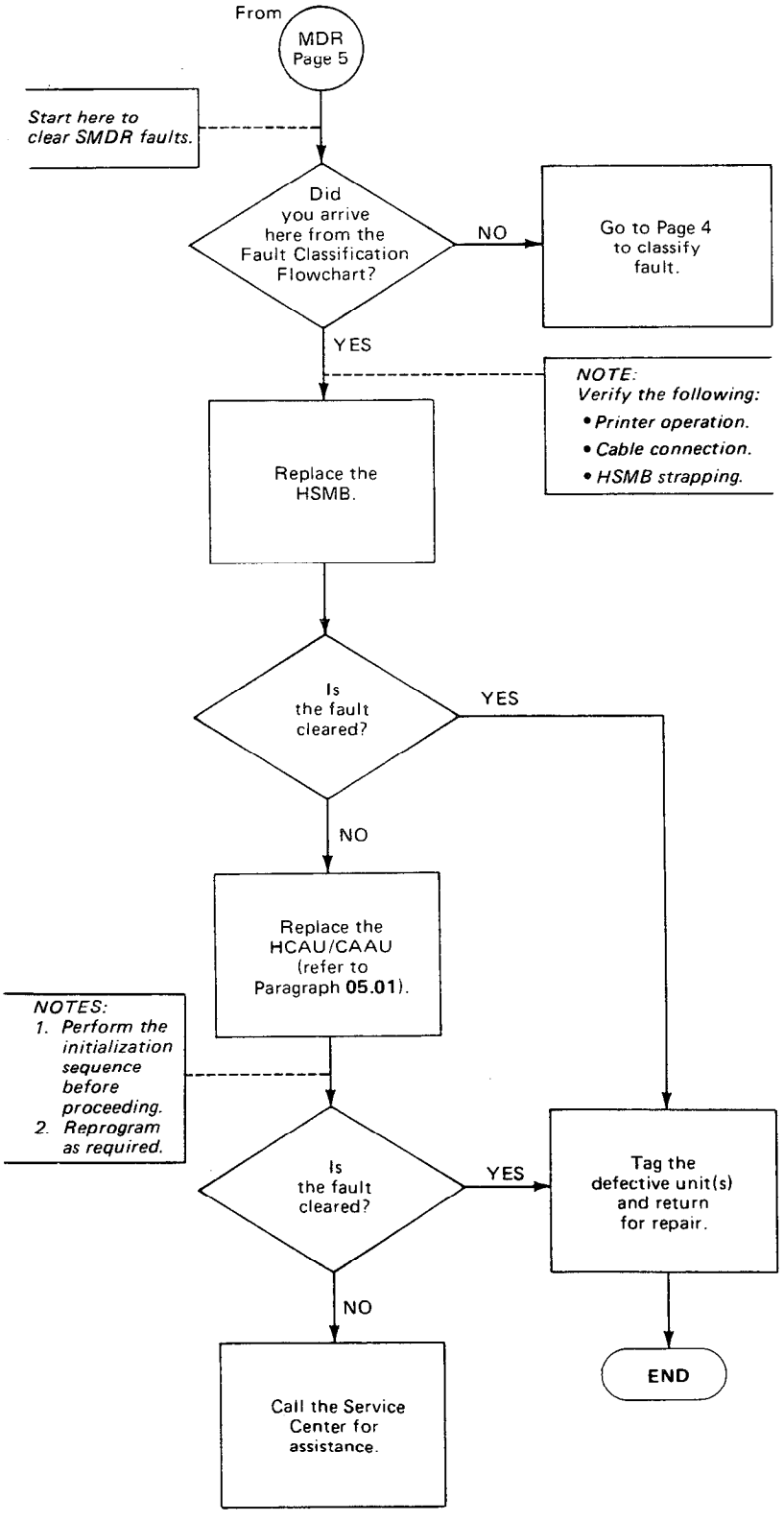

CHART NO. 11
OPX FAULTS

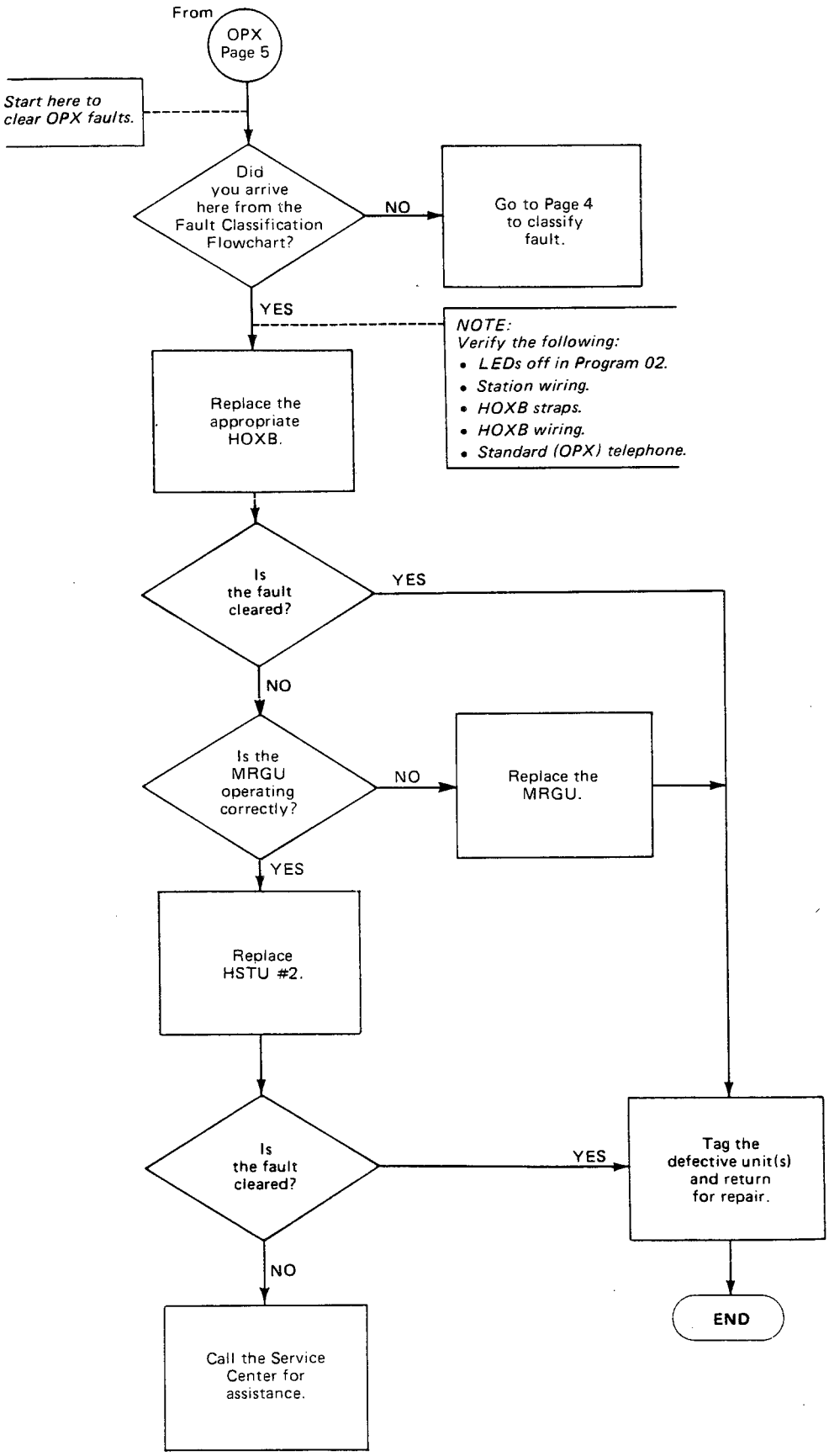

CHART NO. 12
OPL FAULTS

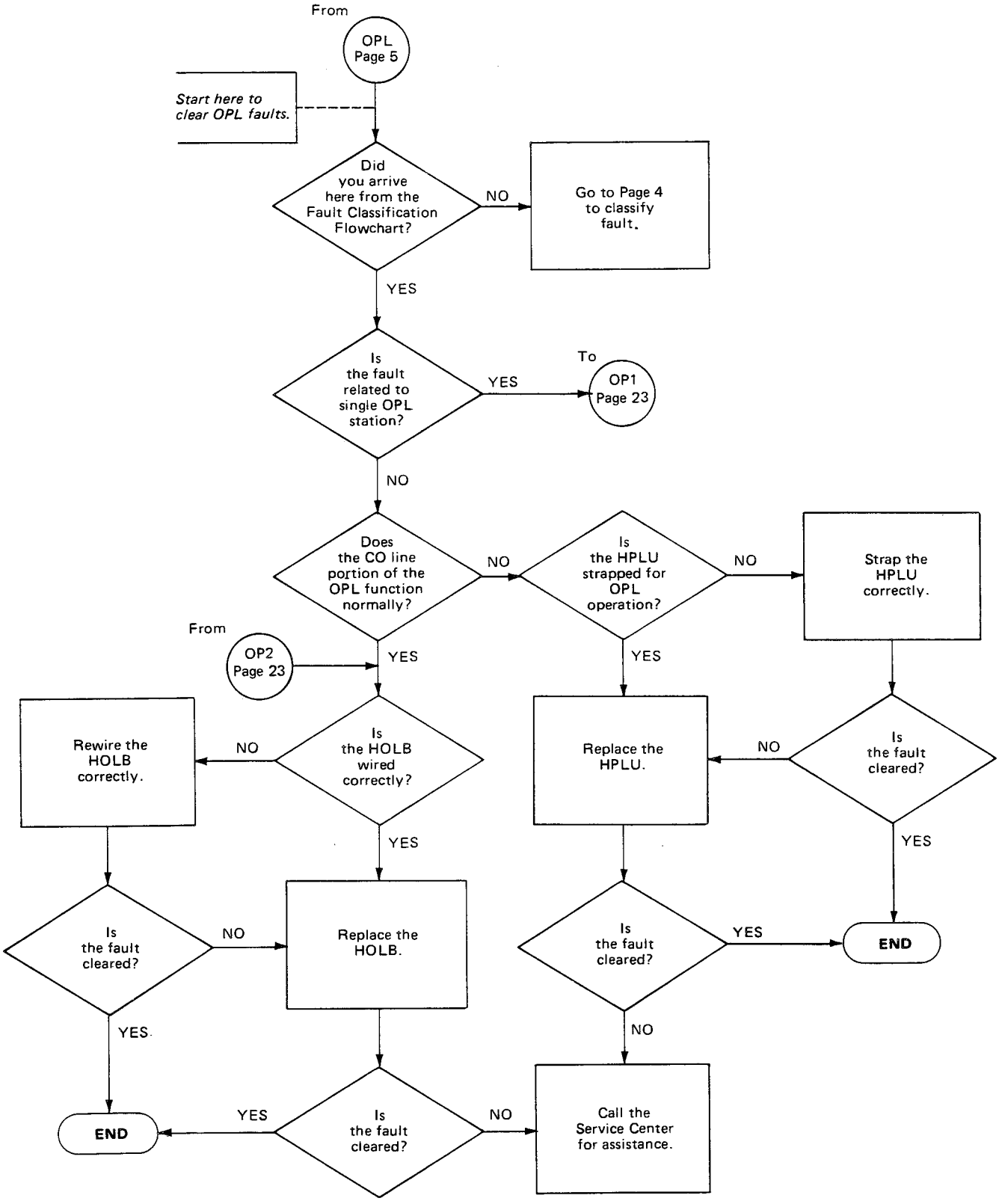

CHART NO. 12
OPL FAULTS (cont.)

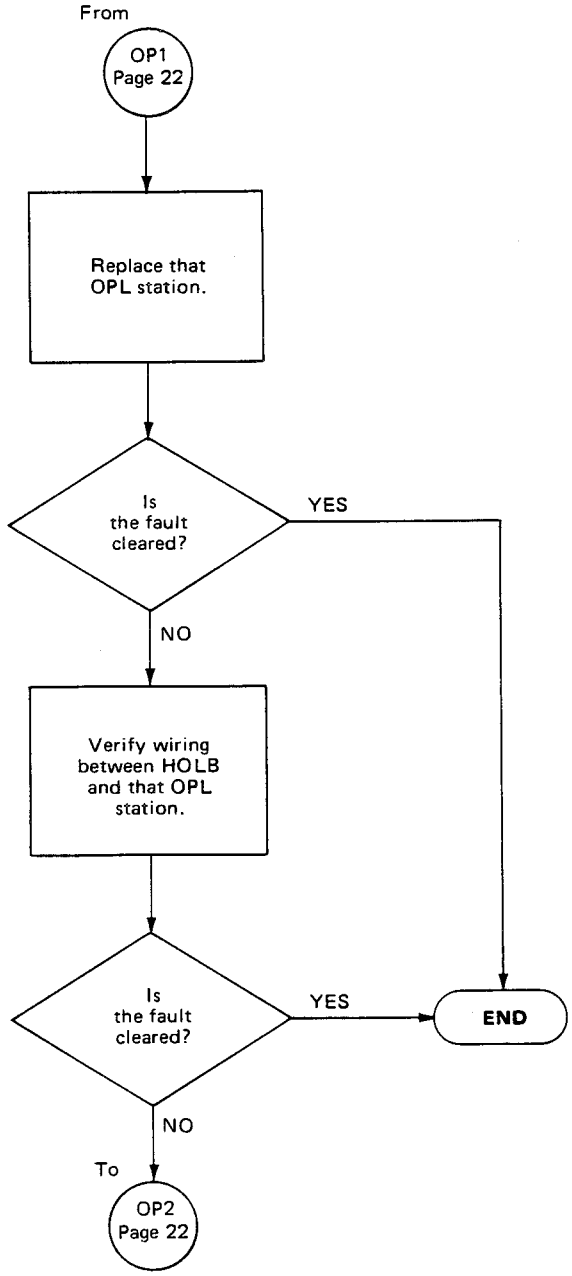

CHART NO. 13
DOOR PHONE FAULTS

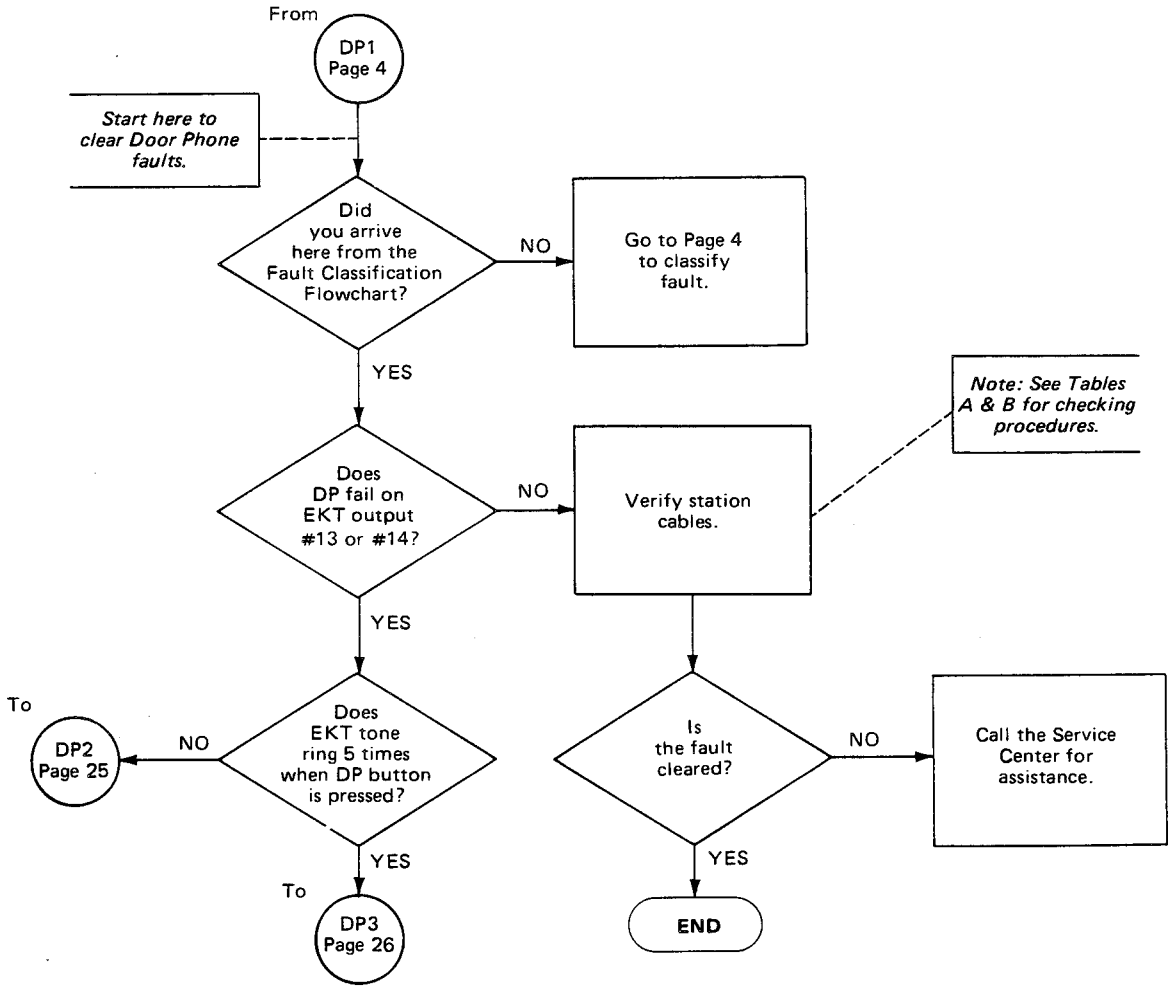

CHART NO. 13
DOOR PHONE FAULTS (cont.)

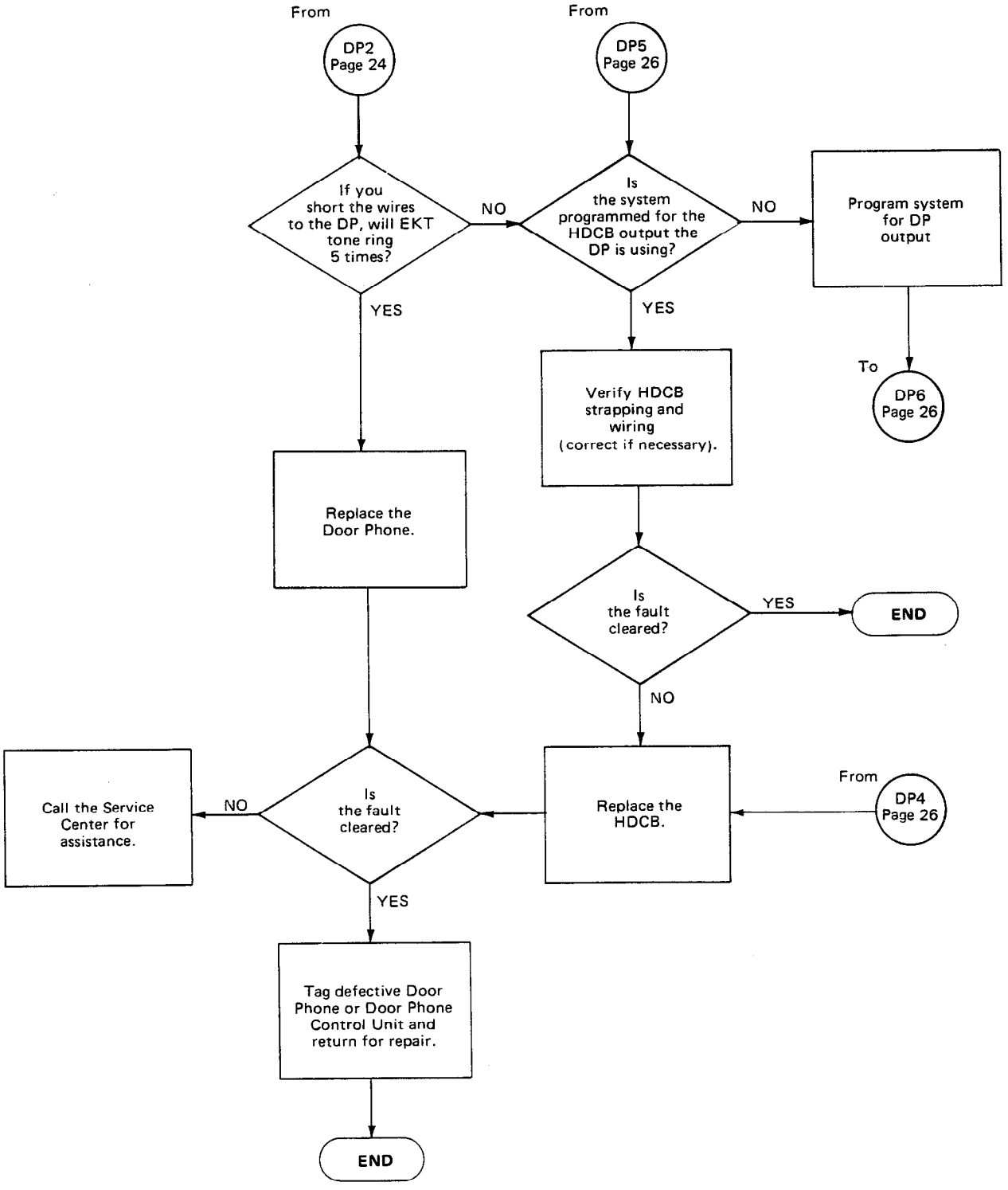

CHART NO. 13
DOOR PHONE FAULTS (cont.)

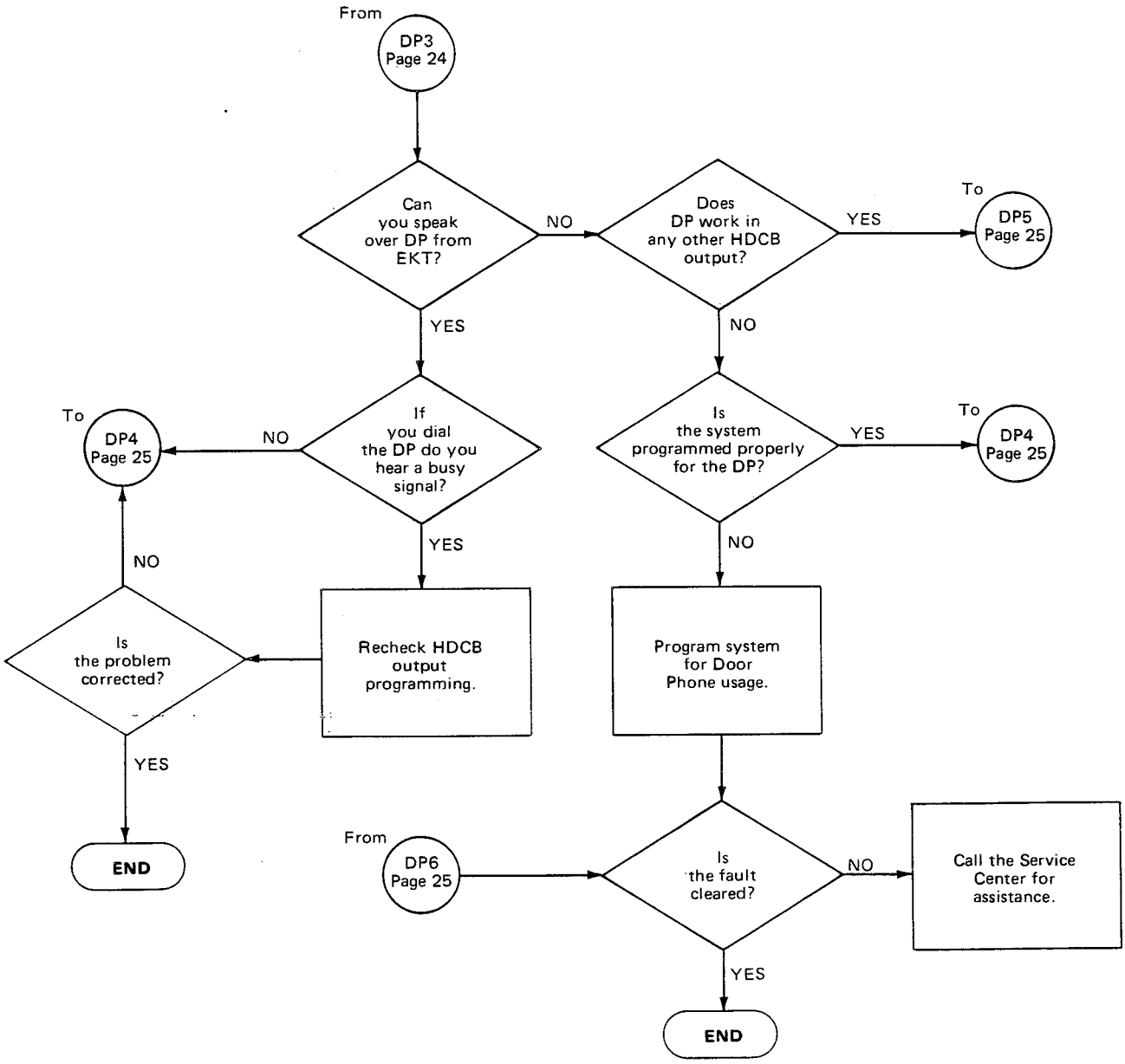

CHART NO. 14
TIE LINE (HTIB) FAULTS

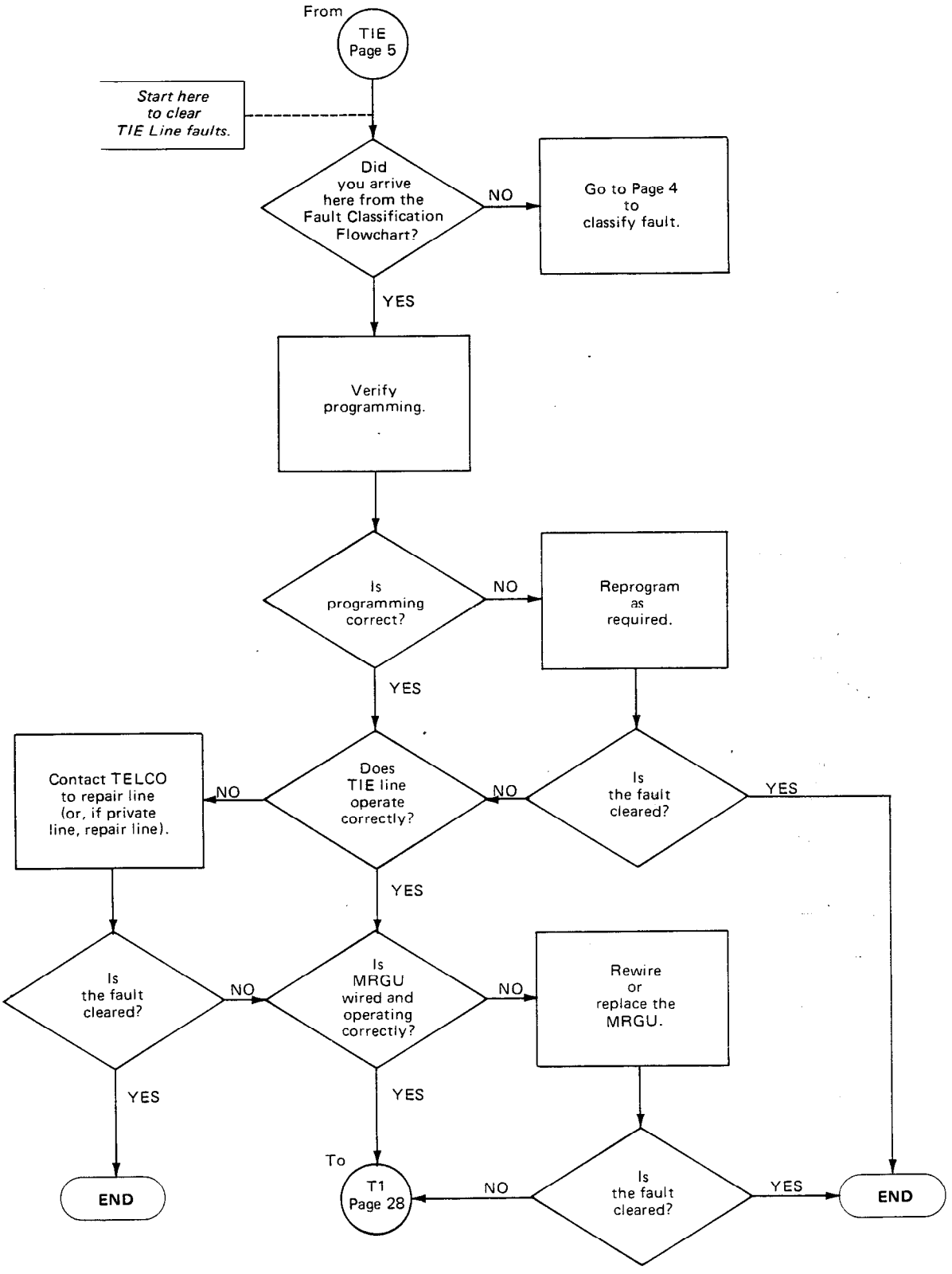
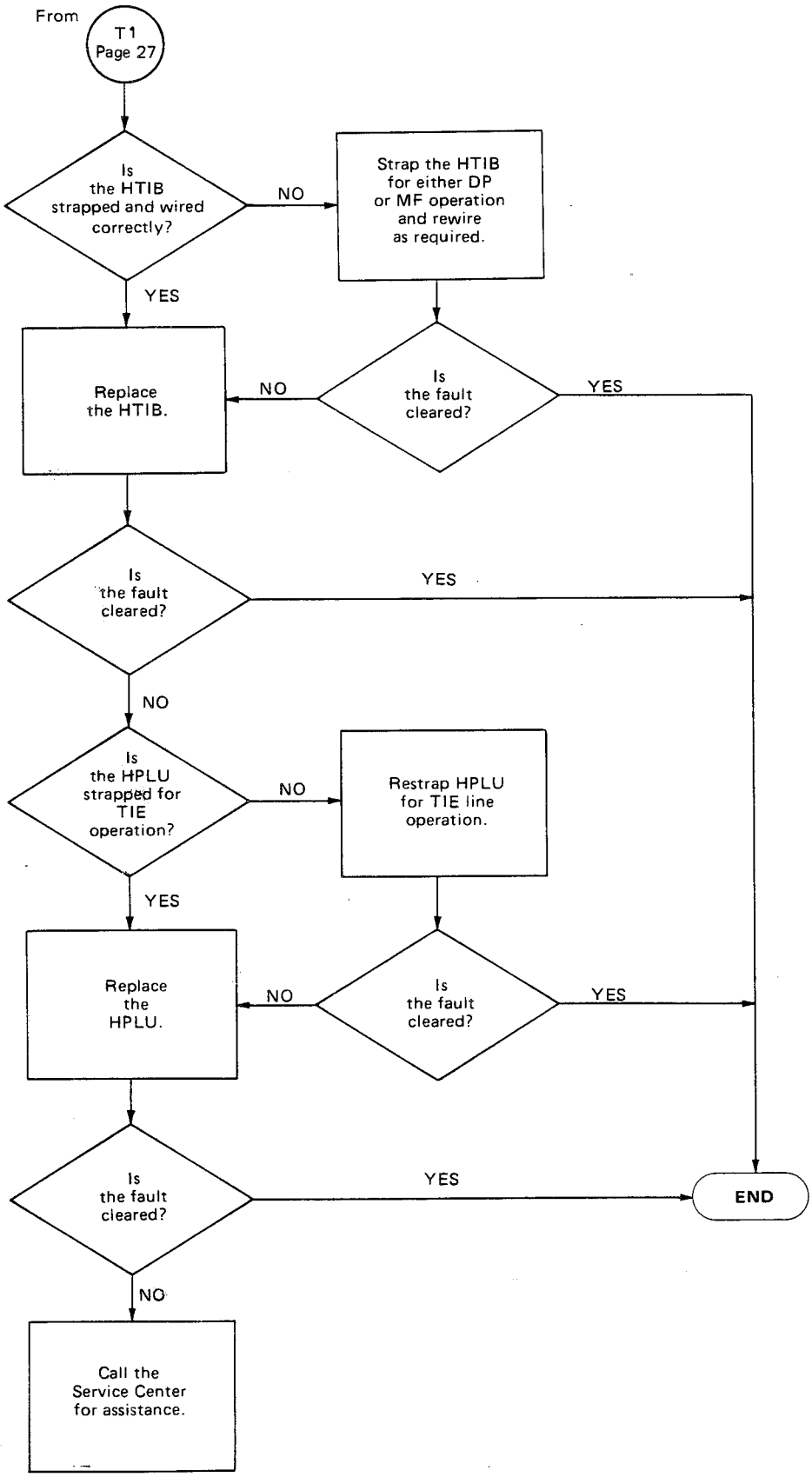
CHART NO. 14
TIE LINE (HTIB) FAULTS (cont.)