Strata III

ELECTRONIC KEY TELEPHONE SYSTEM
EKTS MODEL 102

INSTALLATION AND MAINTENANCE MANUAL

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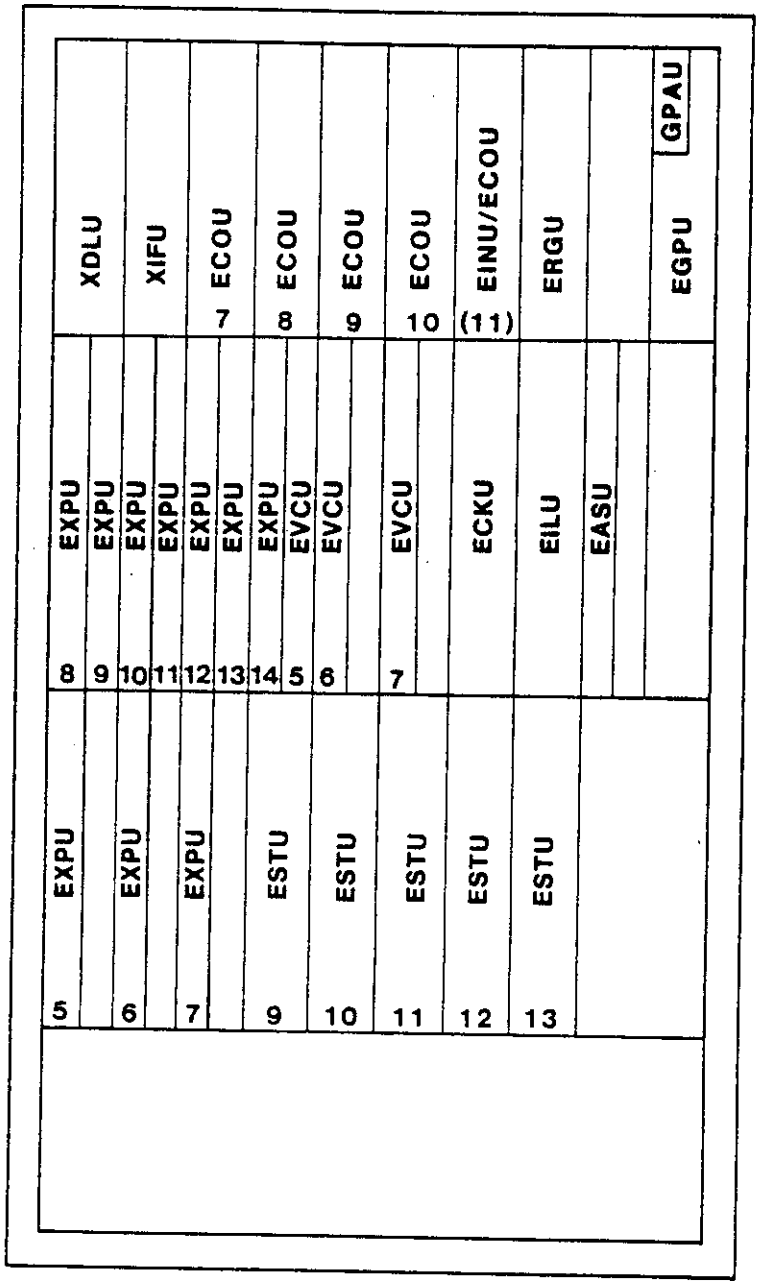

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Strata III

ELECTRONIC KEY TELEPHONE SYSTEM
EKTS MODEL 102

GENERAL DESCRIPTION

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1. GENERAL

1.1 SUMMARY DESCRIPTION

1.1.1 The STRATA III Electronic Key Telephone System is a highly featured, reduced wire system with the main service unit housed in two cabinets having a maximum capacity of 20 central office lines, 4 intercom lines and 50 stations; or 22 C.O. lines, 2 intercom lines and 50 stations. The initial cabinet (designated EKSU) provides inter-connection for 12 central office lines, 2 intercom lines, and 32 stations. Expansion is accomplished on-site with simple plug-in connections. The addition of an expansion cabinet (designated XKSU) provides plug-in connections for an additional 8 C.O. lines, 2 intercom lines and 18 stations. In an expanded system, 2 C.O. lines may be substituted for the additional 2 intercom lines.

1.1.2 Both the EKSU and XKSU are optionally wall mounted by using the EKWM swing-out wall mount kit (one per cabinet).

1.1.3 Cable requirements between the station set and Key Service Unit(s) have been reduced to 3 twisted pairs (non-shielded), thereby minimizing installation time and materials.

1.1.4 STRATA III is an all electronic, wired logic controlled system, utilizing an SCR space division switching network.

1.1.5 All STRATA III stations utilize pushbutton dialing with DTMF tones, and are optionally field-upgradable to provide hands-free answerback on intercom lines.

1.1.6 Direct Station Selection (DSS) with busy station display is provided as an optional separate console, which may be installed in conjunction with extension 10 in a basic system. In an expanded system containing an XKSU, a second fully functional console may be installed at extension 42. Both consoles may then be used to forward calls on an alternate basis.

1.1.7 In addition to operative EDSS consoles, or in lieu of them, non-operative consoles may be installed to function as busy lamp fields. The following combinations are possible:

- EKSU only (basic system)
  2 BLF consoles
  or
  1 EDSS console and 1 BLF console
- EKSU and XKSU (Expanded System)
  1 EDSS console and 3 BLF consoles
  or
  2 EDSS consoles and 2 BLF consoles
  or
  Up to 4 BLF consoles with
  no operative EDSS console

1.1.8 The STRATA III telephone may be equipped with an ESIU interface PCB allowing connection of an external speakerphone unit which permits hands-free operation on outside lines. Alternately, an EHIU interface PCB may be installed, providing connections for a headset. Both interface units also contain connections for an automatic dialer.

1.1.9 STRATA III is electrically compatible with the public telephone network.

1.1.10 Maintenance procedures are based on the rapid location and replacement of defective plug-in units with minimum disruption of service.

1.2 PHYSICAL DESCRIPTION

1.2.1 Key Service Units

1.2.1.1 Both STRATA III System Key Service Units are of the following dimensions (see Figure 1):

Height	29 inches	(735 mm)
Width	16.5 inches	(420 mm)
Depth	12.5 inches	(320 mm)

The weight of a fully equipped EKSU or XKSU is approximately 77 lbs (35 kg).

1.2.1.2 The cabinets each contain 3 shelves for plug-in printed circuit boards (Figures 2 and 3) plus power and cable distribution panels. The printed circuit boards plug into connectors which are mounted on the back-plane of the equipment shelves.

1.2.1.3 The printed circuit boards (Figure 4) measure: 8.7 inches (220 mm) by 7.1 inches (180 mm), each having an 80-pin edge connector.

1.2.1.4 External connections to the EKSU and XKSU are made using standard plug-ended cables.

1.2.2 Electronic Key Telephone

1.2.2.1 The STRATA III Electronic Key Telephone (EKT Figure 5) measures:

Width	10.7 inches	(272 mm)
Depth	9.1 inches	(230 mm)
Height	2.9 inches	(73 mm)

and is equipped with 23 keys, 20 of which are utilized for central office lines and intercom lines. The remaining 3 keys are used for feature operation. Each EKT is connected to the system via a six conductor modular line cord.

1.2.3 Direct Station Selection Console

1.2.3.1 The STRATA III Direct Station Selection console (EDSS, Figure 6) measures:

Width	10.7 inches	(272 mm)
Depth	9.1 inches	(230 mm)
Height	2.9 inches	(73 mm)

and is equipped with 60 keys, 50 of which are utilized for direct station selection; the remaining 10 keys are reserved for feature operation. A modular line cord connects the EDSS console to the system. A maximum of 2 functional EDSS consoles may be installed in an expanded system containing an XKSU.

1.3 ELECTRICAL CHARACTERISTICS

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

1.3.2 The STRATA III system requires 24V DC which is supplied by the EPSA Power Supply Unit, located external to the EKSU and XKSU cabinets.

TABLE A. SUMMARY OF ELECTRICAL CHARACTERISTICS

STATION LOOP LIMITS	1000 feet (305M), 24 gauge (AWG)
RINGING-C.O. LINE	600HZ/800HZ modulated by 16HZ, 1 second on, 3 seconds off
-INTERCOM LINE	600HZ, 1 second on, 3 seconds off
-EDSS	1200Hz, 1 second on, 3 seconds off
DIAL TONE (INTERCOM)	600HZ, continuous
RING BACK TONE (INTERCOM)	600HZ, 1 second on, 3 seconds off
BUSY TONE (INTERCOM REGISTER)	600HZ, .25 second on, .25 second off
WARNING TONE-INTERCOM	600HZ, 1 second
-EDSS	1200HZ, 1 second
DIALING	Push button DTMF
PRIMARY POWER REQUIREMENTS	90-130 VAC at 60HZ, 400VA max.
POWER SUPPLY OUTPUT	24V DC, 8 amperes
ENVIRONMENTAL SPECIFICATIONS:	
OPERATING TEMPERATURE	0°C to 50°C
OPERATING HUMIDITY	20-80% Relative Humidity (without condensation)

1.3.3 Loss of power will cause operational failure of the system: a reserve battery backup system is provided as an option. The power switching unit, designated PBBU, plugs directly into the EPSA. The associated 2 batteries, which are customer supplied, are 12V automotive type. All functions of the STRATA III system operate normally when under battery power and will operate for approximately eight hours. There is no disconnection of any call when switching to battery power.

1.4 FEATURES AND SERVICES

1.4.1 The features and services of the STRATA III EKTS are summarized in Tables B and C, which list the standard and optional features respectively.

2.0 SYSTEM OPERATION

2.1 A system block diagram of the basic STRATA III Electronic Key Telephone System is shown in Figure 7. The basic system consists of the EKSU, Power Supply, Electronic Key Telephone and optional units such as Direct Station Selection console, Busy Lamp Field console, Speakerphone, Headset and Auto-dialer interfaces, and Hands-Free Answer-Back unit. All connections between EKSU and station equipment are made via a customer-provided main distribution frame (MDF). An external tuner (or equivalent) is required as a music-on-hold source.

2.2 Simplified and functional block diagrams of the STRATA III EKSU are shown in Figures 8 and 9 respectively. The EKSU consists primarily of station interfaces (ESTU), C.O. line interfaces (ECOU), intercom interfaces (EINU), 2 solid state space division switching matrixes (EXPU & EVCU), and common control equipment (ECKU, ERGU, EPRU).

2.3 Connections between the Station voice lines and either the C.O. lines or intercom circuits are provided by the main switching matrix (EXPU). The EXPU is a non-blocking, balanced network utilizing SCR crosspoints as switching elements.

2.4 Terminating intercom connections are made via the EVCU. The EVCU is an unbalanced network utilizing MOS analog switches as connecting elements.

2.5 The Common Control equipment consists of circuits for interpretation of dialed information and key selection data. It also controls station set speaker amplifiers and LED illumination.

2.6 The EDSU and EBLU provide a dedicated speech path, control circuits, key selection information and LED illumination data for the EDSS console. The EDSU is not necessary if an EDSS console will not be present in the system.

3.0 SYSTEM CONFIGURATION

3.1 PRIMARY KEY SERVICE UNIT (EKSU)

3.1.1 The EKSU layout is illustrated in Figure 10 which shows the proper locations of the various PCB's utilized in the unit. All printed circuit boards plug in from the front of the cabinet. The rear of the cabinet is removable to allow access for option wiring when the programmable EASU and GPAU PCB's are not utilized.

3.1.2 The EKSU, complete with all options, utilizes a maximum of 15 different circuit boards.

3.1.3 Shelf #1 has a capacity of 10 printed circuit boards. The names and functions of the printed circuit PCB's are as follows:

- **ECOU—Central office unit**—serves as an interface between the EKSU and the public telephone network; ring detection and hold functions are provided by this PCB.
- **EINU—Intercom unit**—provides interface between the station lines during intercom conversations; it also interfaces with the ERGU for intercom dialing and voice paging.
- **ERGU—Register unit**—provides DTMF detection and translation during intercom dialing. It also serves as an interface between the intercom line (EINU) and the intercom voice crosspoint unit (EVCU), for the purpose of voice paging and hands-free answer-back.
- **EGPU—Intercom group paging**—This optional PCB contains 3 features: All Page, Zone Page, and External Page.

TABLE B. STANDARD FEATURES

System

- Automatic Release From Hold
- Differentiated Audible Signalling
  - At Stations: C.O./PBX Call
    Intercom Call
    EDSS Call
- Music On Hold
- Outgoing Call Restriction By Station
- Flexible C.O./PBX Call Signalling Assignment
- Selective Station Paging
- System Size Field Expansion Incorporating Existing Station and Common Equipment

Station

- Choice of Desk or Wall Model
- Automatic Privacy: C.O./PBX Line
  EDSS Line
  Intercom Line
- Privacy Release
- Pushbutton Dialing
- On-Hook Dialing
- Hands-Free Monitoring
- Group Listening
- LED Visual Indicators
- Non-Locking Keys
- Built-In Paging Speakers
- Adjustable Speaker Volume
- Flexible Key Assignment
- Multi-Station Conference
- Multi-Line Conference

Intercom

- Multi-Path
- Automatic Privacy
- Dial Selection of Stations
- Selection of Voice or Tone Signal By Caller
- Remote Intercom Answering
- Automatic Time-Out of Station Paging
- Busy Override
- Intercom Conference
- Soft Page
- Voice or Tone Preference

EDSS

- Direct Station Selection
- Dedicated Attendant Path
- Automatic Line Hold
- Voice or Tone Preference
- Night Transfer of C.O./PBX Call Signalling
- All Call Paging
- Busy Override
- LED Visual Indicators
- Non-Locking Keys
- Busy Lamp Field
- Soft Page

TABLE C. OPTIONAL FEATURES

System

- Battery Backup
- Direct Station Selection (DSS)
- Multiple EDSS/Busy Lamp Field/Arrangement
- Off Premise Line
- Relay Service: Background External Music, Music On Hold, Night Service.
- Swing-Out Wall Mount For Common Equipment

Station

- Automatic Hands-Free Talk-Back
- Hands-Free Visual Indication
- Speakerphone Interface
- Headset Interface
- Autodialer Interface
- Desk-to-Wall Phone Modification Kit
- Mechanical Button Restriction

Intercom

- Group Paging
- All-Call Paging
- External Paging

EDSS

- "I Hold" Indication
- "I Use" Indication
- Line Hold Recall (audible and visual)
- External Night Bell

- **GPAU—Group Assignment Unit—** Mounts directly onto the EGPU PCB. It provides a dip switch, strapping terminals, and logic for assigning stations for group paging.

3.1.4 Shelf #2 has a capacity of 14 printed circuit boards. Functions of the PCB's are as follows:

- **EXPU—Crosspoint unit**—contains the SCR crosspoints which make up the main switching matrix of the EKSU. Each card provides 8 stations with access to all 12 C.O. lines, 2 intercom paths, and the EDSS path.
- **EVCU—Voice crosspoint unit**—provides switching access between the intercom line and the voice page/ringing circuit available to each station. Each card provides connection capability for 8 station lines to the voice page circuit.
- **ECKU—Clock unit**—contains all system timing. It also originates the LED flash control timing, dial tone, ring-back tone, and busy tone.
- **EDSU—Direct Station Selection Unit**—This optional PCB serves as an interface between the EDSS console(s) and the Key Service units. It also provides a dedicated speech link for the EDSS as well as duplicating register functions. Night Transfer selection circuitry is also provided by the EDSU for the EDSS when this option is to be provided.
- **EBLU—Busy Lamp Field unit**—This optional PCB serves as an interface between the EDSS/BLF console for the purpose of monitoring station busy/idle status.
- **EILU**—For the EDSS console, optional special illumination is provided to indicate "I"-use, "I"-hold, and Operator Recall conditions. Operator Recall includes a distinct, audible alarm as well as a visual indication after 45 seconds of a C.O. line being put on hold by the EDSS operator.
- **EIFU—Interface Unit**—Used in conjuntion with the expansion cable (XCBL) and the XIFU PCB to interconnect the EKSU and XKSU. The logic signals extended between the two cabinets are provided with buffering and component protection on the EIFU and XIFU PCB's.
- **EASU—Option Assignment Unit**—optional PCB that provides an alternative to option strapping on the system back-plane. When the EASU is used, assignments such as C.O. line ringing and station restriction can be made on the EASU and then made active by inserting the PCB into the KSU. The EASU also provides test points for the 24 VDC and 12 VDC on its faceplate.

3.1.5 Shelf #3 has a capacity of 9 printed circuit boards. Functions of the PCB's are as follows:

- **ESTU—Station unit**—provides an interface between the EKSU and the Electronic Key Telephone set. Three pairs of wires are required: one carrying voice information, one carrying key selection data from the station set to the EKSU, with the remaining pair carrying LED illumination data from the EKSU to the Electronic Key Telephone.
- **EPRU—Power supply regulator unit**—receives the 24V DC from the external power supply and provides the DC-DC conversion to provide the 12V required by the EKSU. The EPRU houses the main fuses along with the ON-OFF switch, and also allows the music-on-hold function.

3.1.6 Cable Distribution Panel

3.1.6.1 This panel is located at the back of the EKSU and supplies connection points for cables to the MDF. Standard plug-ended connectors are used and are connected without removing the cabinet covers (see figure 11).

3.1.7 Power Regulator Panel

3.1.7.1 This panel (Figure 13), is part of the EPRU and contains an ON/OFF switch, power-on LED indications for 24V DC and 12V DC, and music-on-hold volume control.

3.2 POWER SUPPLY ASSEMBLY

3.2.1 The separate **EPSA** Power Supply Assembly is a fixed unit complete with wall mounting bracket. Attachments to the wall or some other fixed surface is via two 1/4 inch toggle bolts or screws. The unit can accommodate "brown-out" condition or high voltages within an output range of 90VAC to 130VAC 60 Hertz.

TABLE D.

BASIC SYSTEM CONFIGURATION

UNIT	DESCRIPTION	REQUIREMENTS
EKSU-102	ELECTRONIC KEY SERVICE UNIT CONTAINS COMMON EQUIPMENT PCB's EPRU, ECKU, ERGU, EINU*	One per System
EPSA-102	EXTERNAL POWER SUPPLY	One per System
PBBU	POWER BATTERY BACKUP PCB	One per System when battery back-up power desired
EXPU-2	CROSS POINT PCB	One per 8 Stations in EKSU
EVCU-2	INTERCOM MATRIX PCB	One per 8 Stations
ESTU-2	STATION PCB	One per 4 Stations
ECOU-2	OUTSIDE LINE PCB	One per 2 C.O./PBX Lines
EGPU-2	ALL CALL/3-ZONE GROUP/ EXTERNAL PAGE PCB	One per EKSU when features desired
GPAU-2	GROUP PAGING ASSIGNMENT UNIT PCB (SUB-ASSEMBLY FOR EGPU)	One per EKSU for Group Page PCB programming instead of back-plane wiring
EASU-2	OPTION ASSIGNMENT PCB (EXCEPT GROUP PAGE)	One required per EKSU for feature programming instead of back-plane wiring
EKTD-102	20 BUTTON ELECTRONIC TELEPHONE, DESK TYPE	As Desired
EKTD-102/EHFU	EKTD WITH HANDS-FREE ANSWER-BACK	As Desired
EKTW-102	WALL MOUNTABLE TELEPHONE	As Desired
EKTW-102/EHFU	EKTW WITH HANDS-FREE ANSWER-BACK	As Desired
EHFU-2	HANDS-FREE ANSWERBACK PCB FOR INTERCOM CALLS	As Field Upgrade, where Hands-Free Answerback is desired
EDSS-102	DSS OPERATOR CONSOLE	One per basic System (or 2 per expanded system) when desirable Also requires EDSU and EBLU
EDSU-2	DSS PCB	One per primary DSS Console
EBLU-2	DSS ILLUM PCB	One per primary DSS Console
EILU-2	SPECIAL "I HOLD" AND "I USE" ILLUMINATION FOR DSS CONSOLE, INCLUDING "OPERATOR RECALL" AUDIO & VISUAL INDICATION	One per DSS Console, when desired

Maximum: 12 C.O. Lines, 32 Stations, 2 Intercoms

An AC power cord length of 9 1/2 feet allows flexible placement of the power supply in an installation. Physical parameters are as follows:

- LENGTH: 11 7/8 inches (29.8 cm)
- WIDTH: 10 inches (25 cm)
- HEIGHT: 7 3/4 inches (19.3) cm)
- WEIGHT: 32 lbs (14.5 kg)

3.2.2 An optional battery backup capability is available with the PBBU PCB which plugs directly into the EPSA. The battery, which is customer supplied, consists of two 12 volts, automobile type, maintenance-free. All functions of the STRATA III systems operate normally when under battery power and will operate for approximately 8 hours. There is no disconnection of any call when switching to battery power.

3.3 STATION EQUIPMENT

3.3.1 The STRATA III Electronic Key Telephone is designed specifically for use in the STRATA III Electronic Key Telephone System. Its principal components are: Handset, Dial pad, Speaker, Volume control, 20 line/intercom keys and 3 feature operation keys. The 20 pick-up keys are paired with LEDs. The 3 additional feature keys are Hold, PRLS and SPKR, with the last one having an LED indication. The EKT is available with 5 different interchangeable colored faceplates.

3.3.2 Optional features which can be used with the EKT are automatic Hands-free answerback, speakerphone, headset, autodialer, and wall mounting arrangements.

3.3.3 The STRATA III EDSS console is equipped with 60 keys and LEDs. 50 keys are utilized for direct station selection, while their associated LEDs display the busy/idle status of the station sets. The remaining 10 keys and LEDs are utilized for special feature or control functions including Night Transfer, All Call and selection of tone or voice station signaling.

3.3.4 The EDSS console may also be used to provide station busy/idle status only.

3.4 INSTALLATION

3.4.1 All connections to the STRATA III Key Service Units are made via plug-in connector cables or to simple terminal strips. Complete installation instructions including connection diagrams and optional feature installation instructions, are included in the system documentation.

3.5 MAINTENANCE

3.5.1 Maintenance of the STRATA III EKTS is limited to fault corrections. No periodic preventive maintenance is required. Faults are repaired by replacing the faulty printed circuit board, subassembly, or station set. The faulty unit is returned to the manufacturer for repair.

3.6 EXPANSION KEY SERVICE UNIT (XKSU)

3.6.1 The basic STRATA III system may be expanded past 12 C.O./PBX lines, 32 stations and 2 intercom paths by connecting an XKSU to the existing EKSU cabinet via an XCBL Cable Assembly (supplied with the XKSU), installing additional PCB's as system configuration dictates, and connecting the required additional MDF cables and termination blocks.

3.6.2 XKSU dimensions are the same as those of the EKSU.

3.6.3 Figure 12 shows the proper PCB locations in the XKSU. The XKSU utilizes up to 14 different types of PCB's, 12 of which are common to the EKSU and are described in section 3.0. In addition, the following PCB's are utilized:

- **XIFU—Expansion Interface Unit**—Used in conjunction with the expansion cable assembly (XCBL) and the EIFU (which must be installed in the EKSU) to interface the XKSU and EKSU.
- **XDLU—Expansion Data Illumination Unit**—provides the EDSS console(s) with access to the stations connected to the XKSU through interconnection with the EBLU and EDSU via the expansion cable XCBL). The XDLU also provides the system interface for a second EDSS console and/or BLF consoles.

TABLE E.

EXPANSION SYSTEM CONFIGURATION

UNIT	DESCRIPTION	REQUIREMENTS
XKSU-102	EXPANSION KEY SERVICE UNIT INCLUDES ECKU PCB XCBL - EXPANSION CABLE XIFU - EXPANSION INTERFACE PCB	One per Expanded System
EIFU-2	EXPANSION CAPABILITY PCB	One required in EKSU
EVCU-2	INTERCOM MATRIX PCB	One per 8 Stations
ESTU-2	STATION PCB	One per 4 Stations
ECOU-2	OUTSIDE LINE PCB	One per 2 C.O./PBX Lines
EGPU-2	ALL CALL/3-ZONE GROUP/ EXTERNAL PAGE PCB	One per XKSU when features desired for intercoms 3 & 4 or expansion stations 33 thru 50
GPAU-2	GROUP PAGING ASSIGNMENT UNIT	One per XKSU for Group Page PCB programming instead of back-plane wiring
XDLU-2	DSS EXPANSION PCB	One per XKSU when DSS in system (not necessary if XKSU added only for intercoms 3 & 4)
EASU-2	OPTION ASSIGNMENT PCB (EXCEPT GROUP PAGE)	One per XKSU for feature programming instead of back-plane wiring
EINU-2	INTERCOM PCB	One required per XKSU for increasing system intercom paths from 2 to 4
ERGU-2 /RCVR	REGISTER AND RECIEVER PCB	One required per XKSU for increasing system intercom paths from 2 to 4
EXPU-2	CROSS POINT PCB	Required in XKSU as shown in table below

Number of Stations in entire System	Up to 12 C.O./PBX Lines in System	ICM'S 3 & 4 or 13 to 22 C.O./PBX Lines in System
1 to 8	—	1
9 to 16	—	2
17 to 24	—	3
25 to 32	—	4
33 to 40	1	6
41 to 48	2	8
49 to 50	3	10

Maximum: additional 8 C.O. Lines, 18 Stations, 2 Intercoms

3.6.4 Exact XKSU PCB requirements are dependent on system configuration and are outlined in Table E.

3.6.5 The XKSU also has a rear cable distribution panel for connection to the MDF and EPSA.

3.6.6 System expansion by addition of the XKSU does not require the replacement of existing PCB's or station equipment and is accomplished on-site. MDF connection is as shown in Figure 13.

4. SYSTEM FEATURES

4.1 GENERAL

4.1.1 This section contains a brief description of the STRATA III features previously listed in Tables B and C and some of the associated operating procedures. All STRATA III installations provide customers with the standard system features to which the optional features may be added as required.

4.2 STANDARD FEATURES

4.2.1 System

4.2.1.1 Discriminating signaling at stations—Different types of station signaling are provided to give audible indication of external incoming calls, intercom, or EDSS internal calls.

4.2.1.2 Flexible line ringing assignment—A ringing or no-ringing option is provided for each line selectively by station set.

4.2.1.3 Multi-station conference—Conferencing is permitted to a maximum of 4 stations and 1 C.O. line.

4.2.1.4 Multi-trunk conference—Conferencing is permitted to a maximum of 2 C.O. lines and 1 station.

4.2.1.5 Music on hold—C.O. lines placed on hold are connected to music originating from a customer supplied source.

4.2.1.6 Outgoing call restriction by station—Selectively restricts stations from placing all outgoing calls.

4.2.1.7 Push-button dialing—All STRATA III EKTs are equipped with push-button dial pads.

4.2.1.8 Selective paging to each station—Voice paging is allowed via the individual station set speaker after dial-selection on the intercom circuit.

4.2.2 Station

4.2.2.1 Automatic privacy: C.O., EDSS, Intercom—Privacy is automatic on all connections.

4.2.2.2 Privacy release—Operation of the privacy release (PRLS) key allows another station to enter a conversation.

4.2.2.3 Built-in paging speakers—All STRATA III EKT sets are equipped with built-in speakers.

4.2.2.4 Common audible signaling—Tone ringing via the station set speaker is provided for all lines designated to ring at that station. Different ringing through the common speaker is provided for C.O. line, Intercom, and EDSS ringing.

4.2.2.5 Flexible key assignment—Variable trunk assignment is available on 4 pick-up keys to allow for special service trunk access or restriction.

4.2.2.6 Key illumination—LED—Key illumination is provided with LEDs instead of conventional lamps. Four standard illuminations are provided for C.O. lines:

Idle—OFF
Busy—ON
Ringing—Flash (60 I.P.M.)
Hold or PRLS—Wink (120 I.P.M.)

4.2.2.7 Line keys—non locking—All line and intercom keys are non-locking, momentary push buttons. A short subdued tone is heard via the station speaker when each key is operated. (This tone may be optionally deleted.)

4.2.2.8 On-hook dialing—All stations can dial with the handset on-hook. Progress tones are heard via the station speaker, and when the handset is raised the speaker is automatically shut off.

4.2.2.9 Hands-free monitoring—Depression of the SPKR key while returning the handset to its cradle allows hands-free monitoring of an on-hold condition.

4.2.2.10 Group listening—The EKT speaker can monitor the far end C.O. line by depression of the SPKR key with the handset off hook. This creates a "push-to-listen" operation.

4.2.2.11 Speaker adjustable volume—A thumb wheel volume control is used to adjust the level of tone signaling or voice page received through the station speaker.

4.2.3 Intercom

4.2.3.1 Automatic time-out of station paging—Intercom register is held for a maximum of 30 seconds.

4.2.3.2 Busy override: Ringing and paging—Off-hook stations are presented with low-level audible ringing/voice page via the station set speaker.

4.2.3.3 Dial selection of stations—Stations are selected on intercom utilizing a 2-digit code.

4.2.3.4 Intercom Conference—The "PRLS" key can be used to override intercom privacy and create intercom conferencing for up to four parties.

4.2.3.5 Multi-path—Two intercom paths are provided in the basic system, four in the expanded system.

4.2.3.6 Privacy—Privacy is provided on all intercom connections.

4.2.3.7 Remote intercom answering—An intercom call may be answered from any station.

4.2.3.8 Selection of ringing or paging—The dialing of an extra digit allows the caller to select between tone ringing or voice paging for intercom call alerting. A system wide selection is provided to choose which method requires the extra digit.

4.2.4 EDSS

4.2.4.1 All call voice page—A dedicated single button on the EDSS console (labeled "A.C.") will voice page all extensions in the system simultaneously through the built-in station speakers.

4.2.4.2 Automatic line hold—Each calling C.O. line is automatically placed on hold when the EDSS operator activates a station key.

4.2.4.3 Dedicated attendant link—The DSS intercom link is a separate dedicated path used only by the EDSS position.

4.2.4.4 Night transfer—An alternate action button on the EDSS console (labeled "N.T.") provides night ringing at flexibly assigned stations.

4.2.4.5 Tone or Voice preference—When a system is configured for "Voice First" paging from the EDSS, a button on the EDSS console (labeled "TONE") will cause a transition to tone ringing. Alternately, the system can be converted to "Tone First" ringing and the button label would be changed to "VOICE."

4.3 OPTIONAL FEATURES

4.3.1 System

4.3.1.1 Automatic release from Hold—The EKSU will automatically release held C.O. lines if a disconnect signal is received from the Central Office.

4.3.1.2 Direct Station Selection—an optional separate console, which may be installed in conjunction with extension 10 in a basic system. In an expanded system containing an XKSU, a second fully functional console may be installed at extension 42. Both consoles may then be used to forward calls on an alternate basis.

4.3.1.3 Busy Lamp Field Console—A standard EDSS console may be used to provide station busy/idle status. An EDSS used in this manner is referred to as a "Busy Lamp Field" console.

4.3.1.4 External paging—A special 2-digit access code (89) permits access to a customer provided external paging speaker (8 ohm) from an internal three watt amplifier. Optionally, a 600 ohm, two-way voice path is available for an external customer supplied talk-back speaker.

4.3.1.5 Group paging—Special 2-digit access codes (81, 82, or 83) permit voice paging to one of three zones or simultaneously (80) to all stations included in the three zones. Paging is via the station set speakers.

4.3.1.6 Night transfer of ringing—This feature causes incoming C.O. lines to ring at all other designated stations when the EDSS console is switched to "night service."

4.3.1.7 Relay Service

4.3.1.7.1 Background external music—A dry relay closure is optionally provided to disable an external customer provided music system driving external speakers when external paging is activated. The music system must have provision for a relay input.

4.3.1.7.2 Music-on-hold—A dry relay closure is provided optionally to turn on an external music source such as a tape deck. This is a low voltage, low current capability.

4.3.1.7.3 Night service—An optional dry relay contact is available either when a.) Night transfer is activated (for use in turning on an answering machine), or b.) Any C.O. line rings and night transfer is active (for use with central "Nite Bell" with interrupted bell when customer supplied).

4.3.1.8 System battery backup—An optional PCB can be plugged into the STRATA III external Power Supply to provide automatic switching to standby batteries. This operation provides continuous telephone service in case of power interruptions or outages. Low cost batteries can be used to enable system operation for more than eight hours on average.

4.3.2 Station

4.3.2.1 Automatic hands-free talk back—When an EKT is equipped with an optional EHFU (hands-free unit), the station user receives a short warning tone and then can answer voice page calls without lifting the handset.

4.3.2.2 Hands-free visual indication—The LED located above the SPKR key flashes when an incoming voice page has activated the automatic hands-free talk back circuit.

4.3.2.3 Speakerphone, Headset and Auto-dialer Interfacing.—The STRATA III telephone may be equipped with an ESIU interface PCB allowing connection of an external speakerphone unit which permits hands-free operation on outside lines. Alternately, an EHIU interface PCB may be installed, providing connections for a headset. Both interface units also contain connections for an automatic dialer.

4.3.2.4 Wall phone—An EKT is available staged for wall mounting, or the standard EKT may be easily converted for wall phone installation with an optionally supplied mounting bracket and plastic cradle insert.

4.3.3 EDSS

4.3.3.1 "I" Hold illumination—The EDSS operator is given a distinctive hold LED flash indication to indicate the calls placed on hold at the EDSS position. This flash is seen only by the EDSS operator.

4.3.3.2 "I" use illumination—A distinctive flash rate shows the line presently in use at the EDSS position. This flash is seen only by the EDSS operator.

4.3.3.3 Line hold recall—A.C.O. line placed on hold by the EDSS operator for more than 45 seconds will provide both an audible alarm and a distinctive LED flash at the EDSS position for those C.O. lines needing attention.

"We reserve the right, without notice, to make such changes in equipment design or components as progress in engineering or manufacturing methods may warrant."

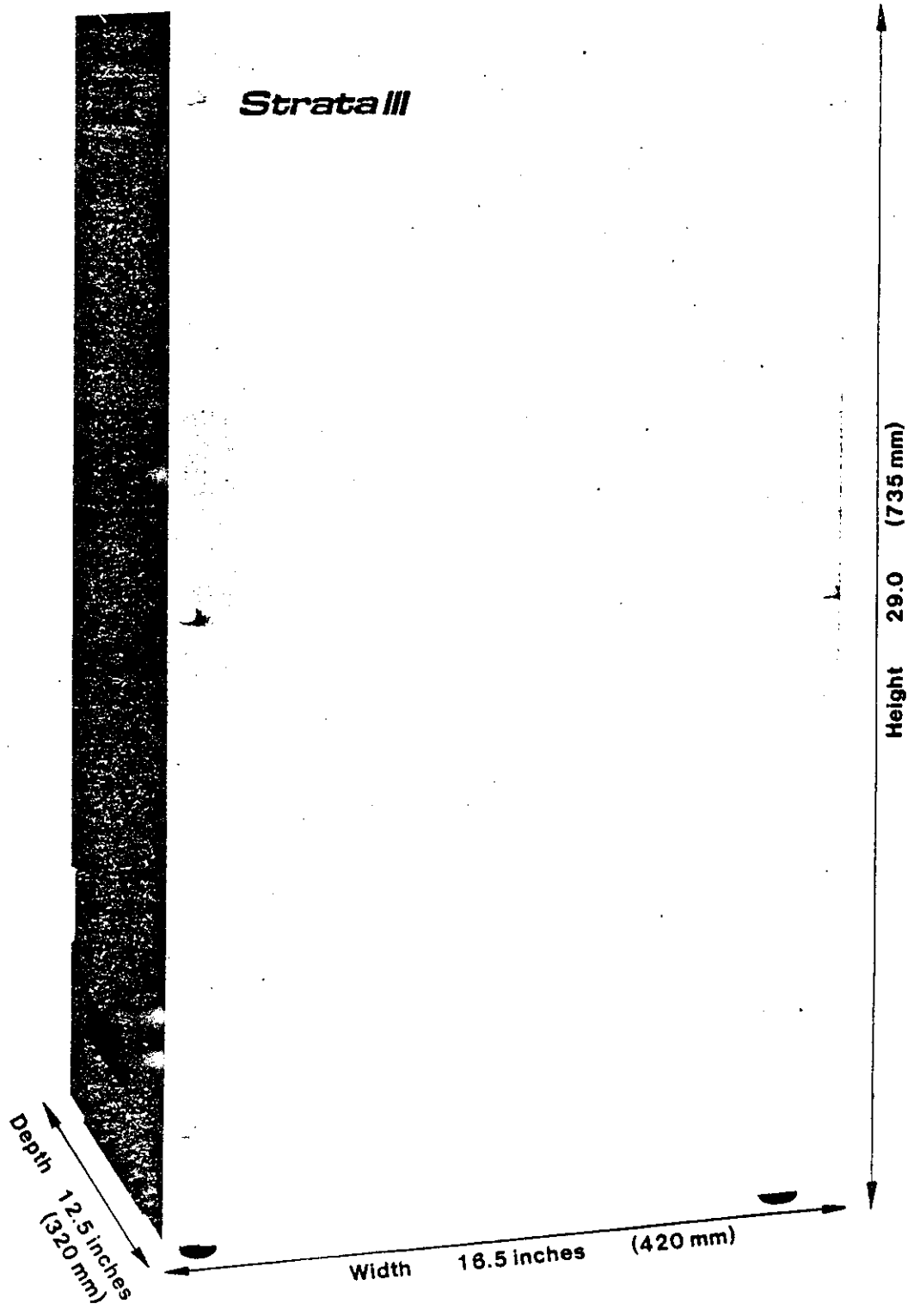


FIGURE 1 – ELECTRONIC KEY SERVICE UNIT
PHYSICAL DIMENSIONS

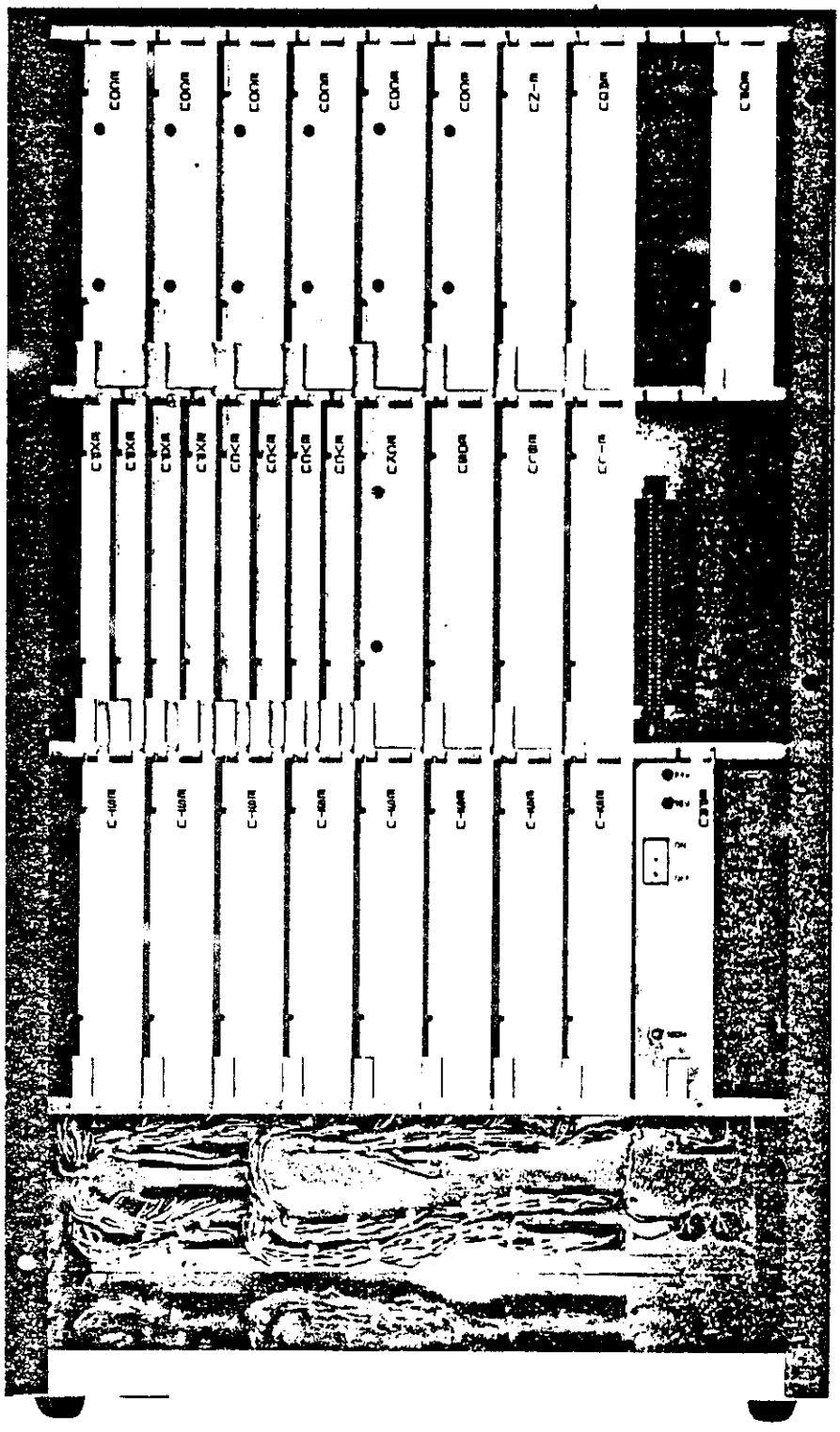


FIGURE 2—ELECTRONIC KEY SERVICE UNIT (EKSU)—INTERNAL VIEW

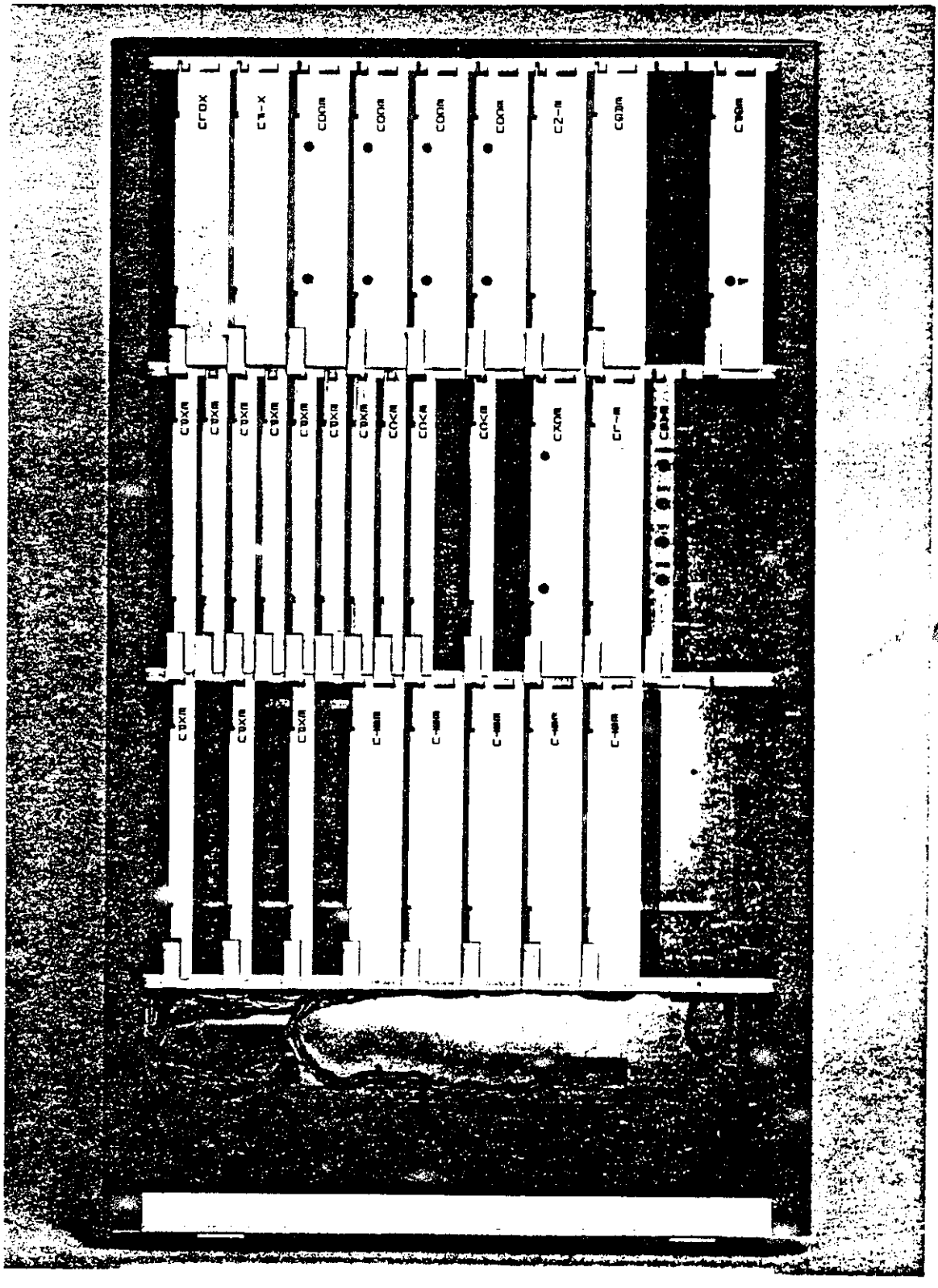


FIGURE 3 —EXPANSION KEY SERVICE UNIT (XKSU)—INTERNAL VIEW

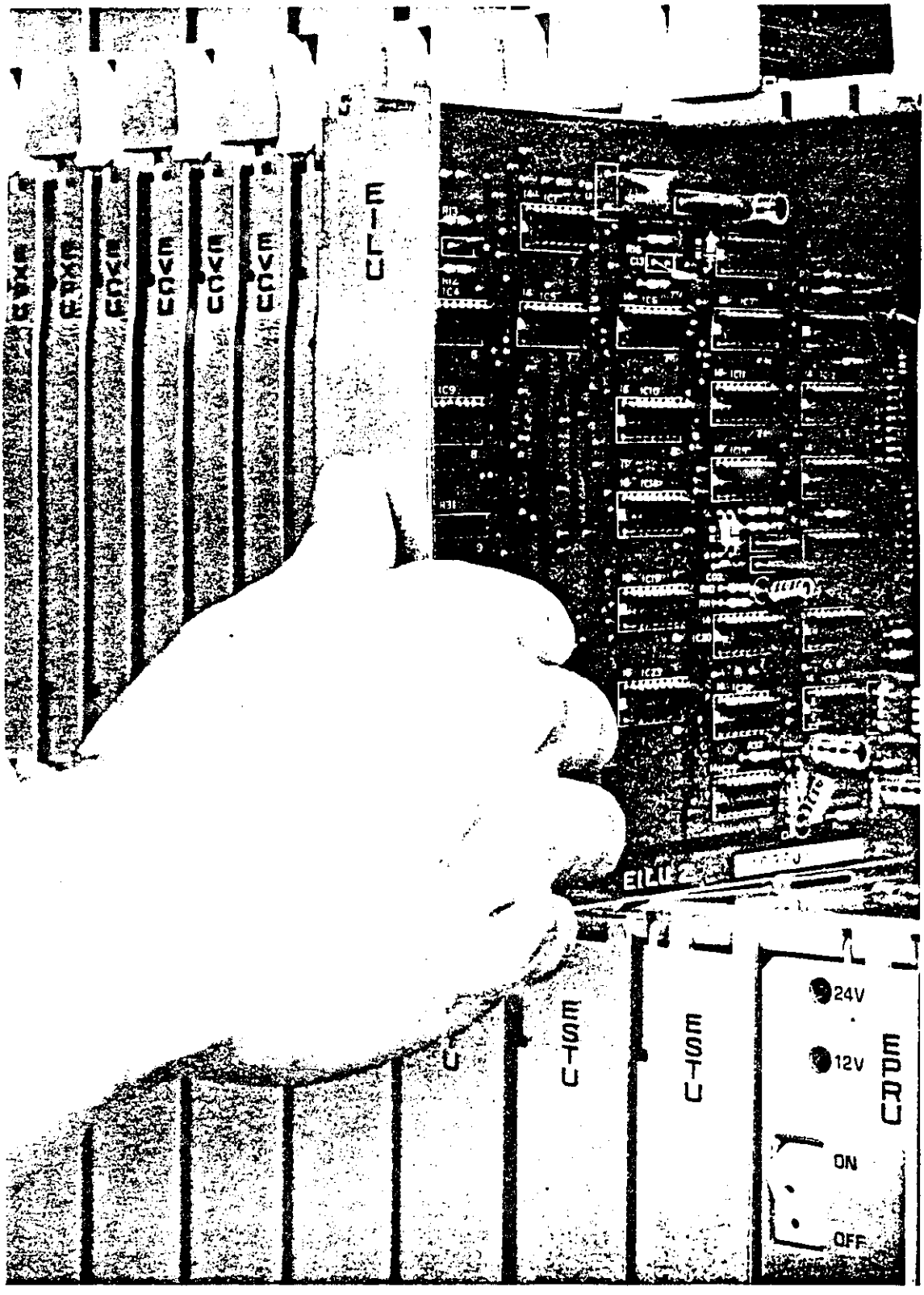


FIGURE 4 — PRINTED CIRCUIT BOARDS

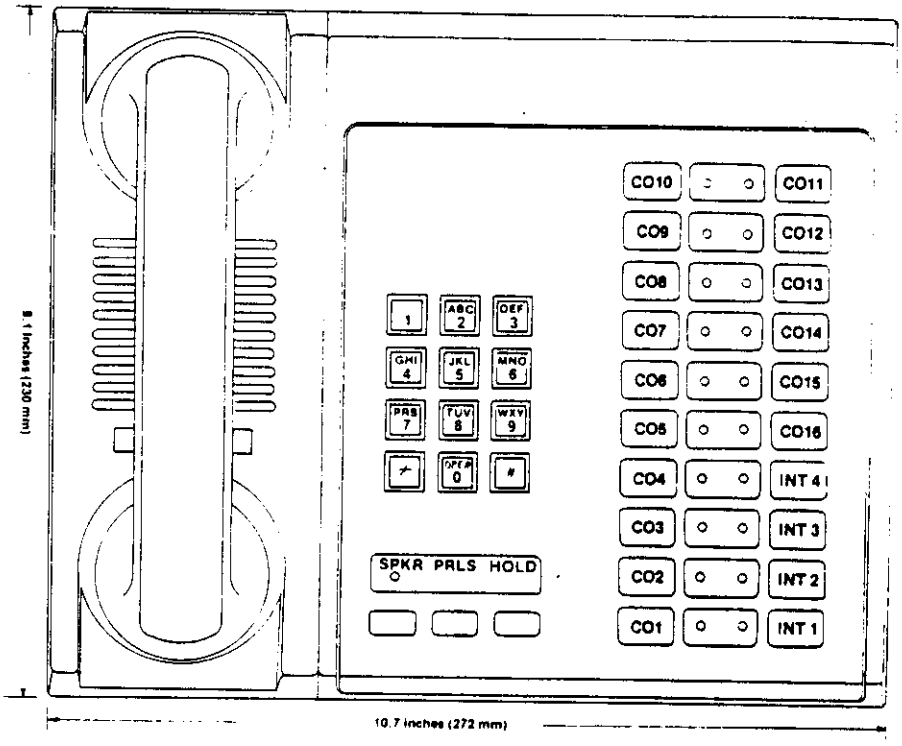
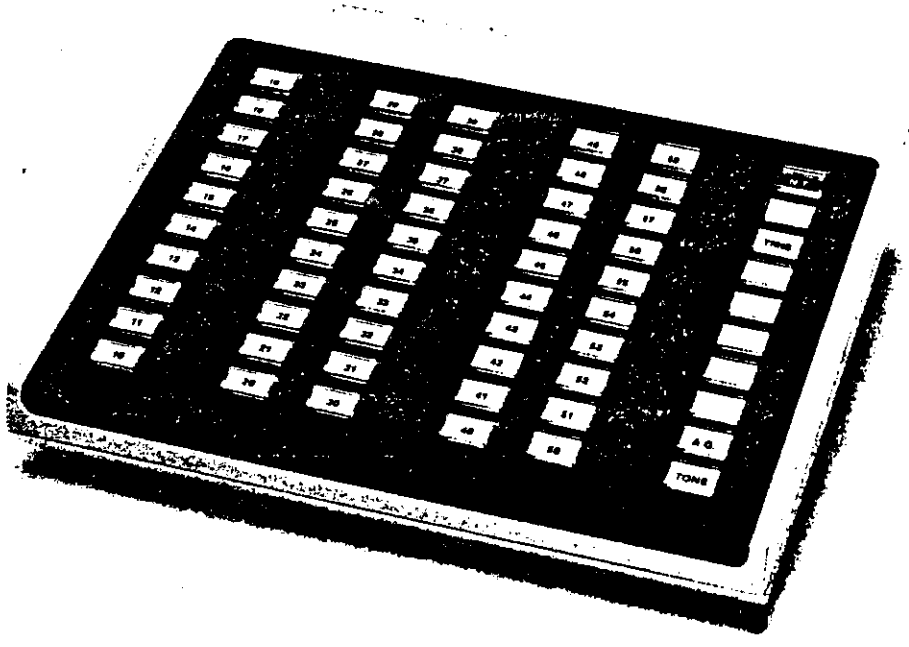


FIGURE 5 – EKT PHYSICAL LAYOUT



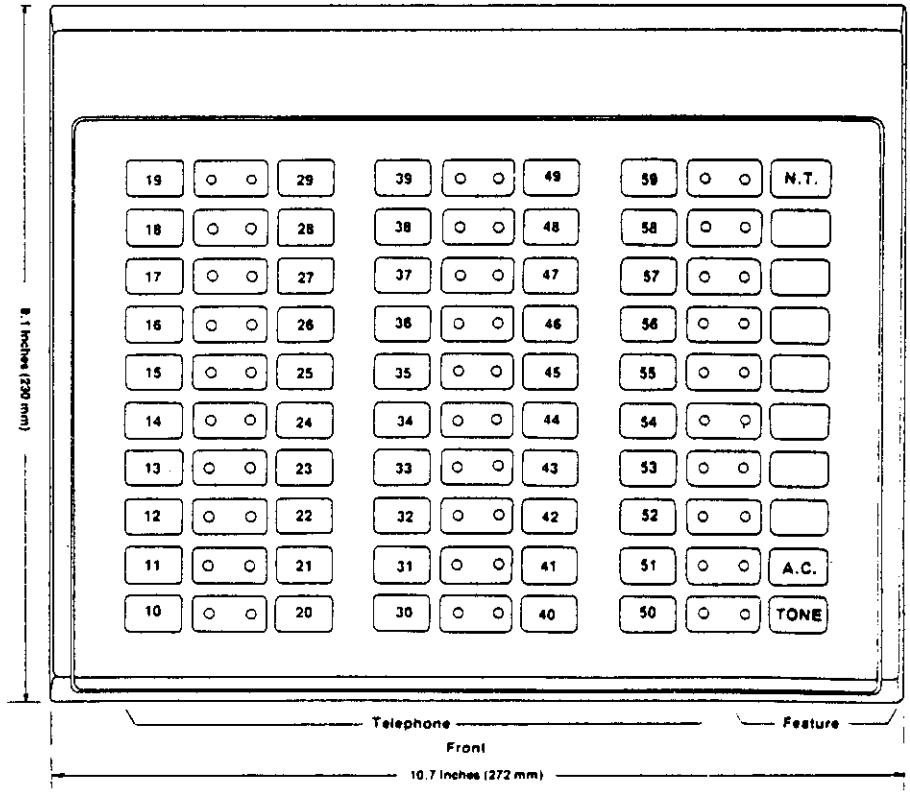


FIGURE 6 – ELECTRONIC DIRECT STATION SELECTION CONSOLE (EDSS)

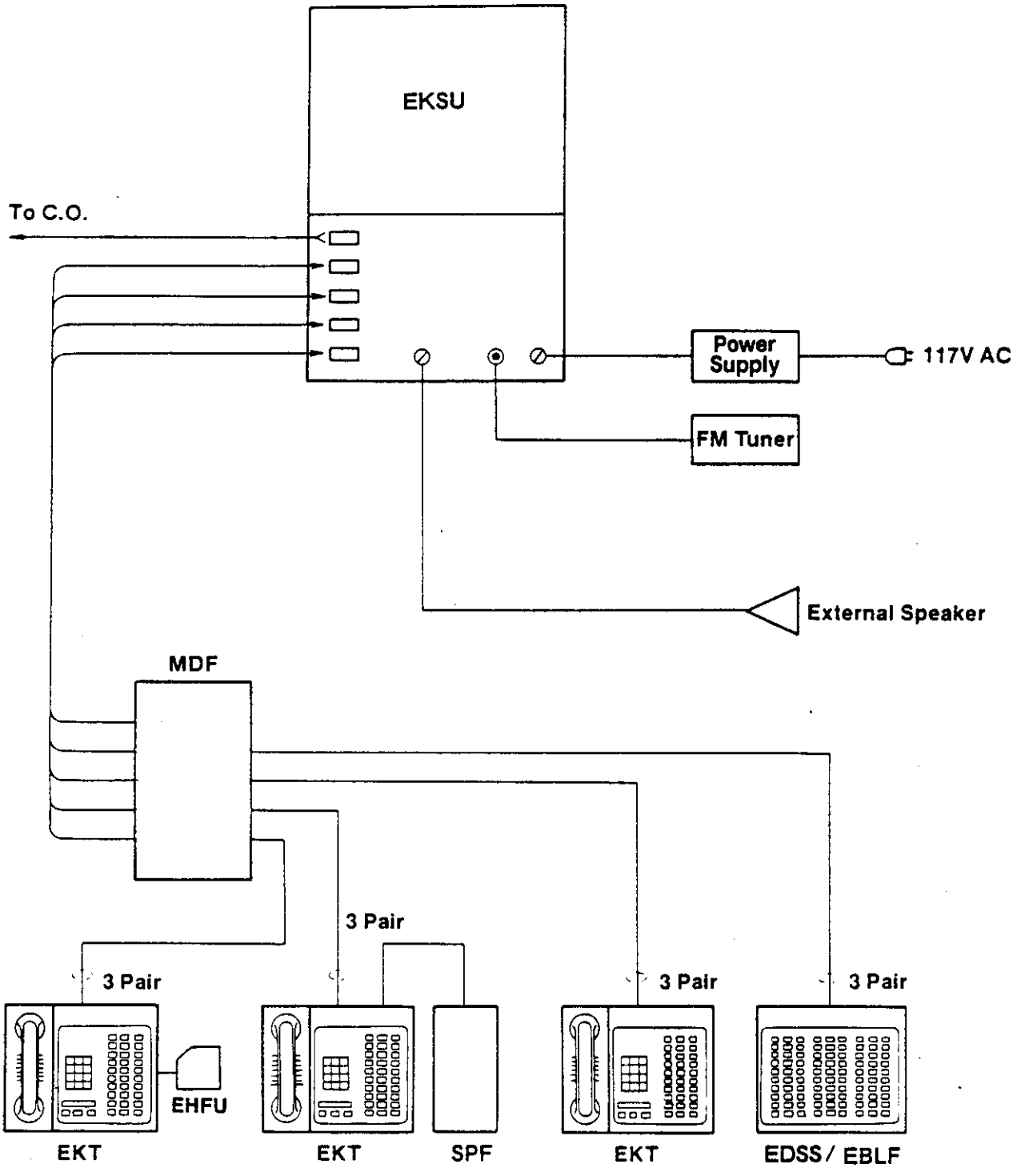


FIGURE 7—SYSTEM BLOCK DIAGRAM

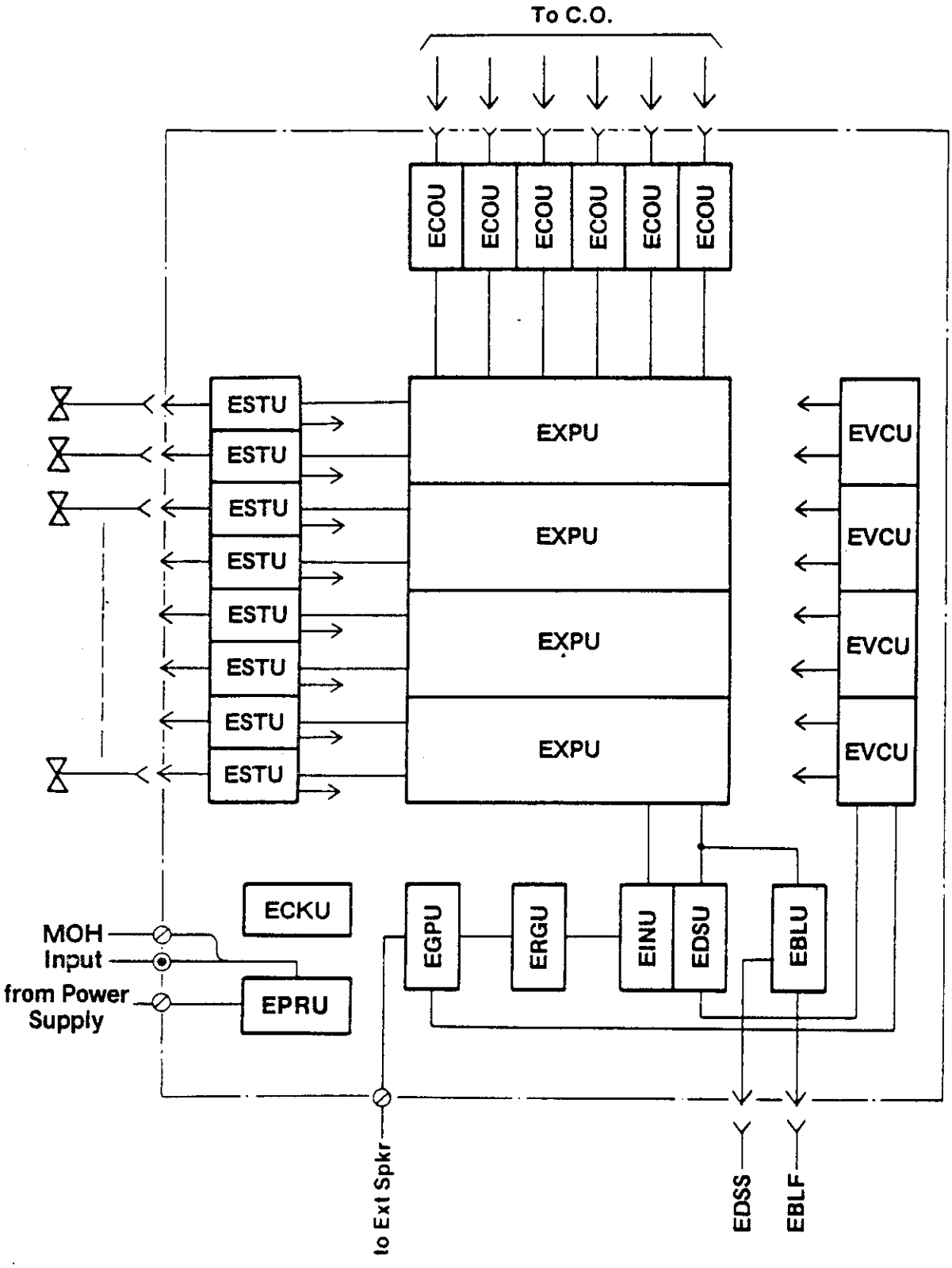


FIGURE 8 —SIMPLIFIED EKSU BLOCK DIAGRAM

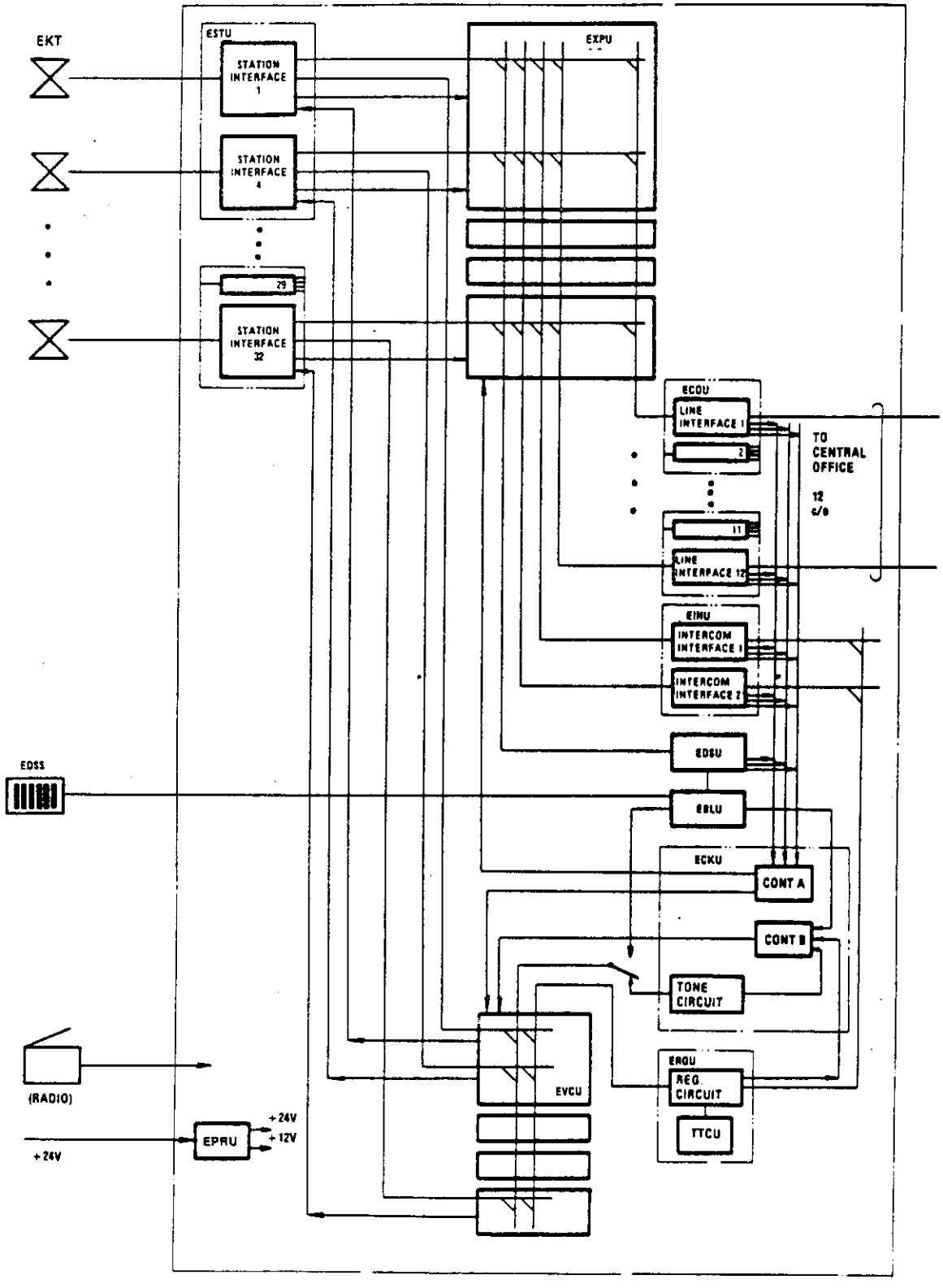


FIGURE 9—FUNCTIONAL BLOCK DIAGRAM

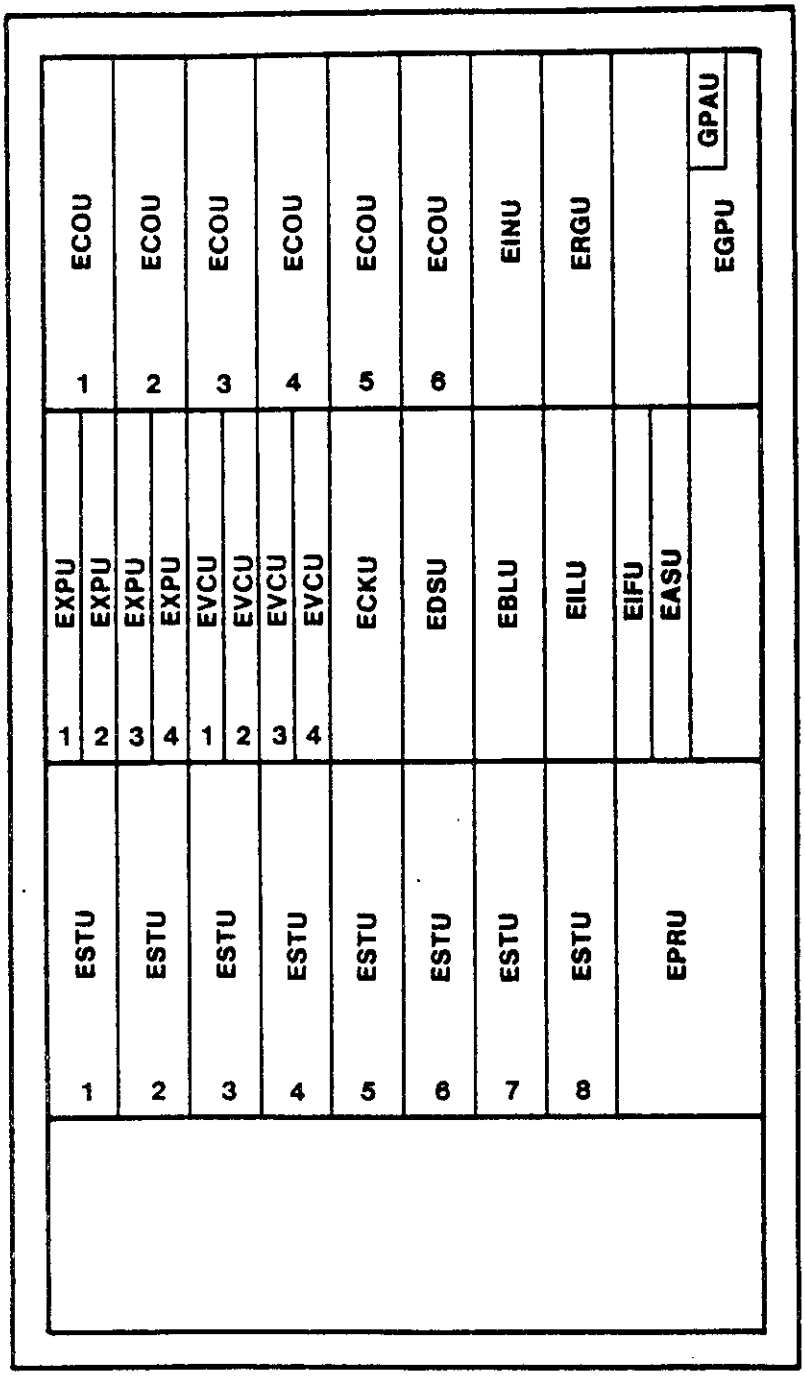


FIGURE 10—EKSU PCB LOCATIONS

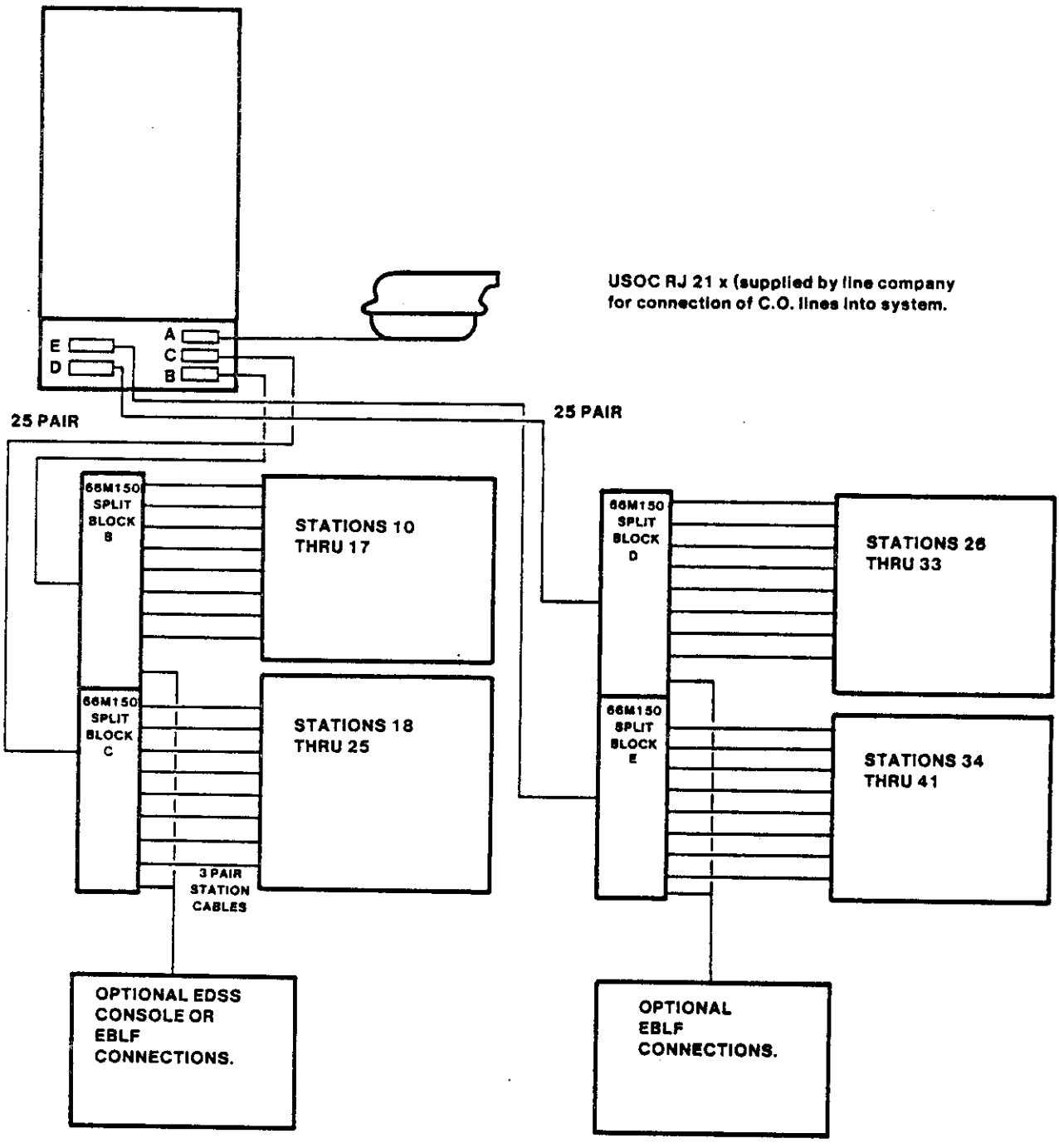


FIGURE 11—MDF CONFIGURATION

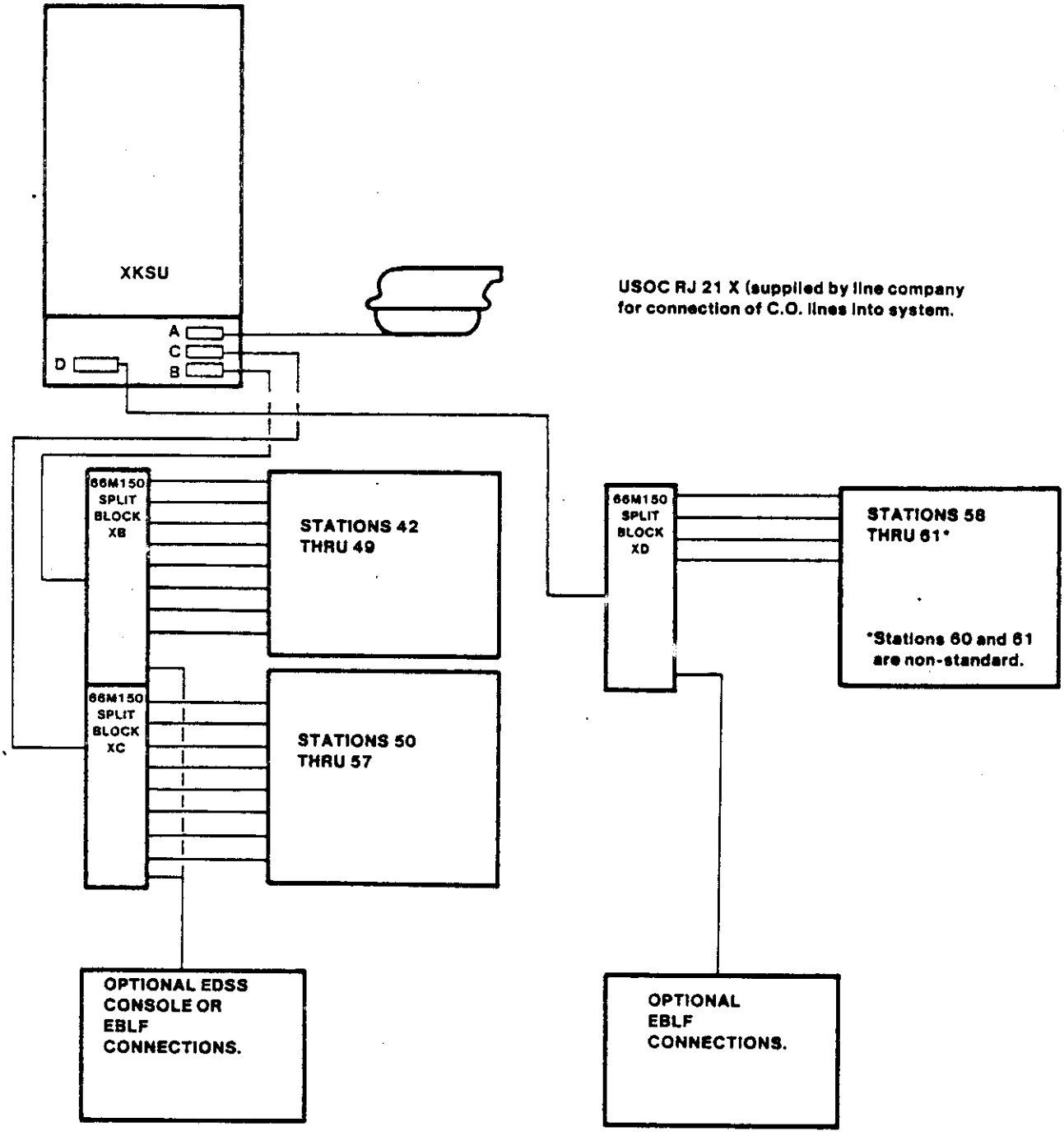


FIGURE 13 – XMDF CONFIGURATION

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Strata III

PRIMARY ELECTRONIC KEY SERVICE UNIT
EKSU MODEL 102

INSTALLATION INSTRUCTIONS

REVISION PAGES

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10	1	January 1981
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38	1	January 1981
40	1	January 1981

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LIST OF FIGURES

1. GENERAL

1.1 The STRATA III primary Electronic Key Service Unit (EKSU) (see Figure 1) contains the shelving, connectors, and inter-wiring for the various common control printed circuit boards necessary to operate up to 12 Central Office lines, 2 paths of intercom, one Direct Station Selection Console and up to 32 stations. A secondary cabinet is needed for expansion past these parameters.

1.2 The primary EKSU also contains connectors for the following optional feature printed circuit boards:

- **EBLU—Busy Lamp Field Unit**—One per EKSU is needed if an EBLF Module or EDSS Console is to be present in the system. See Section 100-004-270 for installation instructions.

- **EDSU—Direct Station Selection Unit**—One per EKSU is required if an optional Electronic Direct Station Selection (EDSS) Console is to be present in the system. See section 100-004-272 for installation instructions.

- **EILU—"I" Illumination Unit**—One per EKSU is necessary if the EDSS operator's station is to be equipped with "I" Use, "I" Hold, and Operator Recall. See section 100-004-274 for installation instructions.

- **EGPU—Intercom Group Paging Unit**—One per EKSU is required if either All Page, Zone Page or External Page are to be available to system users. See section 100-004-276 for installation instructions.

1.3 The primary EKSU is powered by the STRATA III, 24V, DC, 8 ampere Power Supply Assembly (EPSA) which requires connection to a 115V AC (nominal) outlet and an earth ground.

1.4 Six dedicated conductors are required for each STRATA III Electronic Key Telephone (EKT), while four are required to connect an EDSS Console or EBLF.

1.5 Only one EDSS Console and one EBLF Module or two EBLF Modules may be connected to the EKSU. See section 100-004-245 for installation instructions for the EDSS Console. See section 100-004-250 for installation instructions for the EBLF Module.

2. PHYSICAL DESCRIPTION

2.1 The primary STRATA III EKSU is housed in a single metal cabinet of the following dimensions:

Height	29.0 inches	(735 mm)
Width	16.5 inches	(420 mm)
Depth	12.5 inches	(320 mm)

2.2 The weight of a fully equipped primary EKSU is approximately 77 pounds (35 kg).

2.3 The EKSU cabinet contains three shelves for plug-in printed circuit boards. The printed circuit boards plug into connectors which are mounted on the backplane of the shelves.

2.4 Connectors, terminals and input jacks are located on the bottom rear of the EKSU for power, Central Office lines, MOH input, external speakers, and for bringing out the station conductors for termination on the Main Distribution Frame (MDF). These connectors are accessible without the need to remove any EKSU covers.

3. EKSU LOCATION REQUIREMENTS

3.1 POWER REQUIREMENTS—The STRATA III primary EKSU requires 24V DC at 8 amperes. This is provided by the STRATA III Power Supply (EPSA). The Power Supply in turn requires power from a 115V AC outlet (with earth ground as third connection). The outlet should be separately fused and rated at 15 amperes. The STRATA III Power Supply will function properly if 90V AC to 130V AC exists at the AC outlet.

3.2 VENTILATION CONSIDERATIONS—Sufficient ventilation should exist to allow the dissipation of heat generated by the power supply and EKSU. Total heat dissipation for the STRATA III Power Supply and EKSU combined will not exceed 750 BTU under normal operating conditions. Each EKT dissipates less than 10 BTU average.

3.3 SPACE REQUIREMENTS—To allow for adequate ventilation and a service area, there should be no wall or barrier closer than as follows:

Left side	14 inches
Right side	6 inches
Back	1 inch
Front	3 feet
Top	10 inches

This is in addition to space required for the EPSA Power Supply Assembly, MDF, Cable Routing and Service Loops.

3.4 ENVIRONMENTAL FACTORS—The EKSU location should be within the allowable range of 20% to 80% humidity (without condensation). The temperature should be relatively constant within 0° to 50°C range. Exposure to dust and airborne chemicals of a corrosive nature is to be avoided. The possibility of exposure to physical damage should also be taken into consideration.

WARNING: DO NOT LOCATE THE EKSU, MDF, OR IDF IN A CARPETED AREA. AVOID WALKING ACROSS CARPETED AREAS WHEN WORKING IN EKSU. STATIC ELECTRICITY CHARGES GENERATED BY WALKING ON CARPETS ARE POTENTIALLY DANGEROUS TO THE PCB COMPONENTS OF THE STRATA III EKSU. INSTALLATION AND REPAIR PERSONNEL SHOULD BE CAREFUL TO DISCHARGE ANY STATIC CHARGES COLLECTED ON THEIR PERSONS BY TOUCHING THE EKSU OUTER CABINET BEFORE HANDLING ANY PCB's CONTAINED IN THE STRATA III SYSTEM. THE EKSU MUST BE PROPERLY GROUNDED (SEE SECTION 9) TO PROTECT AGAINST STATIC.

3.5 CABLING CONSIDERATIONS—All stations must be within 1,000 cable feet of the EKSU. The EKSU must be so located as to allow station locations to fall within this parameter. Acceptable cable is 24 AWG or 22 AWG telephone cable, three twisted pairs, indoor type, jacketed but not shielded.

4. MAIN DISTRUBUTION FRAME (MDF) CONFIGURATION

4.1 It is recommended that the Main Distribution Frame (MDF) for the primary EKSU consist of four 66MI-50 pair "split" Connection Blocks, and arranged as shown in Figure 2.

4.2 One to four 25 pair male-amphenoled cables of suitable length are connected to connectors B through E located at the bottom rear of the primary EKSU (see Figure 3) and then terminated, one per 66MI-50 block, in the standard color code order as shown in Figures 4 thru 7. (Two 50 pair cable assemblies may be conveniently used.) The functions of the cables are as follows:

- **Cable B**—Key data, voice and LED data pair connections from the primary EKSU to keysets #10 thru #17. (The S-V pair is used only in connecting an EDSS Console or EBLF Module.) Refer to Figure 4.
- **Cable C**—Key data, voice and LED data pair connections from the primary EKSU to keysets #18 thru #25. (The S-V pair is used only in connecting an EDSS Console or EBLF Module.) Refer to Figure 5.
- **Cable D**—Key data, voice and LED data pair connections between the primary EKSU and keysets #26 thru #33. (The S-V pair is used only in connecting an EBLF Module.) Refer to Figure 6.
- **Cable E**—Key, data, voice and LED data pair connections between the EDSU and keysets #34 thru #41. (The S-V pair is used only in connecting an EBLF Module.) Refer to Figure 7.

NOTE: Connector A at the rear of the EKSU is used for connection of the C.O. or PABX lines to the system. See paragraph 8.

4.3 STATION CABLE CONNECTIONS

4.3.1 The individual 3 pair station cables are terminated consecutively exactly as shown in the individual MDF Block connection diagrams (Figures 4 thru 7) on the vacant side of the MDF blocks and bridging clips placed between the

- **ERGU**—Register Unit
- **EINU**—Intercom Unit

6.2 Consult section 100-004-100 for a general description of the above PCB's and their functions.

NOTE: Only one EINU and one ERGU are necessary to introduce both paths of intercom into the primary system.

6.3 The following PCB's which are not present in the primary EKSU package must be field-installed in accordance with the desired system configuration and optional features:

- **EXPU**—Cross Point Unit—One for every eight stations to be connected to the EKSU.
- **EVCU**—Voice Cross Point Matrix Unit—One for every eight stations to be present in the system.
- **ESTU**—Station Unit—One for every four stations to be present in the system.
- **ECOU**—Central Office Unit—One for every two C.O. Lines to be present in the system.

6.4 Table 1 shows the system relationships of the above mentioned PCB's.

6.5 Installation of the above PCB's consists of simple insertion into the proper EKSU connector. Consult Figure 10 for proper location of the various PCB's used in the STRATA III primary EKSU. PCB locations are also marked on the EKSU shelf surfaces for easy reference.

IMPORTANT: ALL PCB's ARE KEYED TO PREVENT INSERTION IN THE WRONG CONNECTOR. THEREFORE DO NOT USE EXCESSIVE FORCE TO INSERT PCB's.

6.6 Each EXPU and EVCU connector in the EKSU is wired to serve a particular pair of

TABLE 1—PCB CONFIGURATION

COMMENT	PCB NAME	ABBREVIATED FUNCTION	NUMBER OF UNITS NEEDED
One Supplied PER Primary EKSU Package	ECKU	Clock	1 per primary system
	EPRU	Power Supply Regulator	1 per system
	ERGU	Register	1 per primary system
	EINU	Intercom	1 per primary system
Install as Determined by System Configuration	EXPU	Cross-Point Connection	1 per 8 stations in EKSU
	EVCU	Voice Matrix	1 per 8 stations
	ESTU	Station Interface	1 per 4 stations
	ECOU	C.O. Line Interface	1 per 2 C.O. Lines
Optional	EDSU	DSS Console Control	1 per EDSS*
Optional	EBLU	DSS and/or BLF Control	1 per EDSS or EBLF*
Optional	EILU	Special Operator LED Illum	1 per EDSS
Optional	EGPU	Group and External Page	1 per primary system

*A maximum of one EDSS console and one EBLF or two EBLF (with no DSS) may be connected to an EKSU. An EDSU is needed only if an EDSS console is present. An EBLU is needed if either an EDSS or EBLF (or both) is present.

ESTU's. Therefore EXPU and EVCU PCB's should be installed as necessitated by the presence in the EKSU of the particular ESTU PCB's with which they are associated. The relationships are as follows:

INSTALLED	ALSO REQUIRED
ESTU (1), ESTU (2)	EXPU (1), and EVCU (1)
ESTU (3), ESTU (4)	EXPU (2), and EVCU (2)
ESTU (5), ESTU (6)	EXPU (3), and EVCU (3)
ESTU (7), ESTU (8)	EXPU (4), and EVCU (4)

6.7 The relationship between the actual stations to be installed and the PCB's which must be installed to accommodate those stations is demonstrated in Figure 11.

7. EKSU AND PCB OPTION WIRING

7.1 EKSU WIRING CONSIDERATIONS

7.1.1 The following PCB's represent optional system functions and may not be called for in the total system configuration. If any of these PCB's are NOT to be installed in the EKSU it is essential that straps be placed on the rear pins of the designated PCB connector(s) as indicated. Refer to Figure 12 for connector locations as seen from the rear of the EKSU and Figure 13 for actual strap placement on the individual connectors.

IMPORTANT: WIRE USED ON THE BACK PLANE MUST BE 30 AWG, INSULATED. INSTALL ONLY WITH A 30 AWG WIRE WRAP TOOL. USE OF INCORRECT WIRE OR TOOL WILL CAUSE PHYSICAL DAMAGE TO CONNECTOR PINS AND POSSIBLE EKSU FAILURE.

7.1.1.1 NO EDSU—If there is to be no EDSS console in the system, an EDSU PCB will not be necessary. Place the following straps on the rear of the EDSU connector:

- PIN 5A to PIN 5B
- PIN 6A to PIN 6B
- PIN 8A to PIN 8B
- PIN 9A to PIN 9B

7.1.1.2 NO EBLU—If there is to be no EDSS console or EBLF in the system an EBLU PCB will not be necessary. Place the following strap on the rear of the EBLU connector:

- PIN 5A to PIN 8B

7.1.1.3 NO EGPU—If Group Paging or External Paging are not to be system features an EGPU PCB will not be necessary. Place the following straps on the rear of the EGPU connector:

- PIN 5A to PIN 5B
- PIN 6A to PIN 6B
- PIN 7A to PIN 7B
- PIN 20A to PIN 20B

7.1.1.4 NO EILU—If there is to be no EDSS console in the system OR the EDSS console is not to be equipped for "I HOLD", "I USE", or "DSS RECALL" (see section 100-004-100, paragraph 4.3.3 for feature descriptions) an EILU PCB will not be required. Place the following straps on the rear of the EILU connector:

- PIN 21A to PIN 21B
- PIN 22A to PIN 22B

7.2 INCOMING CALL SIGNALING

7.2.1 Each STRATA III primary EKSU is factory programmed to have only station #10 "ring" on all incoming calls. (See Figure 14.) To program otherwise, refer to paragraph 7.3.

7.2.2 Each ECOU board installed in the EKSU will send out a signal of +12V DC on pins 20B, 21B, and 22B of its associated connector in the EKSU when activated by an incoming call on its first line. Similarly, an incoming call on the ECOU's second line will activate a signal of +12V DC on pins 20A, 21A, and 22A of the ECOU connector. Each pin is diode isolated from the other two in its group to allow individual line participation in up to three different signaling circuits. (See Figure 15.)

7.2.3 For every 8 stations in the system an EVCU board must be installed. Pins 2A through

9A of each EVCU connector are assigned individually to the 8 consecutive stations serviced by the EVCU board for the purpose of accepting an incoming C.O. call signal for its respective station. (See Figure 16.)

7.2.4 Assignment of incoming call signaling on a permanent basis (see Line Signal Transfer—paragraph 7.4) is accomplished by wiring between the proper ECOU and EVCU signaling pins.

7.2.5 Figure 17 gives an example of possible ringing groups.

7.3 EXCLUSION OF PRIVATE LINES FROM COMMON RING CIRCUIT

7.3.1 The EKSU is factory-wired so that station #10 will "ring" on all lines. This is accomplished by having pins 20B and 20A of all ECOU connectors wired together on to pin 5A of the EBLU connector. To remove a particular line from this "common ring" circuit, it's associated ECOU pin (20B or 20A) must be isolated from this circuit. This is accomplished by "breaking the chain" and then re-connecting it minus the appropriate ECOU connector signaling pin.

7.3.2 The isolated line may then be assigned to ring at any telephone by strapping the isolated ECOU signal emitter pin to the proper EVCU signal receptor pin (refer to Figures 15 and 16).

7.4 NIGHT TRANSFER OF INCOMING SIGNALING

7.4.1 PRINCIPLE OF OPERATION—Installation of the EBLU board allows the programming of up to 3 separate groups of "ringing" stations (refer to Figure 19). Pins 5A, 6A, and 7A on the rear of the EBLU connector are the three input transfer pins representing the three potential line groupings. Connections are wired between these pins and the ECOU signaling pins representing the lines to ring in each group (read paragraph 7.2).

7.4.2 During the day, or when the N.T. feature has not been activated at an EDSS console or EBLF unit, all three groups are connected together and "ring thru"on pin 8B. Hence any station EVCU signaling pin connected to EBLU connector pin 8B will cause the corresponding station to ring for any line appearing in any group. Factory wiring will cause the DSS extension #10 to ring in the day (refer to Figure 19).

7.4.3 When the N.T. feature is activated, continuity between pins 5A, 6A, 7A and pin 8B on the EBLU connector is broken and whatever stations are wired to EBLU connector pin 8B will no longer ring. Factory wiring will cause extension #11 to ring instead.

7.4.3.1 EBLU connector pin 5A will now transfer its signal to EBLU connector pin 5B. Any station with its representative EVCU signaling pin connected to EBLU pin 5B will now ring for any line whose ECOU signaling pin is connected to pin 5A (Refer to Figure 19):

- All #20 (A and B) ECOU connector pins are connected together on EBLU pin 5A. Station #10 EVCU (1) signaling pin (2A) is connected to EBLU pin 8B. Hence station #10 will ring on all lines when the N.T. feature is not is use.
- When the N.T. feature is activated at an EDSS console or EBLF, pin 8B becomes inactive and pin 5A connects then to pin 5B on the EBLU connector. Hence, station #11 will now ring for all incoming calls because all the ECOU signal emitter pins are factory wired to EBLU pin 5A.

7.4.4 WIRING PROCEDURE—

- Isolate the ECOU signaling pins of all C.O. lines not to ring in group #1. Follow the procedure outlined in paragraph 7.3.
- Wire the ECOU signal pins of the lines to ring in group 2 to EBLU pin 6A.
- Wire the ECOU signal pins of the lines to ring in group 3 to EBLU pin 7A.
- Common all the EVCU signal pins representing the stations to ring in group 1 and connect to EBLU pin 5B.

NOTE: Pin #5B, is already factory wired to station #11. Remove it if station #11 is not to be included in group #1.

- Common all the EVCU signal pins representing the stations to ring in group 2 and connect to EBLU pin 6B.

- Common all the EVCU signal pins representing the stations to ring in group 3 and connect to EBLU pin 7B.

7.4.5 In the upper right-hand corner of the EBLU card is located a movable plug, designated "N.T." The card is factory shipped with the plug in the right-most or "DAY" position. In this position the Night-Transfer feature will function as described in the preceding paragraphs. However, by removing and replacing the plug on the two left-most pins ("N.T." setting) the transfer feature will reverse its operation. Pins 5B, 6B, and 7B will now be active during the day setting (EDSS "N.T." lamp off) and inactive when the N.T. button has been pressed (lamp on). Pin 8B will now only be active when the N.T. lamp is on. (See Figure 19). This allows the installer to assign up to 3 groups of "ringing" stations to either the day or night setting, as the customer desires.

7.5 REGISTER TIME-OUT CANCELLATION

The STRATA III System is normally programmed for the dialing register to time out after 20 to 30 seconds if an intercom call or page is not answered handset to handset. The time out feature may be cancelled by cutting the white strap S1, labelled "Timeout", located on the ERGU printed circuit board (see Figure 21).

7.6 TONE FIRST INTERCOM SIGNALING—The STRATA III System is factory-programmed for 2 digit voice and 3 digit (station code plus "1") tone signaling to a selected station dialed on an idle intercom path. The procedure may be reversed (2 digit tone and 3 digit voice signaling) by strapping the ERGU board as follows (refer to Figure 21).

- TONE FIRST—move red strap S2 to P7 (labelled "TONE")
- VOICE FIRST—move red strap S2 to P6 (labelled "VOICE")

7.7 MUSIC ON HOLD

7.7.1 Connect the male input jacks from the music source (tape deck or tuner) to the female MOH input jacks located on the lower rear connection panel of the primary EKSU (see Figure 3).

7.7.2 If a tape deck is to be used the optional MOH relay must be obtained and plugged into position "K1" on the EPRU board (see Figure 22). The relay will then operate when a call is placed on hold, providing a made contact between the two terminals labeled MR (see Figure 3). This circuit may then be used to control a customer supplied, externally mounted slave relay which can then be wired to control power on/off for the tape player. See Figure 23.

7.7.3 If a tuner is used the power plug is simply plugged into an available 110V AC outlet and the tuner left on.

7.7.4 MOH VOLUME CONTROL—To control loudness of music-on-hold, adjust the variable resistor, labelled "MOH", located on the front of the EPRU printed circuit board. Maximum loudness is limited by internal circuits in order to comply with FCC regulations.

7.8 STATION RESTRICTION FROM OUTGOING CALLS

7.8.1 Individual stations may be restricted from accessing idle outside lines. This allows a station to be restricted from making outgoing calls, but still allows the station to answer incoming calls.

7.8.2 Such restricted stations may also access idle lines placed on hold by an unrestricted station, and then dial out. This allows an operator to control and/or log the origin of outgoing calls without the operator's having to dial the calls.

7.8.3 For every 4 stations in the system an ESTU printed circuit board will be present in the EKSU. Pin 17A is the restriction assignment pin for the first station handled by the ESTU. Pin 17B is assigned to the second station while 25A and 25B are assigned to the third and fourth stations respectively.

7.8.4 To restrict a station from accessing an idle outside line connect the ESTU-restriction pin for the station to be restricted to pin 9B of the ECKU connector. See Figures 24 and 25.

7.9 TONE FIRST EDSS SIGNALING

7.9.1 The STRATA III EDSS-equipped system is factory-programmed to establish a voice page

circuit to the selected stations upon pressing the representative key on the EDSS console. The EDSS may be re-programmed to tone page first upon station selection by moving the S1 option strap on the EDSU board from pin P1, labelled "TONE", to P2, labelled "VOICE", (see Figure 26).

7.10 AUTO-RELEASE FROM HOLD

7.10.1 The STRATA III EKSU is shipped factory-wired for auto release of hold (AROH) of outside lines abandoned by the distant party and connected through an ESS-type Central Office. This is accomplished by having the following pins strapped on the rear of the EASU connector:

- PIN 3A to PIN 3B
- PIN 4A to PIN 4B

7.10.2 If the AROH feature is not desired, remove the above mentioned straps and install the following strap on the EASU connector:

- PIN 3A to PIN 4B

7.10.3 If the Central Office serving the STRATA III system is a non-ESS office (crossbar, step) and AROH is desired, cut the strap between EASU pins 3A to 3B and place the following strap on the EASU connector:

- PIN 3B to PIN 4A

7.11 HOOKSWITCH FLASH FEATURE

7.11.1 In STRATA III systems functioning "behind" a PABX it is possible to modify the ECOU PCB's assigned to PABX lines to allow station "PRLS" buttons to be used for "Hookswitch Flash" when such a line is engaged.

7.11.2 To accomplish this on a pro-line basis, move plug P1 on the ECOU PCB from position "C" to position "HL" if the first line of that ECOU is to have Hookswitch Flash capability.

7.11.3 Similarly, move plug P2 to the "HL" position if the second line of the ECOU is to also have Hookswitch Flash capability (see Figure 27).

7.11.4 The "PRLS" button will now send out a Hookswitch Flash signal when the station has engaged a modified ECOU line position and the "PRLS" button is depressed for the required time period. The exact time period required for recognition of this signal by the PABX will vary, depending upon the specifications of the PABX.

7.11.5 When a line position on an ECOU PCB is modified for Hookswitch Flash, operation of the Privacy Release feature on a station engaging that line is also altered. To set up an internal conference all station-users wishing to enter the line must press **AND HOLD DOWN** the respective line button. The station-user already having access to the line must then "tap" their station "PRLS" button.

NOTE: Too long a tap will activate the Hookswitch Flash feature.

8. OPTIONAL RELAY SERVICE

8.1 BACKGROUND EXTERNAL MUSIC

8.1.1 A dry relay closure may be optionally provided to disable an external, customer provided music system driving external speakers when external paging is activated. The music system must have provision for such a relay input.

8.1.2 The optional BR relay must be obtained and installed in position K2 on the EGPU PCB (see Figure 28). A dry closure will now appear between terminals "BR" at the lower rear of the primary EKSU (see Figure 3) when external paging is activated.

8.2 MUSIC ON HOLD

8.2.1 A dry relay closure may be optionally provided to turn on an external music source such as a tape deck.

8.2.2 The optional MOH relay must be obtained and installed on the EPRU PCB in position K1 (refer to Figure 22). Closure will now appear between terminals "MR" at the rear of the EKSU (see Figures 3 and 23) when a call is placed on hold.

24V RELAY

8.3 NIGHT SERVICE

8.3.1 An optional relay is available which, when the Night Transfer feature is activated, will provide a dry contact which may be used either to turn on an answering machine or activate a night bell circuit (interrupted bell circuit and slave relay must be provided).

8.3.2 The optional N.T. relay must be obtained and plugged into position K2 on the EPRU PCB as shown in Figure 22.

8.3.3 If a continuous closure upon activation of the N.T. feature is desired, cut strap S1 on the EBLU PCB (see Figure 29). Do NOT cut the strap if a temporary closure upon incoming signal is desired (such as for a night bell).

9. INTRODUCTION OF C.O. OR PABX LINES INTO SYSTEM

9.1 The STRATA III primary EKSU has a capacity of up to 12 C.O. lines. The C.O. lines are introduced into the system via connector A. A 25 pair double-ended cable (one male amphenol, one femal amphenol) of 25' or less in length, is connected to EKSU connector A and run to the USOCRJ21X (amphenol-type) connector supplied by Central Office.

9.2 The C.O. lines must appear in the RJ21X connector as shown in the following table:

Circuit	Function	Conductor
C.O. LINE NO. 1	T	W-BL
	R	BL-W
C.O. LINE NO. 2	T	W-OR
	R	OR-W
C.O. LINE NO. 3	T	W-GN
	R	GN-W
C.O. LINE NO. 4	T	W-BR
	R	BR-W
C.O. LINE NO. 5	T	W-SL
	R	SL-W
C.O. LINE NO. 6	T	R-BL
	R	BL-R
C.O. LINE NO. 7	T	R-OR
	R	OR-R
C.O. LINE NO. 8	T	R-GN
	R	GN-R
C.O. LINE NO. 9	T	R-BR
	R	BR-R
C.O. LINE NO. 10	T	R-SL
	R	SL-R
C.O. LINE NO. 11	T	BK-BL
	R	BL-BK
C.O. LINE NO. 12	T	BK-OR
	R	OR-BK

NOTE: The STRATA III System is not influenced by TR reversals.

9.3 Upon connection of the EKSU cable A to the RJ21X connector the C.O. lines will appear in the system in their order of appearance in the RJ21X connector.

10. POWER CONNECTIONS

10.1 The STRATA III power supply (EPSA) supplies 24V DC to the EKSU via the furnished connecting cable. Input required is 90V AC to 130V AC.

10.2 The physical dimensions of the power supply are:

Length	11 7/8" (29.8 cm)
Width	10" (25 cm)
Height	7 3/4" (19.3 cm)
Weight	32 lbs

10.3 The following procedure should be followed in connecting the EPSA to the EKSU PRIOR to the installation of any of the PCB's in the EKSU. This is desirable in order to ground the EKSU and prevent damage to the PCB components caused by static electricity:

- Wall mount the power supply in order to conform to U.L. safety parameters.

- Plug the power supply into its dedicated AC receptacle and check the 24V and 12V indicators to ascertain that all is in working order.
- Unplug the power supply and connect the EPSA to the EKSU using the connector cord supplied see Figure 30.
- Plug the EPRU printed circuit board into the proper EKSU slot with the rocker switch in the "off" position.
- Plug in the power supply line cord again and turn on the EPRU.
- Check to see that the two LED indicators on the EPRU are lit (if not, refer to the maintenance section 100-004-500).
- Flip the rocker switch on the EPRU to the "off" position.

IMPORTANT: IT IS ESSENTIAL THAT THE EKSU RECEIVE A SOLID EARTH GROUND ON THE "E" TERMINAL. USE EITHER A COMMERCIALLY AVAILABLE EARTH GROUND INDICATOR OR MEASURE THE RESISTANCE BETWEEN "3rd PRONG" EARTH GROUND AND A COLD WATER PIPE. IF NEITHER OF THESE ARE POSSIBLE, THEN THE FOLLOWING TEST SHOULD BE CARRIED OUT PRIOR TO CONNECTING THE EKSU TO THE POWER SUPPLY.

CAUTION: Hazardous voltages are exposed during the following test. Use great care when working with AC voltage.

10.3.1 Obtain a suitable voltmeter and set the meter to handle a possible reading of up to 250V AC.

10.3.2 Connect the meter probes between the two main AC voltage points. The meter should register 90 to 130V AC.

10.3.3 Move one probe to the "GND" terminal. Either the same reading or a reading of 0 volts should be obtained.

10.3.4 If the reading is 0 volts leave the one probe on GND and move the other probe to the 2nd input terminal.

10.3.5 If a reading of 0 volts is obtained on both input terminals, the outlet is not properly grounded.

10.3.6 Remove both probes and set the meter on "ohms." Place one probe on the GND terminal and the other on the one input terminal that rendered a reading of approximately OV. A reading of less than one ohm should be obtained. If not, the ground is inadequate and a "cold water pipe" ground wire will have to be connected to terminal "E" on the rear of the EKSU. In this case, the connector cable spade tip from the EPSA should not be connected to "E".

10.4 Upon adequately grounding the EKSU, the proper PCB's may now safely be installed.

11. INSTALLATION FINALIZATION

11.1 Upon the installation of all necessary PCB's, telephone sets, EKSU wiring, etc., the system should then be powered-up and the various system features tested for correct operation. This may be accomplished by referring to and following the steps outlined in the STRATA III telephone and EDSS Console User's Guides.

11.2 Should a malfunction occur, refer to section 100-004-500.

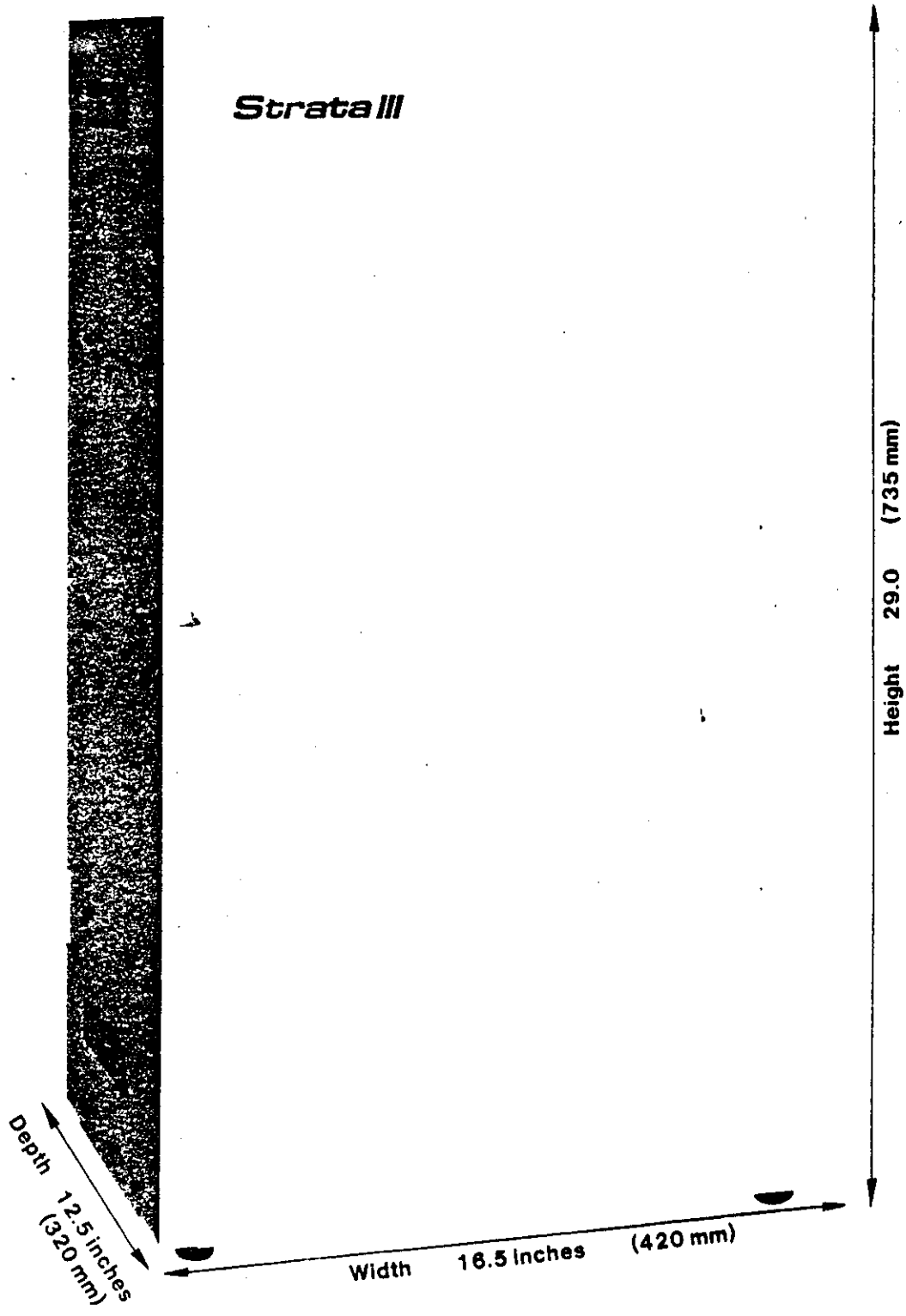


FIGURE 1—EKSU—PHYSICAL DIMENSIONS

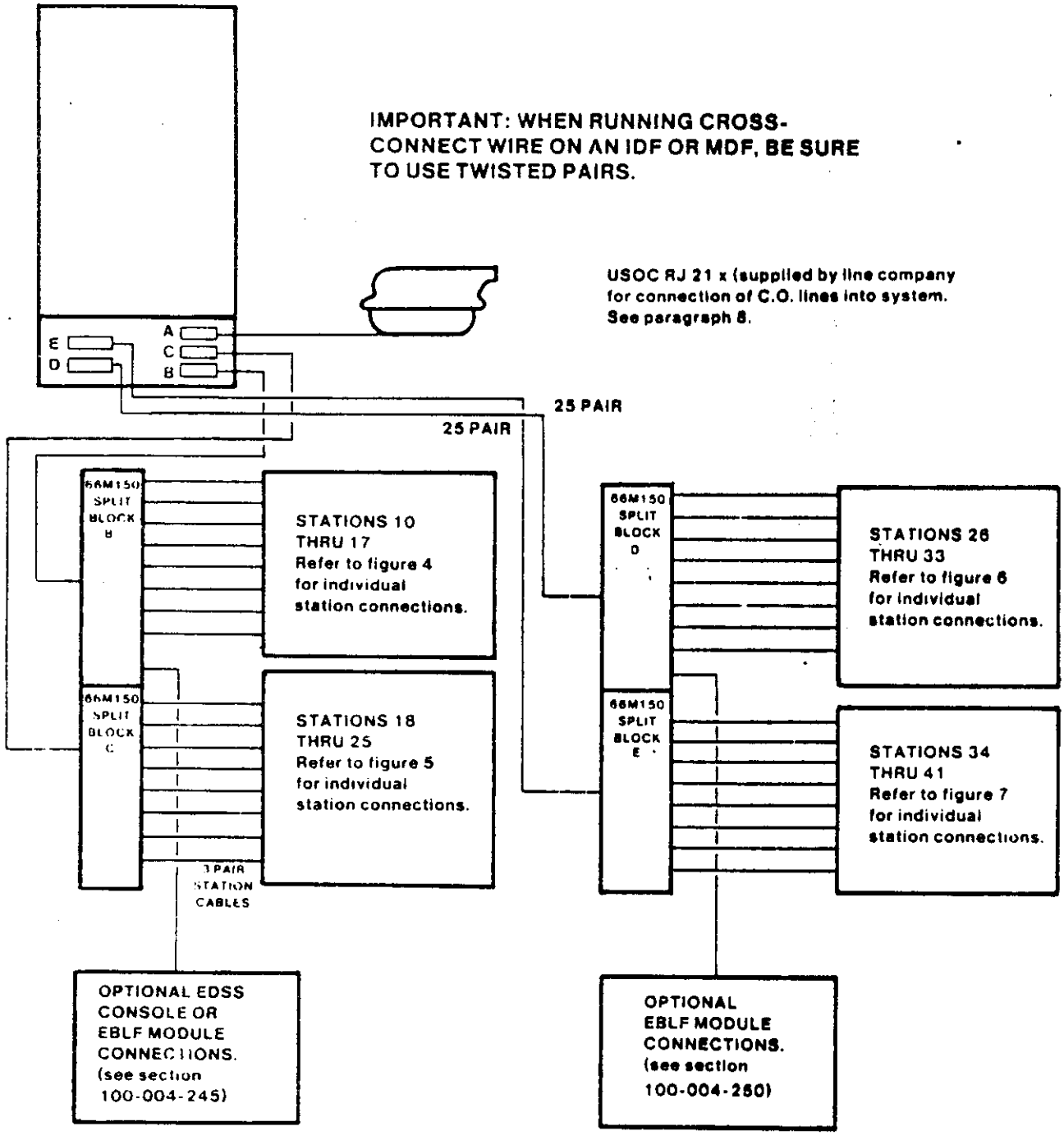


FIGURE 2—MDF CONFIGURATION

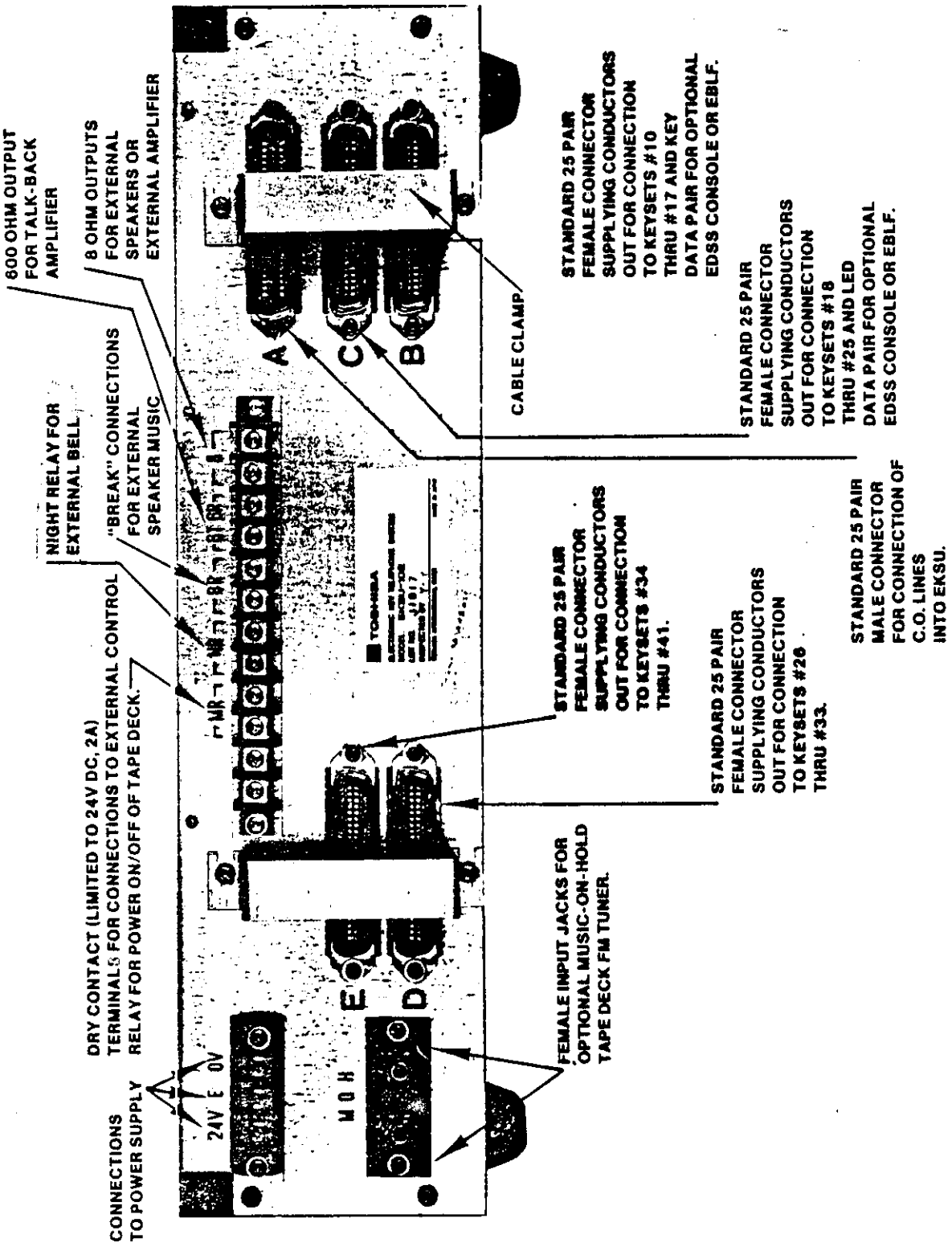


FIGURE 3—REAR EKSU CONNECTION PANEL

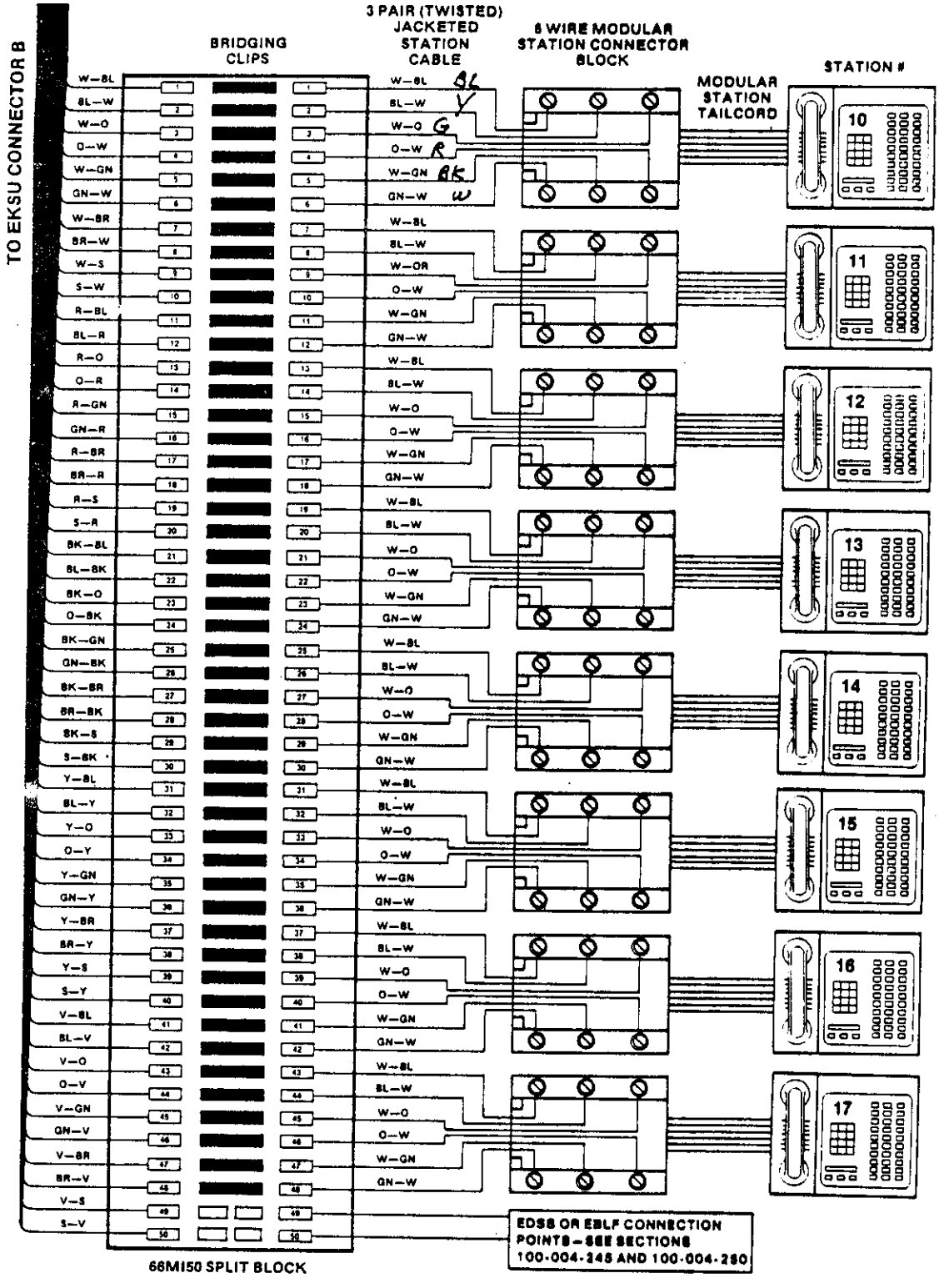


FIGURE 4—MDF BLOCK 'B' CONNECTION DIAGRAM

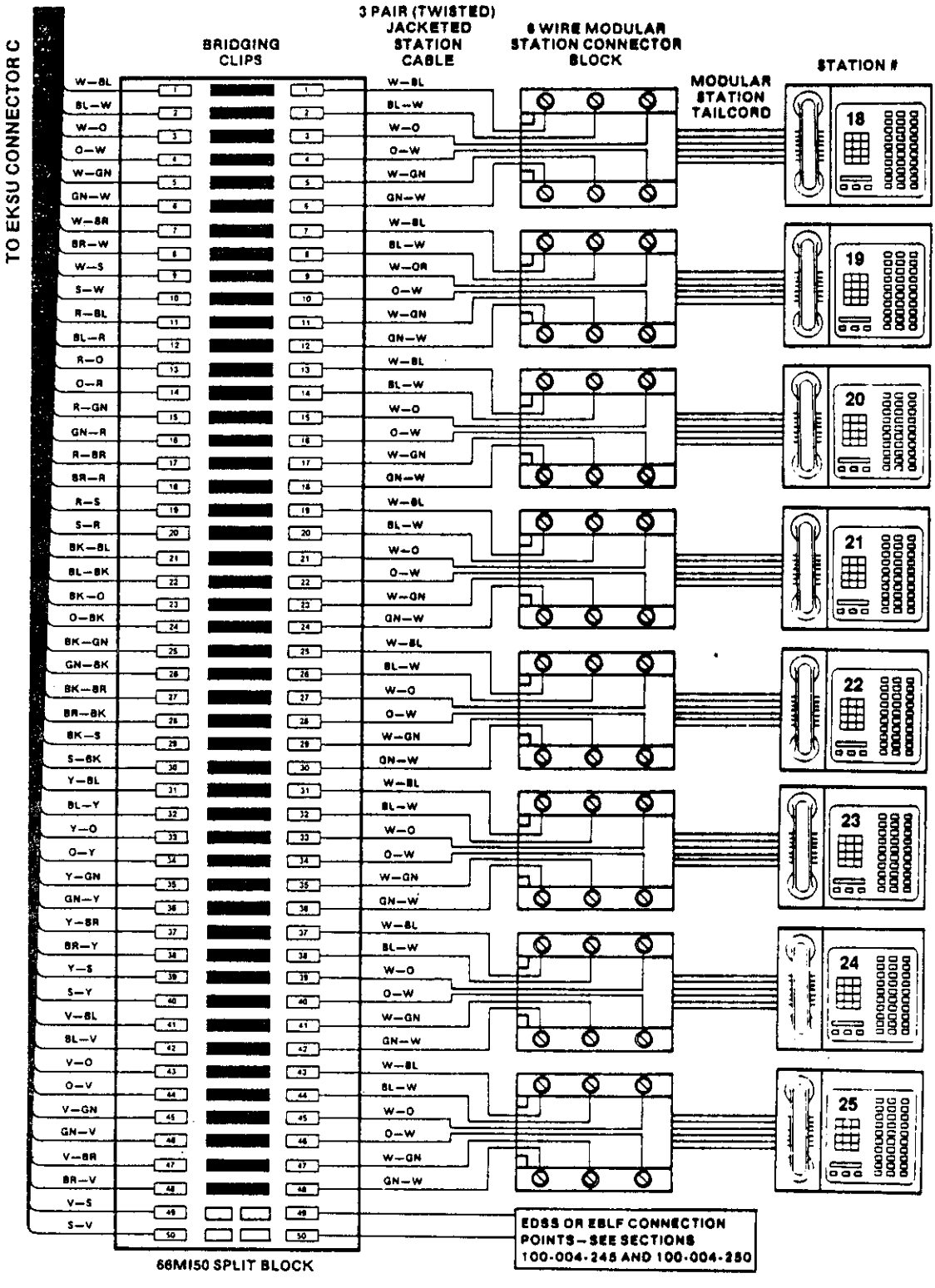


FIGURE 5—MDF BLOCK 'C' CONNECTION DIAGRAM

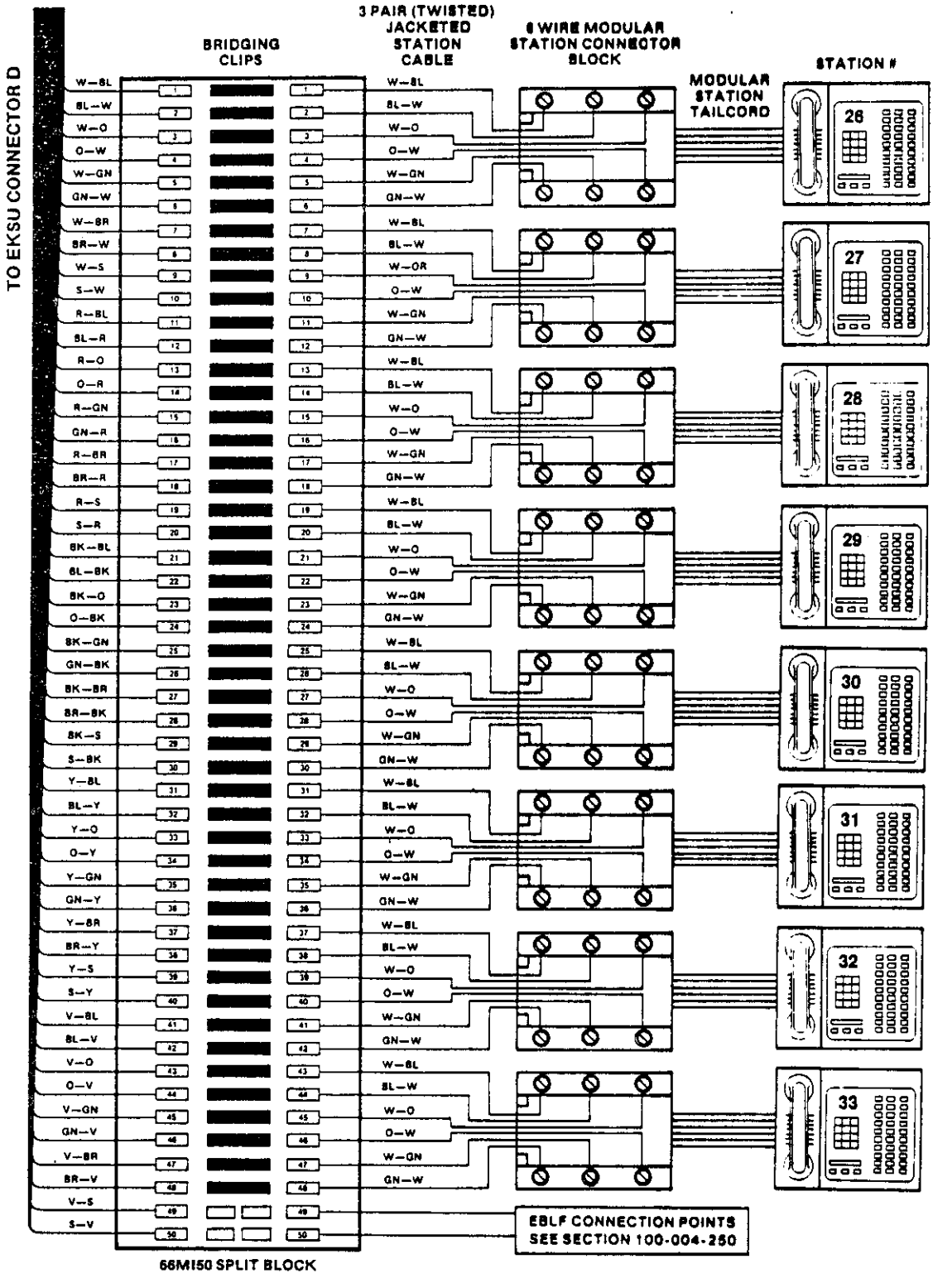


FIGURE 6—MDF BLOCK 'D' CONNECTION DIAGRAM

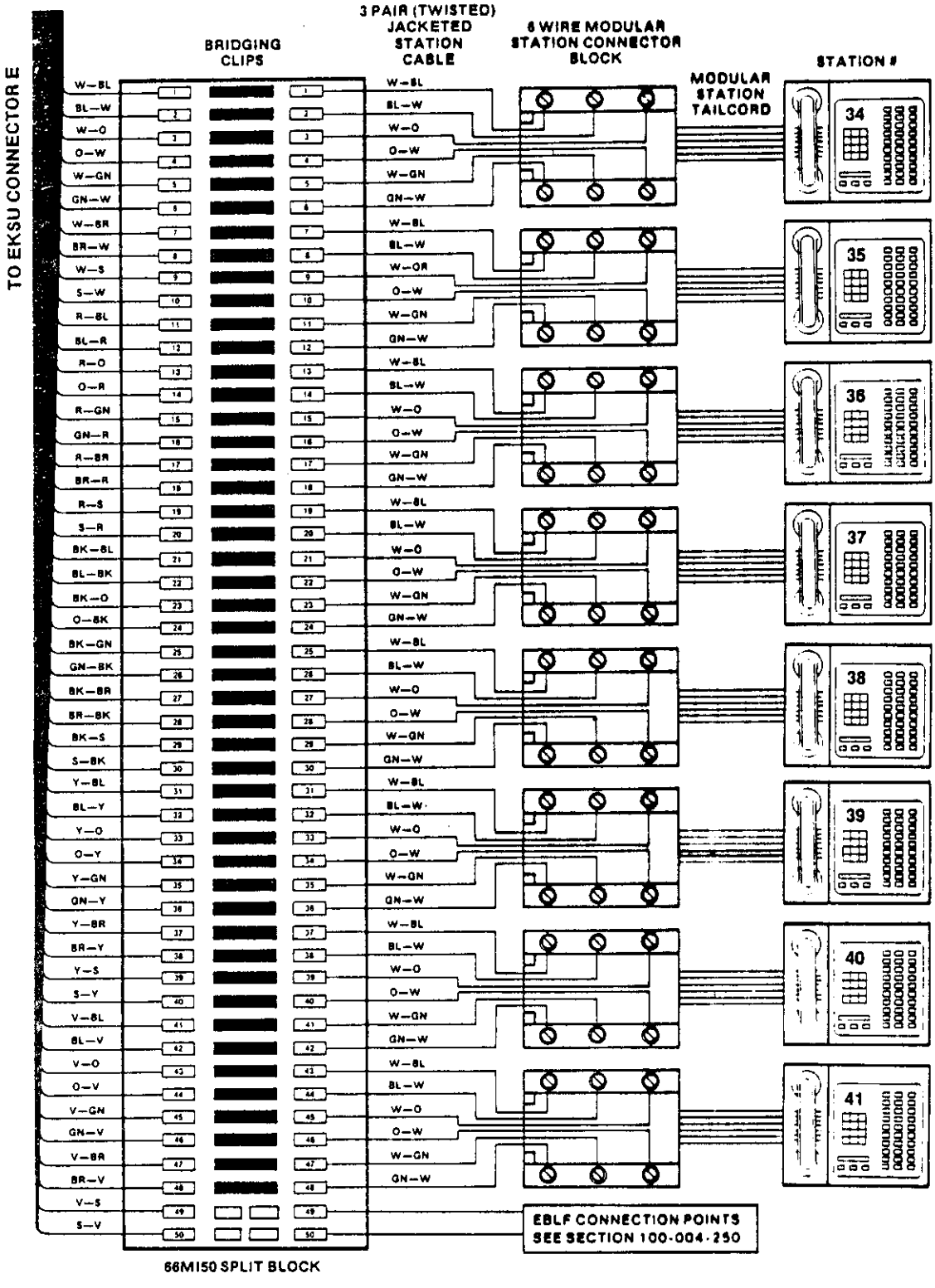


FIGURE 7—MDF BLOCK 'E' CONNECTION DIAGRAM

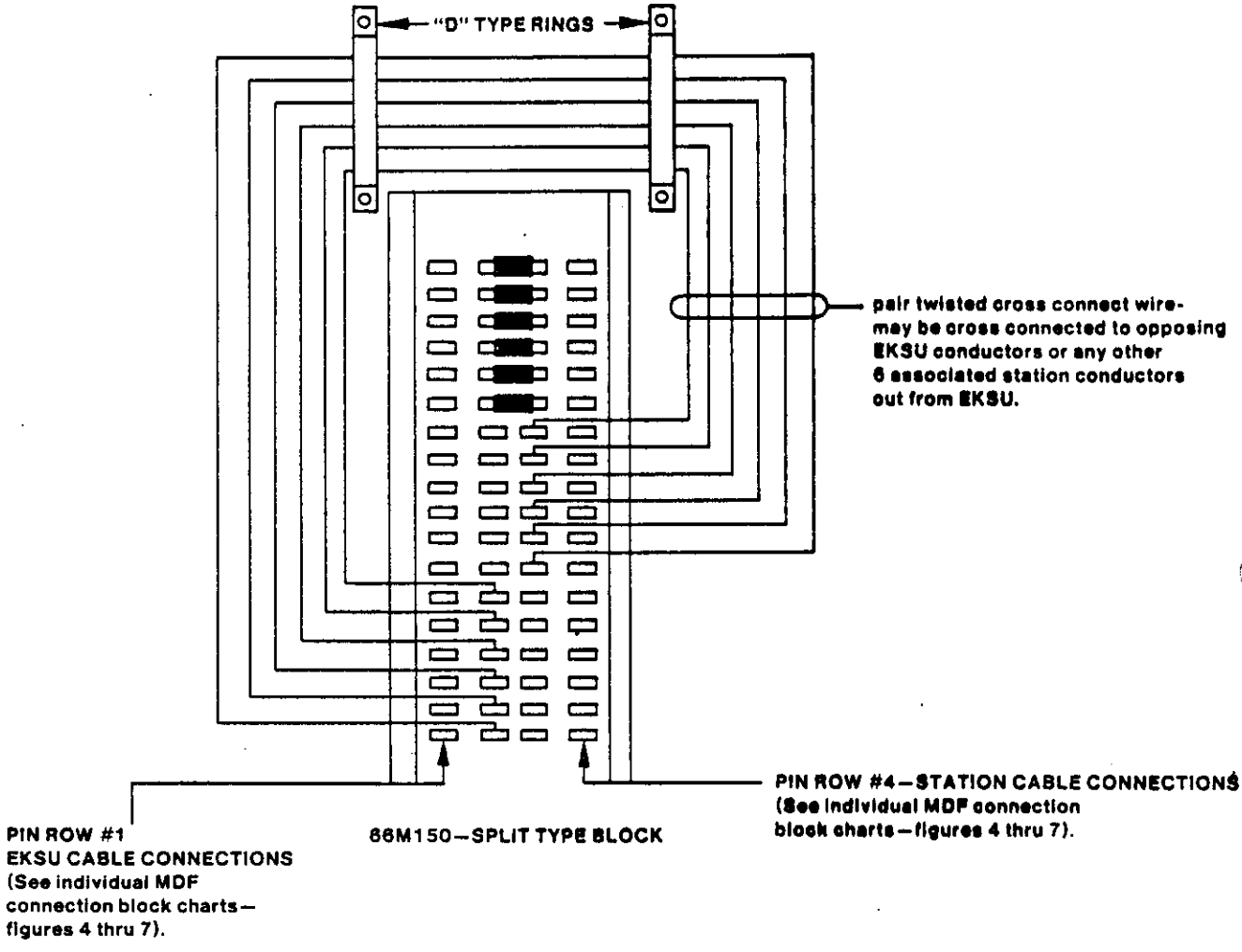
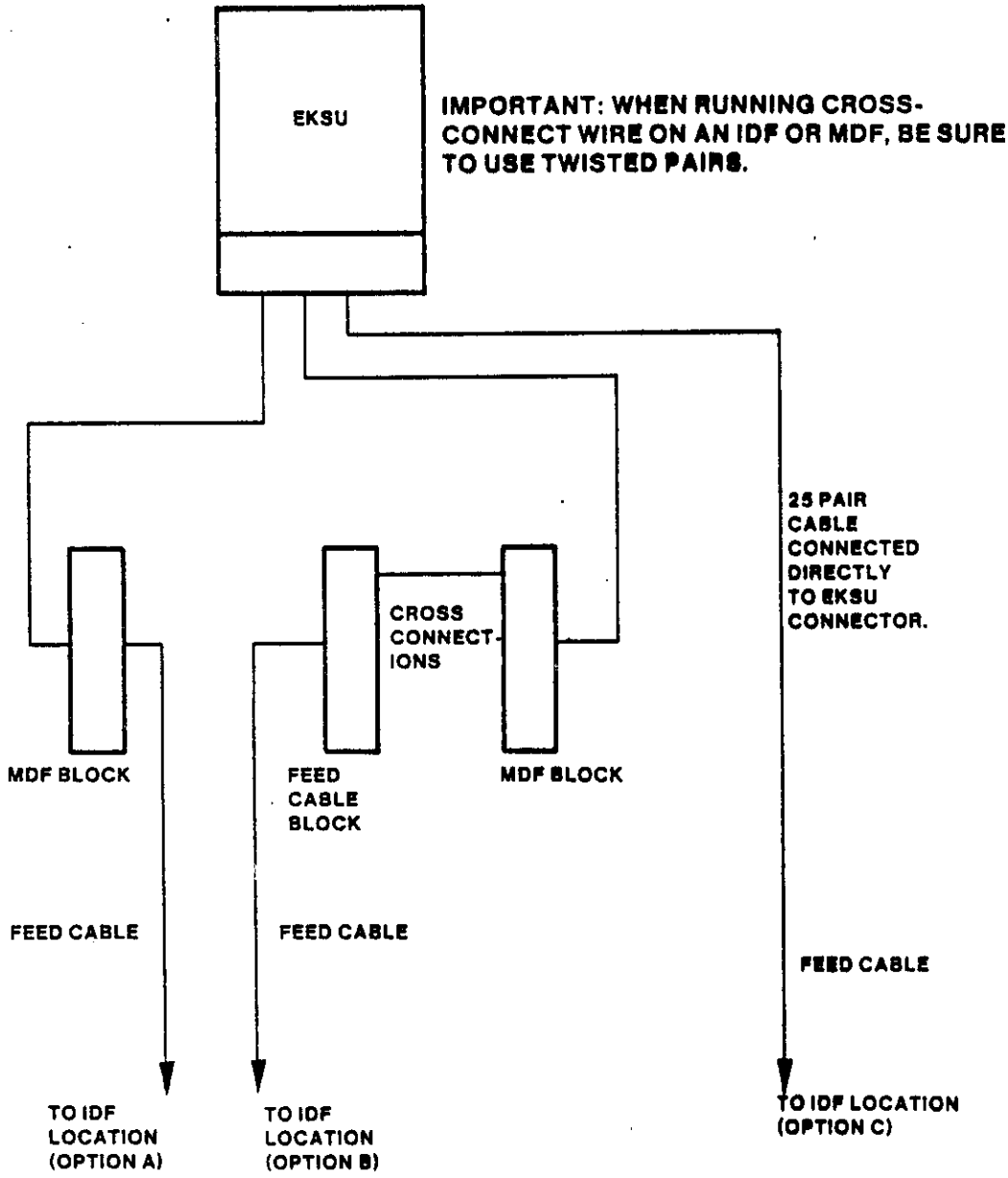


FIGURE 8—INTERCOM CODE RE-ASSIGNMENT



—INTERMEDIATE DISTRIBUTION FRAME OPTIONS

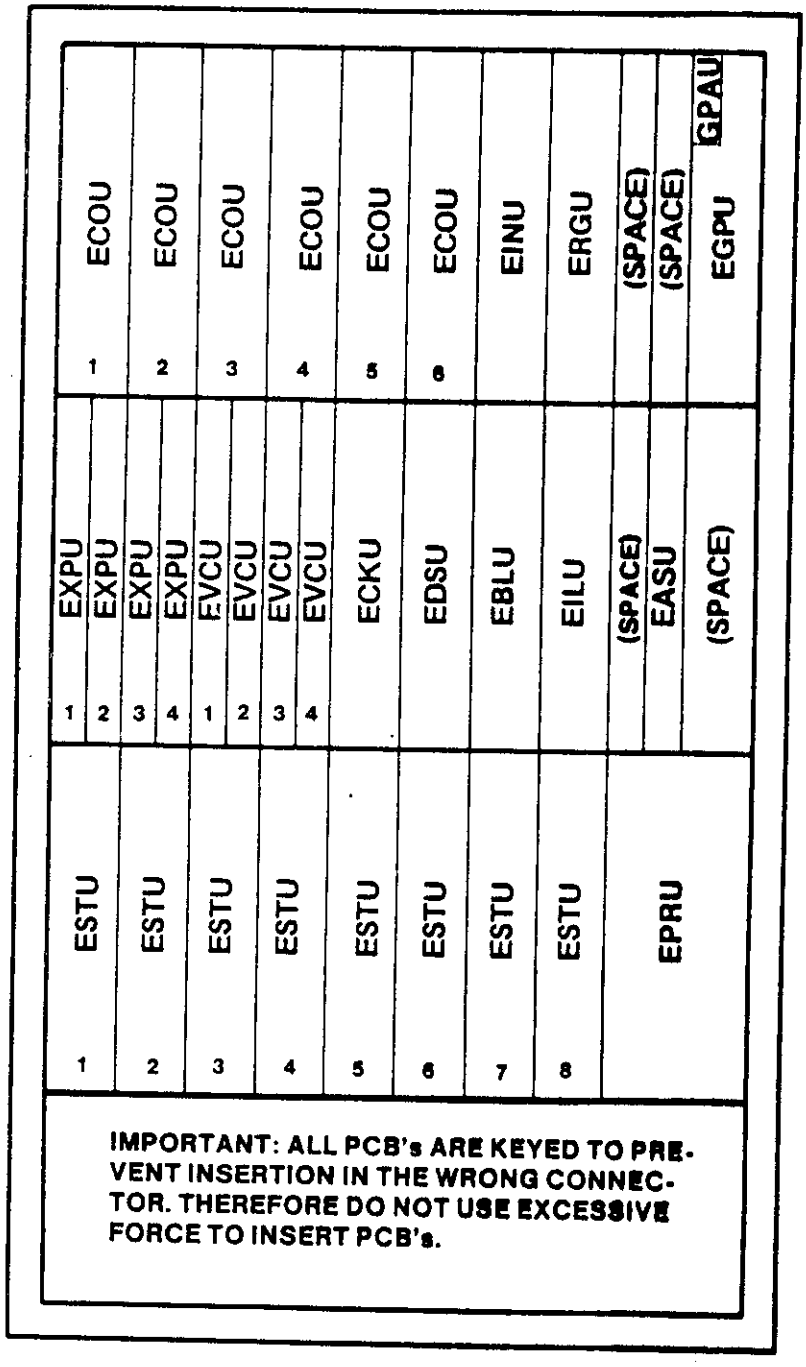


FIGURE 10—LOCATION OF PCB's In EKSU

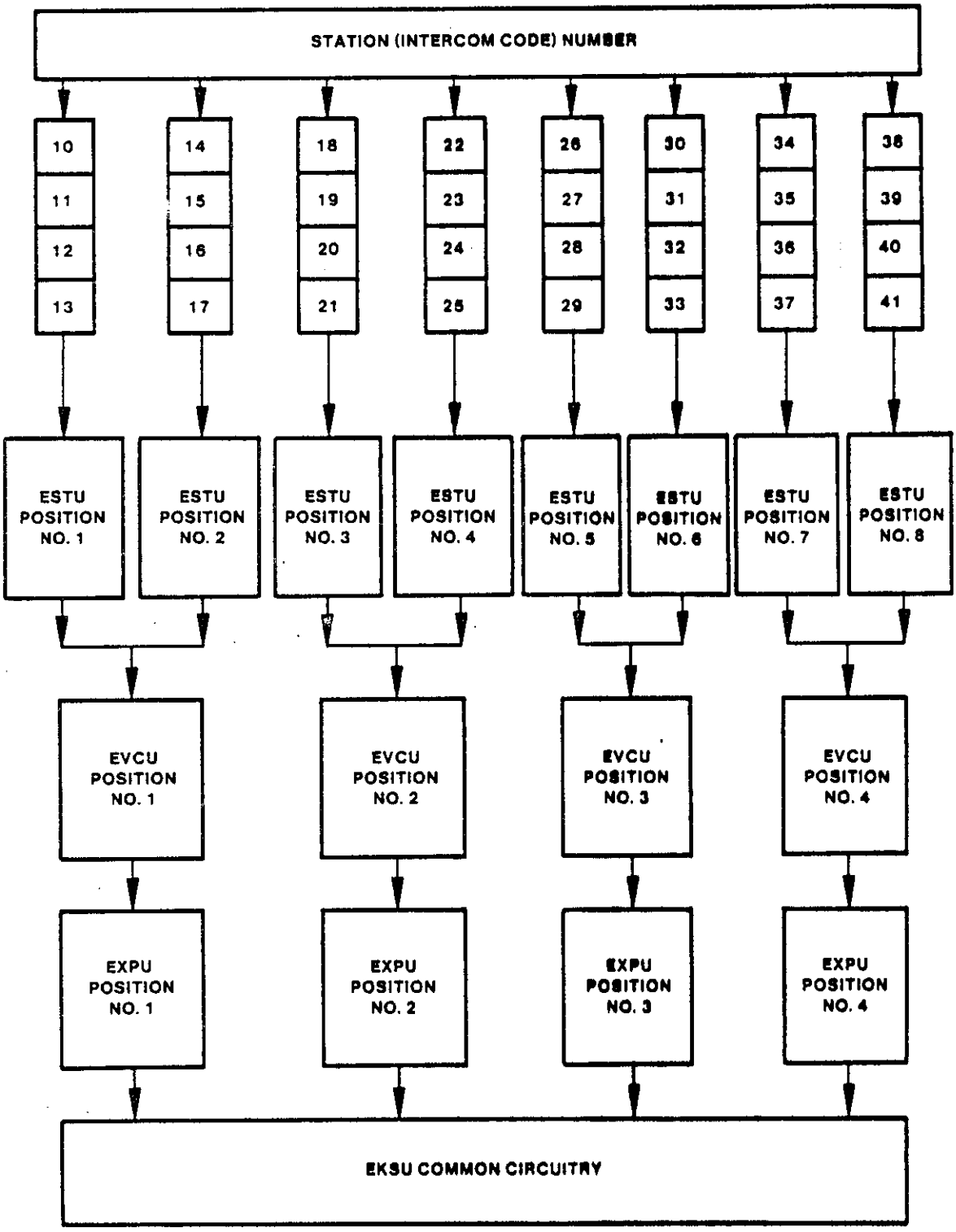


FIGURE 11—STATION TO PCB RELATIONSHIP CHART

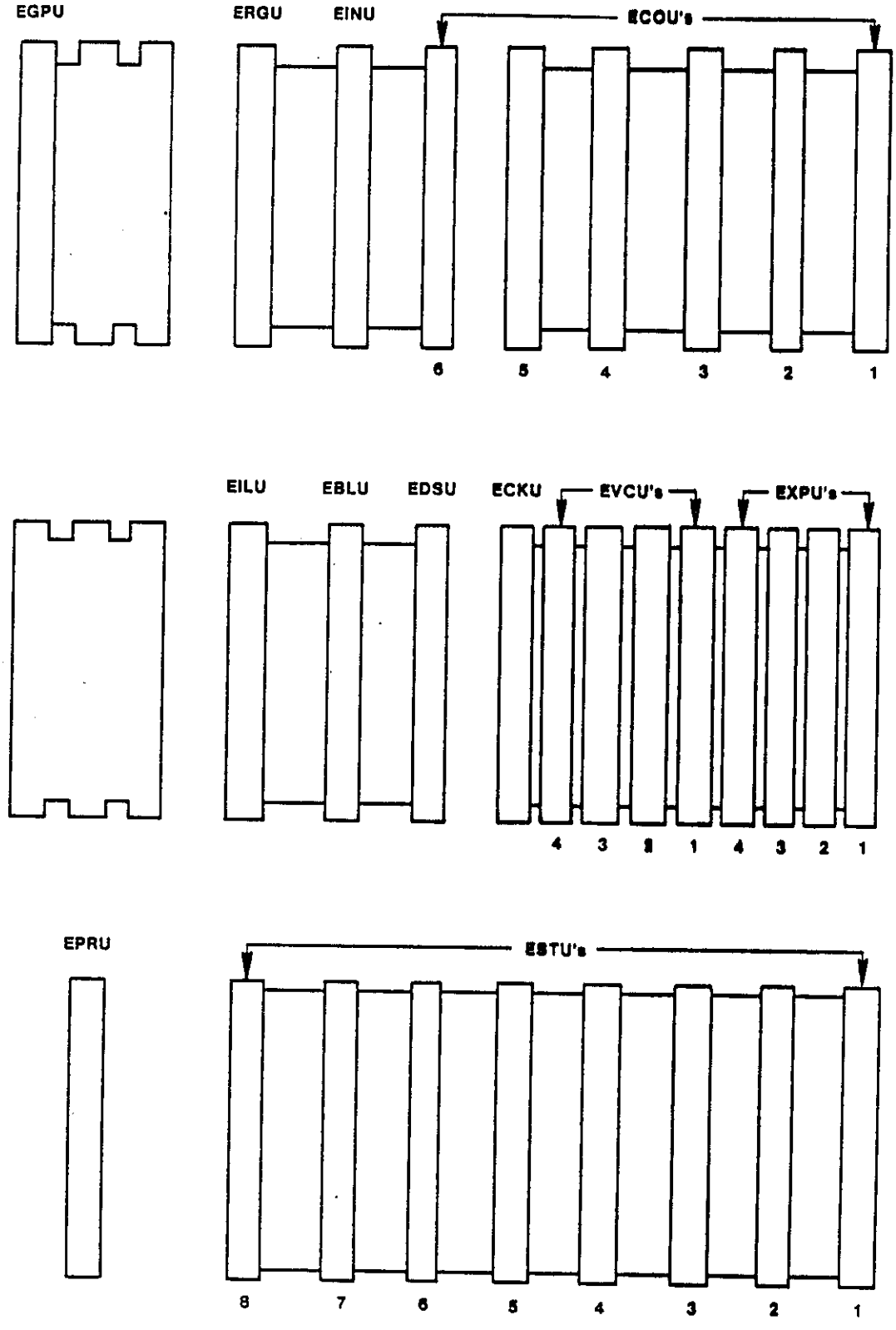


FIGURE 12—REAR VIEW—PCB CONNECTORS IN EKSU

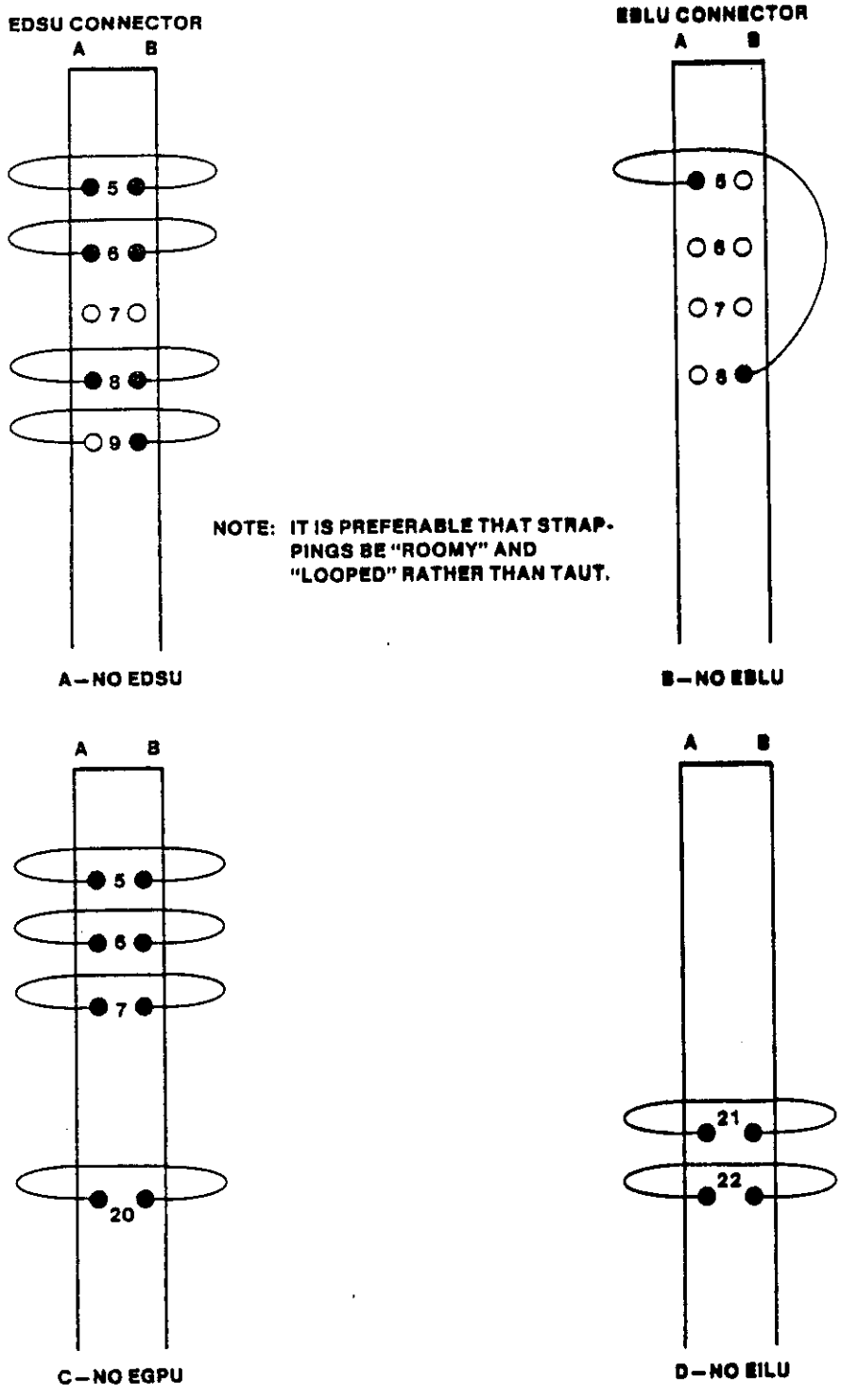


FIGURE 13—EKSU "NO OPTION" WIRING

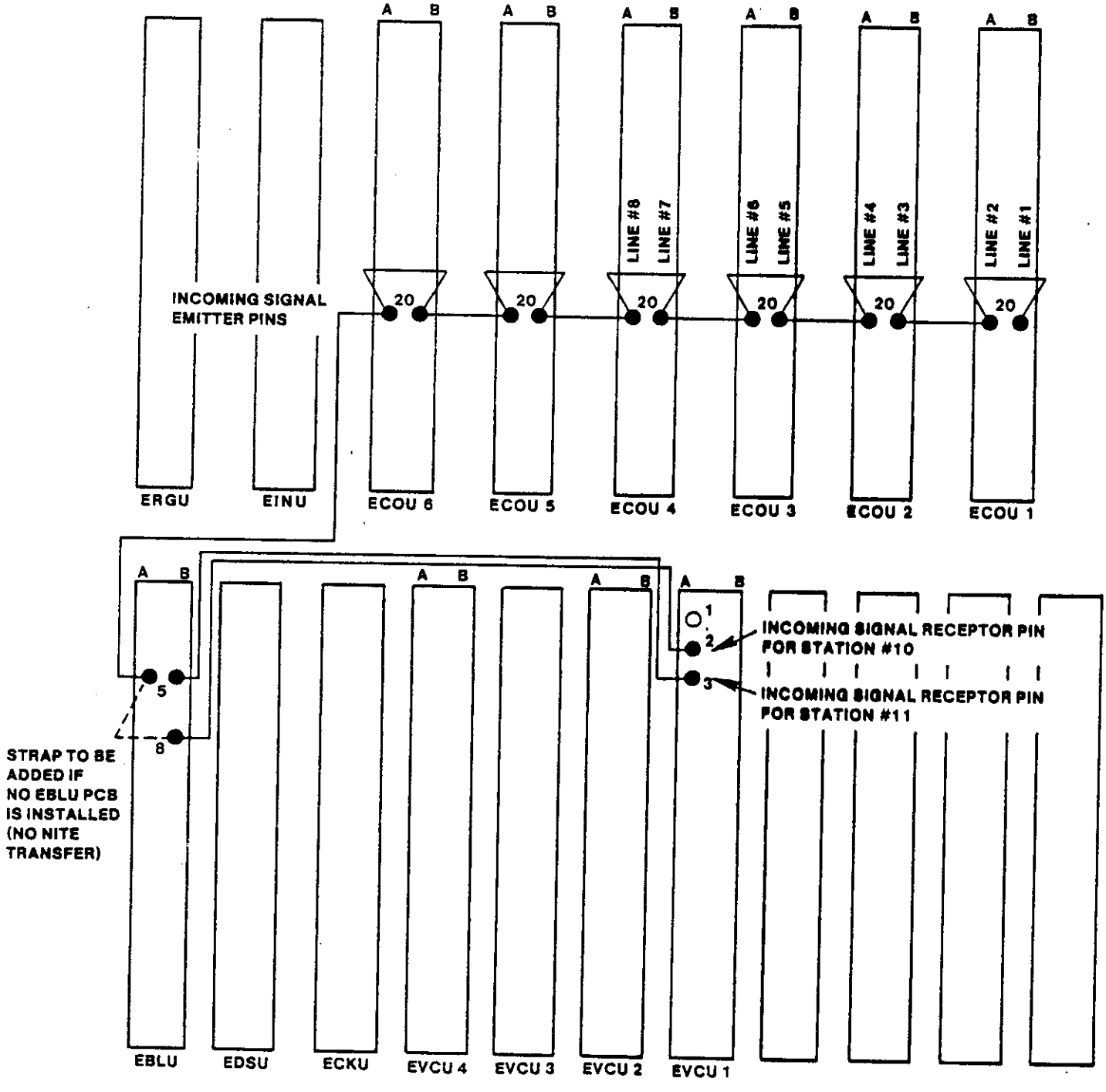


FIGURE 14—FACTORY WIRING FOR STATION #10 TO RING ON ALL LINES

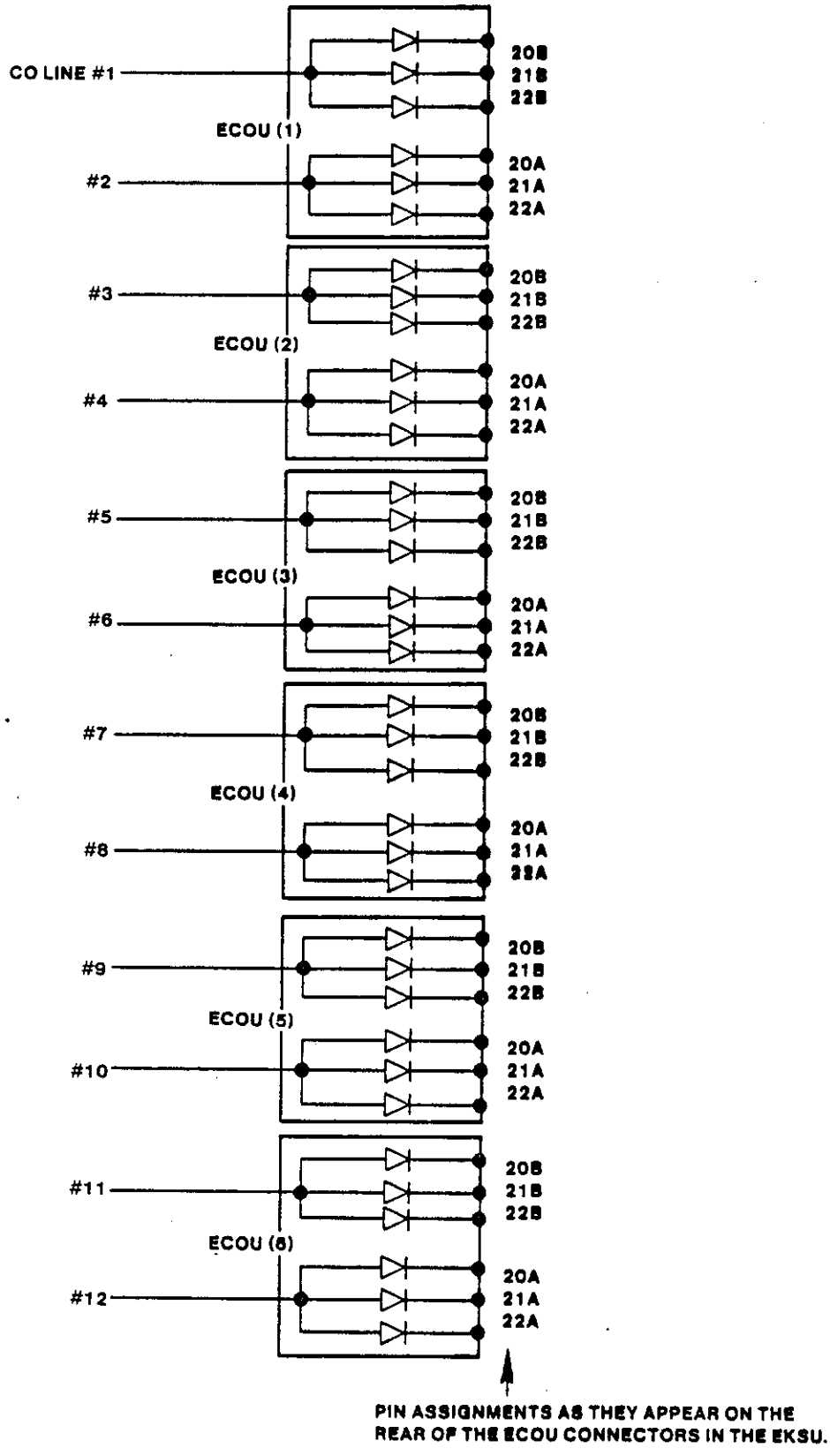


FIGURE 15—C.O. LINE SIGNAL PIN ASSIGNMENT

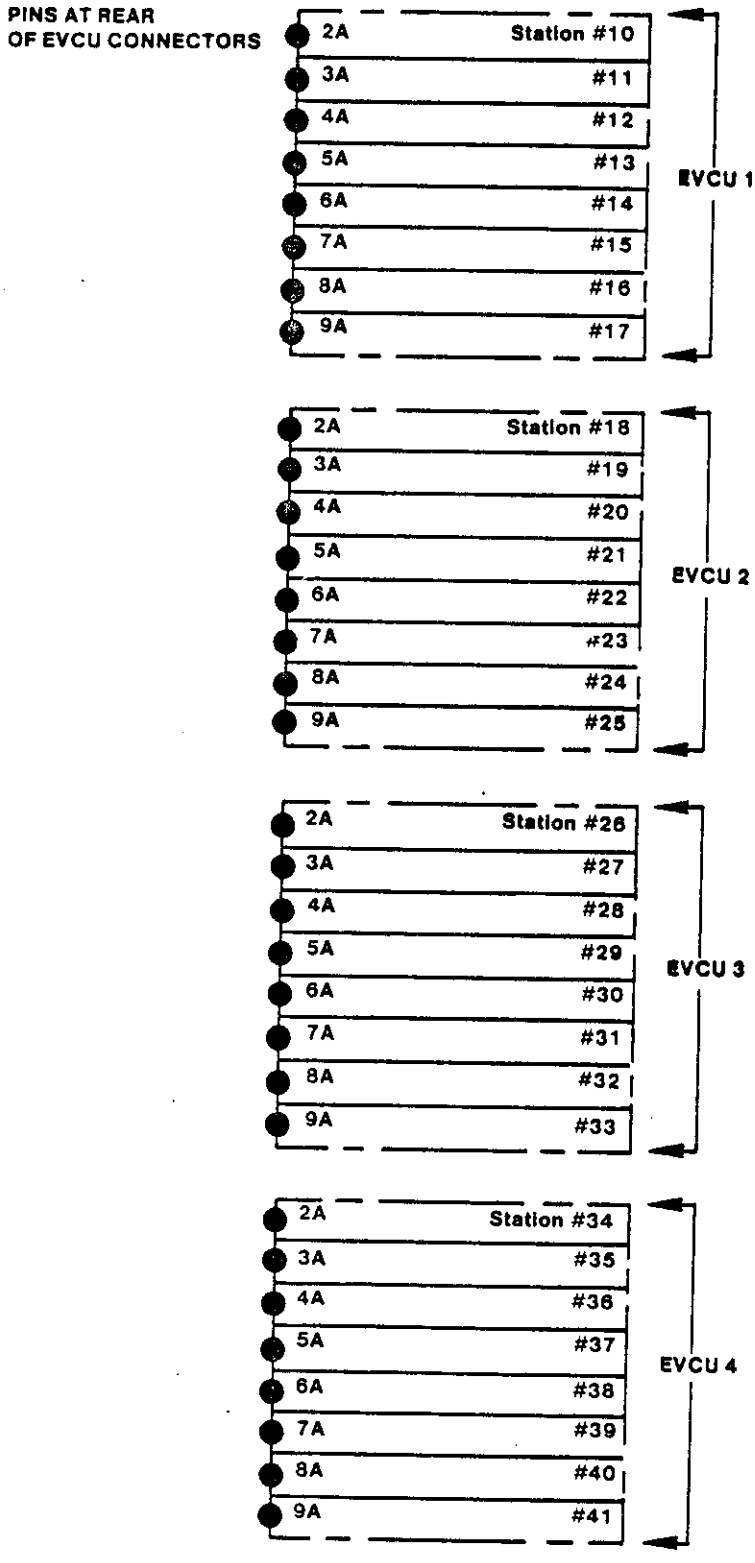


FIGURE 16—STATION C.O. SIGNAL PIN ASSIGNMENT

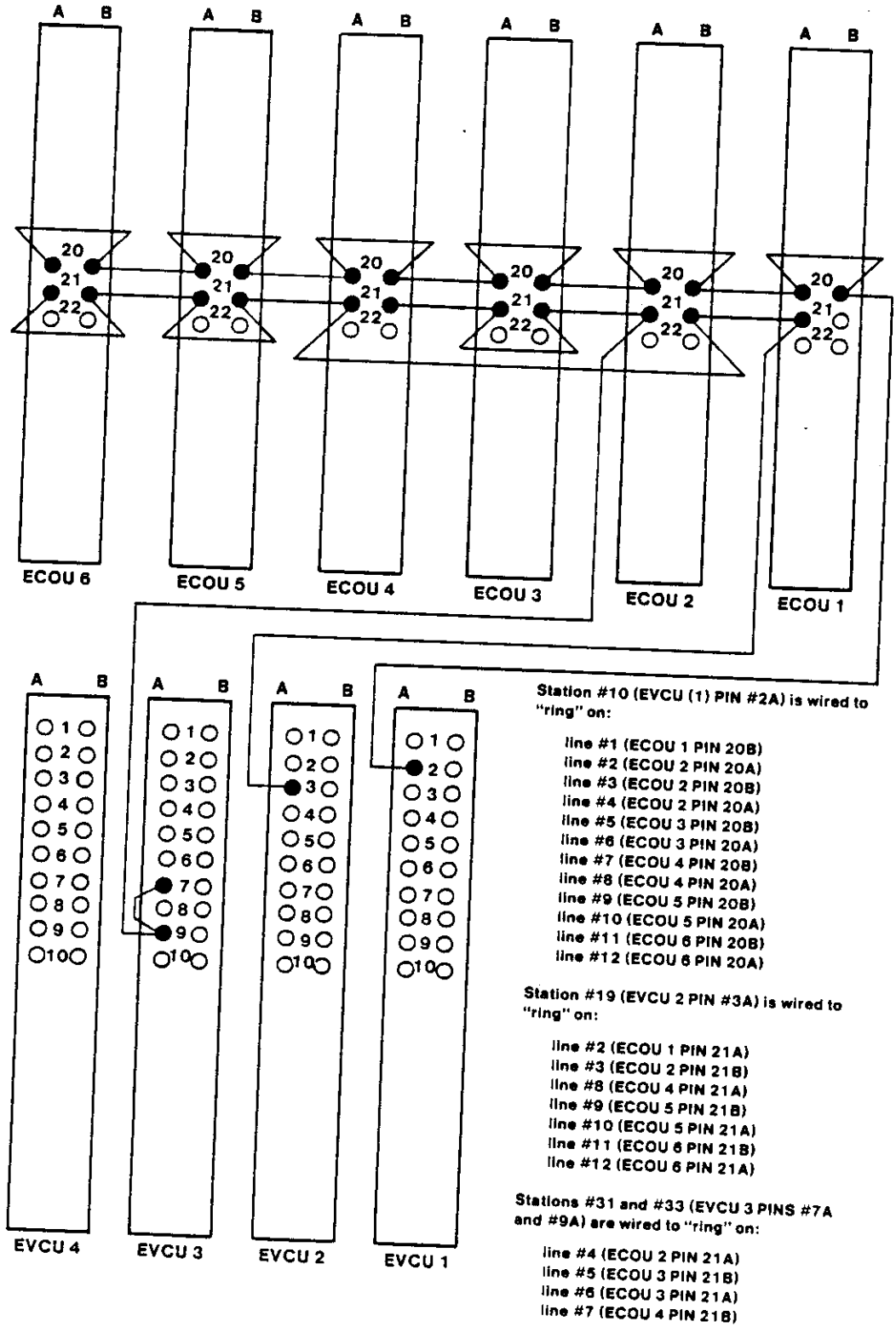


FIGURE 17—PERMANENT C.O. SIGNAL WIRING EXAMPLES

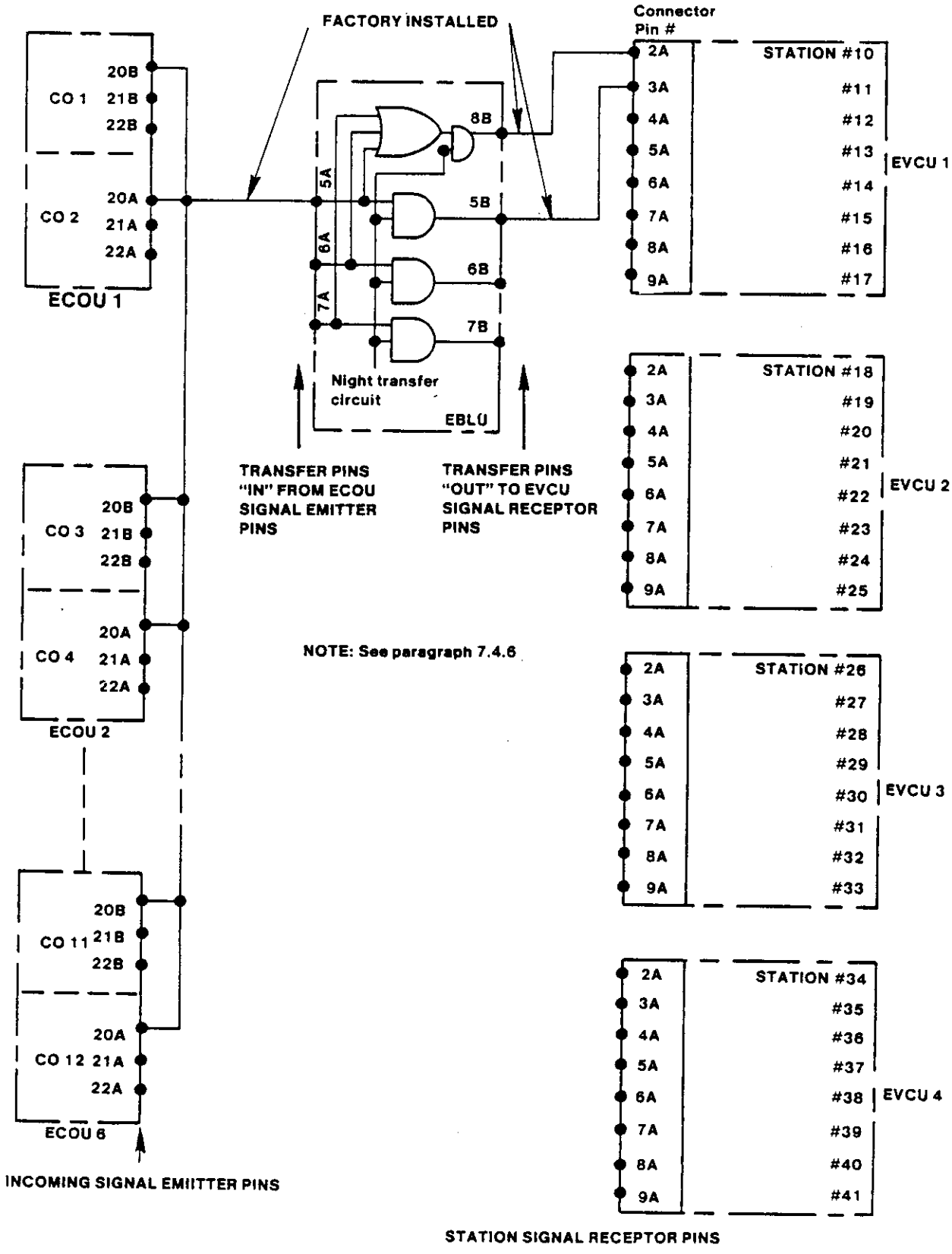


FIGURE 19—FACTORY-PROVIDED INCOMING RING CIRCUIT WITH TRANSFER

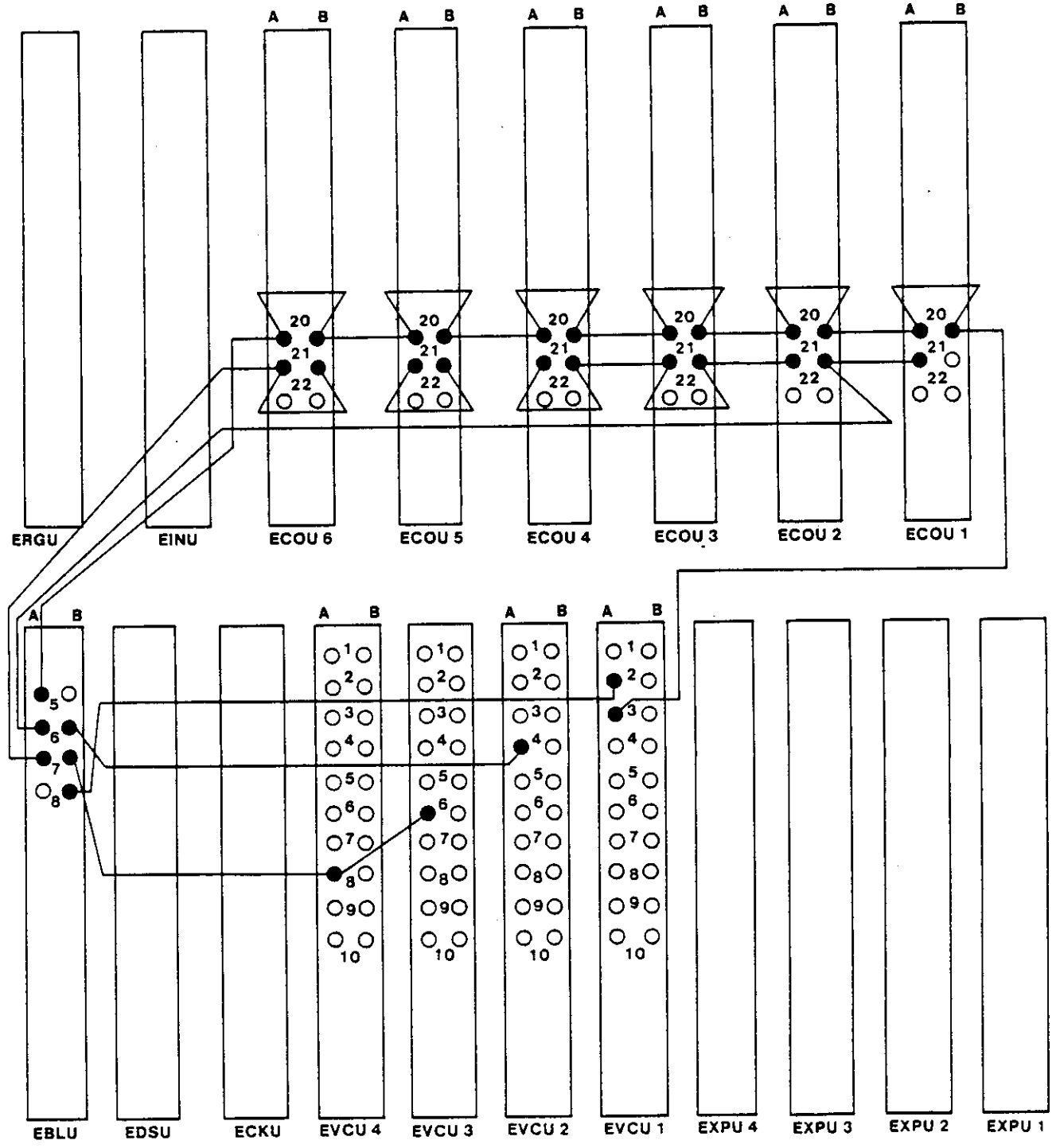


FIGURE 20 – EXAMPLES OF NIGHT TRANSFER CIRCUIT WIRING

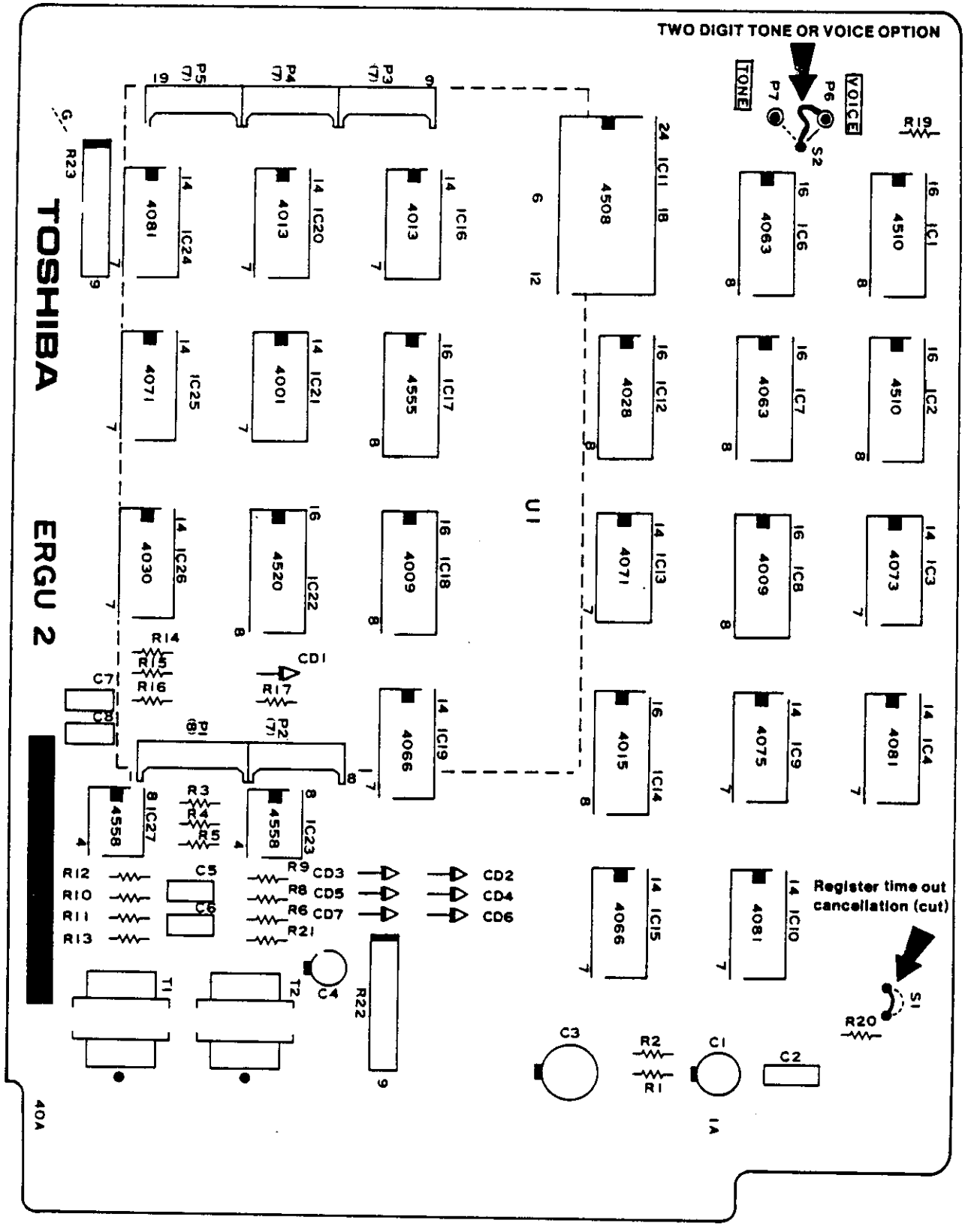


FIGURE 21—ERGU—PHYSICAL LAYOUT

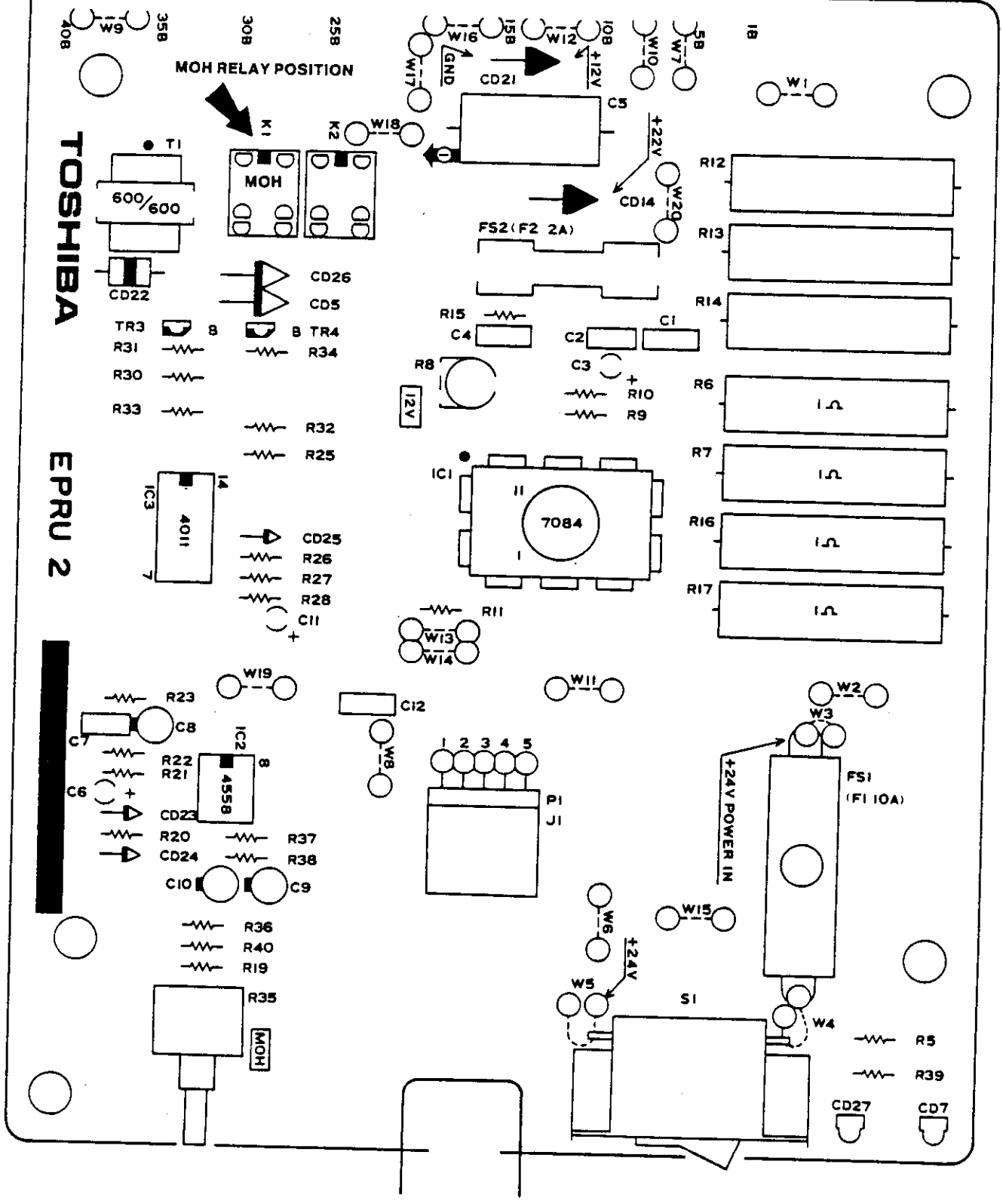


FIGURE 22—EPRU—PHYSICAL LAYOUT

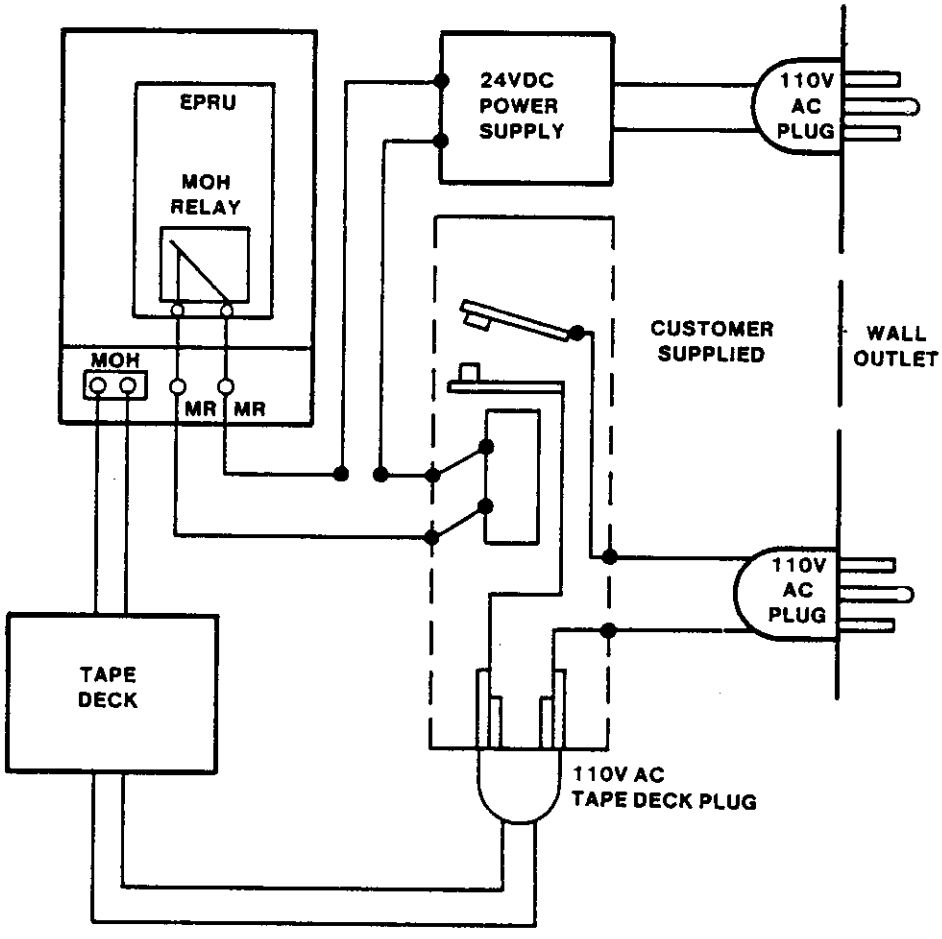


FIGURE 23—TAPE DECK CIRCUIT DIAGRAM

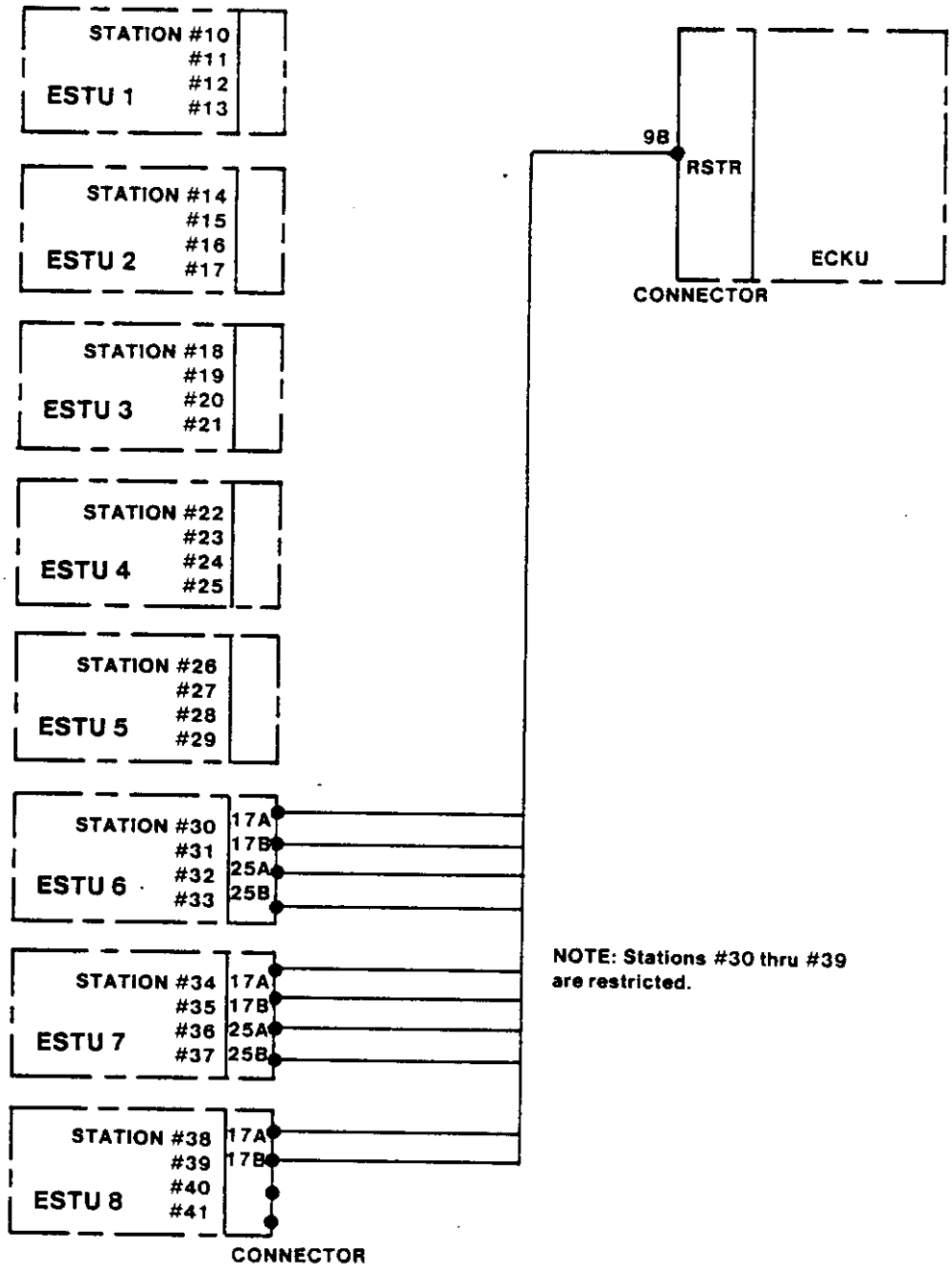


FIGURE 24—EXAMPLES OF STATION RESTRICTION CIRCUIT

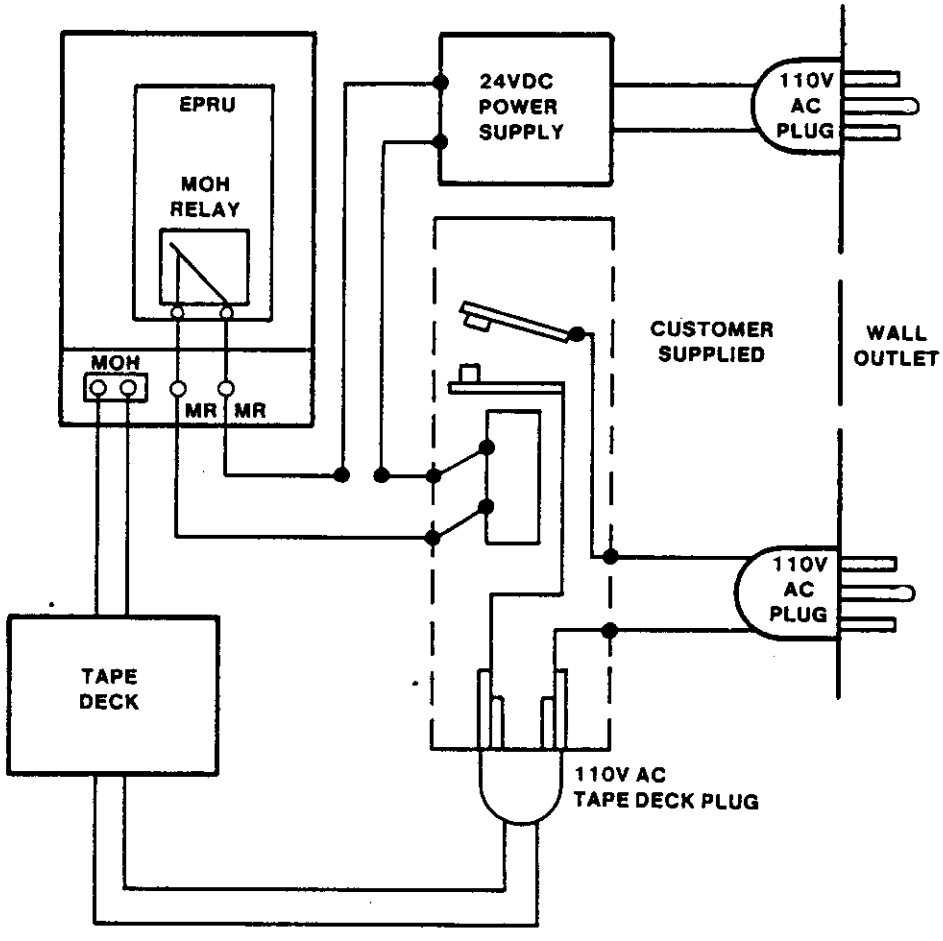


FIGURE 23—TAPE DECK CIRCUIT DIAGRAM

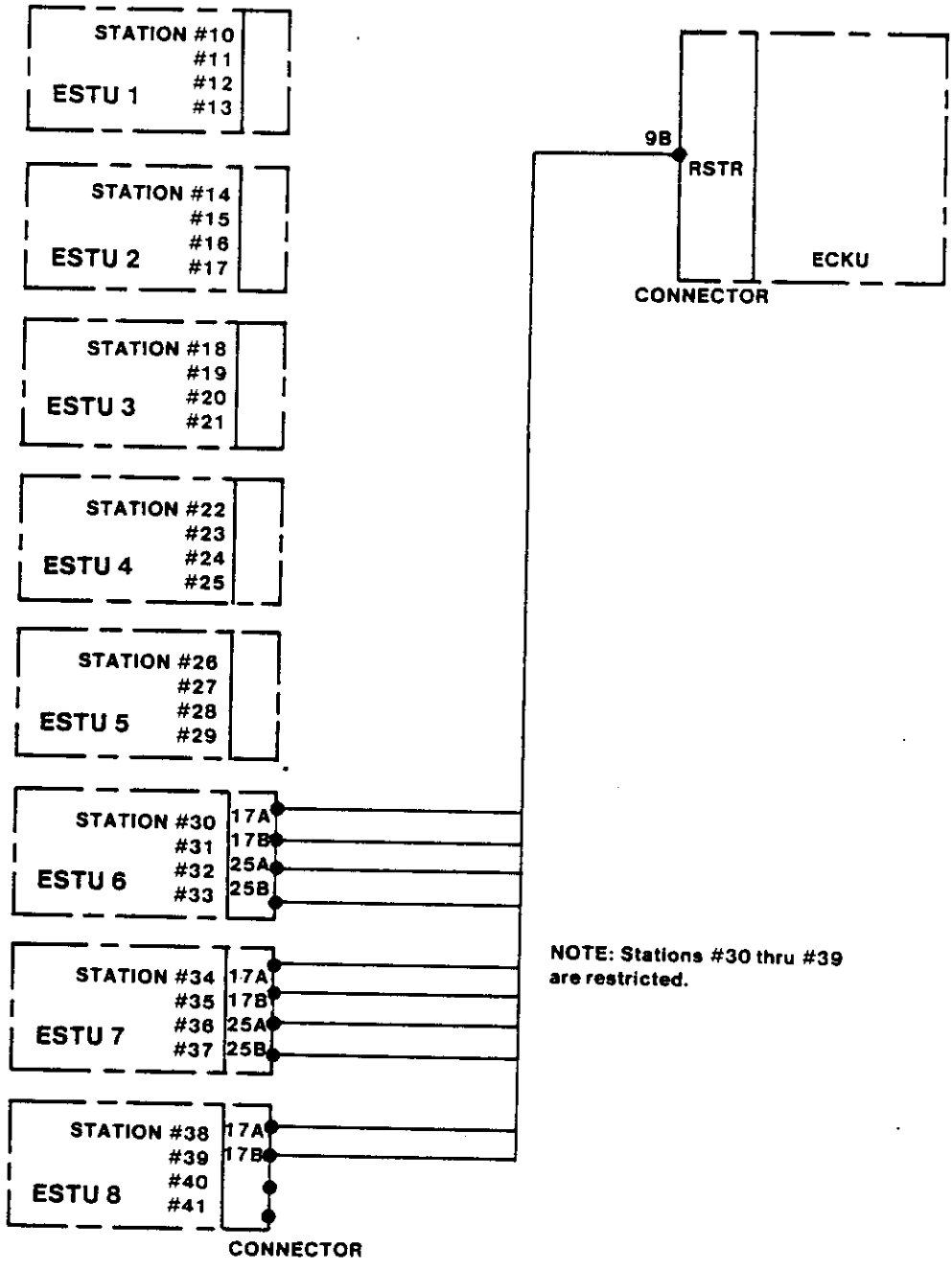


FIGURE 24—EXAMPLES OF STATION RESTRICTION CIRCUIT

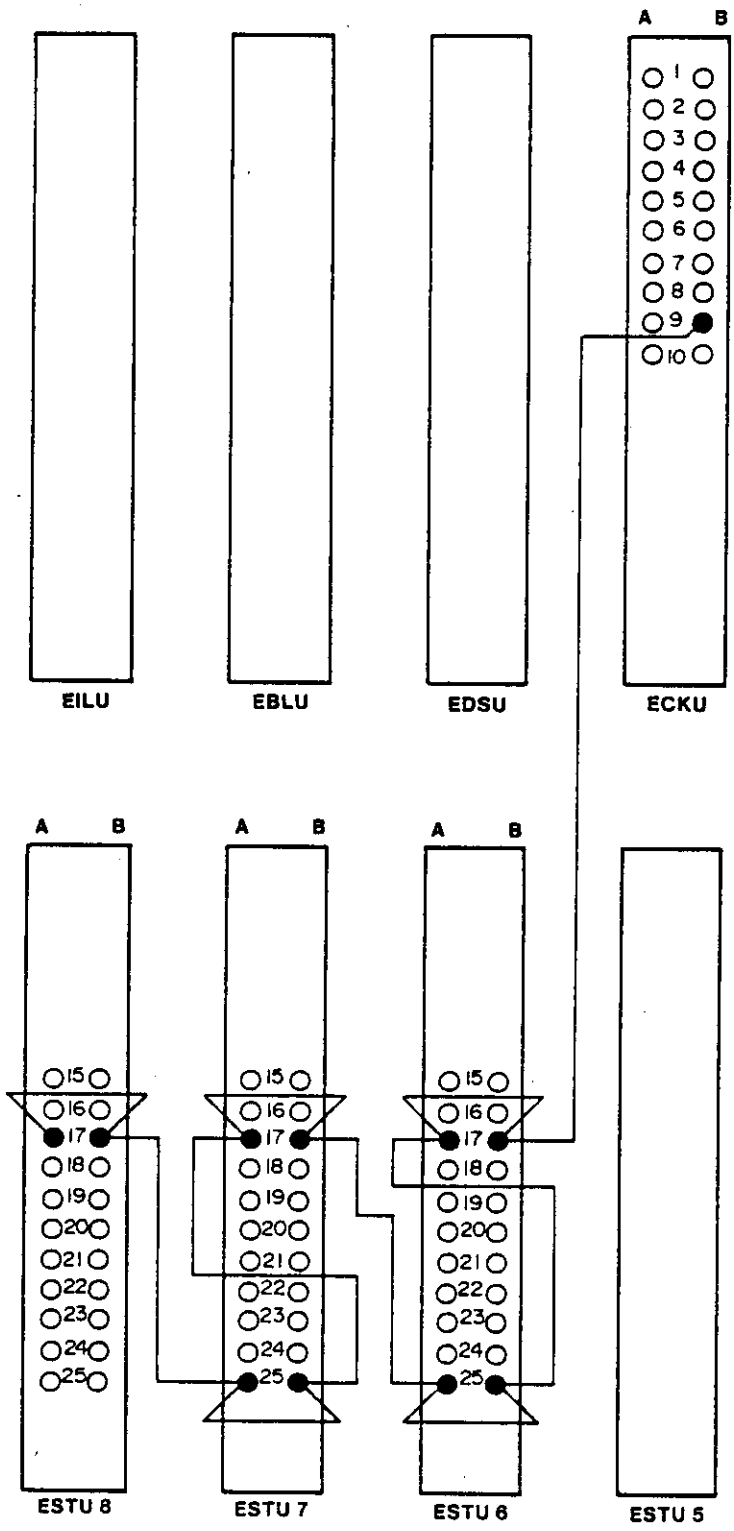


FIGURE 25—EXAMPLES OF STATION RESTRICTION WIRING

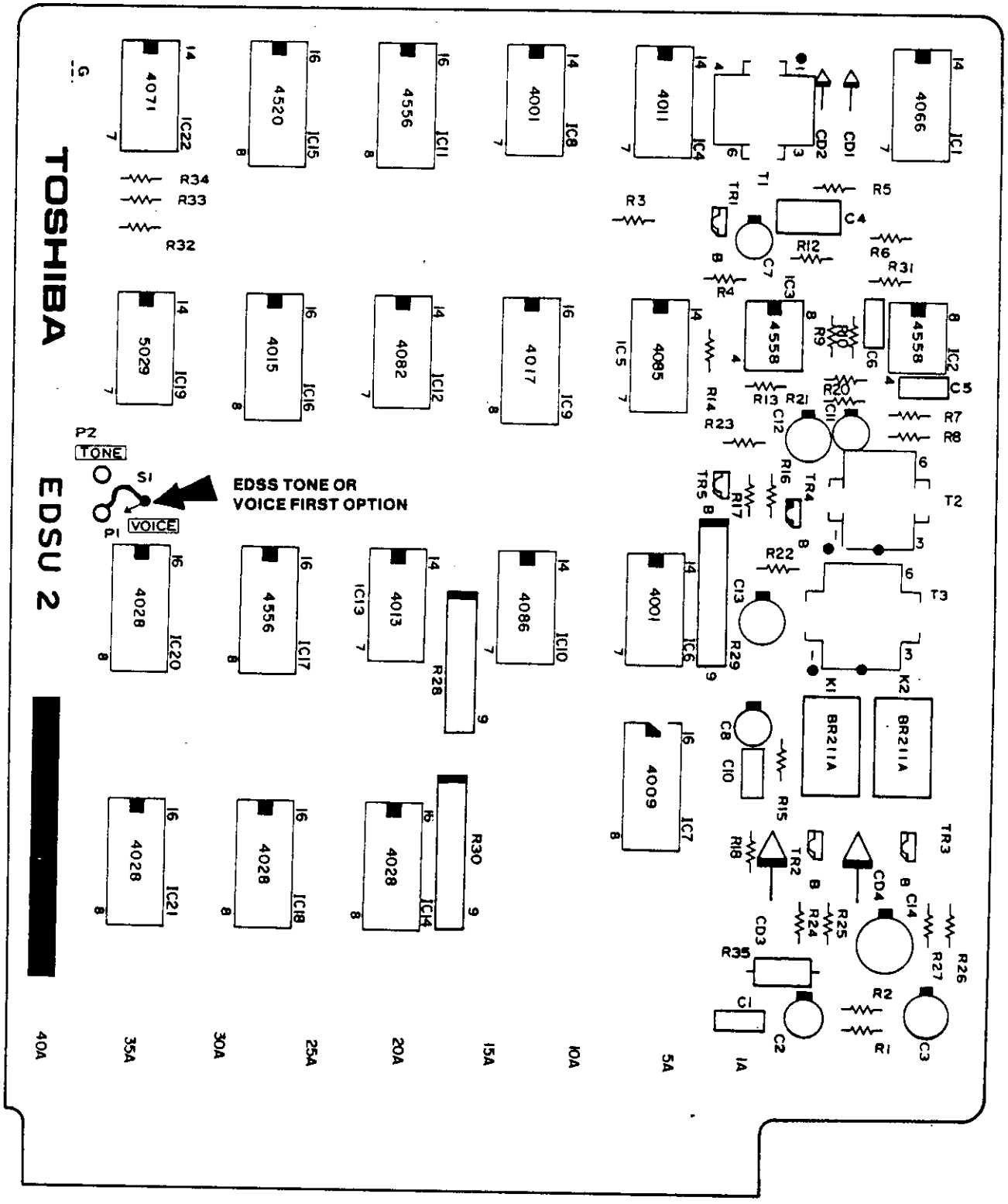


FIGURE 26—EDSU—PHYSICAL LAYOUT

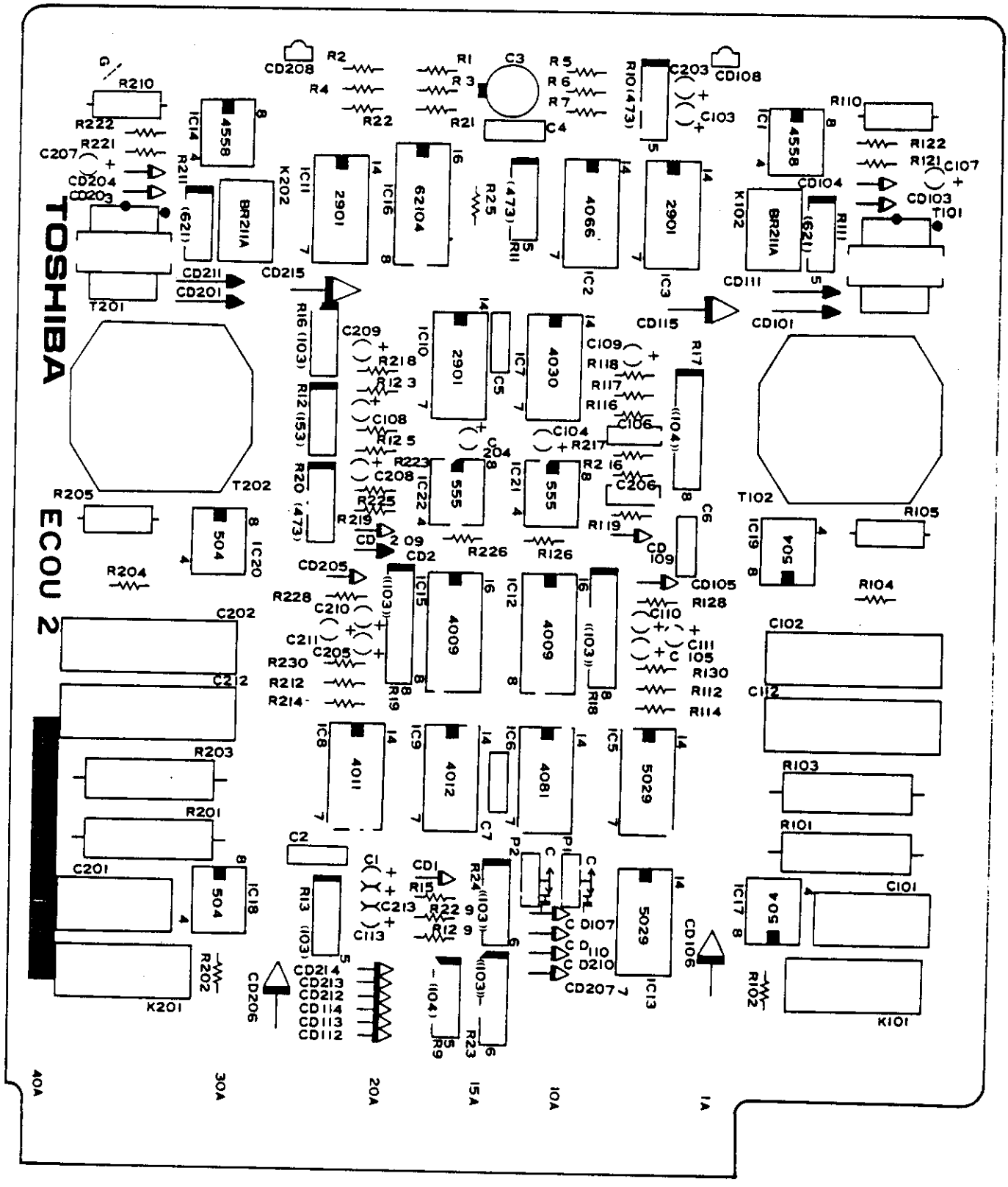


FIGURE 27—ECOU—PHYSICAL LAYOUT

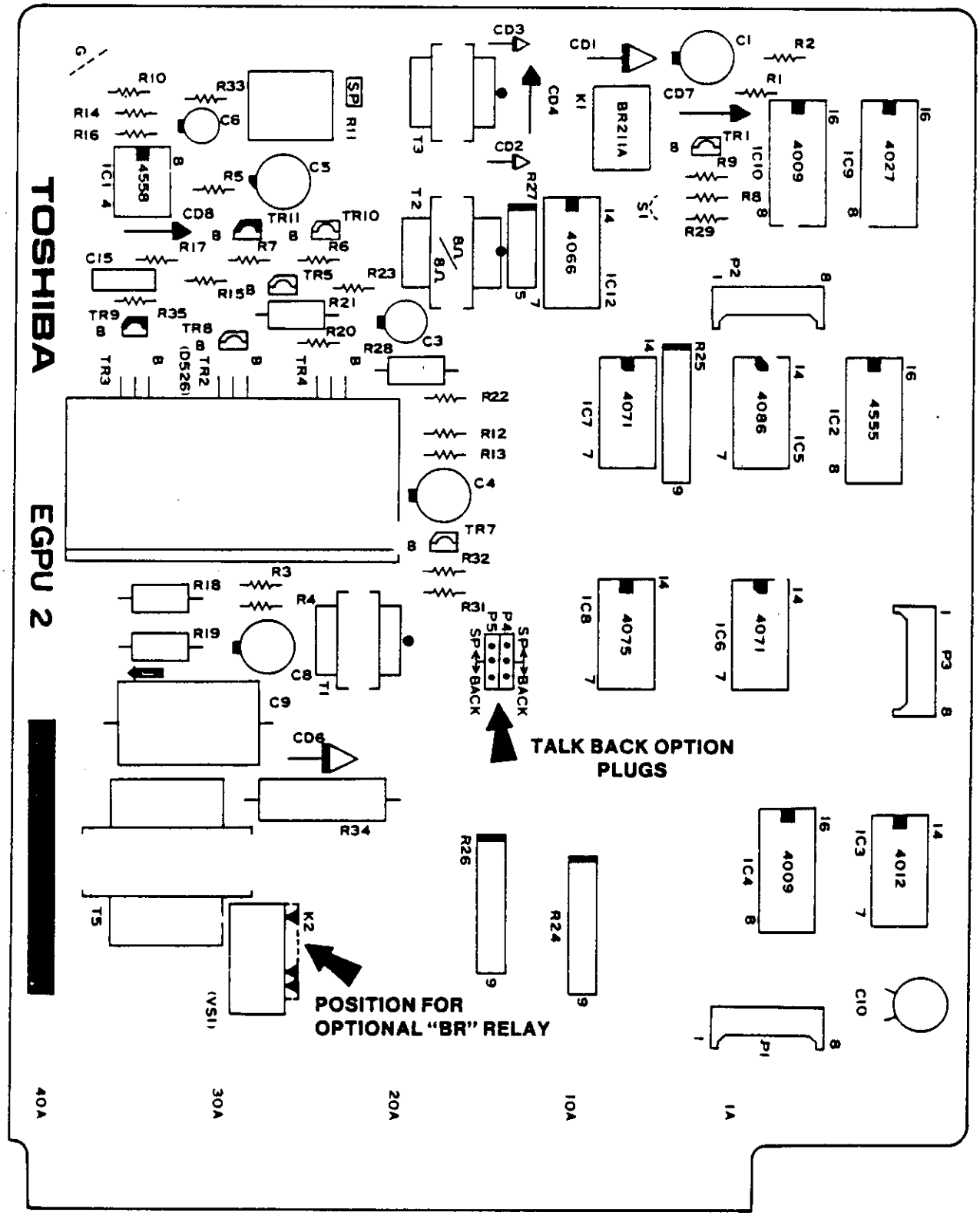


FIGURE 28— EGPU PCB PHYSICAL LAYOUT

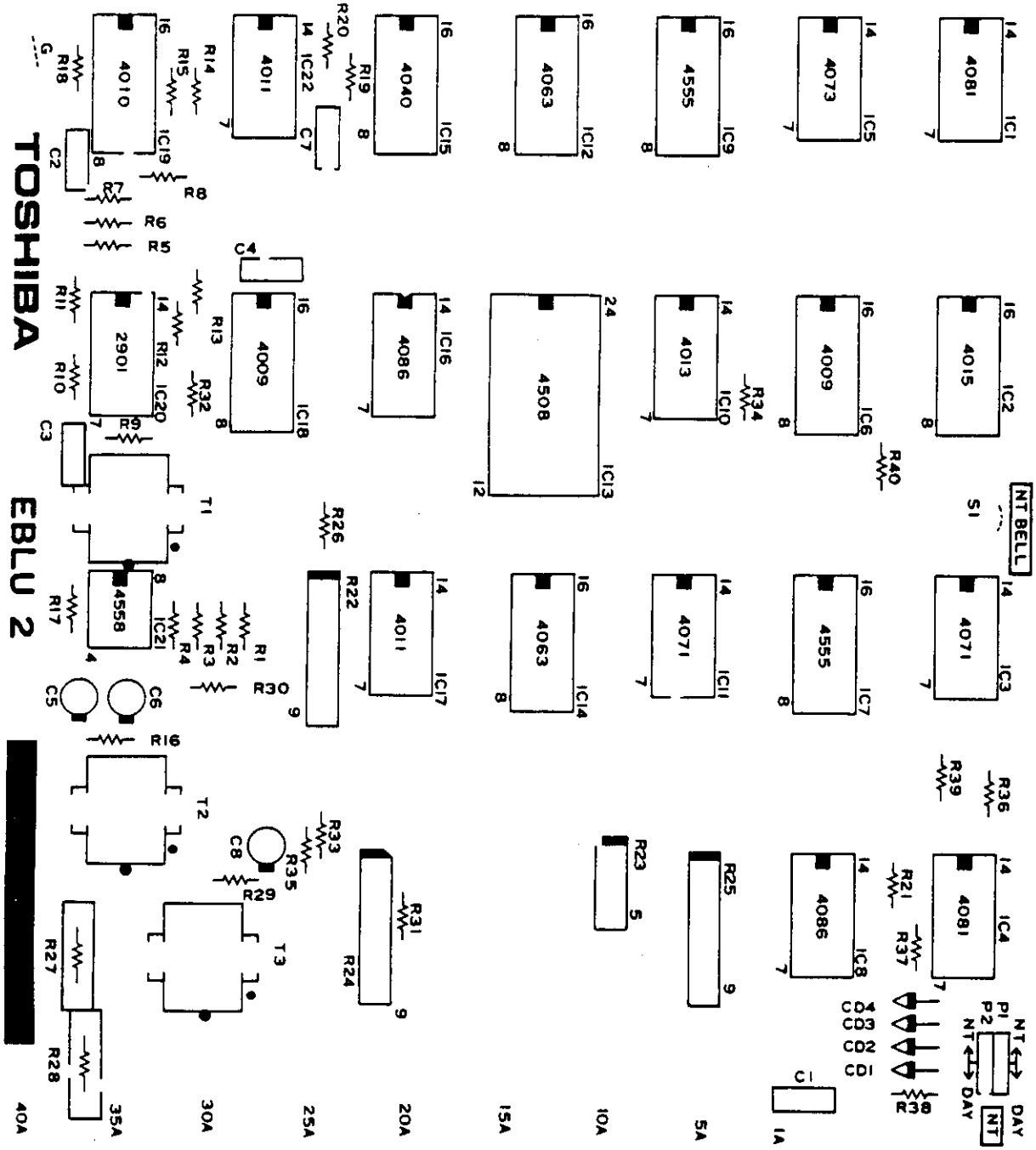


FIGURE 29—EBLU—PHYSICAL LAYOUT

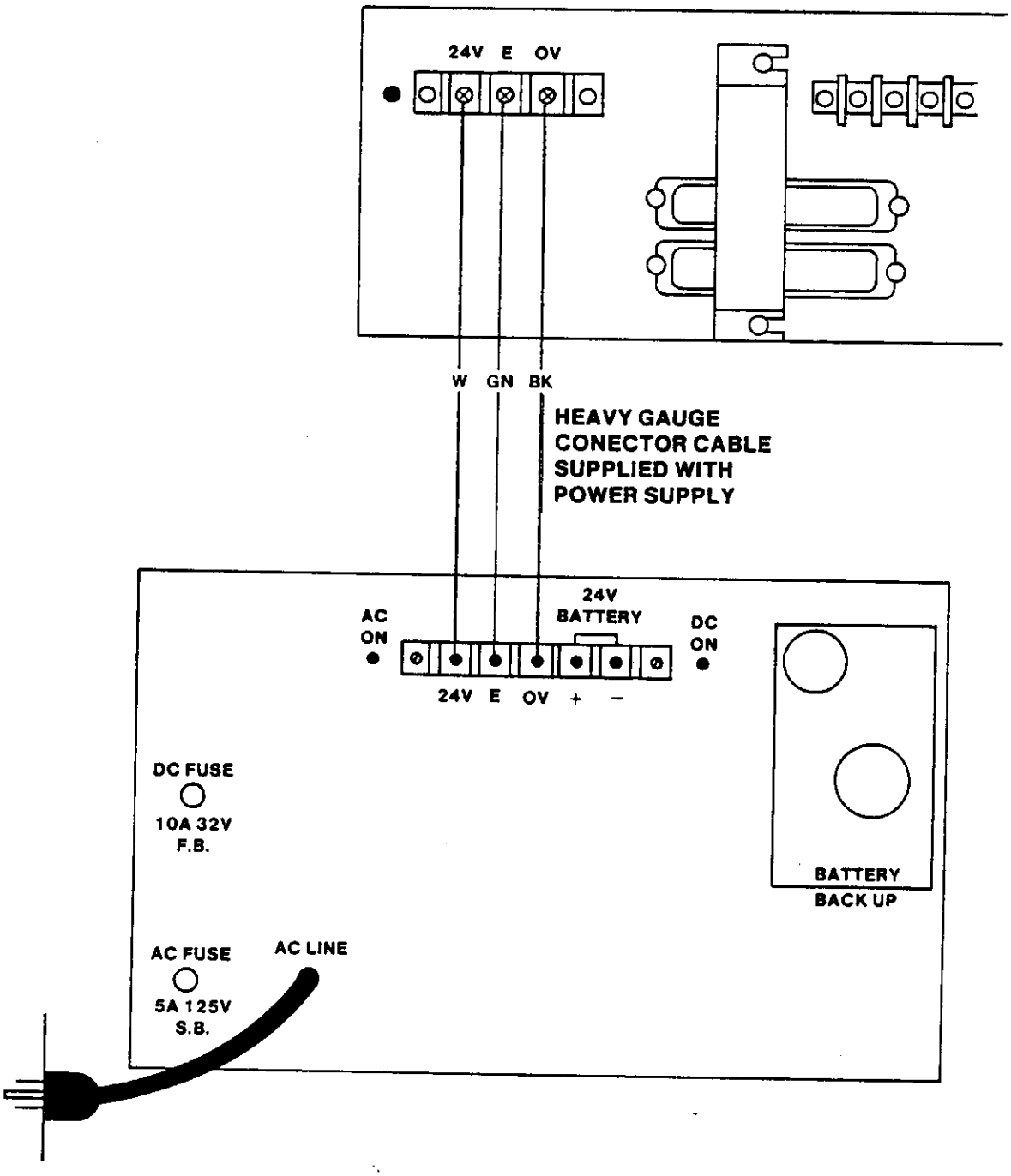


FIGURE 30—EPSA AND EKSU POWER CONNECTION

Strata III

EXPANSION ELECTRONIC KEY SERVICE UNIT
XKSU MODEL 102

INSTALLATION INSTRUCTIONS

REVISION PAGES		
Page	**Revision No.**	**Date**
7	1	October 1980
9	2	January 1981

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LIST OF FIGURES

1. GENERAL

1.1 SUMMARY DESCRIPTION

1.1.1 The Strata III Expansion Key Service Unit (XKSU) works in conjunction with a Strata III primary Electronic Key Service Unit (EKSU) and provides the PCB connectors and interwiring necessary to service the additional PCB's needed to expand the Strata III Electronic key telephone system past its basic configuration of 12 CO/PBX lines, 32 stations and 2 intercom paths. The expanded system will then have a maximum standard configuration of 20 CO/PBX lines, 50 stations, and 4 intercom lines.

1.1.2 An additional 2 stations may be installed in the system (intercom codes 60 and 61) bringing the maximum capacity up to 52 stations. However, these 2 stations will not be represented on an EDSS console and thus will not be able to receive a DSS page in a system so equipped.

1.1.3 An additional 2 CO/PBX lines may be introduced into the system, bringing the maximum capacity up to 22 lines. However, this is accomplished by installing an additional ECOU PCB in the INU2/COU 11 slot in the XKSU, thus sacrificing the capacity for intercom paths 3 and 4.

1.1.4 The XKSU package contains the XCBL Cable Assembly and XIFU PCB which are necessary to integrate the circuitry of the XKSU with that of the EKSU. A second ECKU PCB is also supplied in the XKSU package to coordinate XKSU system functions.

1.1.5 The EIFU PCB must be obtained separately and plugged into the proper slot in the EKSU to be expanded.

1.1.6 If the system to be expanded is to contain an EDSS console or EBLF, the optional XDLU PCB must be installed in the XKSU.

1.1.7 Additional ESTU, EVCU, EXPU and ECOU PCB's must also be obtained and plugged into the proper slots in the XKSU as dictated by the number of stations and CO/PBX lines to be added in the system expansion. Consult paragraph 2.8 of this section.

1.1.8 If intercom paths 3 and 4 are to be included in the system expansion, an EINU and ERGU PCB must be obtained and installed in the XKSU. The inclusion of intercom paths 3 and 4 precludes the addition of non-standard CO/PBX lines 21 and 22.

1.1.9 In addition to increased CO/PBX line, station, and intercom capability, the XKSU provides for the connection of a secondary EDSS console into the Strata III system along with an additional EBLF. An additional EBLF may be installed INSTEAD of the second EDSS, so that an expanded Strata III system may contain any of the following configurations:

- Two EDSS's and two EBLF's
- Four EBLF's with no EDSS

1.1.10 The XKSU receives power for its components from the same Strata III Power Supply Assembly (EPSA) used to power the primary EKSU. No additional power supply is needed.

1.1.11 As in the basic system, connections of Strata III keysets to the expanded system main distribution frame (XMDF) requires 3 twisted pair, indoor jacketed, non-shielded cable runs (XMDF hardware is not supplied in the XKSU package.).

1.1.12 Both the EKSU and XKSU are able to be wall-mounted using the EKWM-102 Wall Mount Assembly (Refer to section 100-004-225).

1.1.13 Section 100-004-210 dealing with the installation of the EKSU should be read and understood thoroughly before proceeding with the installation of the XKSU.

1.2 PHYSICAL DESCRIPTION

1.2.1 The XKSU is housed in a single metal cabinet of the following dimensions (see Figure 1):

Height	29.0 inches	(735mm)
Width	16.5 inches	(420mm)
Depth	12.5 inches	(320mm)

1.2.2 The weight of a fully equipped XKSU is approximately 77 lbs.

1.2.3 The XKSU cabinet contains 3 shelves for housing the various PCB's which in turn plug into the PCB connectors mounted on the back plane of the cabinet (see Figure 2).

1.2.4 Amphenol connectors for "bringing out" the XKSU external conductors for termination on the XMDF are located on the bottom rear of the cabinet, along wth a three-position terminal strip to allow connection of ground (E) from a similar terminal strip on the EKSU (see Figure 3). These connectors are accesssible without the need to remove any XKSU covers.

2. INSTALLATION INSTRUCTIONS

2.1 XKSU CABINET PREPARATION

2.1.1 Carefully remove the XKSU from its packing and place it upright on the floor.

IMPORTANT: DO NOT REMOVE ANY OF THE ACQUIRED PCB'S FROM THEIR PACKING UNTIL YOU ARE INSTRUCTED TO DO SO. THIS IS TO PROTECT THE PCB'S FROM STATIC ELECTRICITY.

2.1.2 Locate the XKSU to the right and parallel to the EKSU to be expanded. Leave approximately 12" between the units. If the XKSU is to be wall mounted refer to section 100-004-225 before proceeding further.

2.1.3 Upon locating the XKSU properly with regard to the EKSU, remove the front cover from the EKSU and push the rocker switch on the EPRU PCB front panel to the "off" position.

WARNING: POWER MUST BE SWITCHED OFF AT THE EPRU BEFORE CONNECTING THE XKSU. DO NOT PULL THE POWER SUPPLY PLUG AS THIS WILL REMOVE THE PROTECTIVE GROUND FROM THE EKSU CABINET. IF THIS PROCEDURE IS NOT FOLLOWED, DAMAGE MAY RESULT TO ALL SYSTEM PCB'S.

2.1.4 Before proceeding further, make sure that the EKSU is properly grounded. Refer to section 100-004-210, paragraph 10.

2.1.5 Loosen the "E" terminals at the bottom rear of both the EKSU and the XKSU and connect one end of the heavy gauge wire that is provided with the XKSU package to each terminal (see Figure 4). Tighten both "E" terminals, being sure that the second connection to the "E" terminal on the EKSU coming from the power supply is intact. The XKSU will now be grounded also.

2.1.6 Remove the rear covers of both the EKSU and XKSU.

2.1.7 Remove the cover plates from the EKSU and XKSU cable assembly entrance points (see Figure 4) located on the right side of each unit as seen from the rear. Save the screws for future use.

2.2 XCBL CABLE ASSEMBLY CONNECTION

2.2.1 Remove the XCBL Cable Assembly from its packing and examine it. The end to be attached to the EKSU will be marked EKSU while the end to be attached to the XKSU will be marked XKSU (see Figure 5). The EKSU end of the cable assembly consists of 12 green, female plugs while the XKSU end consists of 13 plugs. A metal clamp is also present at each end of the protective sheaths for securing the cable assembly to the EKSU and XKSU cabinets.

2.2.2 Using the screws removed in paragraph 2.1.7, affix the cable assembly in place by recessing the appropriate metal clamp into the cut-out space provided in each cabinet (see Figure 6).

2.2.3 There are 80 pins on the rear of an XKSU or EKSU PCB connector. The female cable assembly plugs are designed for connection to either the TOP or BOTTOM 40 pins of a PCB connector. Plugs that are to connect to the topmost 20 pins of a specific PCB connector will be marked "TOP", and the plug positioned with the word "TOP" at the uppermost end (see Figure 7). Plugs marked "BOT" will go on the lower 40 pins of the PCB connector and should be positioned with "BOT" at the downward end.

CAUTION: GREAT CARE SHOULD BE EXERCISED IN CONNECTING THE CABLE ASSEMBLY PLUGS TO THE CONNECTOR PINS. VISUALLY INSPECT THE CONNECTOR PINS BEFORE CONNECTING EACH PLUG. IF ANY ARE BENT, USE A SUITABLE TOOL TO STRAIGHTEN THEM. UPON CONNECTION, VISUALLY INSPECT TO MAKE SURE THAT THE PLUG IS PROPERLY SEATED.

2.2.4 EKSU PLUG PLACEMENT

2.2.4.1 Facing the rear of the EKSU, locate the EIFU PCB connector and cut the 7 white wires on the pins. They are as follows:

32A to 32B
33A to 33B
34A to 34B
35A to 35B
36A to 36B
37A to 37B
39A to 39B

2.2.4.2 To facilitate installation of the cable assembly plugs in the EKSU, it is recommended that the plugs be attached in the following order (refer to Figure 8):

PR BOTTOM
PR TOP
IF BOTTOM
IF TOP
X1 BOTTOM
X1 TOP
X2 BOTTOM
X2 TOP
X3 BOTTOM
X3 TOP
X4 BOTTOM
X4 TOP

2.2.4.3 Use the 4 stick-on cable clasps already present in the EKSU to hold the harness wires safely in place (see Figure 9).

2.2.5 XKSU PLUG PLACEMEMT

2.2.5.1 Referring to Figure 10, connect the XCBL Cable Assembly Plugs in the XKSU in the following order, observing the same precautions followed in placing the EKSU plugs:

PR TOP
X7 BOTTOM
X7 TOP
X8 BOTTOM
X8 TOP
X9 BOTTOM
X9 TOP
X10 BOTTOM
X10 TOP
X11 BOTTOM
X11 TOP
DL BOTTOM
IF TOP

2.2.5.2 Use the 4 stick-on cable clasps that came in the XCBL Cable Assembly package to secure the harness wires safely in place. Position them as shown in Figure 11.

2.3 EXPANDED MAIN DISTRIBUTION FRAME (XMDF) CONFIGURATION

2.3.1 At the bottom rear of the XKSU are 4 amphenol connectors marked A, B, C and D. Amphenol 'A' is used for introduction of expansion CO/PBX lines 13 through 22 into the system. This amphenol is discussed in detail in paragraph 2.9. Amphenols B, C, and D are standard 25 pair female amphenols and are used to bring "out" the individual station, EDSS and EBLF data conductors.

2.3.2 It is recommended that the Main Distribution Frame for the XKSU consist of 66M1-50 pair "split" connection blocks and arranged as shown in Figure 12.

2.3.3 One to three 25 pair, male amphenoled cables of suitable length are connected to amphenols B, C and D on the bottom rear of the XKSU and then terminated, one per 66M1-50 block, in the standard color-code order as shown in Figures 13 through 15. The functions of the cables are as follows:

- CABLE B: Key, Voice and LED data pair connections from the XKSU to keysets #42 through #49. The V-S pair is the key data connection points for the W-BL pair of the running cable for an EDSS console or EBLF (see Figure 13).
- CABLE C: Key, Voice and LED data pair connections from the XKSU to keysets #50 through #57. The V-S pair is the LED data connection points for the W-GN pair of the running cable for an EDSS console or EBLF (see Figure 14).

- CABLE D: Key, Voice and LED data pair connections from the XKSU to keysets #58 through #61. The BK-GN through V-BL pairs are spare along with the V-GN and V-S pairs. The V-O and V-BR pairs are the Key and LED data connection points for an EBLF (see Figure 15).

2.3.4 It is recommended that the B, C, and D termination blocks be marked "XB", "XC" and "XD" to differentiate them from the EKSU cable termination blocks. The "XA", "XB", "XC" and "XD" cable termination blocks will henceforth be referred to collectively as the XMDF.

2.4 INTERMEDIATE DISTRIBUTION FRAME CONFIGURATION

2.4.1 Should station locations warrant, "feed" cables may be run to secondary station cable connection points. These feed cables may be terminated directly on the XMDF blocks opposite the appropriate XKSU conductors (Figure 16, Option A), terminated on their own block and cross connected to the proper XKSU conductors (Figure 16, Option B), or connected directly to the connector at the rear of the XKSU (Figure 16, Option C).

IMPORTANT: WHEN RUNNING CROSS-CONNECT WIRE ON AN IDF OR XMDF BE SURE TO USE TWISTED PAIRS.

2.4.2 Before connecting a feed cable directly to an XKSU connector as in Option C in Figure 16 it should be noted that the conductors contained in the connector will be accessible at the feed cable termination point only. Included stations and possibly EDSS and EBLF connections, (depending on connector chosen) will not be accessible at the XMDF.

2.5 STATION CABLE CONNECTIONS

2.5.1 The individual 3 pair station cables are terminated consecutively exactly as shown in the individual XMDF block connection diagrams (Figures 13 thru 15), on the vacant side of the XMDF blocks, and bridging clips placed between the XKSU and keyset pins. The use of split blocks and bridging clips allows the easy isolation of keysets and system circuits and eliminates the need for time consuming cross-connecting.

2.5.2 All stations must be within 1,000 cable feet of the service units. Acceptable cable is 24 AWG or 22 AWG telephone cable, three twisted pairs, indoor type, jacketed but not shielded.

2.5.3 Whenever possible it is recommended that all individual 3 pair station cables be "run home" to the XMDF. This reduces the number of wires that must be terminated at various points and thus reduces the chance of a reversal, short, or open in the system. However, when necessary IDF's are permissible. See paragraph 2.4.

2.5.4 Unlike conventional key systems, the STRATA III Electronic System provides dedicated conductors for each station in the system. Connections of more than one station to the same conductors may cause damage to system components. Stations may not be "bridged" or "looped" on the same running cable.

WARNING: WHEN INSTALLING STATION CABLE DO NOT RUN PARALLEL TO OR WITHIN 3 FEET OF AC POWER LINES. SUCH POWER LINES SHOULD BE CROSSED AT RIGHT ANGLES ONLY.

2.5.5 Each station connector block must have 6 terminals upon which the 6 wires of the station running cable are to be terminated. For individual EKT and connector block wiring instructions refer to section 100-004-230.

2.6 INTERCOM CODE ASSIGNMENT

2.6.1 Intercom codes are assigned to individual stations in the STRATA III system by connecting the station cables to the proper set of 6 XKSU conductors appearing on the XMDF. (See Figures 13 thru 15.)

2.6.2 Initially, it is recommended that the intercom codes be assigned to the stations by terminating the station cable wires opposite the proper 6 XKSU conductors and inserting bridging clips between the XKSU and station cable pin rows.

2.6.3 After station cable termination on the XMDF blocks it may prove necessary to change a station's intercom code. To accomplish this all six connections must be moved to the 6 XKSU conductors representing the desired intercom code position. This may be done by actually reconnecting the station cable opposite the proper XKSU conductors and again placing bridging clips or by leaving the station cable terminated in its original position, removing the bridging clips, and running cross-connect wire between the station cable pins and the XKSU pins. The (twisted pair) cross-connect wire may be run in accordance with the installing company's standard practices, or "up and over" as shown in Figure 17.

2.7 XKSU OPTION WIRING

IMPORTANT: BE SURE TO READ SECTION 100-004-210, PARAGRAPH 7: EKSU AND PCB OPTION WIRING, BEFORE PROCEEDING WITH XKSU OPTION WIRING.

INSTALLATION OF THE OPTIONAL EASU PCB RENDERS BACKPLANE WIRING UNNECESSARY (SEE SECTION 100-004-280).

WIRE USED ON THE BACK PLANE MUST BE 30 AWG, INSULATED; INSTALL ONLY WITH A 30 AWG WIRE WRAP TOOL. USE OF INCORRECT WIRE OR TOOL WILL CAUSE PHYSICAL DAMAGE TO CONNECTOR PINS AND POSSIBLE XKSU FAILURE.

2.7.1 XKSU WIRING CONSIDERATIONS

2.7.1.1 The following PCB's represent optional system functions and may not be called for in the total system configuration. If any of these PCB's are NOT to be installed in the XKSU it is essential that straps be placed on the rear pins of the designated PCB connector(s) as indicated. Refer to Figure 18 for connector locations as seen from the rear of the XKSU and Figure 19 for actual strap placement on the individual connectors.

2.7.1.2 NO EGPU—If Group Paging or External Paging are not to be system features an EGPU PCB will not be necessary. Place the following straps on the rear of the EGPU connector:

- PIN 5A to PIN 5B
- PIN 6A to PIN 6B
- PIN 7A to PIN 7B
- PIN 20A to PIN 20B

2.7.1.3 NO EILU—If there is to be no EDSS console in the system OR the EDSS console is not to be equipped for "I HOLD", "I USE", or "DSS RECALL" (see section 100-004-100, paragraph 4.3.3 for feature descriptions) an EILU PCB will not be required. Place the following straps on the rear of the EILU connector:

- PIN 21A to PIN 21B
- PIN 22A to PIN 22B

2.7.1.4 NO EASU—If extension #42 is to be equipped with an EDSS console (secondary EDSS—see section 100-004-245) and an EASU will **NOT** be installed in the XKSU, the following strap must be placed on the rear of the EASU connector in the XKSU:

- PIN 10A to PIN 10B

2.7.2 INCOMING CALL SIGNALING

2.7.2.1 Each ECOU board installed in the XKSU will send out a signal of +12V DC on pins 20B, 21B, and 22B of its associated connector when activated by an incoming call on its first line. Similarly, an incoming call on the ECOU's second line will activate a signal of +12V DC on pins 20A, 21A, and 22A of the ECOU connector. Each pin is diode isolated from the other two in its group to allow individual line participation in up to three different signaling circuits. (See Figure 20.)

2.7.2.2 For every 8 expansion stations added to the system an EVCU PCB must be installed in the XKSU. Pins 2A through 9A of each EVCU PCB connector are assigned individually to the 8 consecutive stations serviced by that EVCU for the purpose of accepting an audible incoming call signal for its respective station (see Figure 20).

2.7.2.3 Assignment of incoming call signaling on a permanent basis is accomplished by wiring between the proper ECOU and EVCU PCB connector pins.

2.7.2.4 Both the EKSU and XKSU are backplane wired to have C.O./PBX lines 1 thru 16 ring at station #10 (see Figure 21).

2.7.2.5 Pin 20 of ECOU positions 7 and 8 in the XKSU are "common wired" to pin 6A on the XIFU connector which in turn transmits any incoming signal to pin 6A on the EIFU PCB connector in the EKSU via the XCBL Cable Assembly.

2.7.2.6 In model 102A and later model EKSU's, pin 6A of the EIFU PCB is connected to pin 16A of the EASU PCB connector, which establishes continuity with the "common ring" circuit factory-wired in the EKSU. In model 102 EKSU this strap must be added (see Figure 21).

2.7.2.7 If an EASU is **NOT** installed in the EKSU and an EBLU is **NOT** installed either be sure that pin 5A of the EBLU PCB connector is wired to pin 8B to complete the ring circuit for station/intercom code #10 (see Figure 21).

2.7.2.8 ECOU 9 (outside lines 17 and 18), ECOU 10 (outside lines, 19 and 20) and EINU/ECOU11 (optional outside lines 21 and 22) are **NOT** included in the common ring circuit and must have their respective ECOU signal emitter pins wired to the appropriate EVCU signal receptor pins of station(s) to ring on those lines (see Figure 20).

2.7.3 EXCLUSION OF PRIVATE LINES FROM COMMON RING CIRCUIT

2.7.3.1 The procedure for excluding certain outside lines from the factory-wired common ring circuit in the XKSU is the same as that for lines appearing in the EKSU. Read section 100-004-210, paragraph 7.3.

2.7.4 NIGHT TRANSFER OF INCOMING SIGNALING

2.7.4.1 Night Transfer (N.T.) of C.O. or PBX line incoming signaling is an optional feature of an EDSS or EBLU. For principle of operation refer to section 100-004-210, paragraph 7.4.

2.7.4.2 If any of the expansion stations (intercom codes 42 through 61) are to be "split" into more than one ringing group the optional EASU PCB must be installed in the XKSU (see section 100-004-280).

2.7.4.3 To assign an expansion station to one of the three possible "DAY" or "NIGHT" ringing groups a strap must be added from pin 7A of the XIFU PCB connector to the EVCU signal receptor pin representing that station. Additional expansion stations to be assigned to the ringing group should then have their EVCU signal receptor pins wired one to the other in a chain-like manner. (See Figure 22).

2.7.4.4 A strap must also be added in the EKSU from pin 7A of the EIFU PCB connector to either pin 5B, 6B, or 7B of the EBLU PCB connector, depending on which group is to include the expansion stations (see Figure 22).

2.7.5 AUTO-RELEASE FROM HOLD

2.7.5.1 The XKSU is shipped without provision for auto-release of hold (AROH). If an EASU PCB is not being installed in the XKSU, wiring **MUST** be performed on the rear of the EASU PCB connector (see Figure 23).

2.7.5.2 If AROH is desired and the C.O. office is an ESS-type place the following straps:

- PIN 3A to PIN 3B
- PIN 4A to PIN 4B

2.7.5.3 If the Central Office serving the STRATA III system is a non-ESS office (crossbar, step) and AROH is desired, cut any straps present between EASU pins and place the following strap:

- PIN 3B to PIN 4A

If the AROH feature is not desired, cut any straps present on the EASU pins and place the following strap

- PIN 3A to PIN 4B

2.7.6 STATION RESTRICTION FROM OUTGOING CALLS

2.7.6.1 Individual stations may be restricted from accessing idle outside lines. This allows a station to be restricted from making outgoing calls, but still allows the station to answer incoming calls.

2.7.6.2 Such restricted stations may also access idle lines placed on hold by an unrestricted station, and then dial out. This allows an operator to control and/or log the origin of outgoing calls without the operator's having to dial the calls.

2.7.6.3 An ESTU PCB will be present for each 4 stations connected to the XKSU. Pin 17A is the restriction assignment pin for the first station handled by the ESTU. Pin 17B is used to restrict the second station. Pins 25A and 25B are used to restrict the third and fourth stations respectively.

2.7.6.4 A station is restricted by connecting its ESTU restrictor pin to pin 9B of the ECKU connector (see Figure 24).

2.7.7 HOOK SWITCH FLASH FEATURE—Read Section 100-004-210, paragraph 7.11.

2.8 PRINTED CIRCUIT BOARD CONFIGURATION

IMPORTANT: IT IS RECOMMENDED THAT PCB INSERTION IN THE XKSU BE LEFT UNTIL LAST TO PROTECT THE UNITS FROM POSSIBLE STATIC VOLTAGE DISCHARGES WHEN CONNECTING CABLE RUNS, ETC.

2.8.1 The following PCB's must be installed in the XKSU (see Figure 25):

- XDLU—An XDLU must be installed in the XKSU if one or more of the following conditions exist:

  An EDSS is installed and one or more stations are connected to the XKSU.

  A second EDSS is installed in the system.

  A busy lamp field is connected to the XKSU.

  If a second EDSS is installed, place the XDLU "C.O. RINGING" plug in the (TRNS) position as illustrated in (Figure 26).

- EIFU—If an XDLU is installed set all EIFU Dip Switches in the open position (see Figure 27) and make certain that the seven white jumper wires on the rear of the EIFU PCB are cut before installing in the EKSU (see Figure 28).
- XIFU—Install in the XKSU (see Figure 25).
- ECKU—In addition to the ECKU present in the EKSU, install an ECKU in the proper slot in the XKSU.
- EINU—If the expanded system is to have 4 paths of intercom, install in the INU/COU slot in the XKSU. This will be in addition to the EINU already present in the EKSU.

NOTE: If ECOU 11 is to be installed to introduce CO/PBX lines 21 and 22, four paths of intercom is not possible. Do not install EINU in XKSU.

- ERGU—If an EINU PCB is installed in the XKSU, install in the proper slot in the XKSU. This will be in addition to the ERGU present in the EKSU (read section 100 004 210, paragraph 7.5 and 7.6 for strapping considerations).

2.8.2 ECOU PCB REQUIREMENTS

2.8.2.1 One ECOU PCB must be installed in the XKSU for every 2 CO/PBX lines to be introduced into the system past the basic capacity of 12. The ECOU requirements are demonstrated in the following chart:

ECOU 7	CO/PBX LINE 13 14
ECOU 8	CO/PBX LINE 15 16
ECOU 9	CO/PBX LINE 17 18
ECOU 10	CO/PBX LINE 19 20
ECOU 11*	CO/PBX LINE 21* 22*

*CO/PBX lines 21 and 22 may be introduced in the system by inserting an ECOU PCB in the COU/INU slot in the XKSU (see Figure 25). However, this precludes the installation of the EINU/PCB necessary to activate intercom paths 3 and 4.

2.8.3 ESTU AND EVCU PCB REQUIREMENTS

2.8.3.1 ESTU and EVCU PCB requirements for the XKSU are dependent on the number of stations in the expanded system and each PCB serves a specific, fixed set of stations. Refer to Figure 29 to establish which ESTU's and EVCU's must be installed in the XKSU.

NOTE: The presence of any one of the four station members of a set requires the installation of the ESTU and EVCU serving that set.

2.8.4 EXPU PCB REQUIREMENTS

2.8.4.1 In order for stations 1 through 32 (intercom codes 10 through 41, which are already served by EXPU's 1 through 4 in the basic EKSU) to have access to CO lines 13 through 22, intercoms 3 and 4, and/or 2nd EDSS paging, additional EXPU's must be installed in the XKSU. These additional EXPU PCB requirements are demonstrated in Figure 30.

2.8.4.2 In order for expansion stations 33 through 52 (intercom codes 42 through 61) to have access to C.O. lines 13 through 22, intercom paths 3 and 4, and/or 2nd EDSS paging, EXPU's 12, 13, and 14 may have to be installed, depending on the exact stations to be functional (refer to Figure 29).

2.8.4.3 In order for expansion stations 33 through 52 to have access to C.O. lines 1 through 12, intercoms 1 and 2, and/or primary EDSS paging, EXPU's 5, 6, and 7 may have to be installed in the XKSU depending on exact stations to be functional (refer to Figure 29).

2.8.5 OPTIONAL EGPU PCB

2.8.5.1 The EGPU PCB serves a dual purpose and should be installed in the XKSU if either of the following feature additions are required:

- Intercom paths 3 and 4 are active and are to have access to Group Paging, External Paging, and/or All Call paging features.
- Expansion stations (intercom codes 42 through 61) are to be assigned to one of the original three Group Page zones.

2.8.5.2 Refer to section 100-004-276 for backplane wiring instructions.

2.9 INTRODUCTION OF C.O./PABX LINES 13 THRU 22

2.9.1 The expanded Strata III Electronic Telephone System can handle a full complement of 20 outside lines. An additional 2 outside lines (numbers 21 and 22) may also be accommodated by sacrificing the capacity for optional intercom paths 3 and 4 and plugging in an ECOU PCB in EINU/ECOU position 11 (refer to Figure 25).

2.9.2 Outside lines 1 thru 12 are accommodated by the EKSU and are introduced via Amphenol connection A on the rear of the EKSU (refer to sections 100-004-210, paragraph 9).

2.9.3 Outside lines 13 thru 22 are introduced in a similar manner via connector "A" at the rear of the XKSU (refer to Figure 3).

2.9.4 A 25 pair double-ended cable (one male amphenol, one female amphenol) of 25' or less in length is connected to XKSU connector 'A' and run to the USOC RJ21X (amphenol-type) connector supplied by Central Office.

2.9.5 The C.O. lines must appear in the RJ21X connector as shown in the following table:

Circuit	Function	Conductor
C.O. or PBX line No. 13	T R	W-BL BL-W
C.O. or PBX line No. 14	T R	W-OR OR-W
C.O. or PBX line No. 15	T R	W-GN GN-W
C.O. or PBX line No. 16	T R	W-BR BR-W
C.O. or PBX line No. 17	T R	W-S S-W
C.O. or PBX line No. 18	T R	R-B B-R
C.O. or PBX line No. 19	T R	R-OR OR-R
C.O. or PBX line No. 20	T R	R-GN GN-R
C.O. or PBX line No. 21*	T R	R-BR BR-R
C.O. or PBX line No. 22*	T R	R-S S-R

2.9.6 Upon connection of the XKSU cable "A" to the RJ21X connector, the C.O. lines will

appear in the system in their order of appearance in the RJ21X connector.

NOTE: The STRATA III System is not influenced by TR reversals.

2.10 INSTALLATION FINALIZATION

Upon the installation of all necessary PCB's, telephone sets, XKSU wiring, etc., the system should then be powered up and the various system features tested for correct operation. This may be accomplished by referring to and following the steps outlined in the STRATA III Telephone and EDSS Console User's Guides.

2.11 Should a malfunction occur, refer to section 100-004-510.

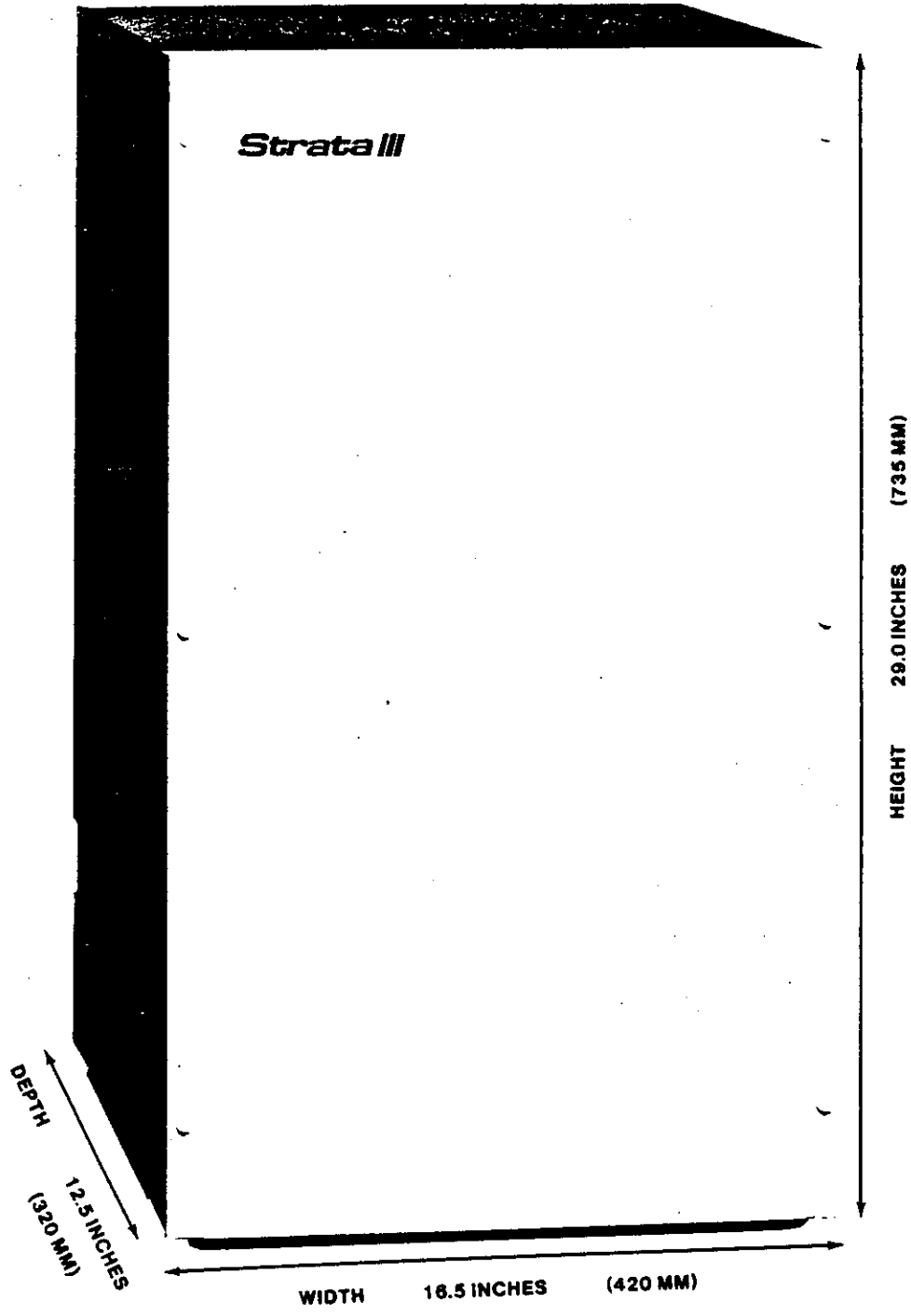


FIGURE 1 – FRONT VIEW OF XKSU

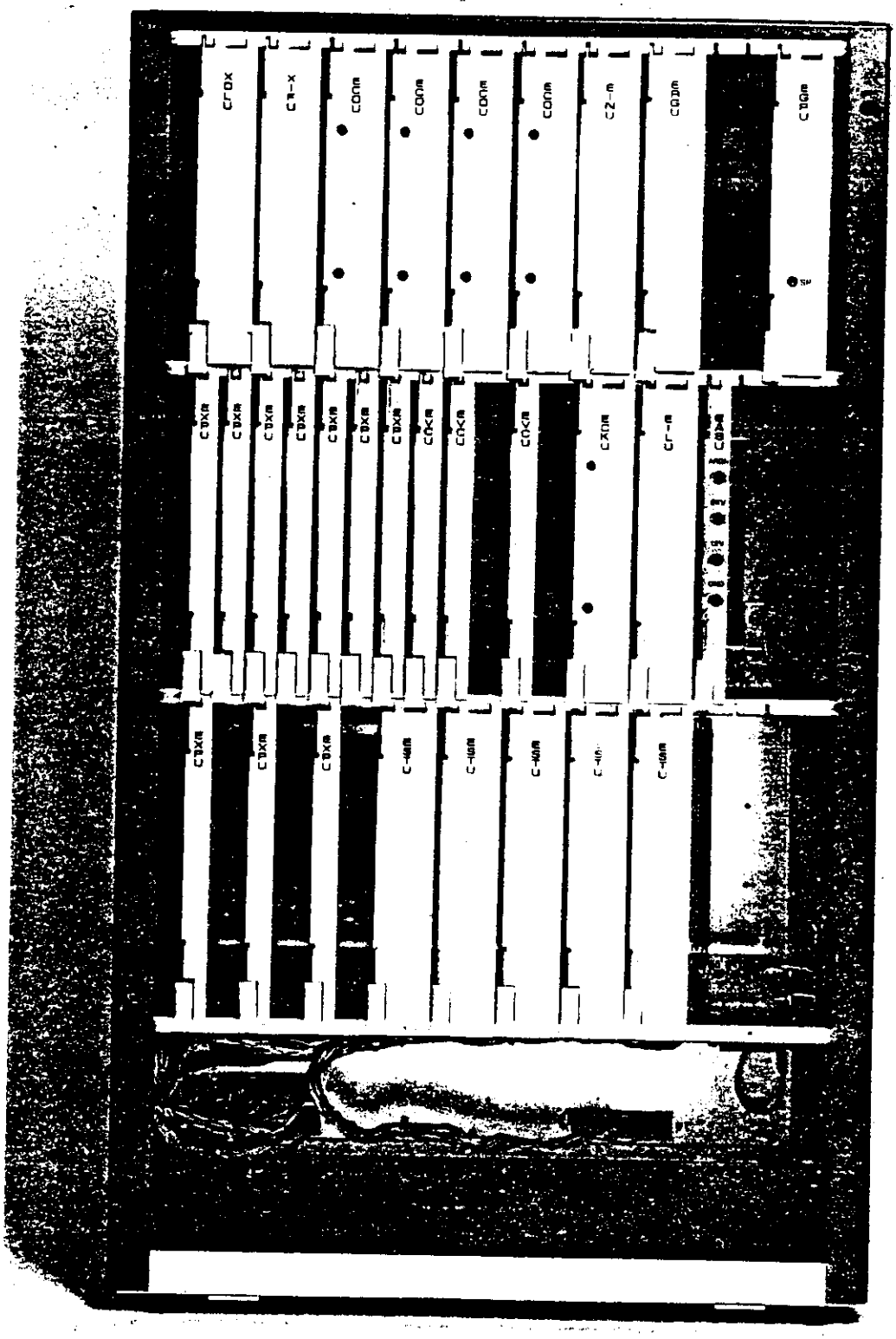


FIGURE 2—FRONT VIEW OF XKSU WITH FRONT PANEL OFF

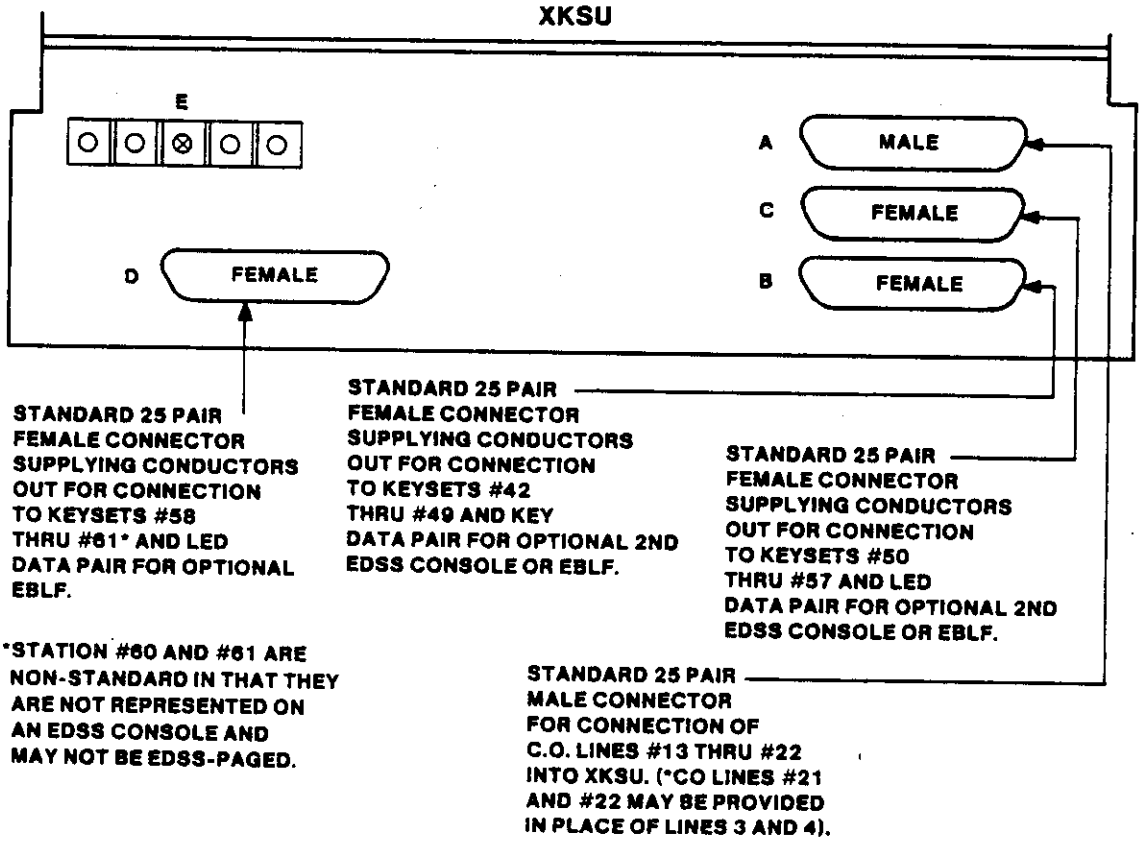


FIGURE 3—REAR XKSU CONNECTION PANEL

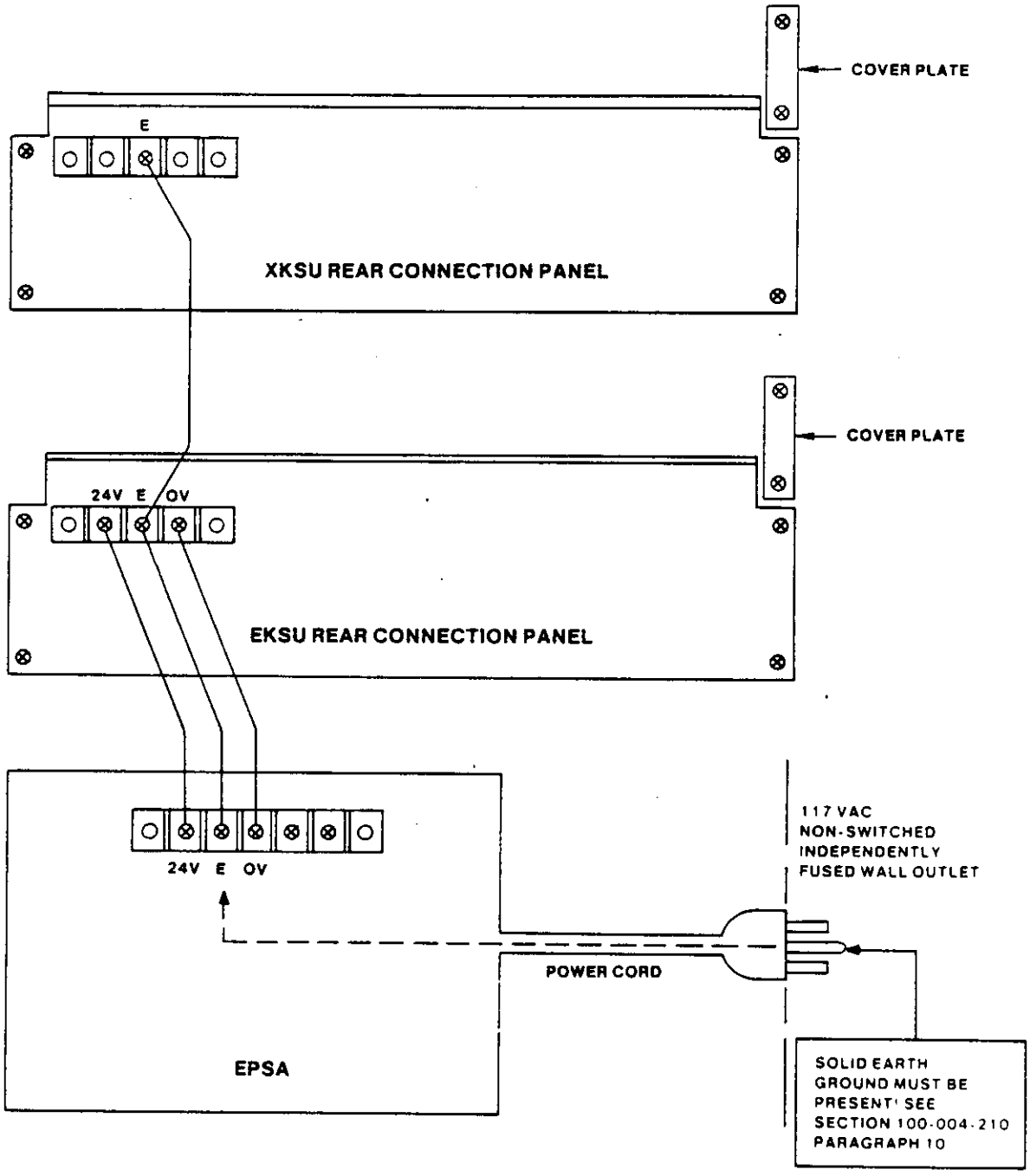


FIGURE 4—PROPER XKSU GROUNDING AND COVER PLATE LOCATIONS

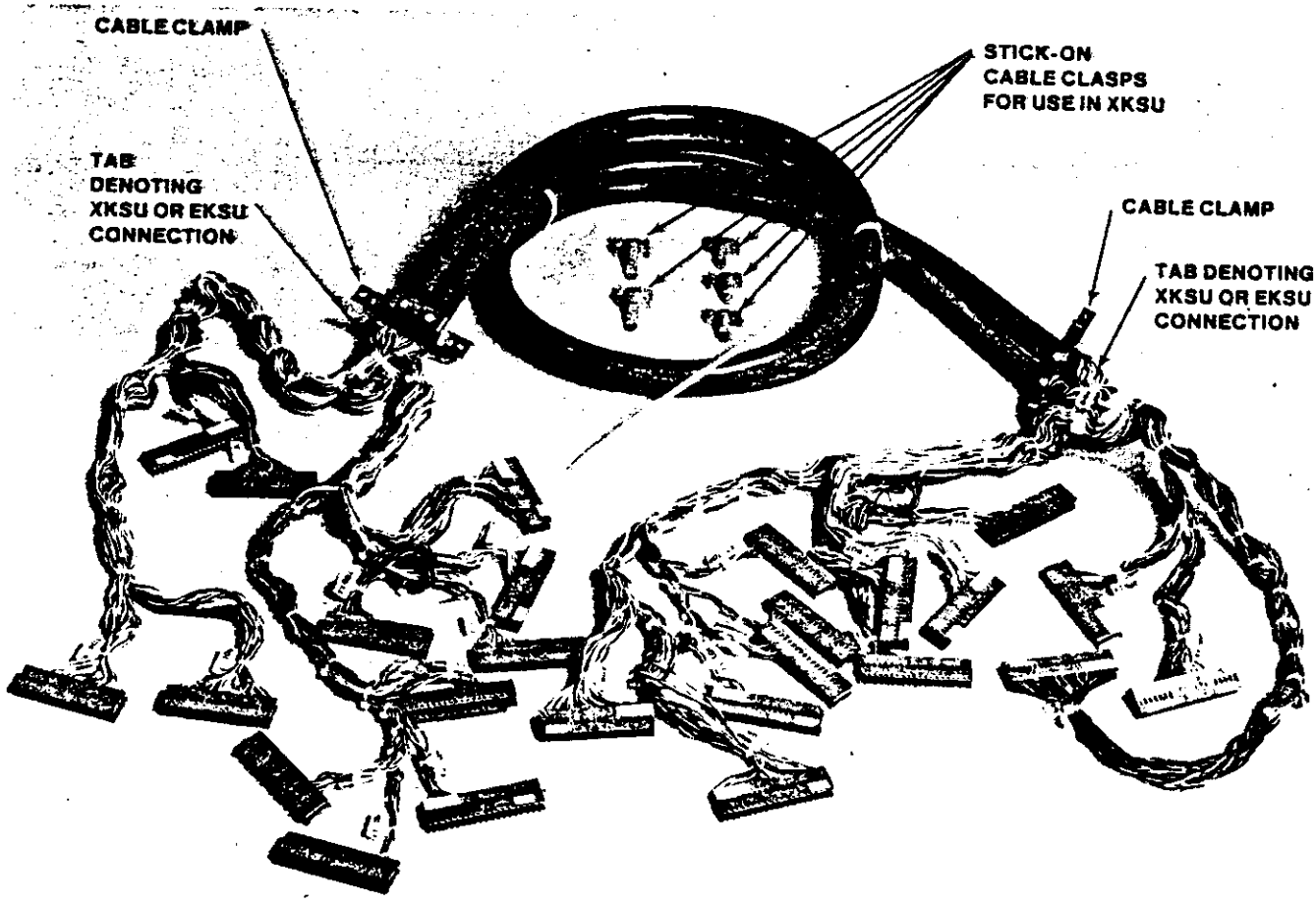


FIGURE 5—XCBL CABLE ASSEMBLY

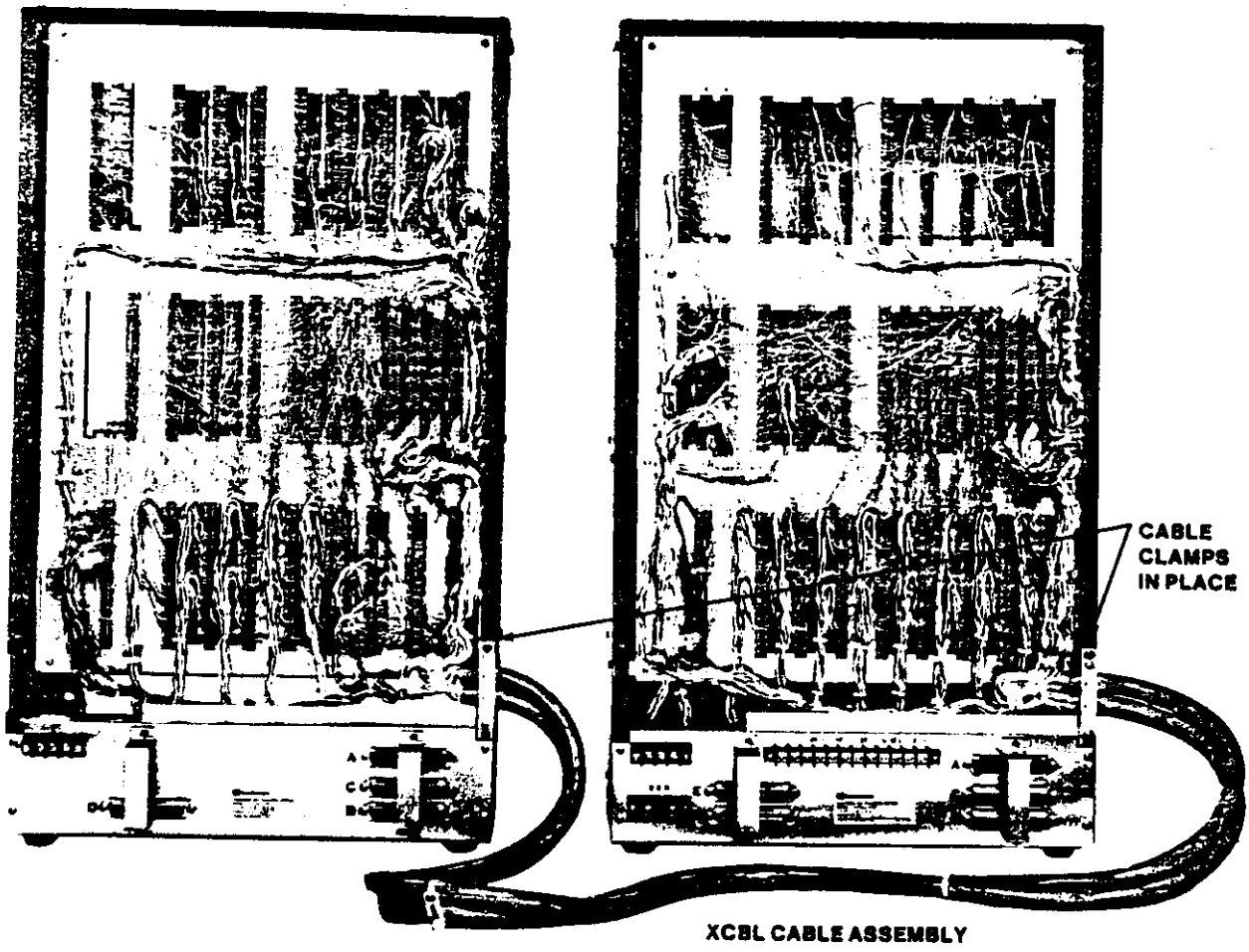


FIGURE 6—XCBL CABLE ASSEMBLY PLACEMENT

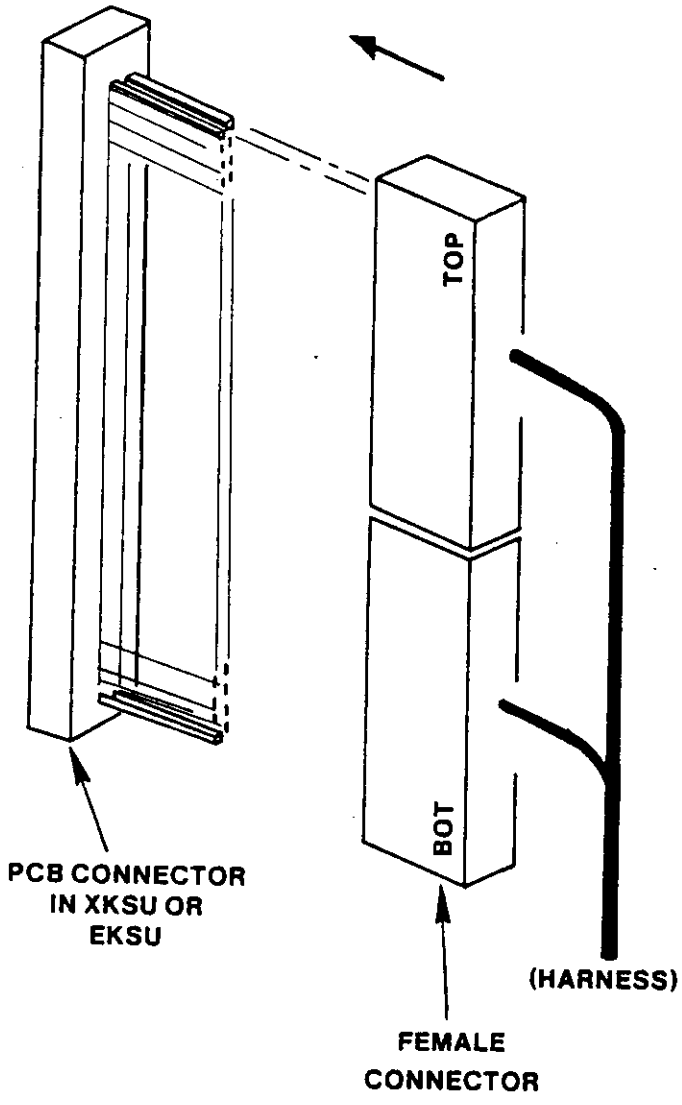


FIGURE 7 – XCBL CABLE ASSEMBLY PLUG CONNECTION

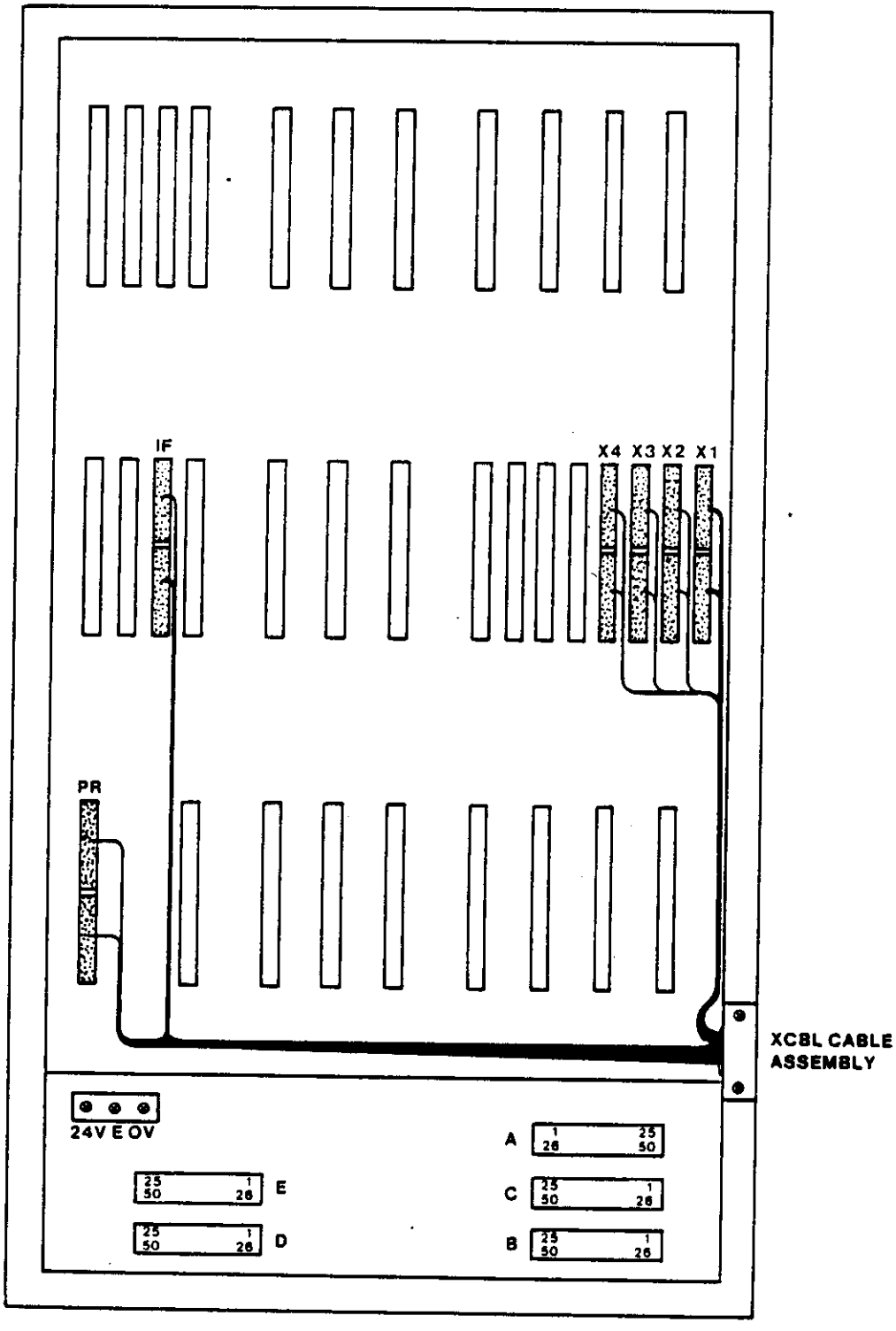


FIGURE 8—XCBL PLUG PLACEMENT IN EKSU

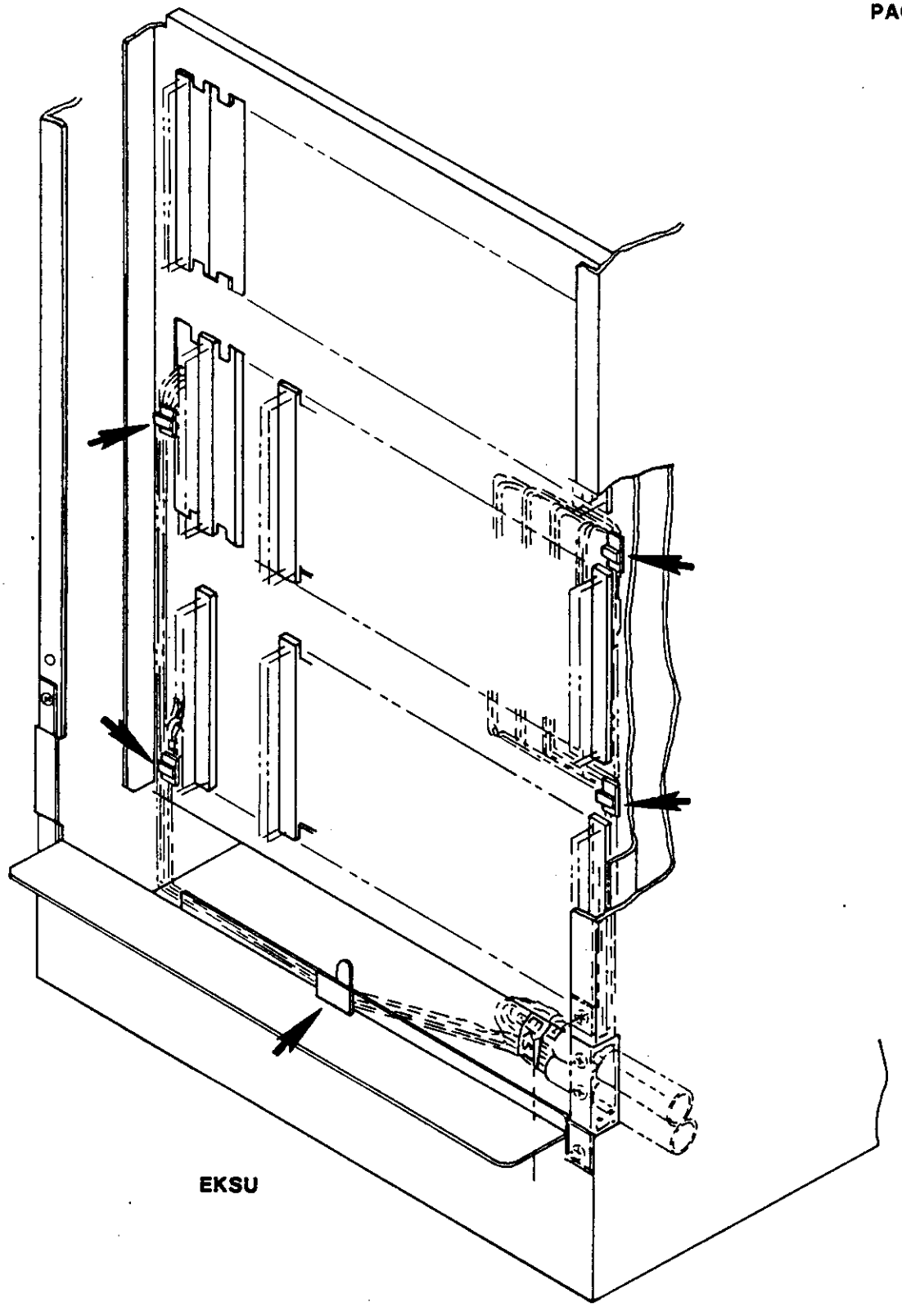


FIGURE 9—EKSU HARNESS CLASP LOCATIONS

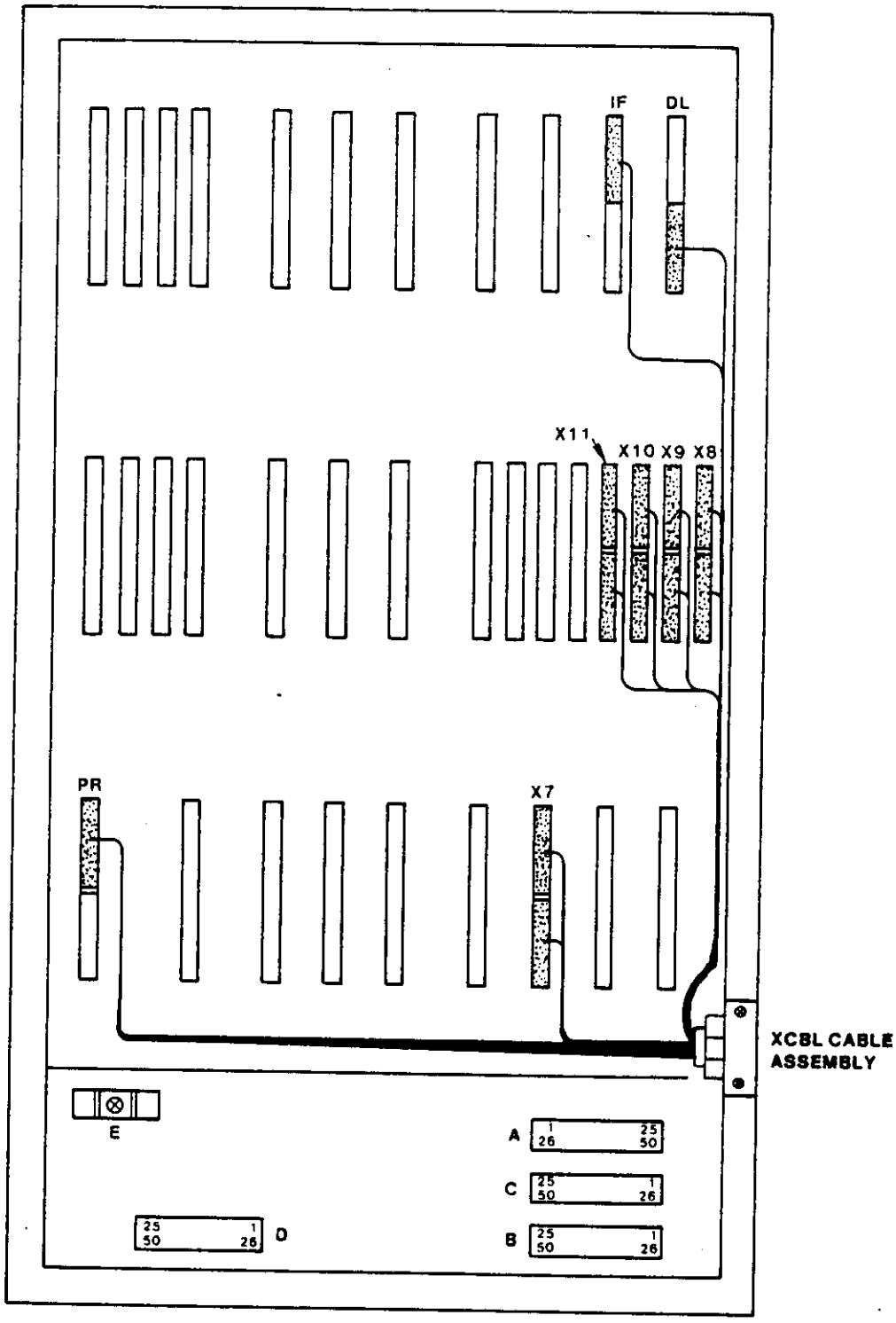
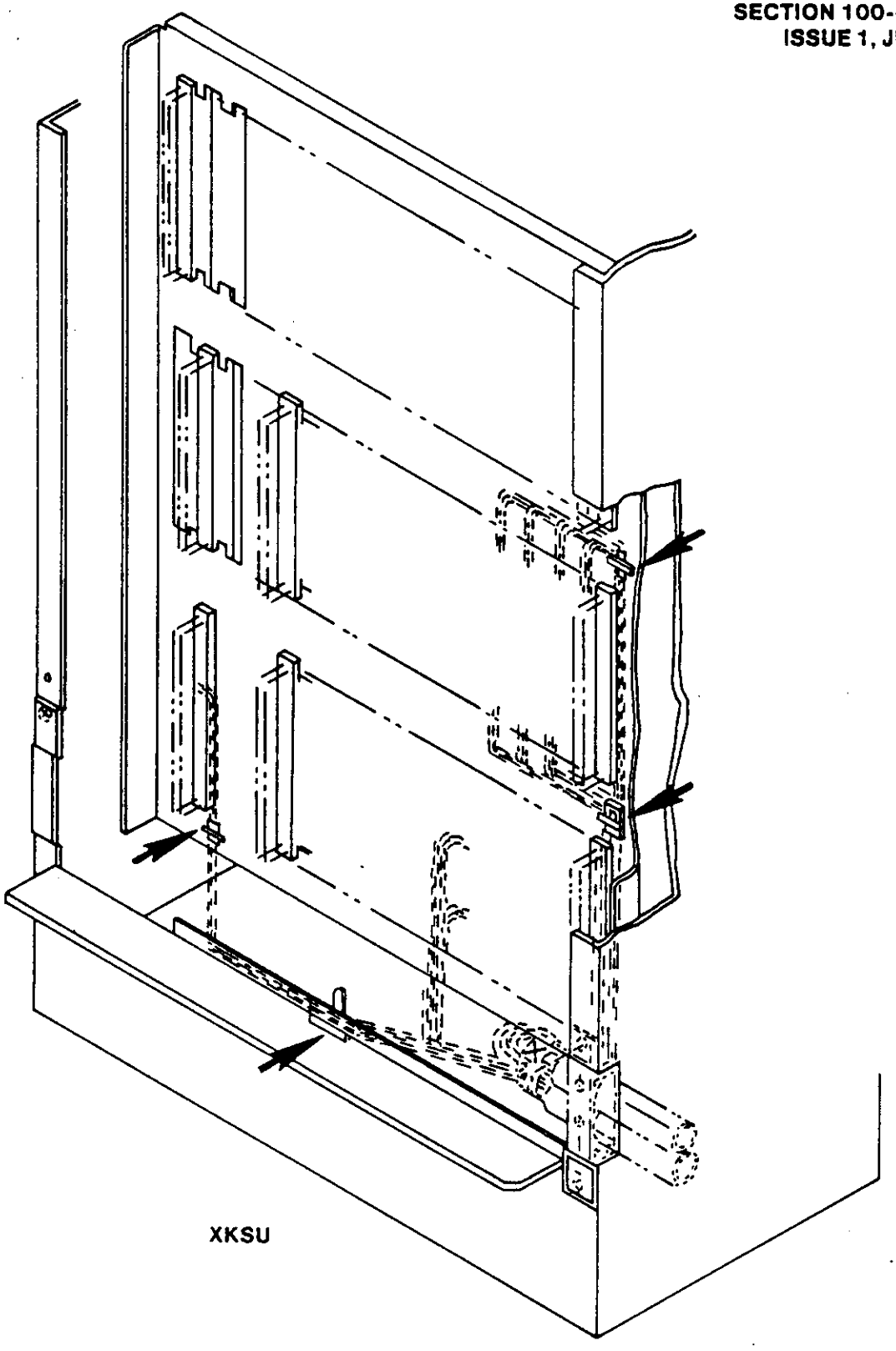


FIGURE 10—XCBL PLUG PLACEMENT IN XKSU



XKSU

FIGURE 11 – XKSU HARNESS CLASP PLACEMENT

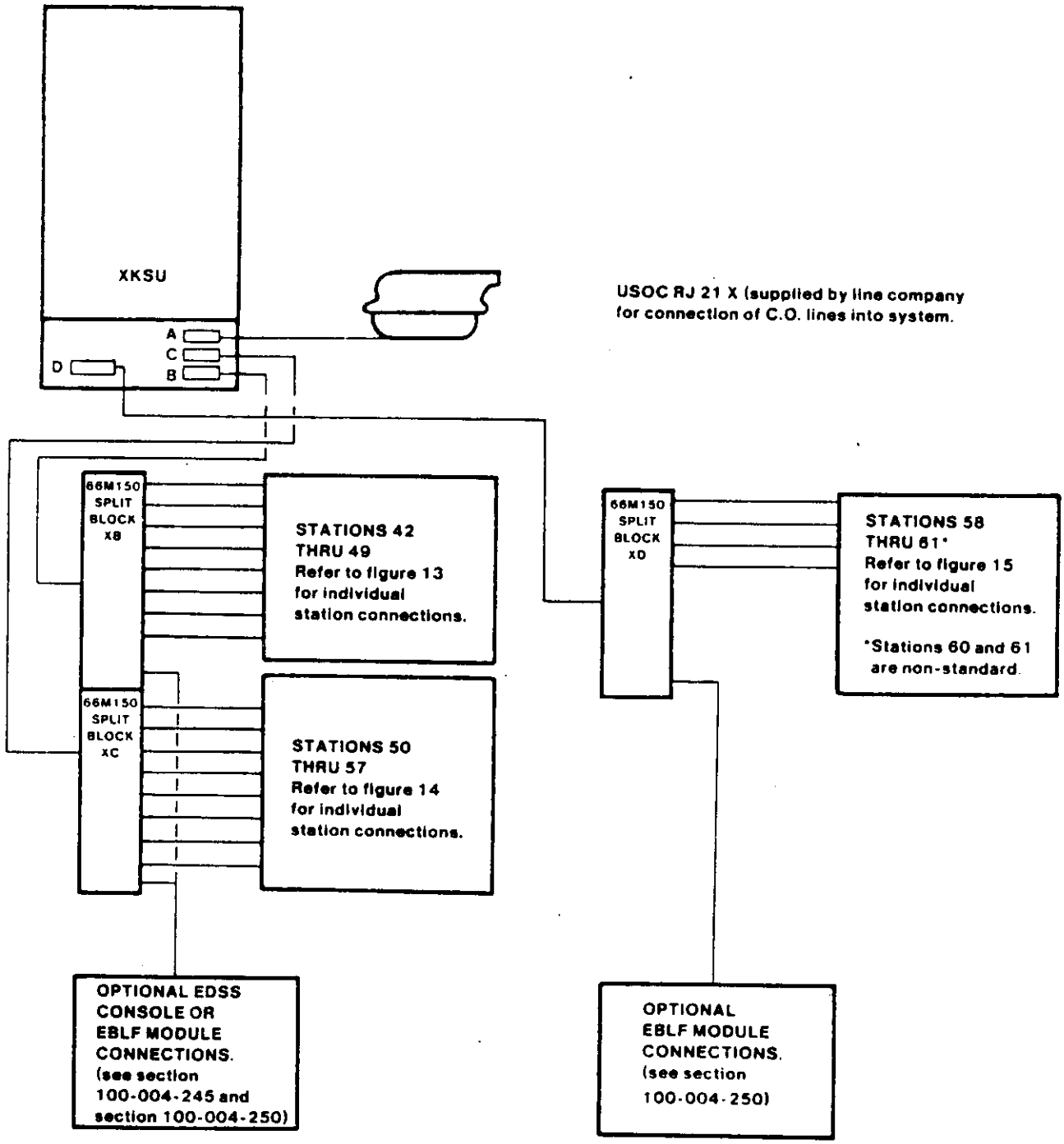


FIGURE 12—XMDF CONFIGURATION

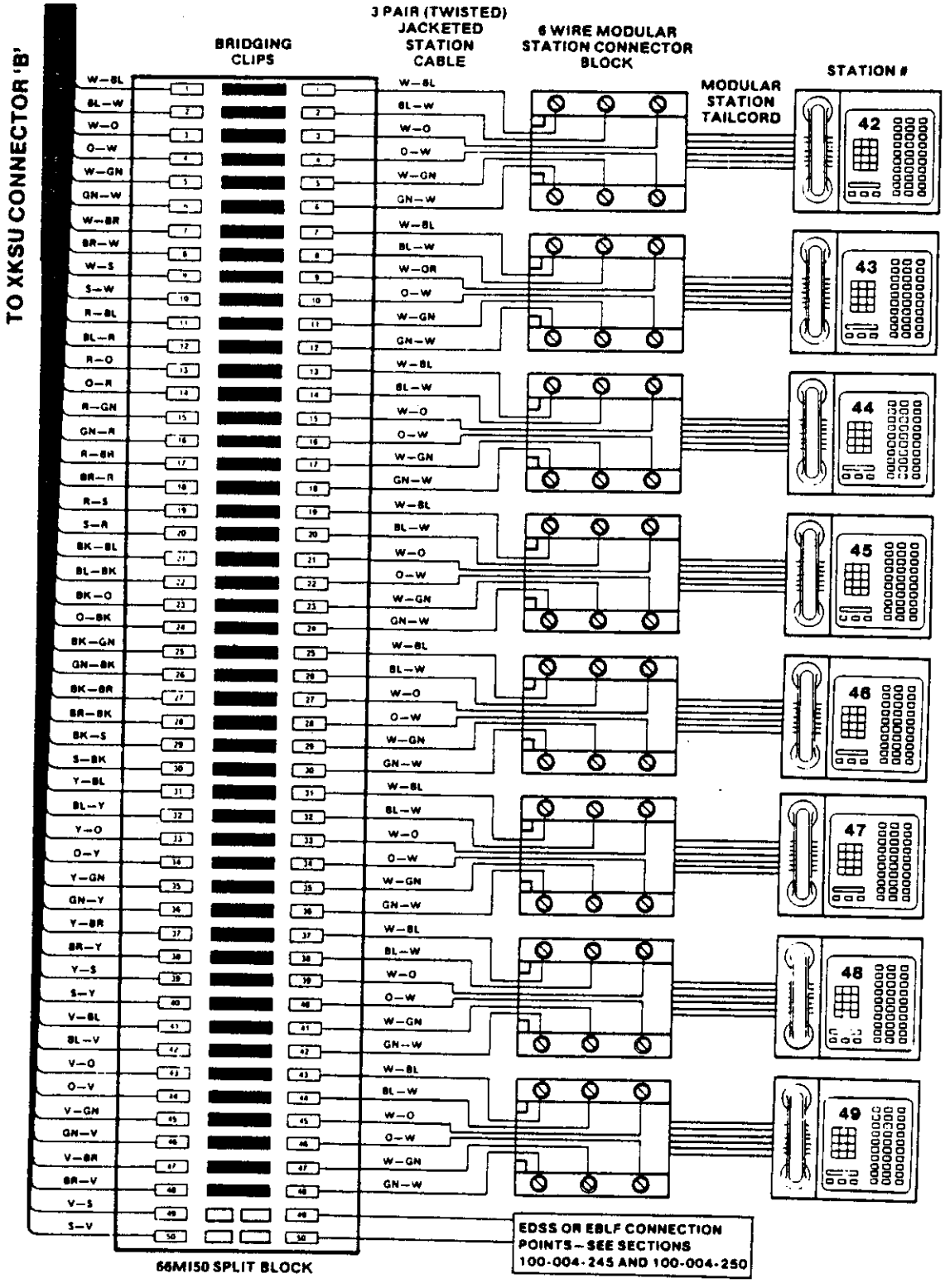


FIGURE 13 – XMDF BLOCK 'XB' CONNECTION DIAGRAM

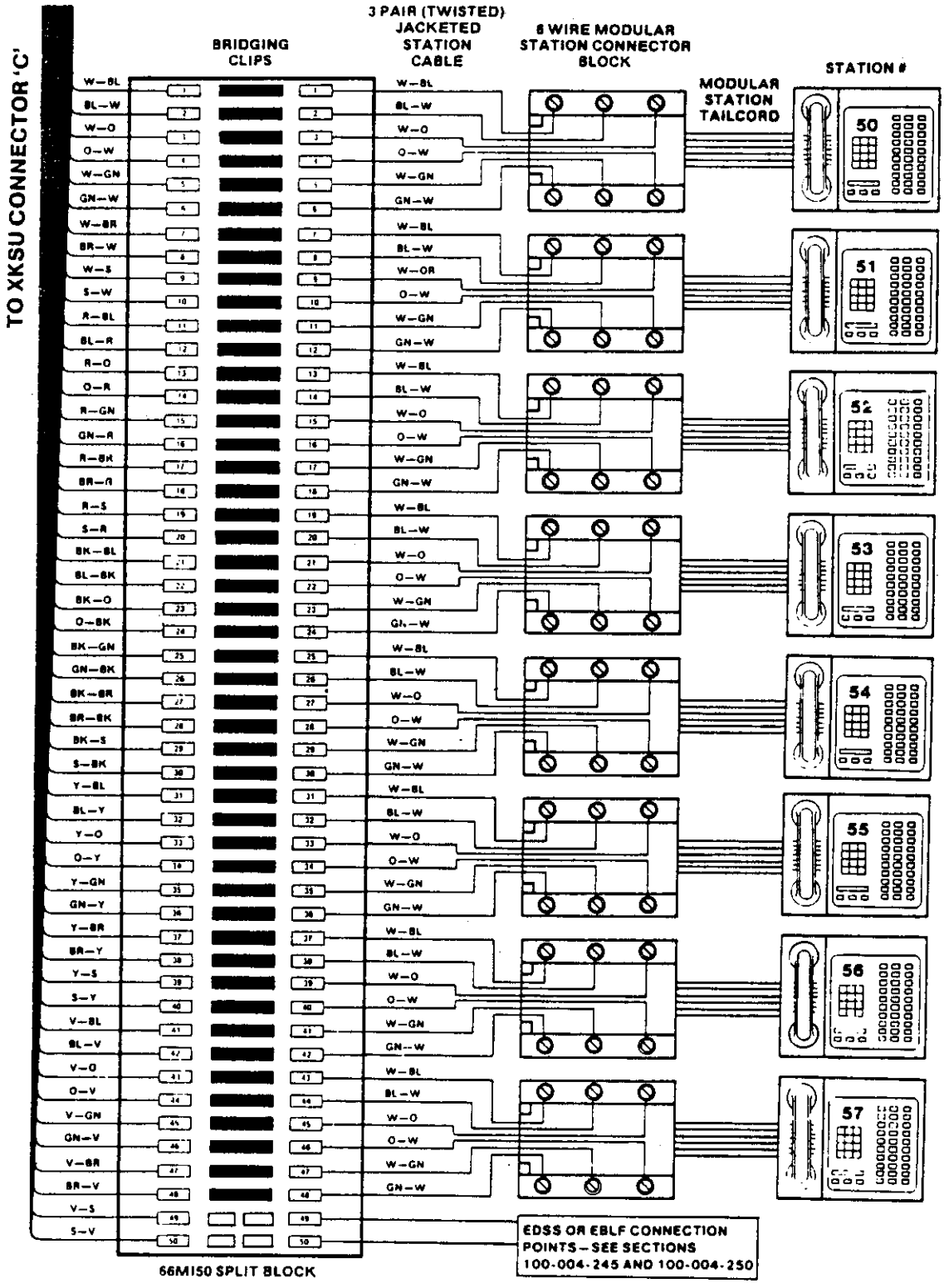


FIGURE 14 – XMDF BLOCK 'XC' CONNECTION DIAGRAM

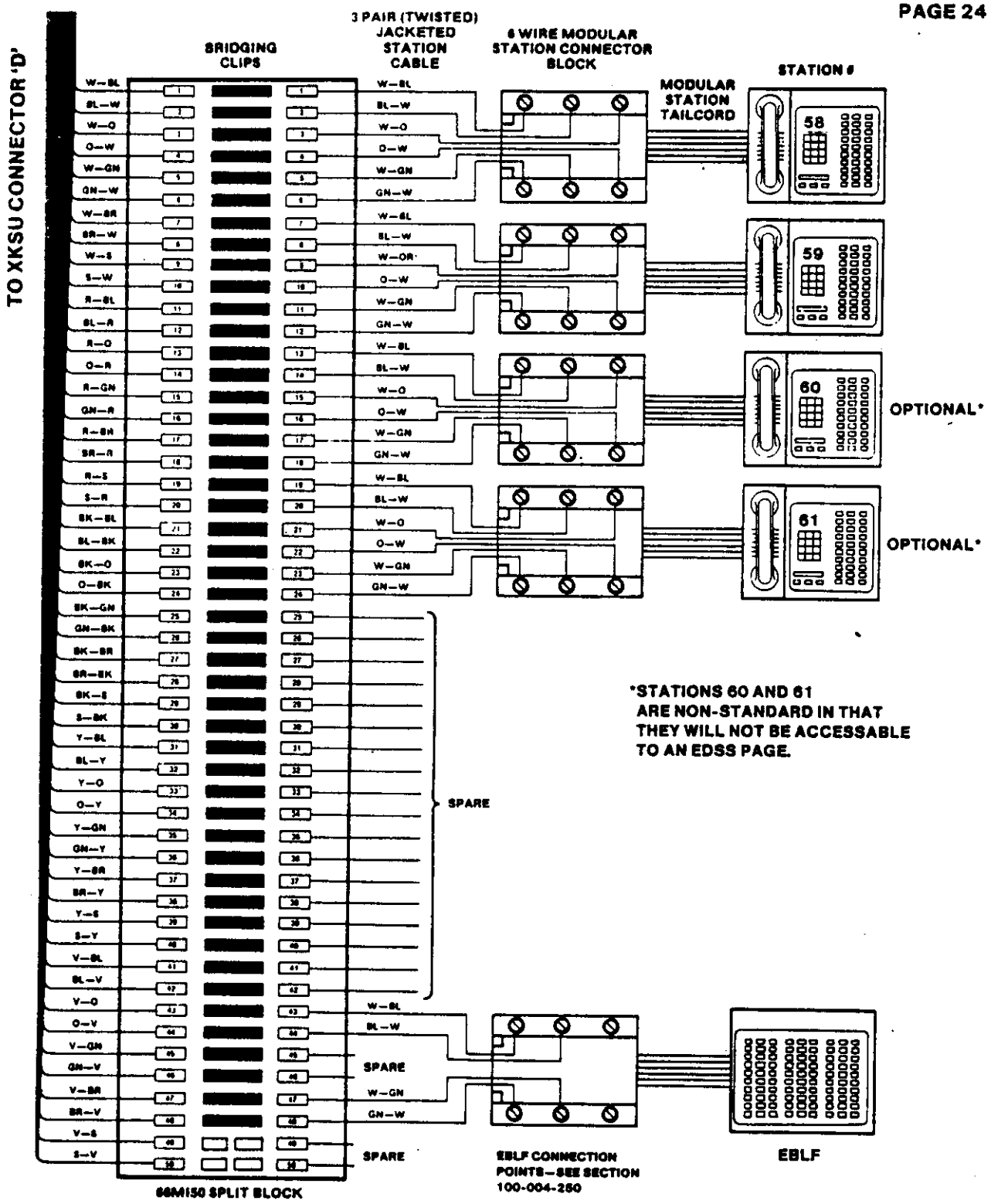


FIGURE 15—XMDF BLOCK 'XD' CONNECTION DIAGRAM

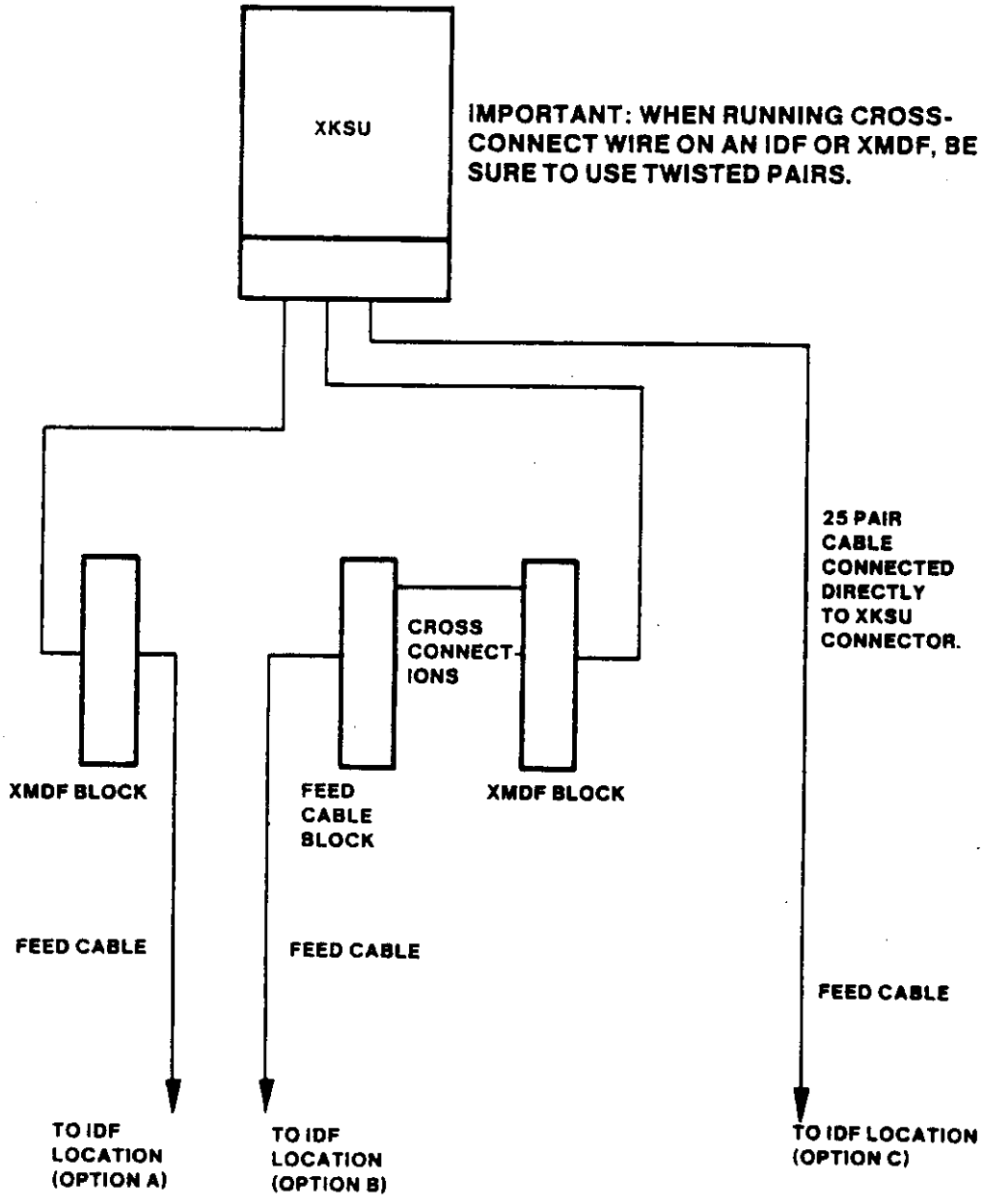


FIGURE 16—INTERMEDIATE DISTRIBUTION FRAME OPTIONS

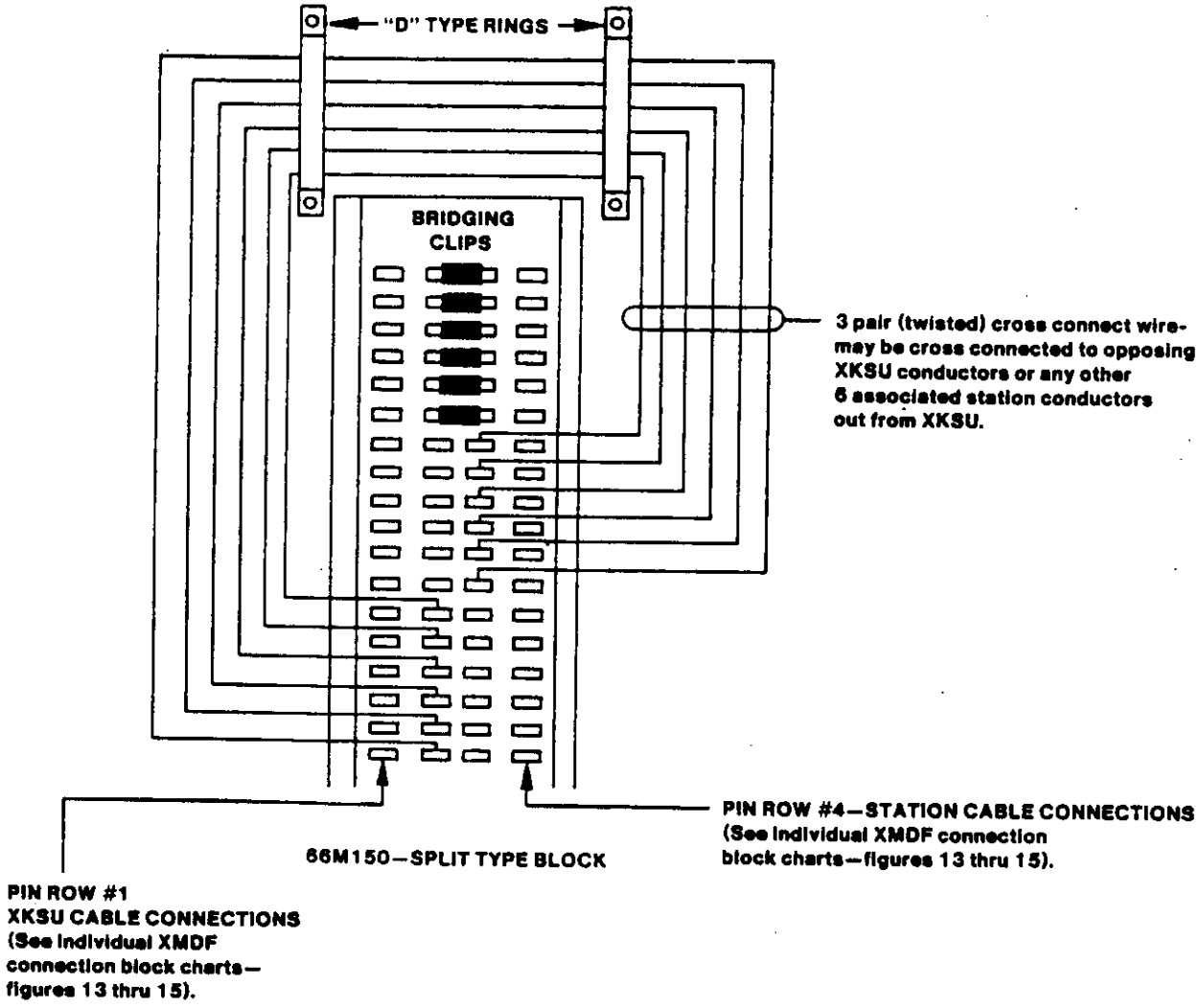


FIGURE 17—INTERCOM CODE RE-ASSIGNMENT

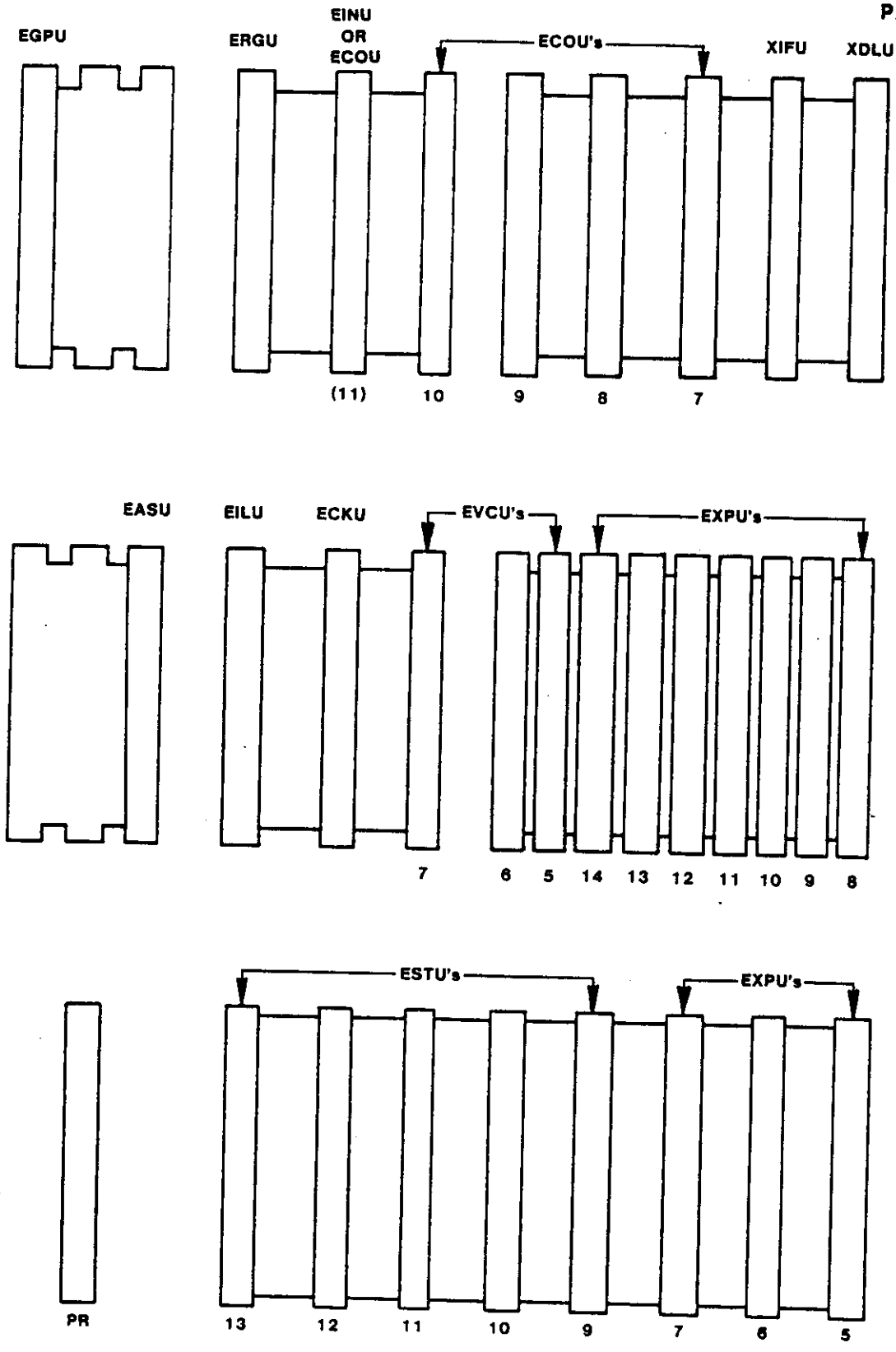
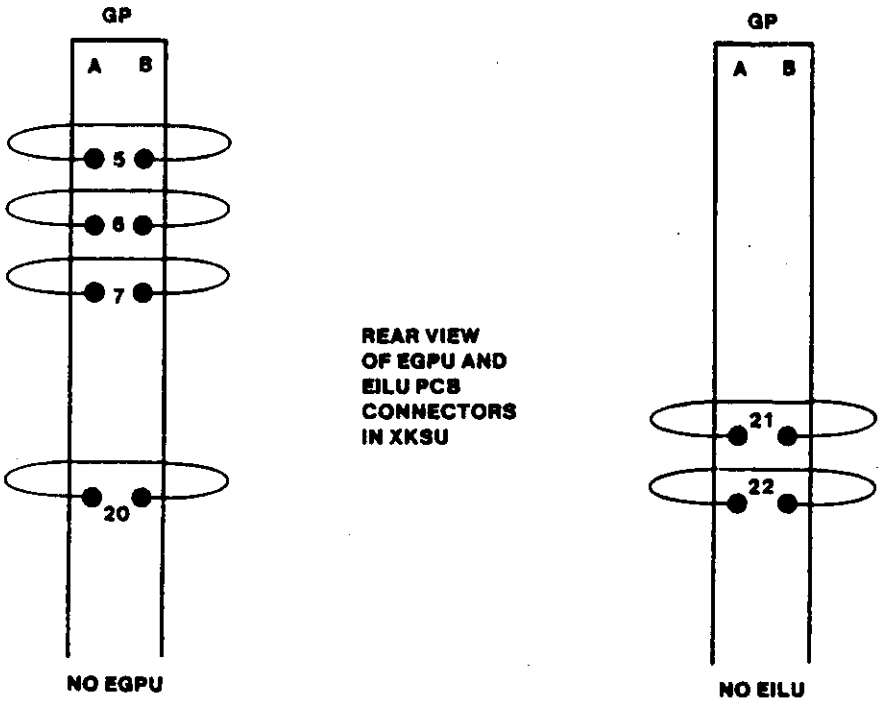


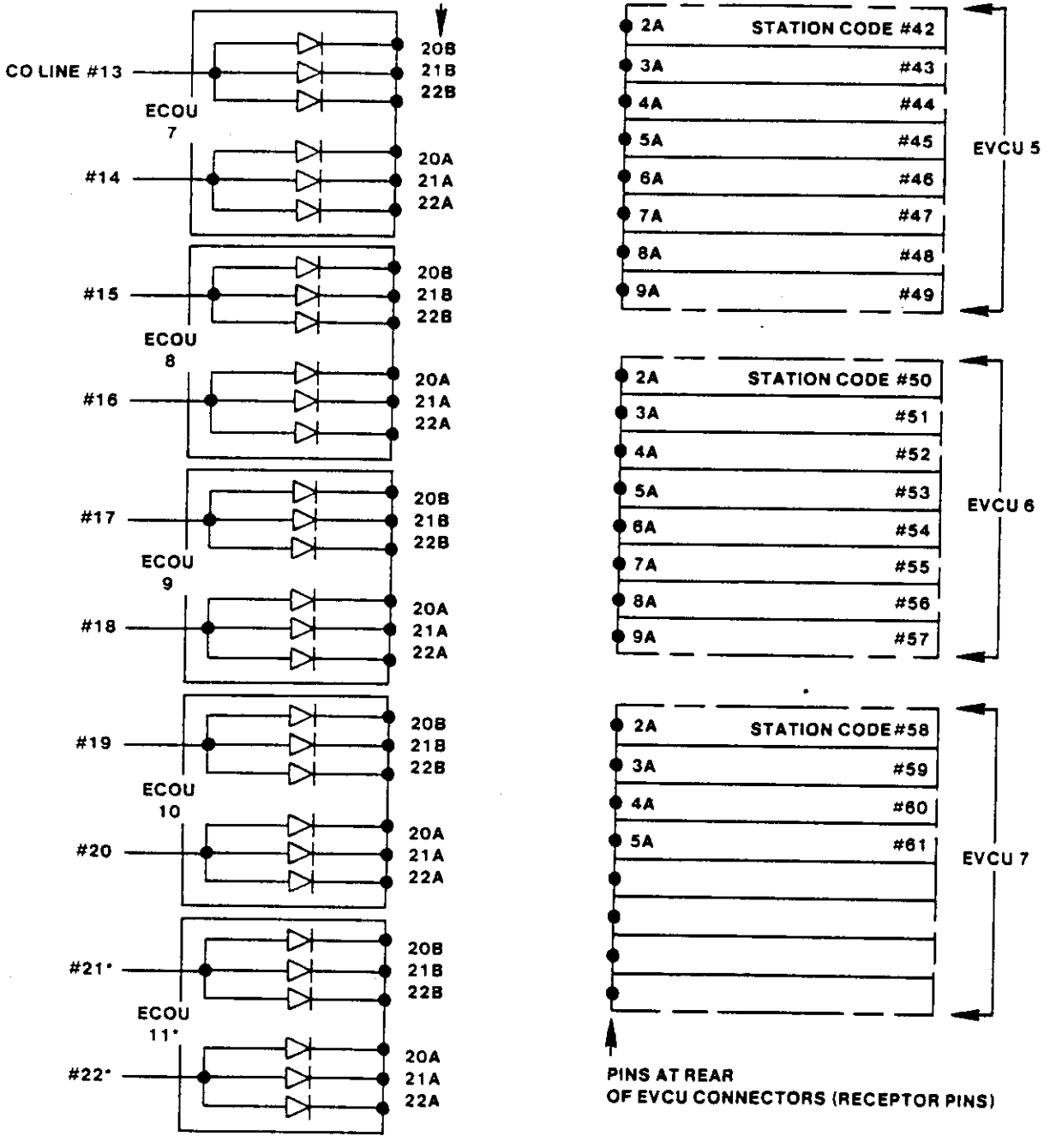
FIGURE 18—REAR VIEW—PCB CONNECTORS IN XKSU



NOTE: IT IS PREFERABLE THAT STRAPPINGS BE "ROOMY" AND "LOOPED" RATHER THAN TAUT.

FIGURE 19—"NO EGPU" AND "NO EILU" STRAP PLACEMENT

PIN ASSIGNMENTS AS THEY APPEAR ON THE
REAR OF THE ECOU CONNECTORS IN THE XKSU



*INSTEAD OF EINU (NO INTERCOMS 3 AND 4)

FIGURE 20—INCOMING CALL SIGNALING ASSIGNMENT PIN LOCATIONS

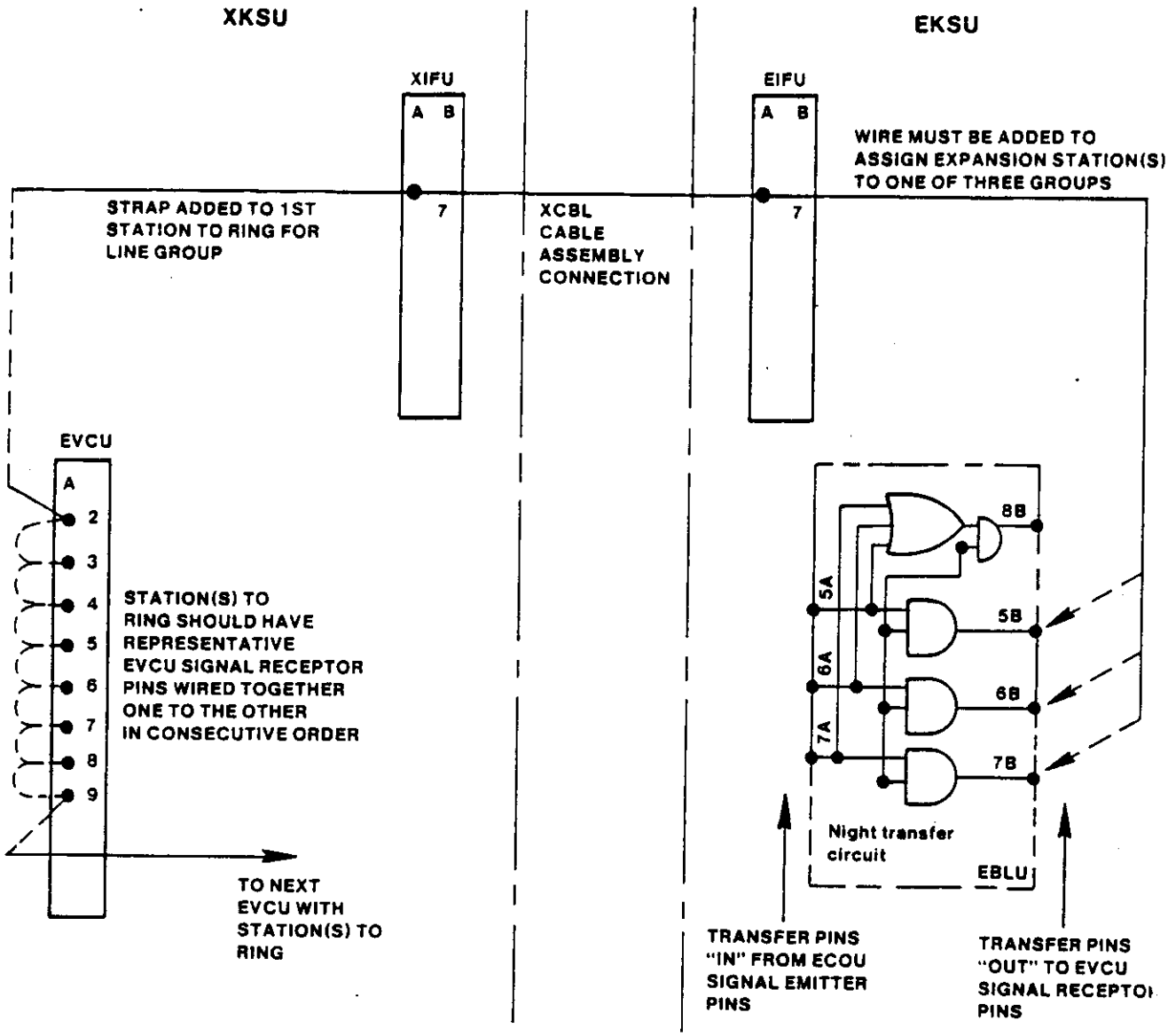
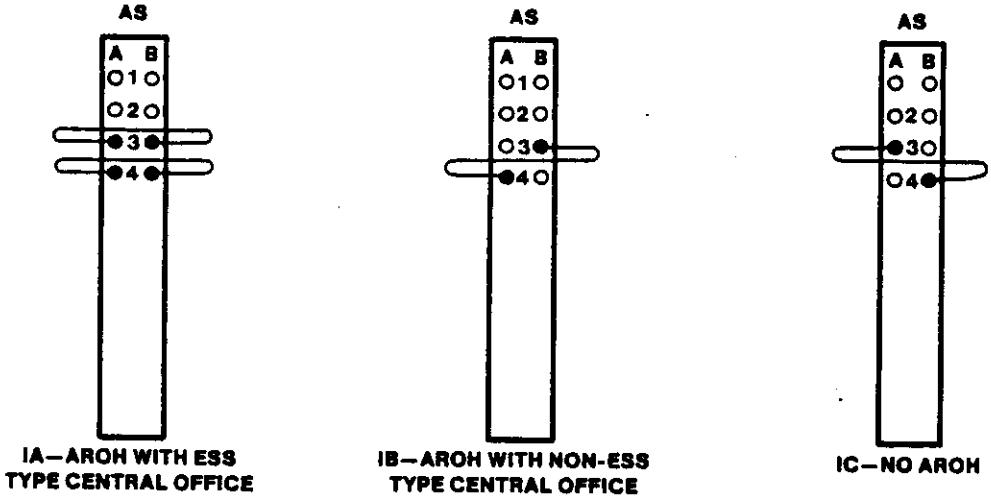


FIGURE 22—BACKPLANE WIRING ASSIGNMENT OF EXPANSION STATION(S) TO NIGHT RINGING GROUP



REAR VIEWS—EASU PCB CONNECTOR IN XKSU

FIGURE 23—AROH WIRING OPTIONS

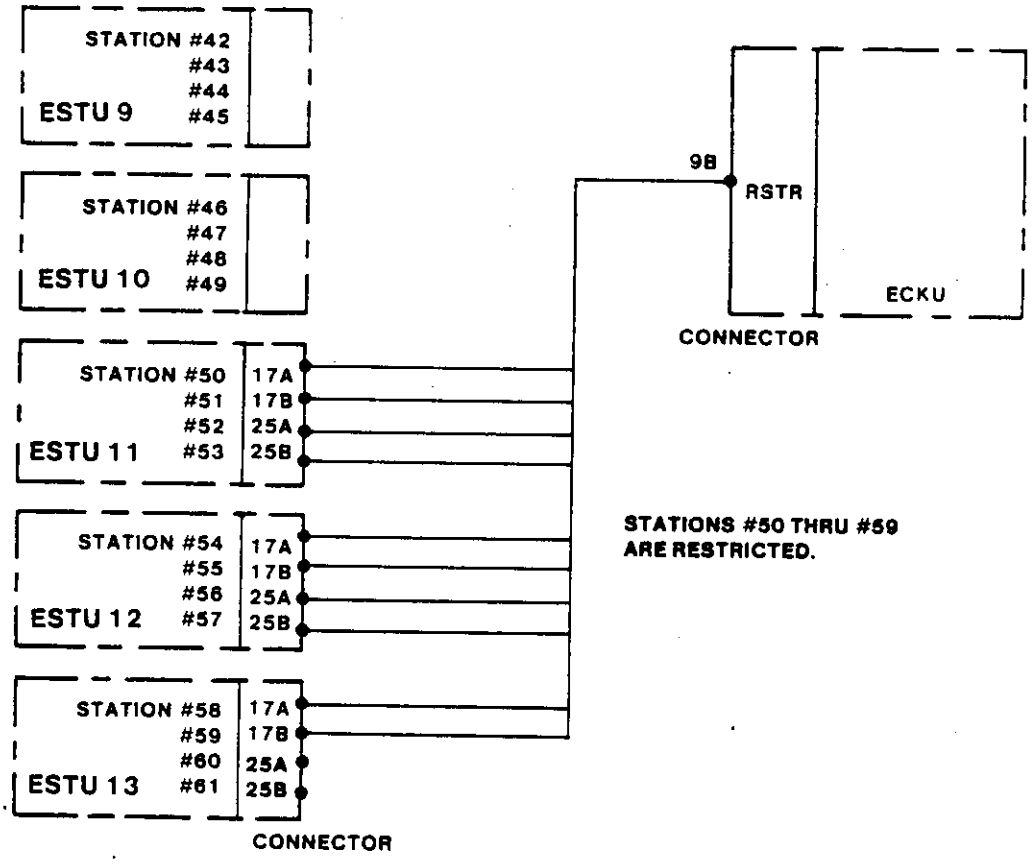


FIGURE 24—EXAMPLE OF STATION RESTRICTION CIRCUIT IN XKSU

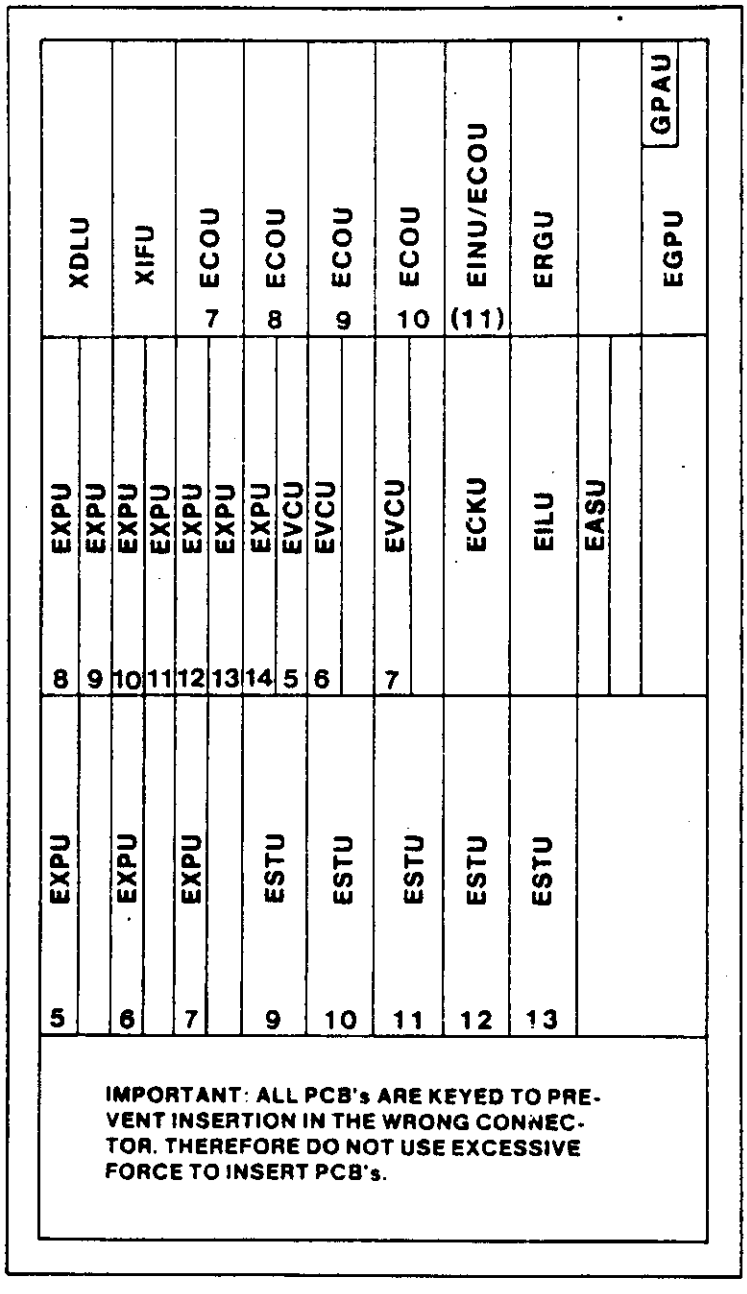
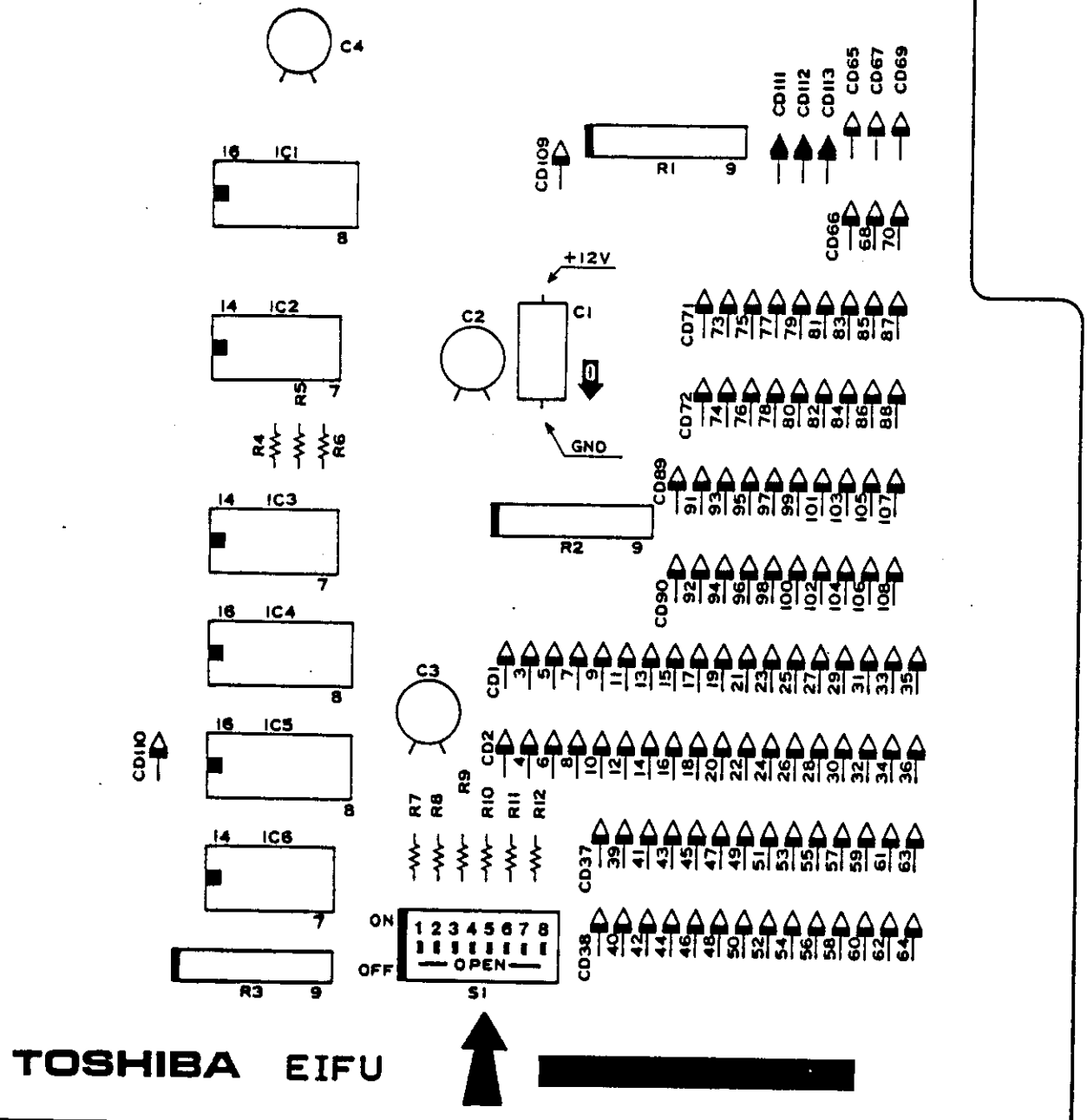


FIGURE 25—XKSU PCB LOCATIONS



NOTE: IF NO XDLU IS INSTALLED IN XKSU (NO EDSS OR EBLF IN SYSTEM), MOVE EIGHT ROCKERS UP, OTHERWISE MAKE SURE ALL ROCKERS ARE DOWN (OPEN).

FIGURE 27—EIFU PCB LAYOUT

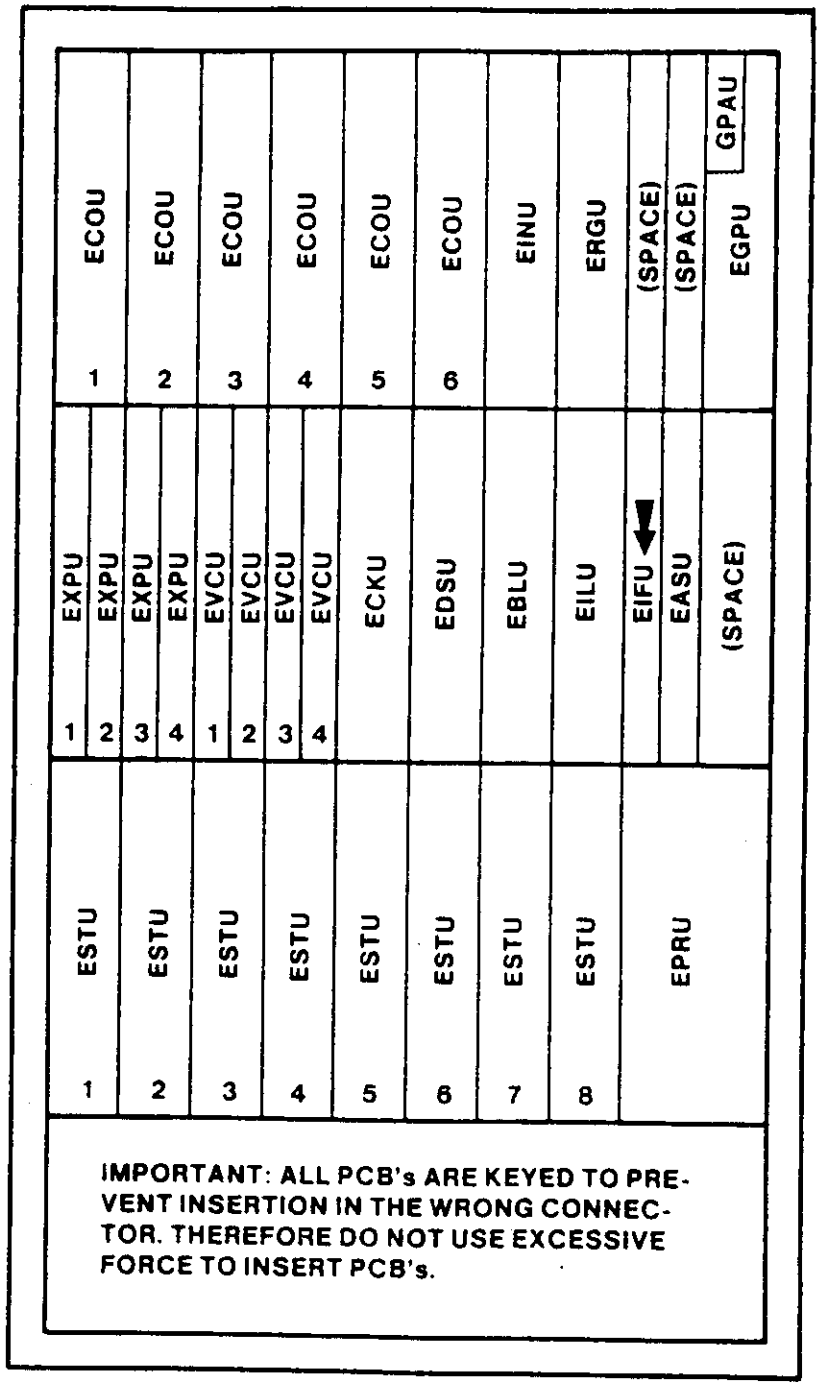


FIGURE 28—EKSU PCB LOCATIONS

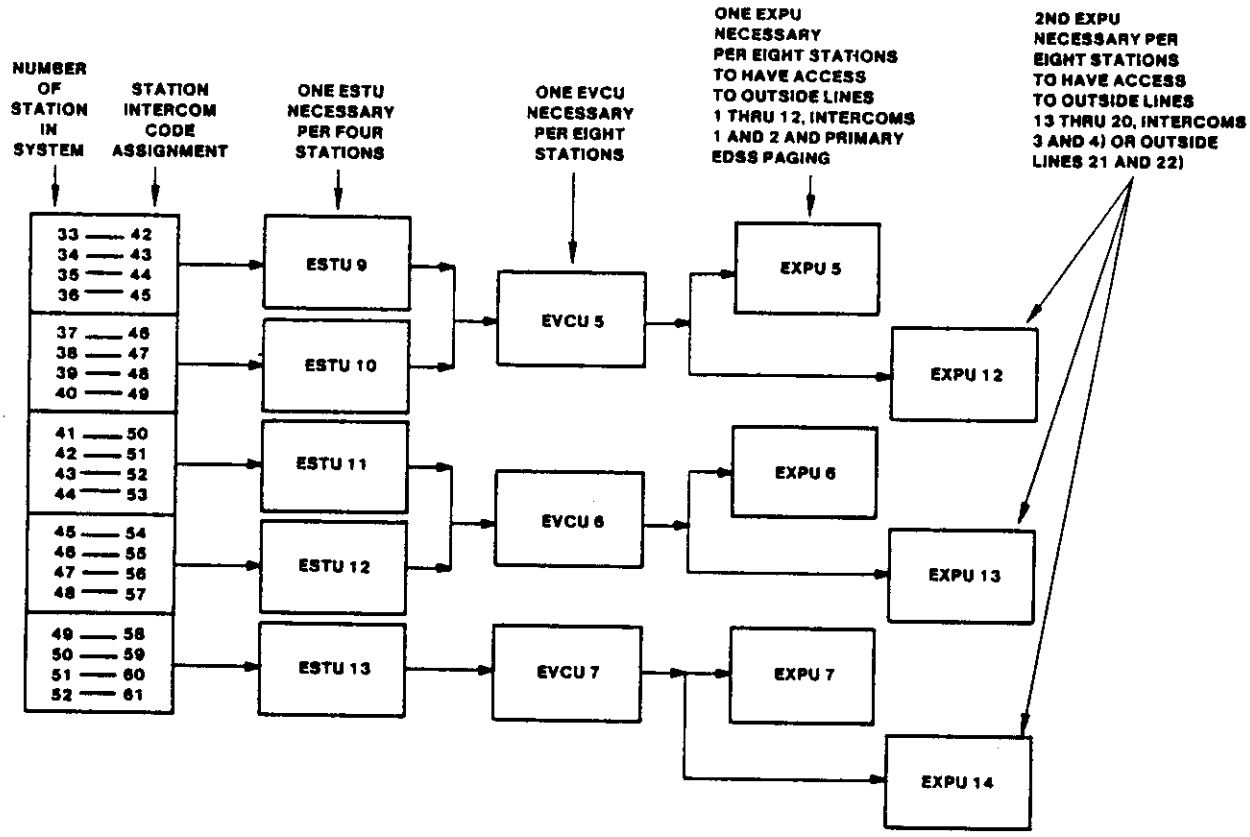
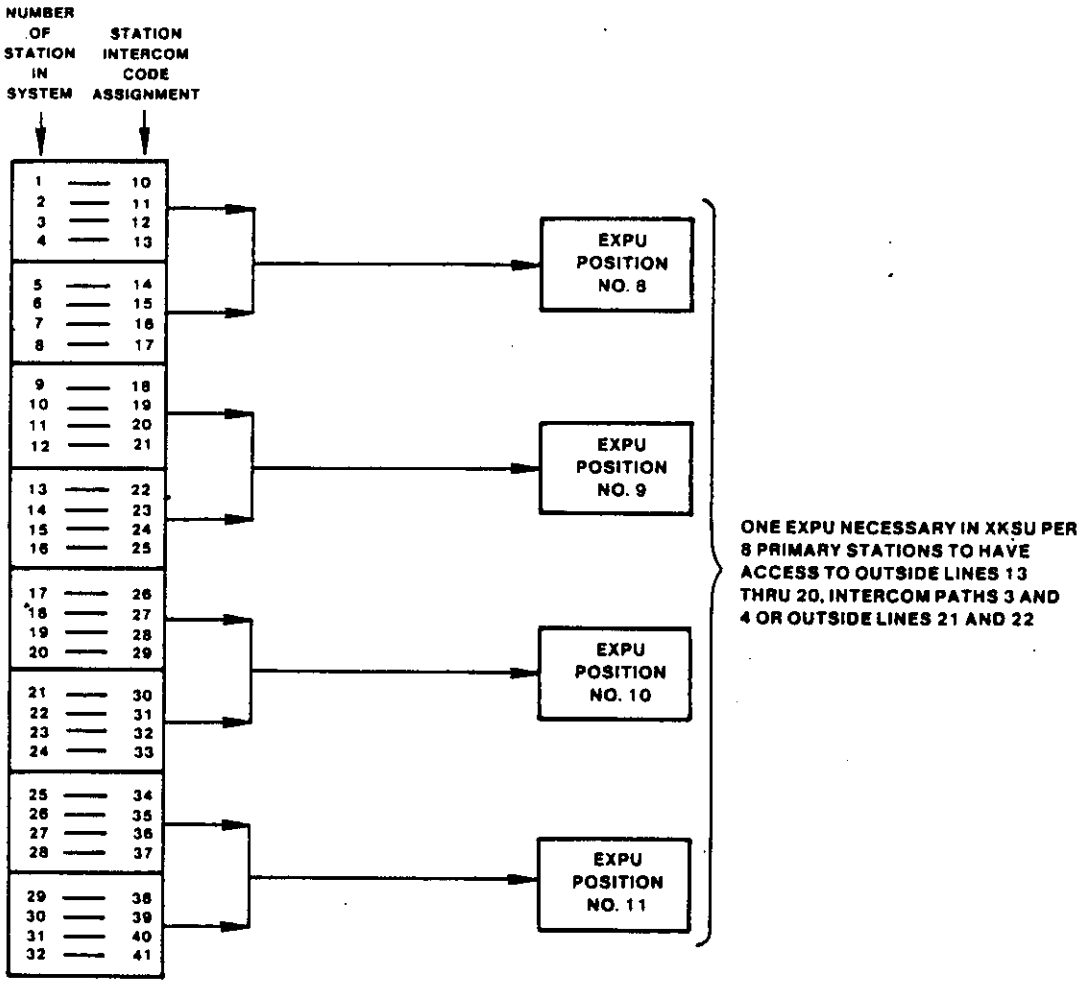


FIGURE 29—EXPANSION STATION TO PCB RELATIONSHIP CHART



NOTE: ESTU, EVCU, AND PRIMARY EXPU PCB's SERVICING STATIONS (INTERCOM CODES) 10 THRU 41 ARE LOCATED IN EKSU.

FIGURE 30—PRIMARY STATION TO XKSU RELATIONSHIP CHART

SECTION 100-004-225
ISSUE 1, JUNE 1979

Strata III

EKSU AND XKSU WALL MOUNT KIT
EKWM MODEL 102

INSTALLATION INSTRUCTIONS

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LIST OF FIGURES

1. GENERAL

1.1 The EKWM-102 Wall Mount Kit is used to wall mount the EKSU and XKSU. One kit is required for each cabinet.

1.2 The EKWM-102 Kit is shown in Figure 1 and consists of the following parts:

QUANTITY	NAME
1	Lower Wall Bracket
1	Main Shelf
1	Hinge Pin
2	Side Angles
1	Top Pivot Plate
1	Top Wall Plate
2	Wing Bolts
4	M4 Lock Washers
4	M4 Fillister-head Machine Screws
7	1/4" × 2" Molly Fasteners
7	1/4" Steel Washers
3	Plastic Washers
4	1/2" Steel Washers
1	Cotter Pin
1	Paper Template

1.3 Be certain that all parts are included before proceeding.

2. WALL MOUNT LOCATION REQUIREMENTS

2.1 In addition to observing the EKSU location requirements outlined in Section 100-004-210 Paragraph 3, care must be taken to insure that the wall chosen for the EKSU mounting is strong enough for that purpose and is reasonably flat and vertically straight (plumb).

2.2 If the above conditions cannot be met, a sheet of 3/4 inch plywood should be placed against, and attached to, the wall to serve as a mounting area for the EKSU and/or XKSU.

2.3 If a plywood backboard is used it will be necessary to substitute 7 lag bolts for the Molly Fasteners provided in the Kit and suitably alter the instructions in paragraph **3.**

2.4 Refer to Figure 2 to determine the wall space required for mounting the basic EKSU and Figure 3 for an expanded system including an XKSU.

2.5 Note that the maximum allowable separation (shown in Figure 3) between the EKSU and XKSU is determined by the Expansion Cable length of 1.5 meters (59.06 inches).

3. INSTALLATION INSTRUCTIONS

3.1 To make the cabinet lighter and easier to lift, it is desirable to mount the EKSU and/or XKSU following the procedures outlined below **BEFORE** any PCB's are installed.

3.2 The Wall Mount Kit should be installed in the following sequence (part numbers are identified in Figure 4):

3.2.1 After the location of the EKSU (XKSU) has been decided, attach the Paper Template (provided in the kit) to the wall. Make certain that the Template is flat against the wall, level, and at the correct height. Mark the centers of the 4 bolt holes for the Lower Wall Bracket (1) and the 3 bolt holes for the Upper Wall Plate (10).

3.2.2 Remove the Paper Template from the wall and drill a 7/16" hole for each of the 7 Molly Fasteners. (If lag bolts are being used, drill a smaller pilot hole in each location and skip to 3.2.4.)

3.2.3 Place all of the Molly Fasteners in the holes, secure them, and remove the bolts.

3.2.4 Fasten the Lower Wall Bracket (1) to the wall using four Molly Bolts and 1/4" Steel Washers. Make certain that the Lower Wall Bracket is level and that the proper side is up (as shown by the "UP" arrow stamped on the part) before securing it.

3.2.5 Attach the Main Shelf (2) to the Lower Wall Bracket (1) using the Hinge Pin (3) and

insert two of the Plastic Washers (4) and four 1/2" steel washers (14), in the locations shown in Figure 4. Place the Cotter Pin (13) through the hole in the bottom of the Hinge Pin and spread the Cotter Pin.

3.2.6 Make certain that the Main Shelf (2) swings freely and then bring it to the closed position and secure it using the two Wing Bolts (5) as shown in Figure 4.

3.2.7 Before placing the EKSU (XKSU) on the Main Shelf, attach the two Side Angles (6) to the cabinet's lower sides and the Top Pivot Plate (7) to the top rear of the cabinet. To install the Side Angles and Top Pivot Plate, it is necessary to remove existing screws (8) (two for each part) from the cabinet, put the part in place, and re-install the same screws.

3.2.8 When the Side Angles (6) and Top Pivot Plate (7) have been attached, place the EKSU (XKSU) on the Main Shelf (2), align the holes in the Side Angles with the holes in the Main Shelf, and secure the assembly using the four M4 Fillister-Head Machine Screws and Lockwashers (9) provided in the kit.

3.2.9 Remove the Wing Bolts (5) and carefully swing the Main Shelf/EKSU assembly far enough from the wall to allow the Top Wall Plate (10) to be attached to the Top Pivot Plate (7) by inserting the pin (11) on the Top Wall Plate through the hole in the left side of the Top Pivot Plate and inserting the Plastic Washer (4) as shown in Figure 4.

3.2.10 Swing the Top Wall Plate (10) and Top Pivot Plate (7) together until the Ball Catch (12) is mated and then swing the entire Assembly back to the normal position and reinsert the Wing Bolts (5).

3.2.11 When the assembly is in place against the wall, secure the Top Wall Plate (10) to the wall using three Molly Bolts and 1/4" steel washers.

3.2.12 When all bolts are secure, remove the Wing Bolts (5) and test the assembly for smooth operation. Place shims between the Top Wall Plate (10) and the wall, as necessary, to achieve smooth operation.

3.3 Cabling and Power Connections

3.3.1 Proper cable routing is essential for smooth operation of the Wall Mount Assembly. Refer to Section 100-004-210 for MDF Cabling Instructions and Power Connections while referring to Figure 5 of this Section for proper cable routing information.

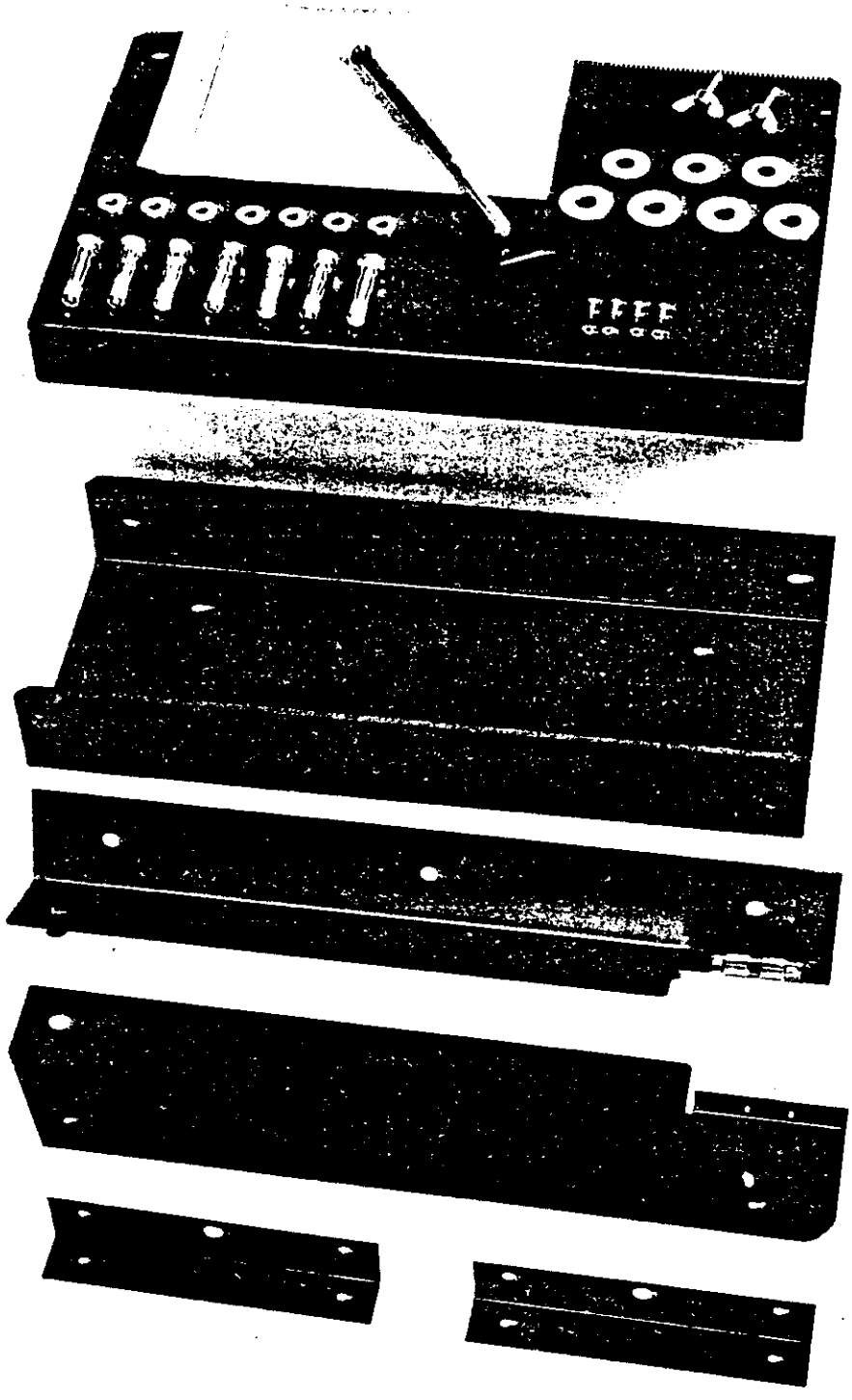

FIGURE 1—EKWM-102 WALL MOUNT KIT

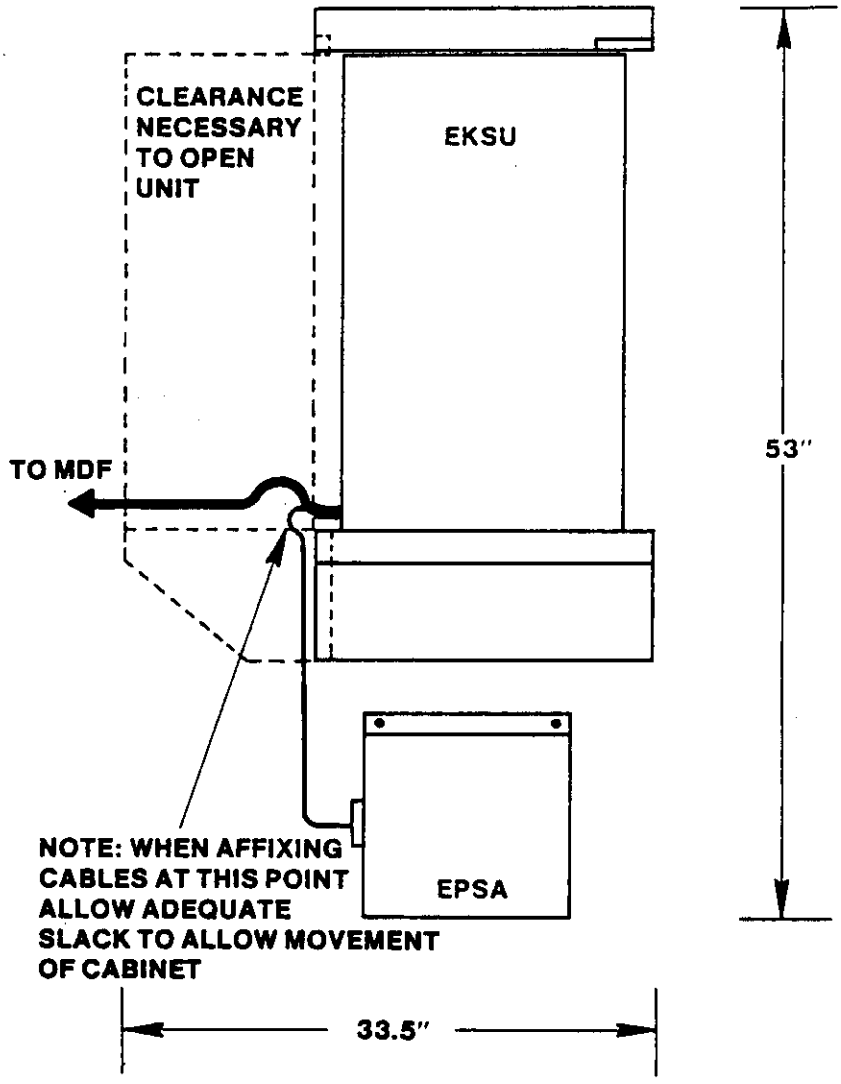

FIGURE 2 – BASIC SYSTEM INSTALLATION

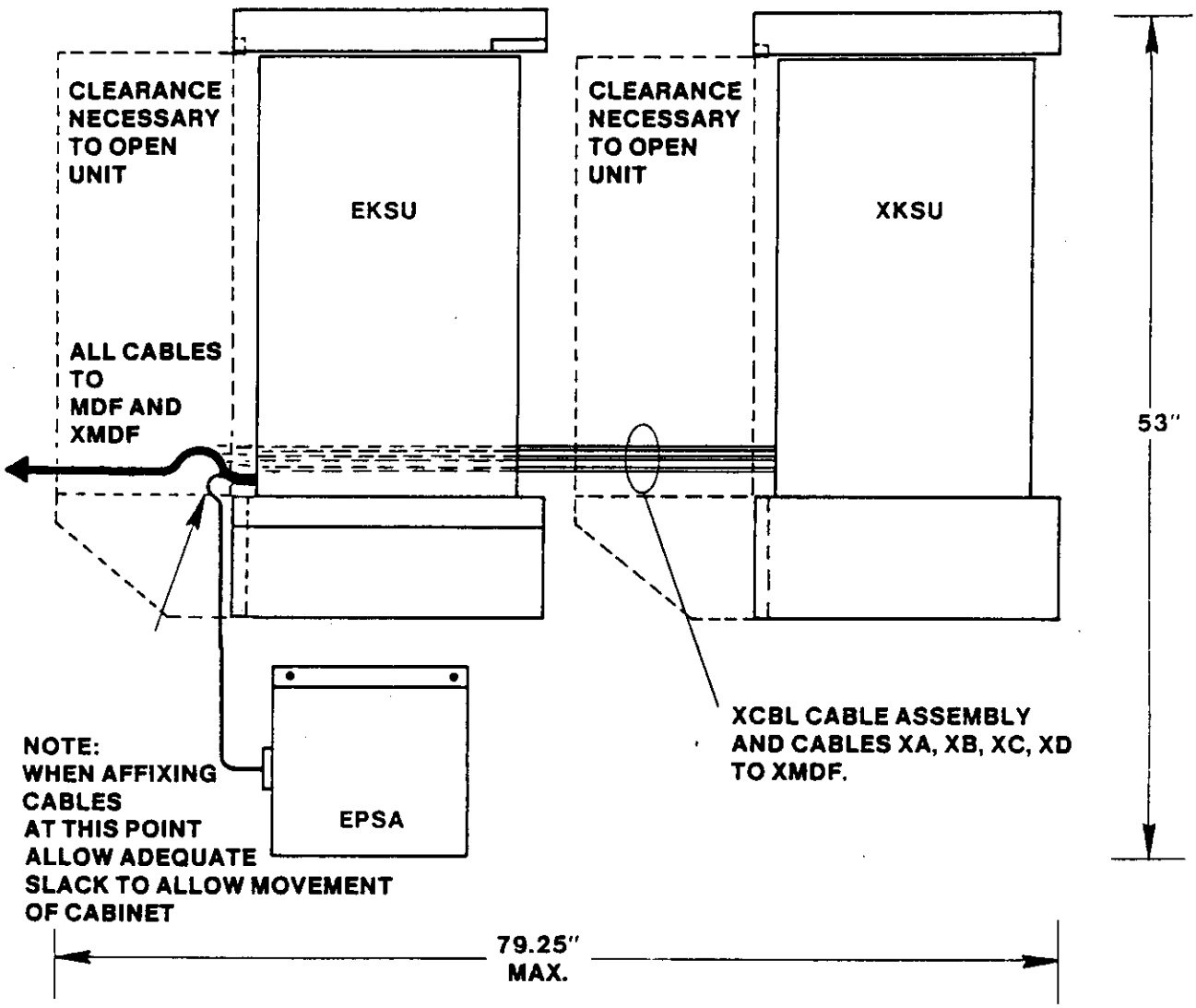

FIGURE 3—EXPANDED SYSTEM INSTALLATION

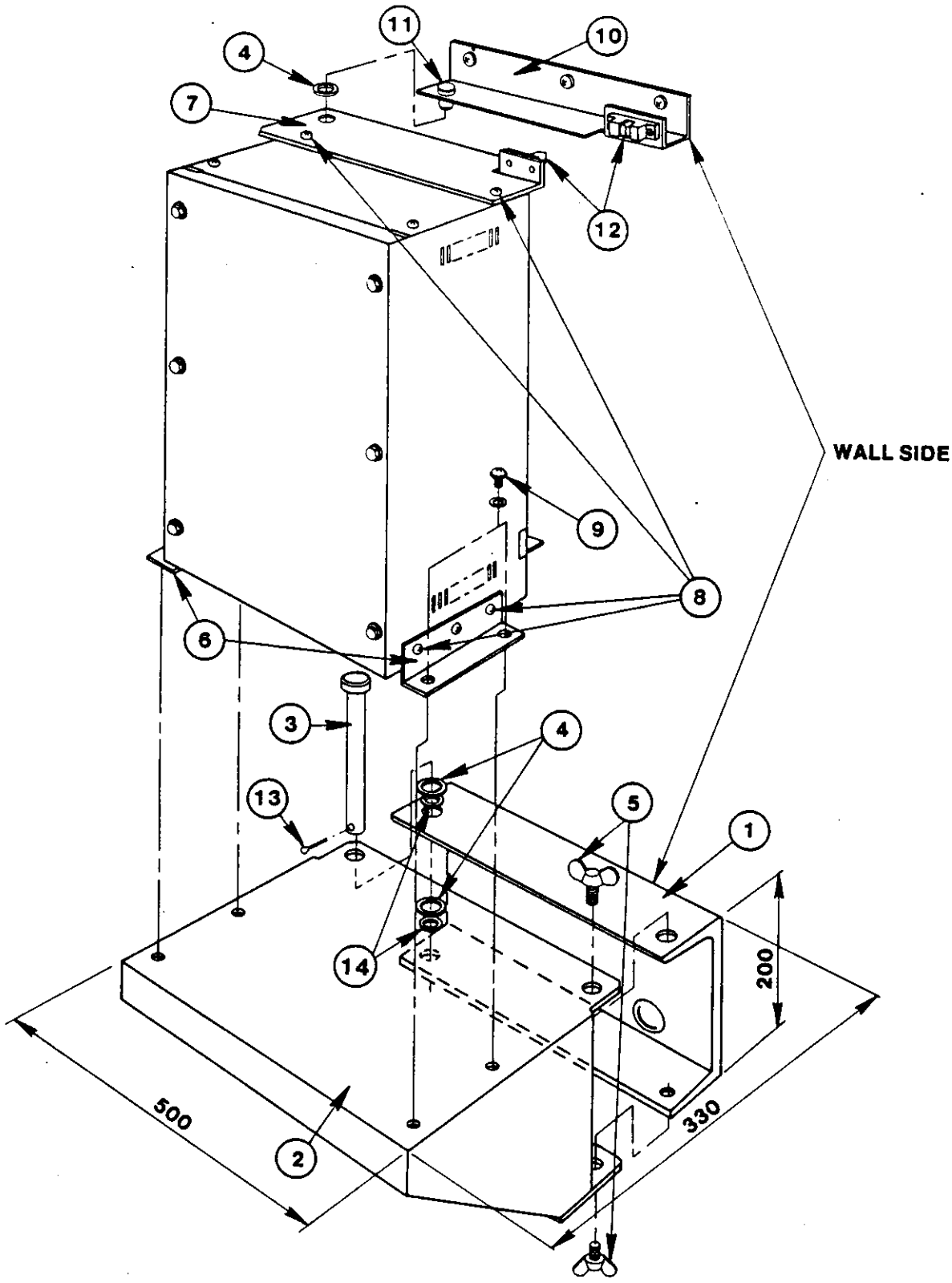

FIGURE 4—WALL MOUNT KIT ASSEMBLY DIAGRAM

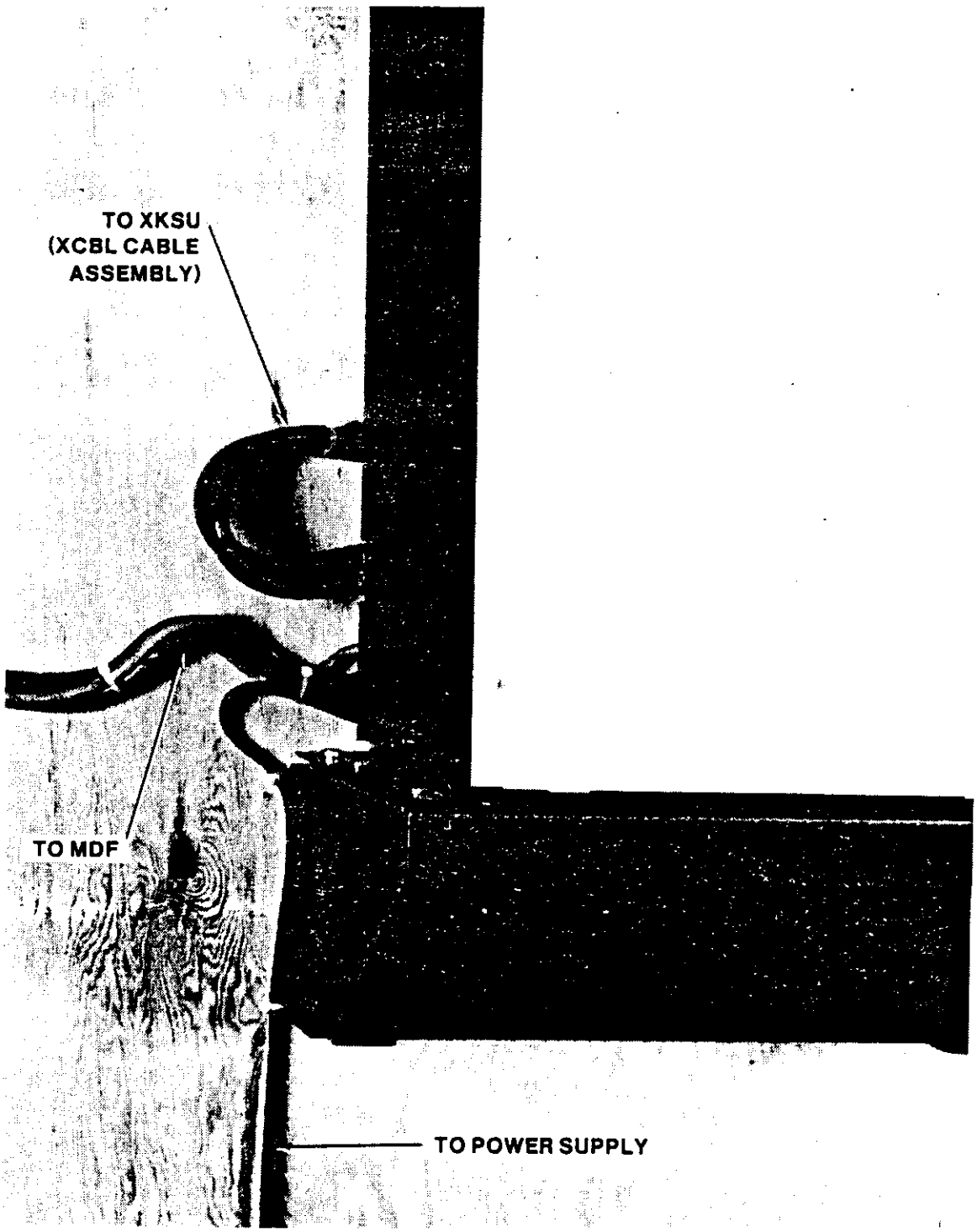

FIGURE 5—CABLING EXAMPLE

SECTION 100-004-230
ISSUE 2, OCTOBER 1980

Strata III

ELECTRONIC KEY TELEPHONE
EKT MODEL 102

INSTALLATION INSTRUCTIONS

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1. GENERAL

1.1 The STRATA III Electronic Key Telephone (EKTD-102) shown in **Figure 1,** is designed specifically for use with the STRATA III Electronic Key Service Unit (EKSU) and with the Expansion Key Service Unit (XKSU).

1.2 The EKT-102's dimensions are:

Width	10.7 inches (272 mm)
Depth	9.1 inches (230 mm)
Height	2.9 inches (73 mm)

1.3 Up to thirty-two (32) EKT's (extensions #10 to #41) may be connected to a primary system. If desired, up to an additional twenty (20) EKT's (extensions #42 to #61) may be connected to an expanded STRATA III system. Extensions #60 and #61 are available optional extensions. However, these extensions are not represented on the Electronic Direct Station Selection console (EDSS) and cannot receive a DSS page.

1.4 The EKT is equipped with tone dial and with twenty-three (23) non-locking keys. Sixteen (16) keys are utilized for Central Office (C.O.) lines. Four (4) keys are used to access intercom (INT) lines. (INT keys 3 and 4 are used for the appearance of C.O. lines 21 and 22 in systems having these optional outside lines.) The three remaining keys are for feature operation.

1.5 The three feature keys are labeled:

- SPKR — Speaker control key
- PRLS — Privacy Release key
- HOLD — Place caller on "hold" key

1.6 The features controlled by these keys are:

- GROUP LISTENING — If the SPKR key is depressed the distant party's responses are relayed over the EKT's built-in speaker. While the SPKR button is held down the handset transmitter is disabled.
  To speak to the distant party it is necessary to release the SPKR button and to speak into the handset.

- INTERNAL CONFERENCE — To admit a third party to an existing 2-way conversation, it is only necessary to hold the PRLS button down while the 3rd party presses the flashing C.O. line key to join the conversation.

- CALL ON HOLD —To place an existing call on hold, press the HOLD button. The C.O. line LED will begin to wink.

- EXTERNAL CONFERENCE — To establish an External Conference:
  Place the original caller on hold.
  Call the 2nd outside party and also place on hold.
  Press the Line Keys for both C.O. lines being held, simultaneously.
  NOTE: In some areas if the originator of the External Conference terminates, the two remaining parties will be disconnected.

- HOOKSWITCH FLASH — On PBX lines the PRLS button will act as a Hookswitch Flash.

- "I USE" INDICATION — To identify the INT or C.O. line being used by the EKT, press the PRLS button. The LED associated with the INT or C.O. line engaged will begin to flash. The flash will cease when the PRLS button is released.

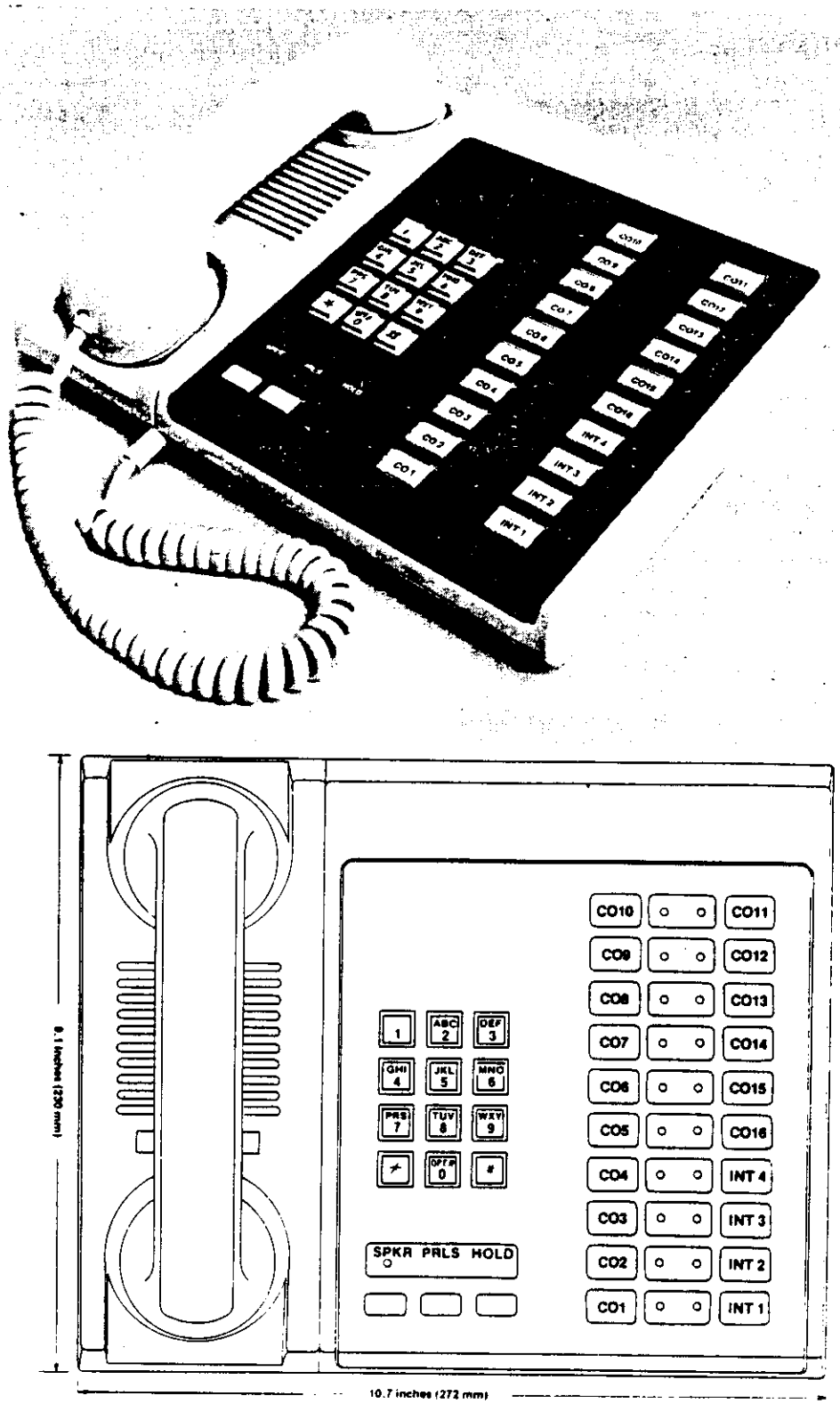

FIGURE 1 – EKT PHYSICAL LAYOUT

1.7 The EKT-102 can be ordered with a number of optional features:

- EKTD-102/EHFU — Desk model EKT with hands-free answer-back on Intercom and DSS Page
- EKTD-102/ESPF — EKTD with built-in speakerphone, hands-free answer-back and Automatic Dialer Interfacing
- EKTW-102 — Wall Mountable EKT
- EKTW-102/EHFU — Wall mountable EKT with hands-free answer-back on Intercom and DSS Page

1.8 The EKT-102 can be field upgraded to incorporate a number of optional features:

- EHFU-2— Hands-free Answer-back on intercom and DSS page. See Section 100-004-235 for installation instructions.
- EHIU-2 — Automatic Dialer Interface.
  — Headset Interface.
  See Section 100-004-239 for installation instructions.
- ESIU-2 — Speakerphone Interface
  — Automatic Dialer Interface
  See Section 100-004-237 for installation instructions.

2. CABLING INSTRUCTIONS

2.1 Each EKT to be installed in a STRATA III System requires a dedicated 6-conductor connection to the EKSU or XKSU via a Main Distribution Frame (MDF) or Intermediate Distribution Frame (IDF). Three pair, twisted, #24AWG, indoor jacketed telephone cable is recommended. No metallic shielding is required.

NOTE: It is recommended that bridging clips not be inserted in the MDF until all other installation steps are completed and checked. This is a precaution against foreign voltages being accidently applied to equipment during installation of cable.

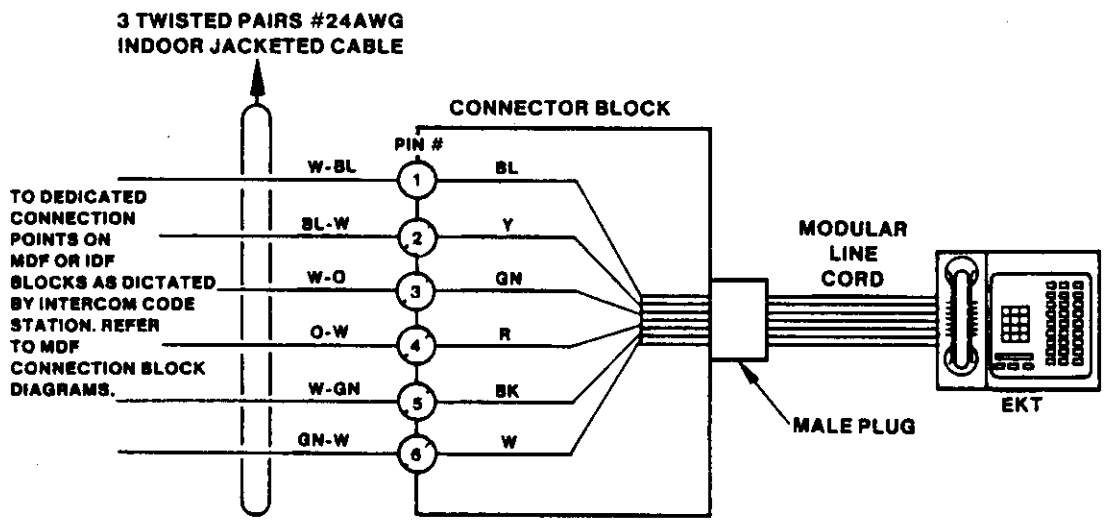

FIGURE 2 — STATION CONNECTOR BLOCK CONNECTIONS

2.2 The overall length of the connecting cable should not exceed 1000 feet, between the EKT and the EKSU.

2.3 Whenever possible, it is recommended that all individual station cables be run "home" to an MDF. This will reduce the number of wires which must be terminated at various points and reduce the chance of a reversal, short or open in the system.

2.4 Unlike conventional key systems, the STRATA III System provides dedicated conductors for each telephone in the system. Connection of more than one EKT to the same conductors may cause damage to system components. Extensions may not be "bridged" or "looped" on the same running cable conductors.

2.5 A 6-conductor modular station connector block should be mounted in the vicinity of each EKT. The standard modular EKT line cord is 7 feet in length and the maximum allowed length is 25 feet. The 6 conductors of the station running cable and the 6 conductors of the station block are connected as shown in **Figure 2.**

2.6 Different manufacturers of modular station blocks have employed different color codes to indicate the sequence of the pins in their modular blocks.

2.6.1 The color code sequence employed in the three currently most popular models (Automatic Electric GTE, Suttle, and Northern Telecom) is shown in **Figure 2.**

2.6.2 Some earlier Northern Telecom models have Blue and White reversed. Earlier Northern Telecom blocks as well as other manufacturer's models should be checked with a meter before a connection is attempted. Which lead represents pin #1 and which pin #6 must be determined before a connection can safely be made see **Figure 3.**

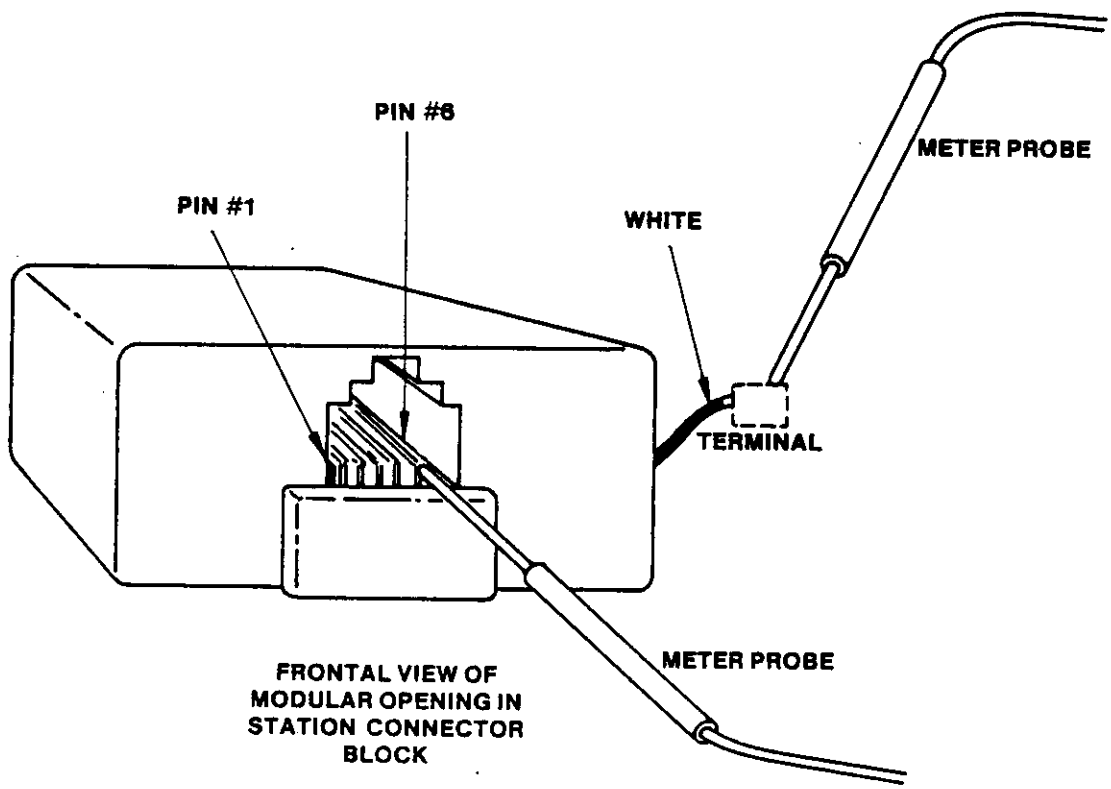

FIGURE 3 — VERIFICATION OF CONNECTOR BLOCK WIRING

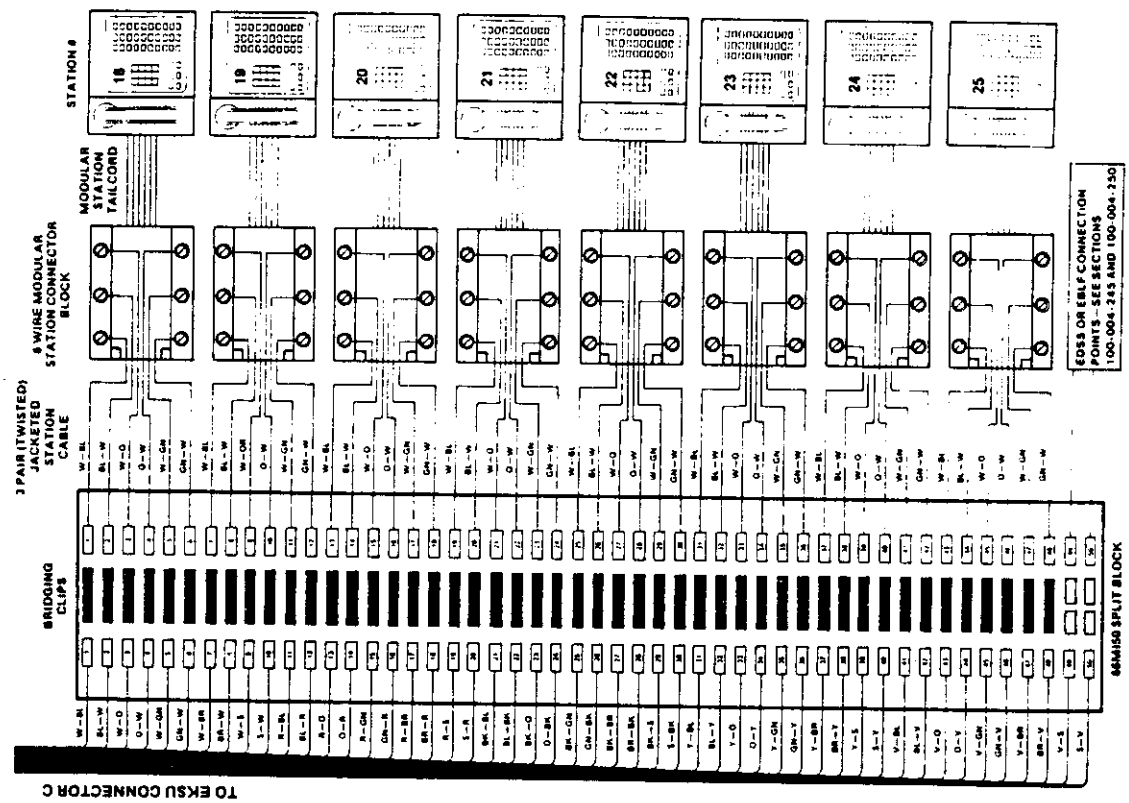

FIGURE 4B — EKSU MDF BLOCK "C" CONNECTION DIAGRAM

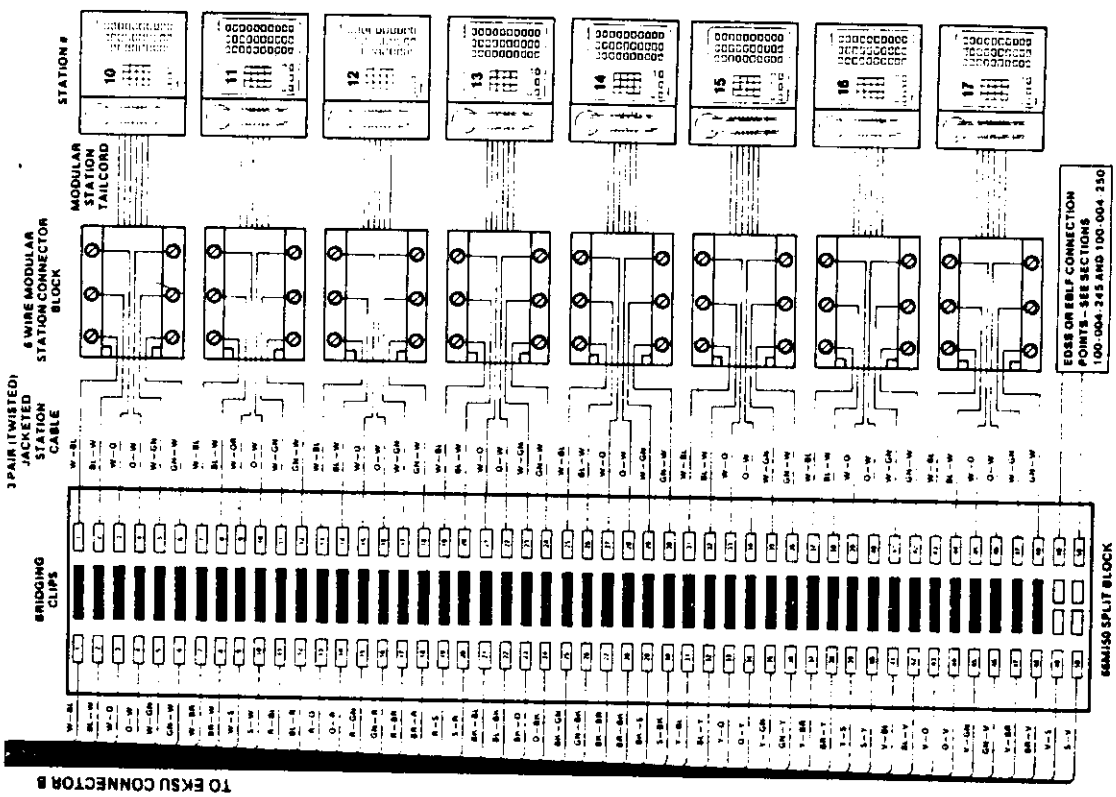

FIGURE 4A — EKSU MDF BLOCK "B" CONNECTION DIAGRAM

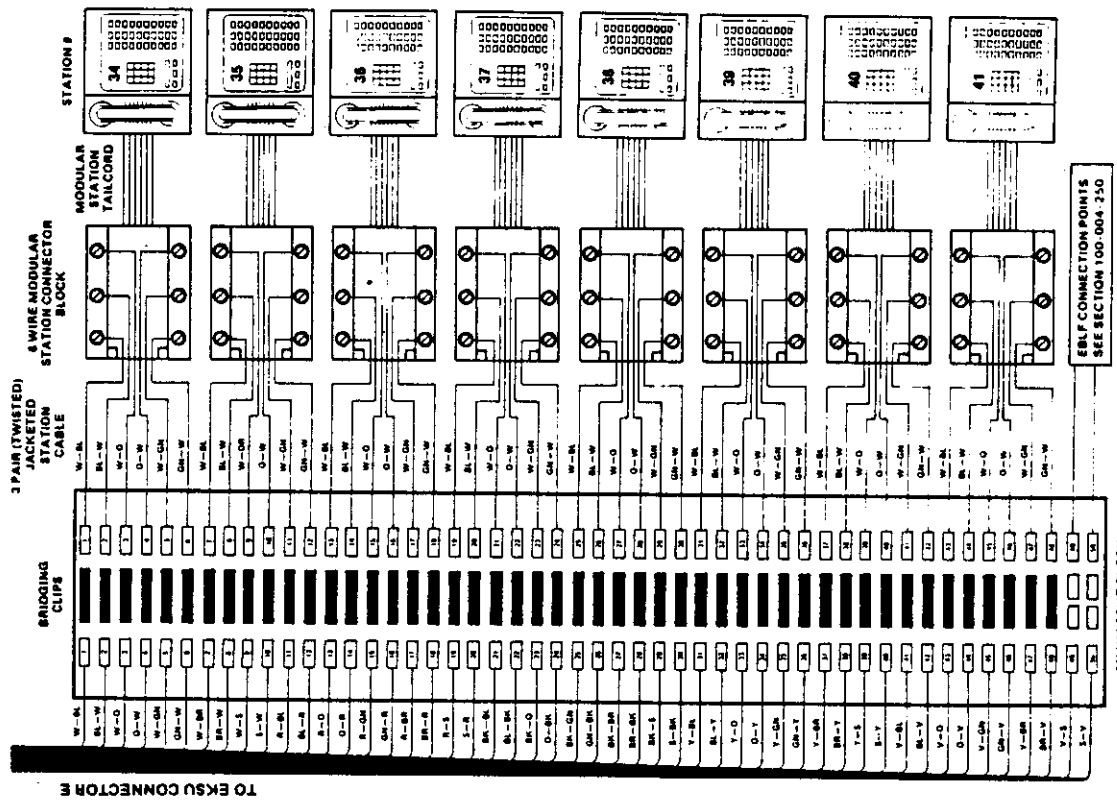

FIGURE 4D — EKSU MDF BLOCK "E" CONNECTION DIAGRAM

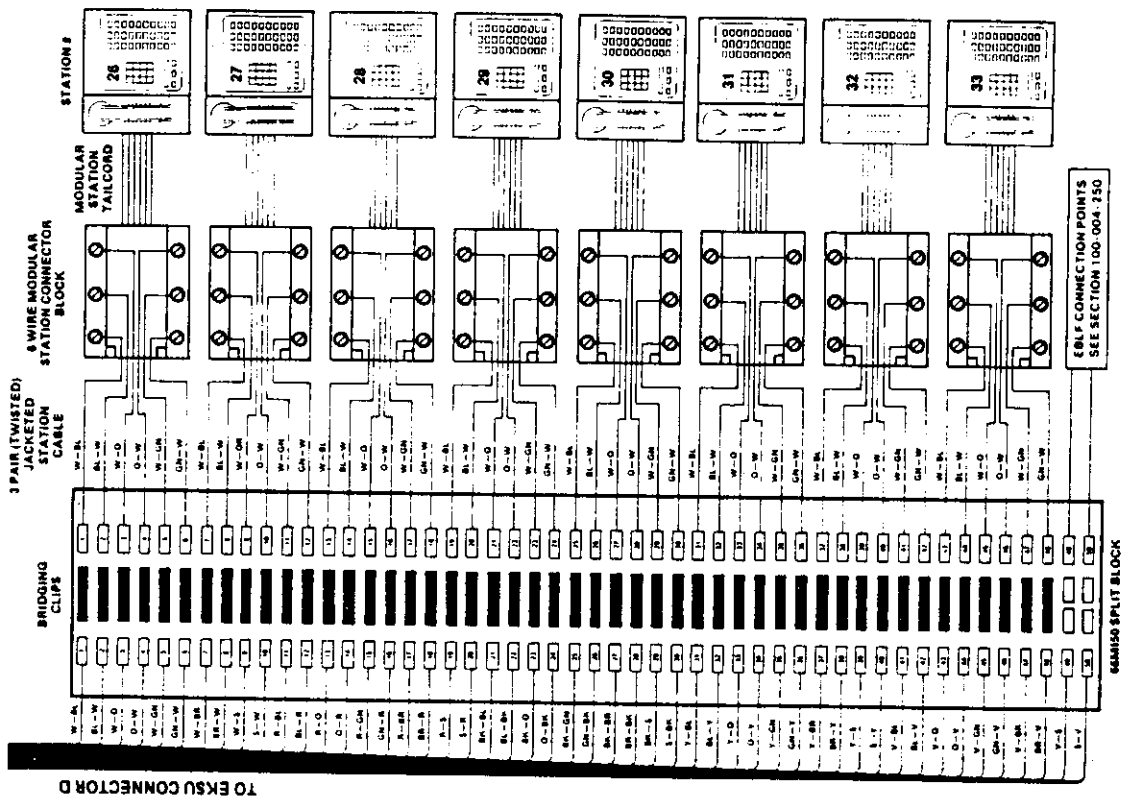

FIGURE 4C — EKSU MDF BLOCK "D" CONNECTION DIAGRAM

2.7 EKSU stations (extensions #10 through #41) are terminated on MDF's "B", "C", "D", and "E" as shown in **Figures 4A, 4B, 4C, and 4D.**

2.8 XKSU stations (extensions #42 through #61) are terminated on MDF's "XB", "XC", and "XD" as shown in **Figures 5A, 5B, and 5C.**

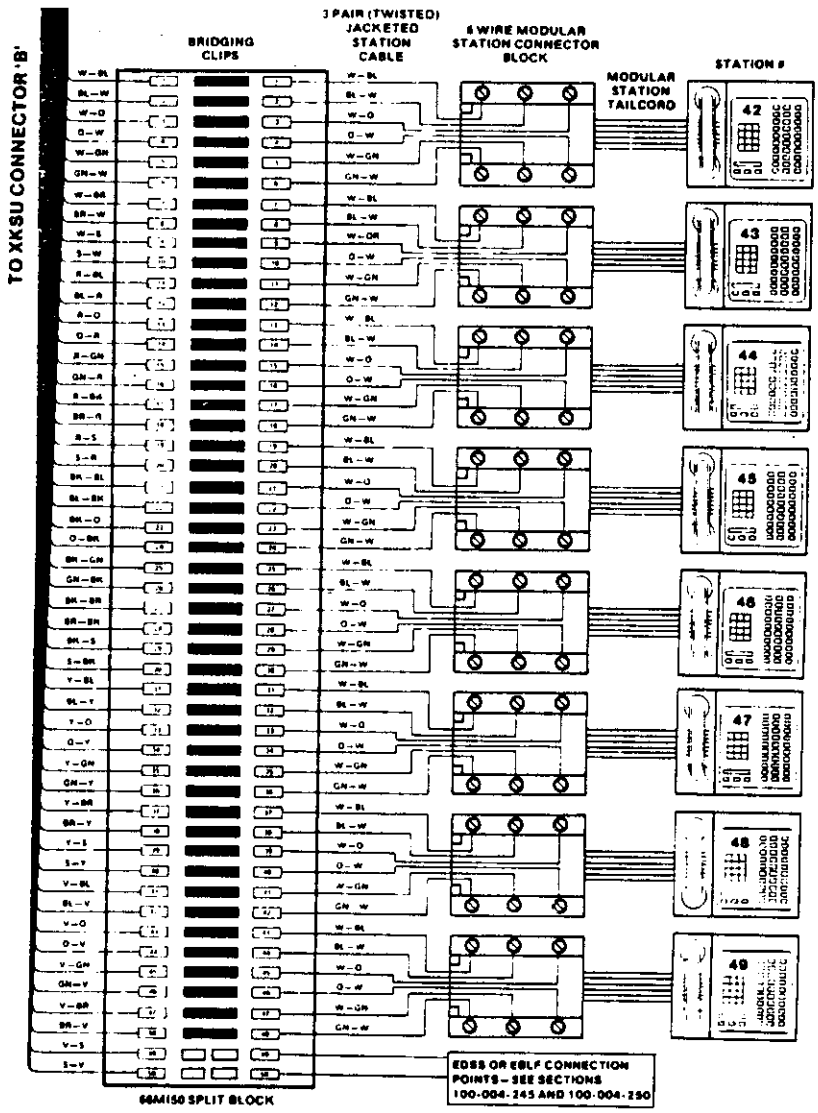

FIGURE 5A — XKSU MDF BLOCK "XB" CONNECTION DIAGRAM

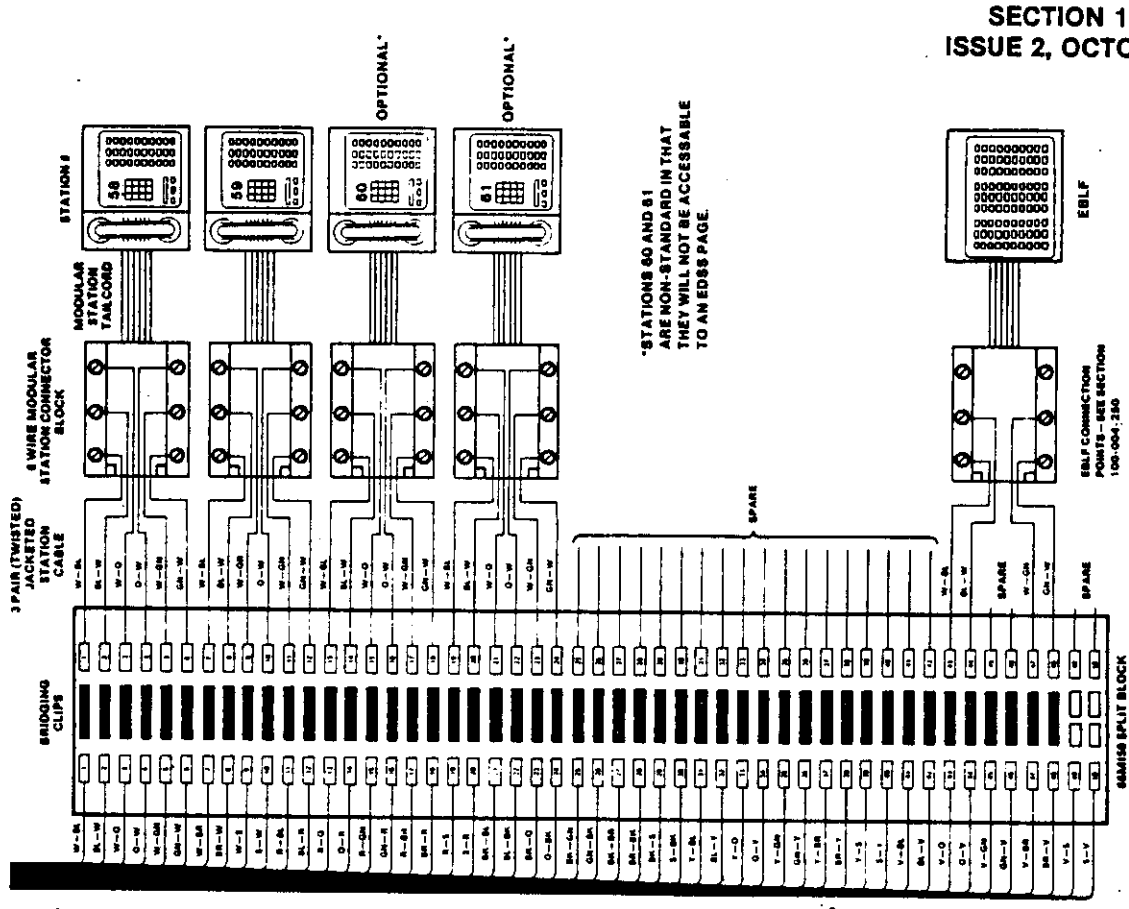

FIGURE 5C — XKSU MDF BLOCK "XD" CONNECTION DIAGRAM

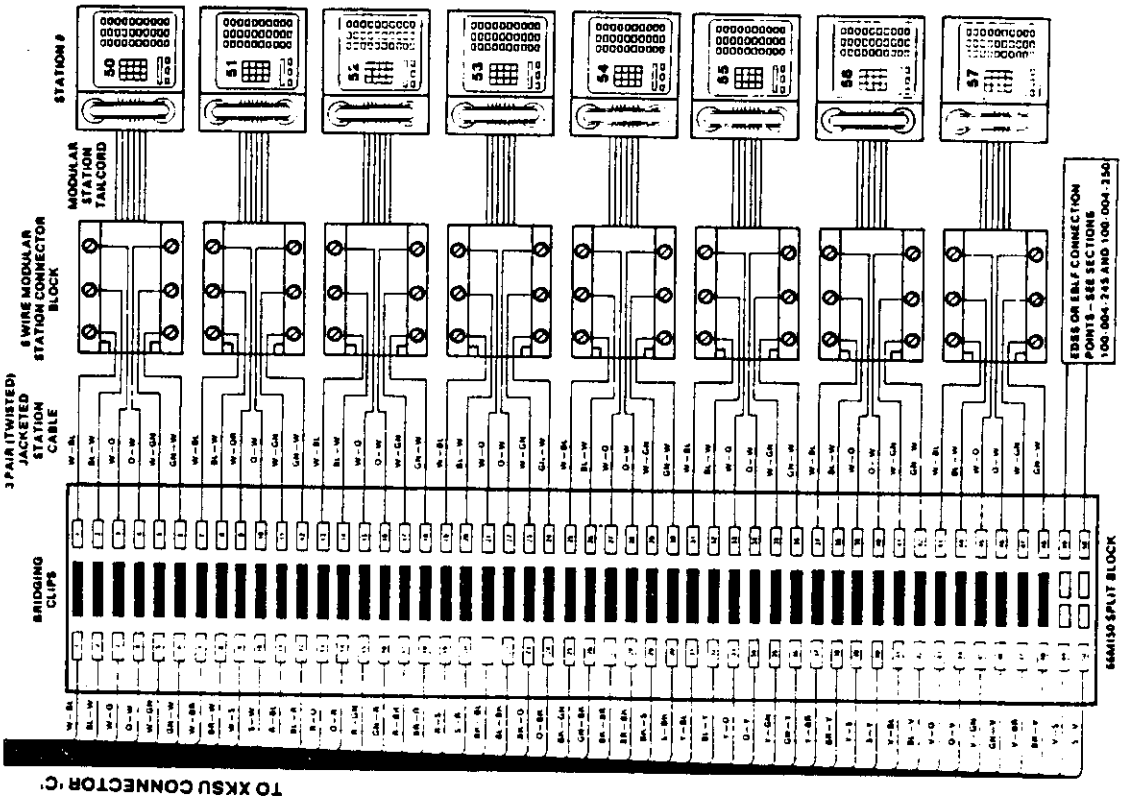

FIGURE 5B — XKSU MDF BLOCK "XC" CONNECTION DIAGRAM

4. STATION RESTRICTION FROM DIALING OUTGOING CALLS

4.1 Individual stations may be restricted from accessing idle C.O. lines. This prevents a station from making outgoing calls, but will permit the station to answer incoming calls and to originate and receive intercom calls.

4.2 Restricted stations may use idle C.O. lines placed on hold by an unrestricted station to dial out. This allows an operator to control and/or log the origin of outgoing calls, without the operator's having to dial the individual numbers.

4.3 To restrict an EKT connected to a KSU equipped with an EASU PCB, refer to Section 100-004-280.

4.4 If no EASU PCB is installed in the KSU, refer to Sections 100-004-210 and 100-004-215 for instructions on backplane wiring in the KSU required to accomplish the restriction of outgoing call dialing.

5. RESTRICTED ACCESS TO C.O. LINES

5.1 The EKT-102's in a STRATA III System can be programmed to limit access to certain C.O. lines. This feature can be used to limit access to Private Lines, WATS, Foreign Exchange, or Unrestricted Lines.

5.2 In a primary system access to C.O. line positions #11 and #12 can be limited to those stations having a need for the special lines assigned to these positions.

5.2.1 Special lines can be connected to C.O. line positions #11 or #12 even though there may be no C.O. lines #10, #9, #8, etc. connected in the system.

5.2.2 C.O. line connection locations on the EKSU MDF "A" block are shown in **Figure 9A.**

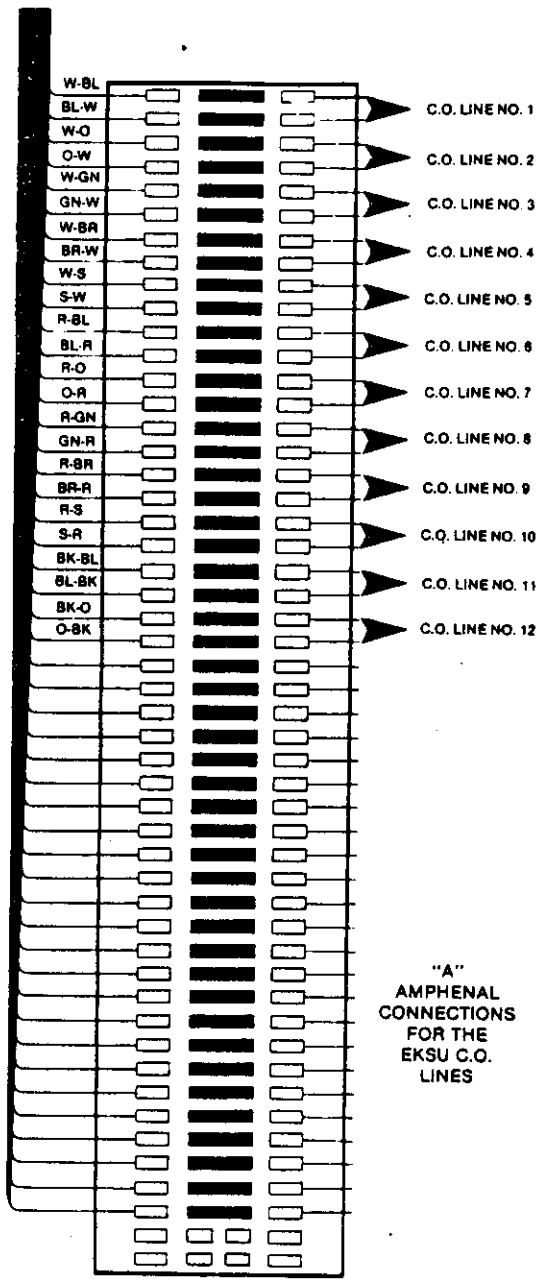

FIGURE 9A — EKSU 'A' MDF BLOCK

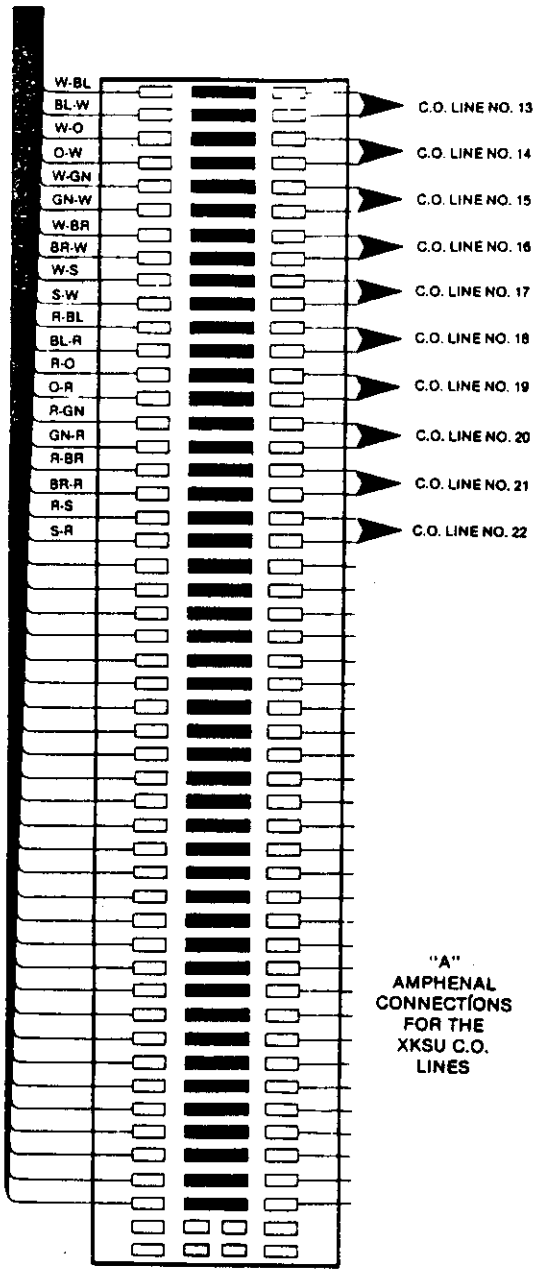

FIGURE 9B — XKSU 'XA' MDF BLOCK

5.3 In an Expanded system normal access to C.O. lines #11, #12, #15, and #16 can be restricted at any telephone. See **Figure 9B** for the C.O. line connection locations on the XKSU MDF "XA" block.

5.4 The programming of restricted access to C.O. lines #11, #12, #15 and #16 is accomplished via two dip switches located on the EKT PCB. To reach these dip switches the handset well and main top cover must be removed from the EKT:

5.4.1 Loosen the four captive screws underneath the front and rear projections of the EKT case.

5.4.2 Remove the handset well by lifting it up and to the left.

5.4.3 Remove the main top cover by lifting it up and to the right.

5.5 As shown in **Figure 10,** the two dip switches are located at the right edge of the EKT PCB. Each dipswitch contains eight rockers. Each rocker on a dip switch is numbered from 1 to 8. One side of the switch is labeled "OPEN" and the other (unlabeled) side will be referred to as the "CLOSED" side of the switch.

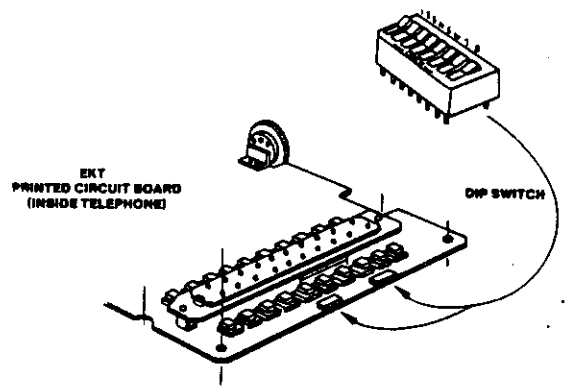

FIGURE 10 — LOCATION OF DIP SWITCHES ON EKT PCB

5.5.1 If the rocker is down or depressed on the "OPEN" side of the switch, and is raised on the "CLOSED" side, it is in the "OPEN" position.

5.5.2 If the rocker is down on the "CLOSED" side of the switch, and is raised on the "OPEN" side, it is in the "CLOSED" position.

5.5.3 Dip Switch A (nearest the rear of the EKT case) controls access to C.O. lines #11 and #12.

5.5.4 Dip Switch B (nearest the front of the EKT case) controls access to C.O. lines #15 and #16.

5.5.5 Both dip switches on an EKT-102 are, normally, factory set with rockers 1 & 2 and 5 & 6 in the CLOSED position and rocker 3 & 4 and 7 & 8 in the OPEN position as shown in **Figure 11.** This programming provides for normal access to and appearance of C.O. Lines #1 to #16 on the EKT.

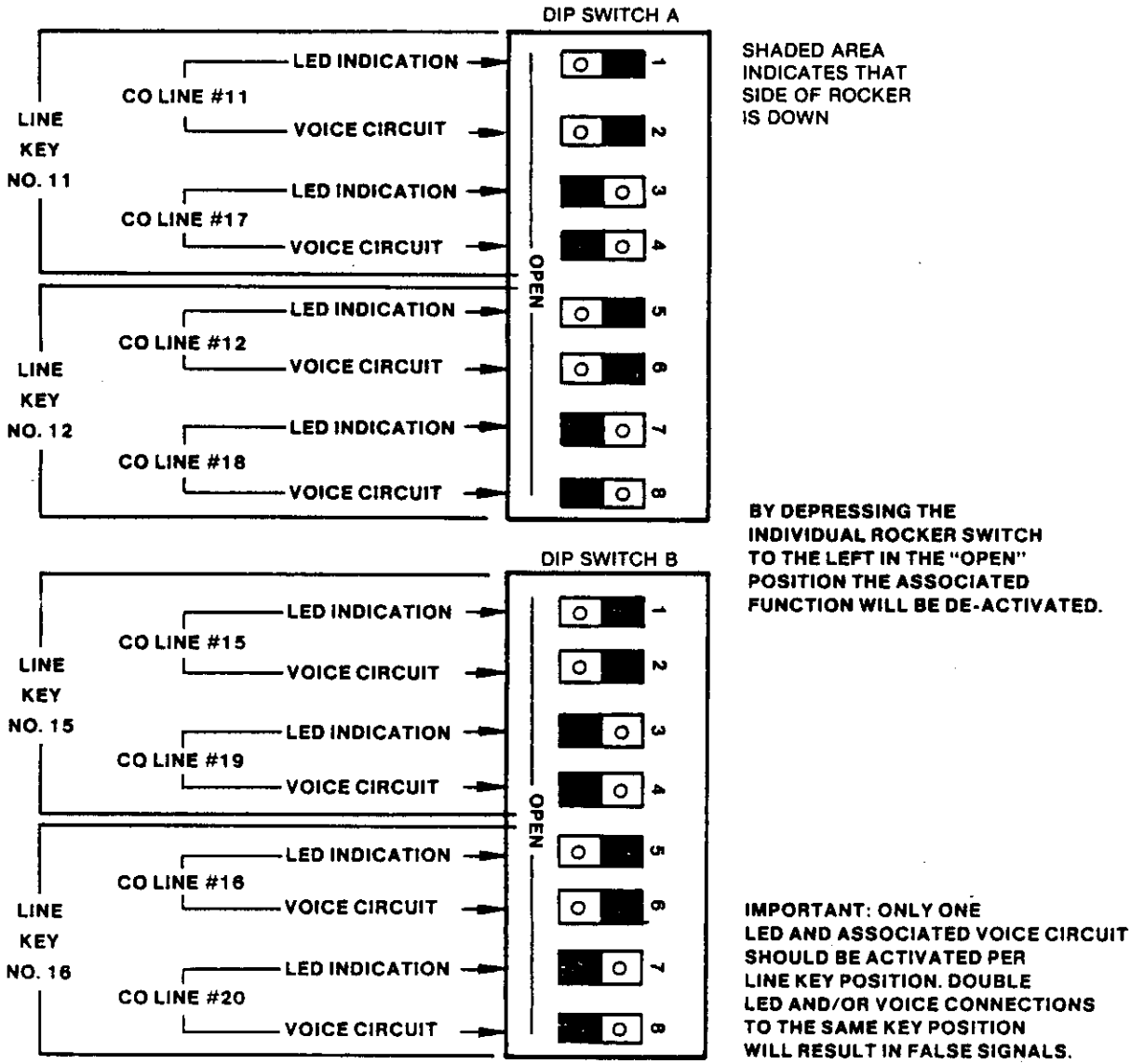

FIGURE 11 — PROGRAMMING FOR NORMAL ACCESS AND OPERATION OF C.O. LINES #1 to #16

5.6 To restrict access from an EKT in a Primary System (No XKSU) to C.O. lines #11 and #12, only rockers 1 & 2 and 5 & 6 of Dip Switch A must be re-programmed.

5.6.1 If rockers 1 & 2 are placed in the OPEN position, there is no access via the EKT to C.O. line #11, nor LED indication of the line's activity. See **Figure 12.**

5.6.2 If rockers 5 & 6 of Dip Switch A are put in the OPEN position, there will be no LED indication for, nor access to C.O. line #12. See Dip Switch A of **Figure 12.**

5.7 In an Expanded System access to C.O. lines #15 and #16 can be restricted by setting Dip Switch B rockers 1 & 2 and 5 & 6 in the OPEN position. See **Figure 12.**

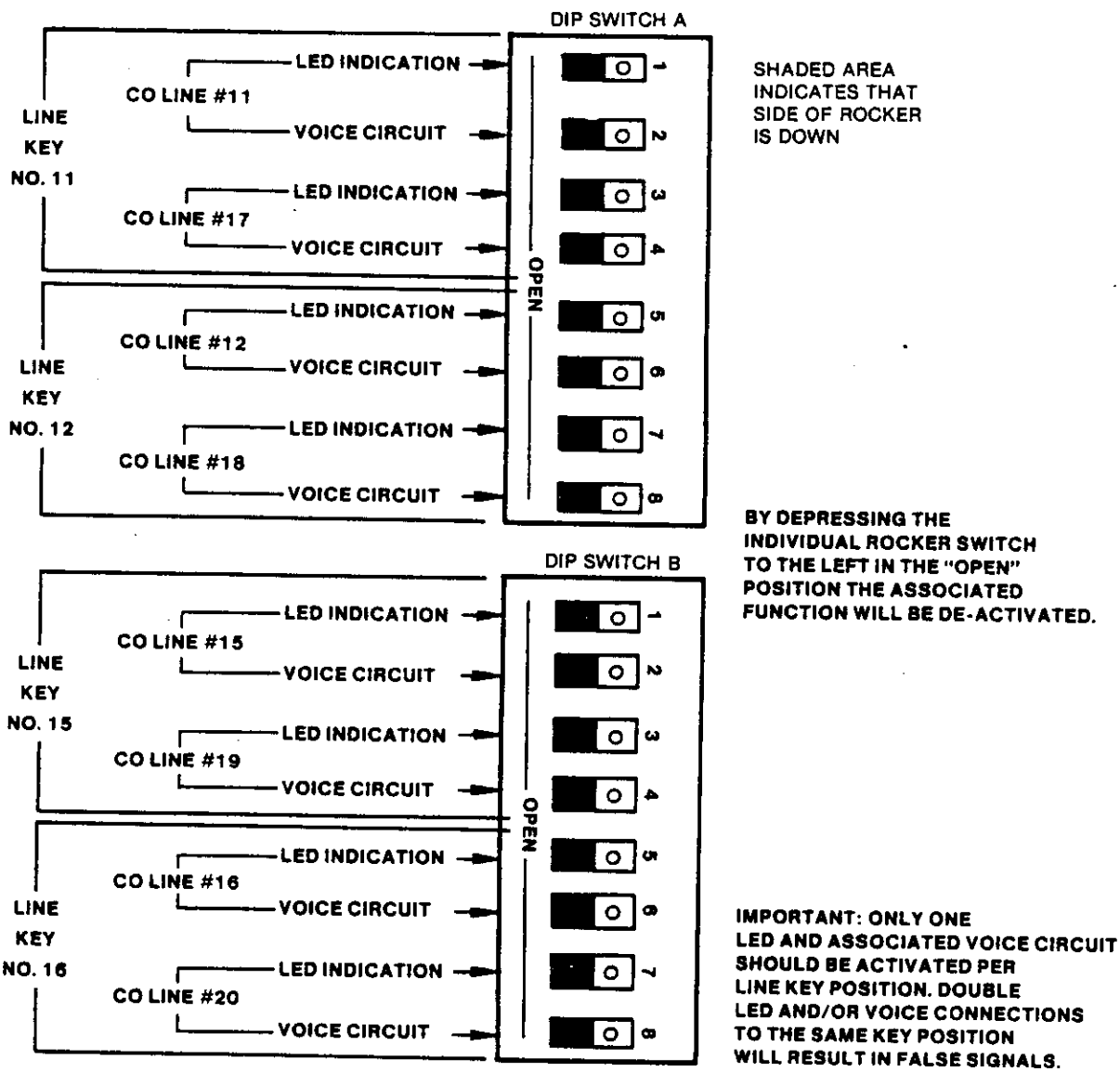

FIGURE 12 — ACCESS TO C.O. LINES #11, 12, 15, and 16 RESTRICTED

6. FLEXIBLE KEY ASSIGNMENTS

6.1 In an Expanded STRATA III System up to twenty C.O. lines may be connected without sacrificing intercom paths. However, as there are only sixteen (16) C.O. line appearance keys on the EKT-102, C.O. lines #17, #18, #19, and #20 will be without appearances on the EKT, unless other C.O. line appearance keys are substituted. Each EKT can be programmed to permit the appearance and accessing of C.O. lines #17 through #20 as follows:

- C.O. Line #17 may be accessed on C.O. Line Key #11.
- C.O. Line #18 may be accessed on C.O. Line Key #12
- C.O. Line #19 may be accessed on C.O. Line Key #15.
- C.O. Line #20 may be accessed on C.O. Line Key #16

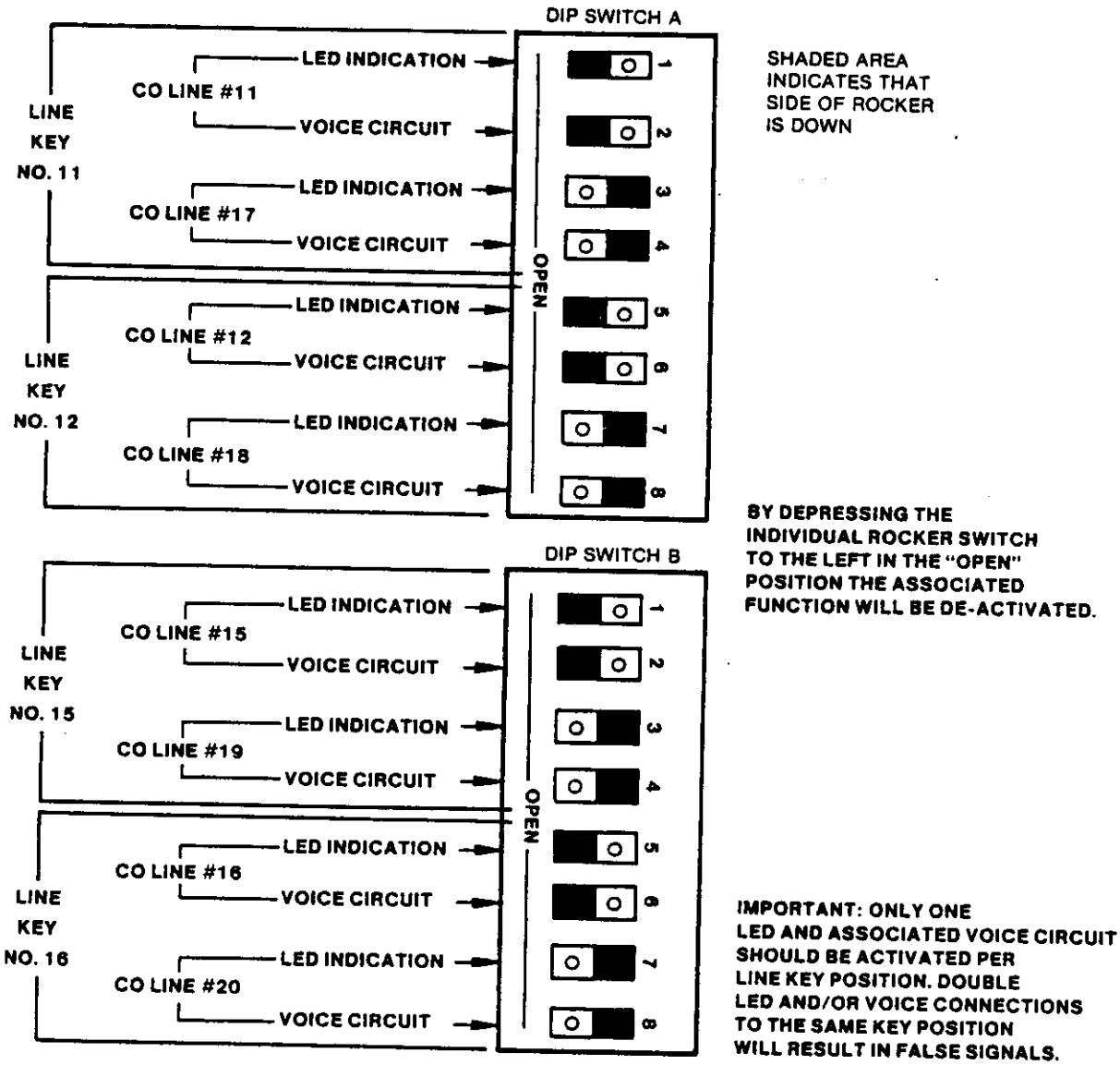

FIGURE 13 — C.O. LINES #17 to #20 SUBSTITUTED FOR LINES #11 and #12 & #15 and #16

6.2 When a C.O. line (#17 through #20) is substituted for another C.O. line on its appearance key, the original C.O. line can no longer be accessed from the EKT. If for example, C.O. line #17 is accessable on an EKT at Line Key No. 11, C.O. Line #11 cannot be accessed by that telephone.

6.3 To program the appearance of C.O. lines #17 through #20 on the EKT:

6.3.1 Remove the handset well and main top cover as outlined in paragraph 5.4 of this section.

6.3.2 If C.O. Line #17 is to appear on Line Key No. 11 and be accessable from the EKT, rockers 1 and 2 should be in the OPEN position and rockers 3 and 4 should be in the CLOSED position on Dip Switch A. See **Figure 13.**

6.3.3 To have C.O. Line #18 appear on and be accessable from Line Key No. 12, set rockers 5 & 6 in the OPEN position and 7 & 8 in the CLOSED position on Dip Switch A as shown in **Figure 13.**

6.3.4 To have C.O. Line #19 appear on and be accessable from Line Key No. 15, set Dip Switch B rockers 1 & 2 in the OPEN position and 3 & 4 in the CLOSED position. See **Figure 13.**

6.3.5 If C.O. Line #20 is to appear at and be accessable from Line Key No. 16, set rockers 5 & 6 in the OPEN position and 7 & 8 in the CLOSED position on Dip Switch B. See **Figure 13.**

CAUTION: While it is physically possible to activate (place in the CLOSED position) more than one VOICE CIRCUIT or LED rocker for the same

TABLE A — EFFECTS OF DIP SWITCH SETTINGS

Rocker No.	Position	C.O. Line	Line Key	Effect
1	CLOSED	11	11	LED indication of activity
	OPEN	11	11	No LED indication of activity
2	CLOSED	11	11	VOICE CIRCUIT Active
	OPEN	11	11	VOICE CIRCUIT Inactive
3	CLOSED	17	11	LED indication of activity
	OPEN	17	11	No LED indication of activity
4	CLOSED	17	11	VOICE CIRCUIT Active
	OPEN	17	11	VOICE CIRCUIT Inactive
5	CLOSED	12	12	LED indication of activity
	OPEN	12	12	No LED indication of activity
6	CLOSED	12	12	VOICE CIRCUIT Active
	OPEN	12	12	VOICE CIRCUIT Inactive
7	CLOSED	18	12	LED indication of activity
	OPEN	18	12	No LED indication of activity
8	CLOSED	18	12	VOICE CIRCUIT Active
	OPEN	18	12	VOICE CIRCUIT Inactive

DIP SWITCH A

Rocker No.	Position	C.O. Line	Line Key	Effect
1	CLOSED	15	15	LED indication of activity
	OPEN	15	15	No LED indication of activity
2	CLOSED	15	15	VOICE CIRCUIT Active
	OPEN	15	15	VOICE CIRCUIT Inactive
3	CLOSED	19	15	LED indication of activity
	OPEN	19	15	No LED indication of activity
4	CLOSED	19	15	VOICE CIRCUIT Active
	OPEN	19	15	VOICE CIRCUIT Inactive
5	CLOSED	16	16	LED indication of activity
	OPEN	16	16	No LED indication of activity
6	CLOSED	16	16	VOICE CIRCUIT Active
	OPEN	16	16	VOICE CIRCUIT Inactive
7	CLOSED	20	16	LED indication of activity
	OPEN	20	16	No LED indication of activity
8	CLOSED	20	16	VOICE CIRCUIT Active
	OPEN	20	16	VOICE CIRCUIT Inactive

DIP SWITCH B

Line Key, this **MUST** be avoided as it will result in False busy signals and other interferences with the operation of the C.O. lines.

6.4 **TABLE A** outlines the effects of the individual rocker settings on the EKT-102's users ability to access C.O. lines #11, #12, and #15 through #20. If all rockers are set in the OPEN position, (as shown in **Figure 12**), the EKT user could not access, nor would there be an LED display of the activities of C.O. lines #11, #12, and #15 through #20.

7. INCOMING CALL SIGNALING

7.1 Each STRATA III System is factory programmed to have all incoming calls ring at extension #10, when in the day mode.

7.2 If an EDSS or EBLF is installed in the system, the system may be put in **Night Transfer (NT)** mode. In **NT** mode, incoming calls will ring at extension #11. Review Section 100-004-245 ELECTRONIC DIRECT STATION SELECTION CONSOLE (EDSS).

7.3 To exclude private lines from the common ring circuit:

7.3.1 If an EASU PCB is installed refer to Section 100-004-280.

7.3.2 If no EASU PCB is installed see Section 100-004-210 or Section 100-004-215.

8. FINALIZATION OF EKT INSTALLATION

8.1 After all installation and modification procedures have been completed, place the six bridging clips on the proper pins in the MDF or IDF. Be certain the EKT modular line cord is plugged securely into the station connector block, and into the EKT.

8.2 Referring to the STRATA III Telephone User's Guide, test the functions of the EKT. Should a malfunction occur, refer to sections 100-004-500, Primary Electronic Key Service Unit - Maintenance Procedures, or Section 100-004-510, Expanded Electronic Key Service Unit - Maintenance Procedures.

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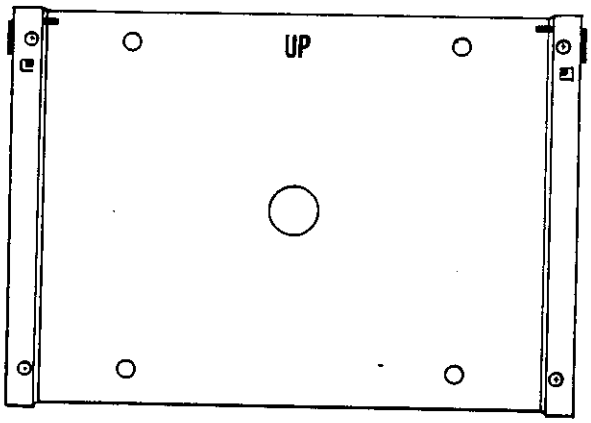

FIGURE 1—WALL MOUNTING PLATE

1. GENERAL

1.1 A STRATA III wall mountable Electronic Key Telephone (EKTW) or a desk model (EKTD), field converted for wall mounting, may be mounted on a wall or any other flat, vertical surface to which the wall mounting plate can be secured. See **Figure 1.** NOTE: For instructions on field conversion of an EKTD to an EKTW, see SECTION 100-004-232.

1.2 Mounting screws or mollies, appropriate for the surface on which the wall mounting plate is to be secured, must be provided by the installer.

1.3 The EKTW with the wall mounting plate weighs approximately 5.5 pounds. When selecting the wall site and determining the method to be used in securing the mounting plate to the wall, the additional stresses to which the mounting will be subjected in everyday use must be considered.

2. SECURING THE WALL MOUNTING PLATE

2.1 A locking-tab, with tension screw, is located behind each raised edge of the wall mounting plate, in the upper corner. See **Figure 2**. Loosen the tension screws one full turn each. Work the tabs back and forth by hand to insure that they move freely.

2.2 Position both locking-tabs so that the rear edge of the tab is flush with the back of the plate. See **Figure 2**.

2.3 Secure the wall mounting plate to the wall site selected for the mounting of the EKTW. Make certain the edge of the plate stamped "UP" is up and the bottom edge of the plate is level.

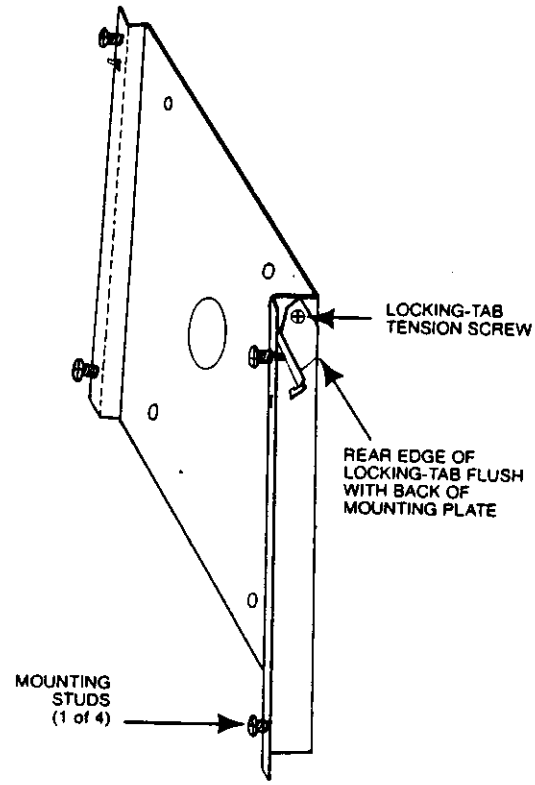

FIGURE 2—WALL MOUNTING PLATE LOCKING-TAB

3. MOUNTING THE EKTW ON THE WALL MOUNTING PLATE

3.1 Align the four keyhole openings in the back of the EKTW with the four studs projecting from the wall mounting plate and position the EKTW with a slight, downward movement.

3.2 To secure the EKTW on the mounting plate, press the locking-tabs flush against the wall mounting plate's raised edges. See **Figure 3**.

3.3 Tighten the tension screw for each locking-tab. Once these tabs are locked into the EKTW keyholes, the telephone cannot be separated from the mounting plate.

3.4 Test the sturdiness of the EKTW mounting.

3.5 Connect the modular plug to the modular jack.

3.6 Test the EKTW's functions.

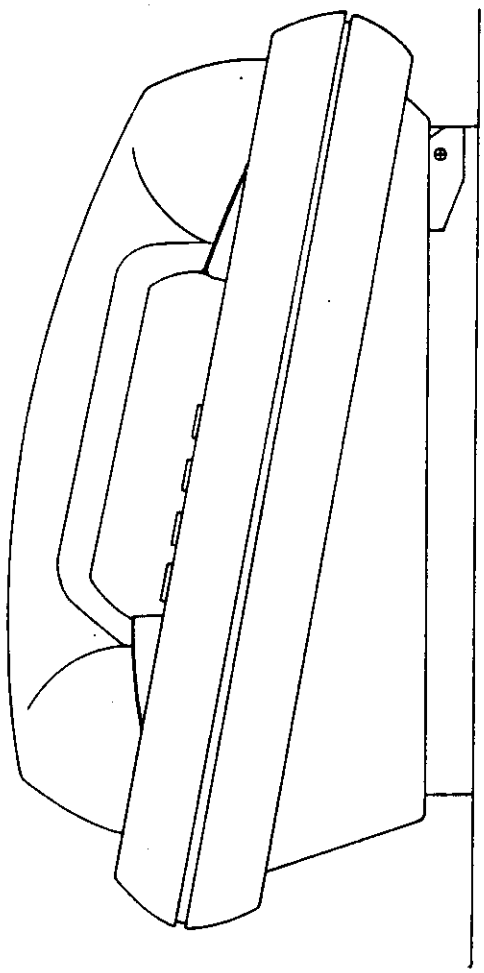

FIGURE 3—EKTW MOUNTED ON WALL MOUNTING PLATE

SECTION 100-004-235
ISSUE 1, MAY 1980

Strata III

EHFU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

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LIST OF FIGURES

1. GENERAL

1.1 The Electronic Hands-Free Unit (EHFU) is an optional printed circuit board (PCB) which provides hands-free talk-back capability in an Electronic Key Telephone (EKT-102) for incoming intercom calls. For hands-free operation on C.O. lines, a speakerphone unit is required. See Section 100-004-237.

1.2 The EHFU can be installed in either a standard desk model telephone (EKTD) or in a wall mounted telephone (EKTW).

CAUTION: To prevent any possible damage to component circuitry, installers should discharge any static charges collected on their persons by touching a well grounded metallic object before opening an EKT or Handling the EHFU PCB.

2. EHFU INSTALLATION INSTRUCTIONS

2.1 To install an EHFU PCB inside an EKT, the EKT covers, the EKT PCB and the metal shielding plate must be removed as follows:

2.1.1 Disconnect the modular line cord plug from the EKT.

NOTE: If an EHFU is to be installed in a wall mounted EKT, it must be removed from its wall mounting plate.

2.1.2 Loosen the four captive screws on the bottom of the EKT.

2.1.3 Remove the handset well by lifting the well up and swinging it to the left.

2.1.4 Remove the main top cover by lifting it up and swinging it to the right.

2.1.5 Disconnect the speaker cable from the P2 connector on the EKT PCB. See **Figure 1**.

2.1.6 Disconnect the handset cord spadetips from the EKT PCB and remove it from the EKT. See **Figure 1**. If installation of the EHFU PCB is being performed in an EKTW, the handset cord will enter from underneath the EKT PCB. Disconnect the spadetips from the board. It is not necessary to remove the handset cord from the EKT.

2.1.7 If an EHIU or ESIU PCB has been installed in the EKTD, its connecting cable must be disconnected from the P3 connector. See **Figure 1**.

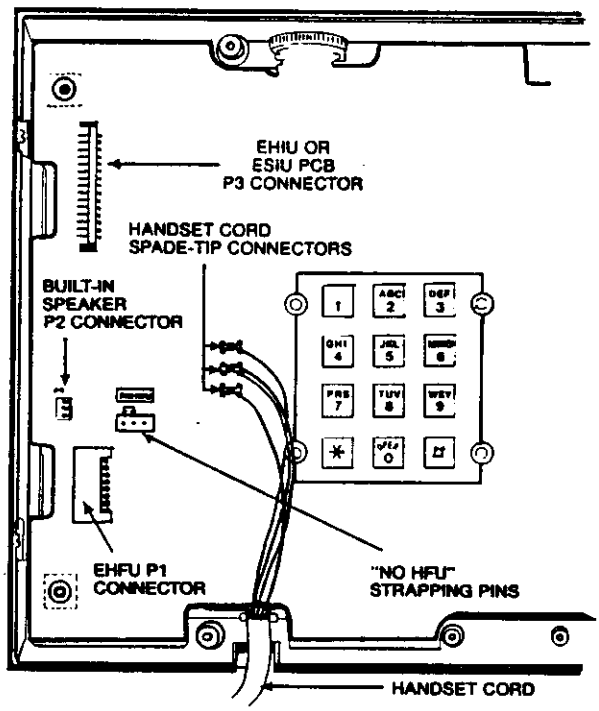

FIGURE 1—LOCATION OF COMMON CONNECTORS ON EKT PCB (LOT NUMBERS "J4" AND LATER)

NOTE: If the EHFU PCB is to be installed in a lot number "1" to "7" EKT, with a previously installed EHIU or ESIU PCB, the first three wires of this connector cable will be soldered to the EKT PCB. DO NOT ATTEMPT TO DISCONNECT THIS CABLE. The lot number appears on the bottom of the EKT case.

2.1.8 Unscrew the four retaining screws located in each corner of the EKT-PCB.

2.1.9 Lift the EKT PCB and the metal shielding plate out of the EKT case and place them face down behind the EKT case.

2.2 The EHFU PCB is positioned differently in a wall mounted EKT (EKTW) than it is in a desk model EKT (EKTD). If installation is being made in an EKTW, proceed to paragraph 2.2.2.

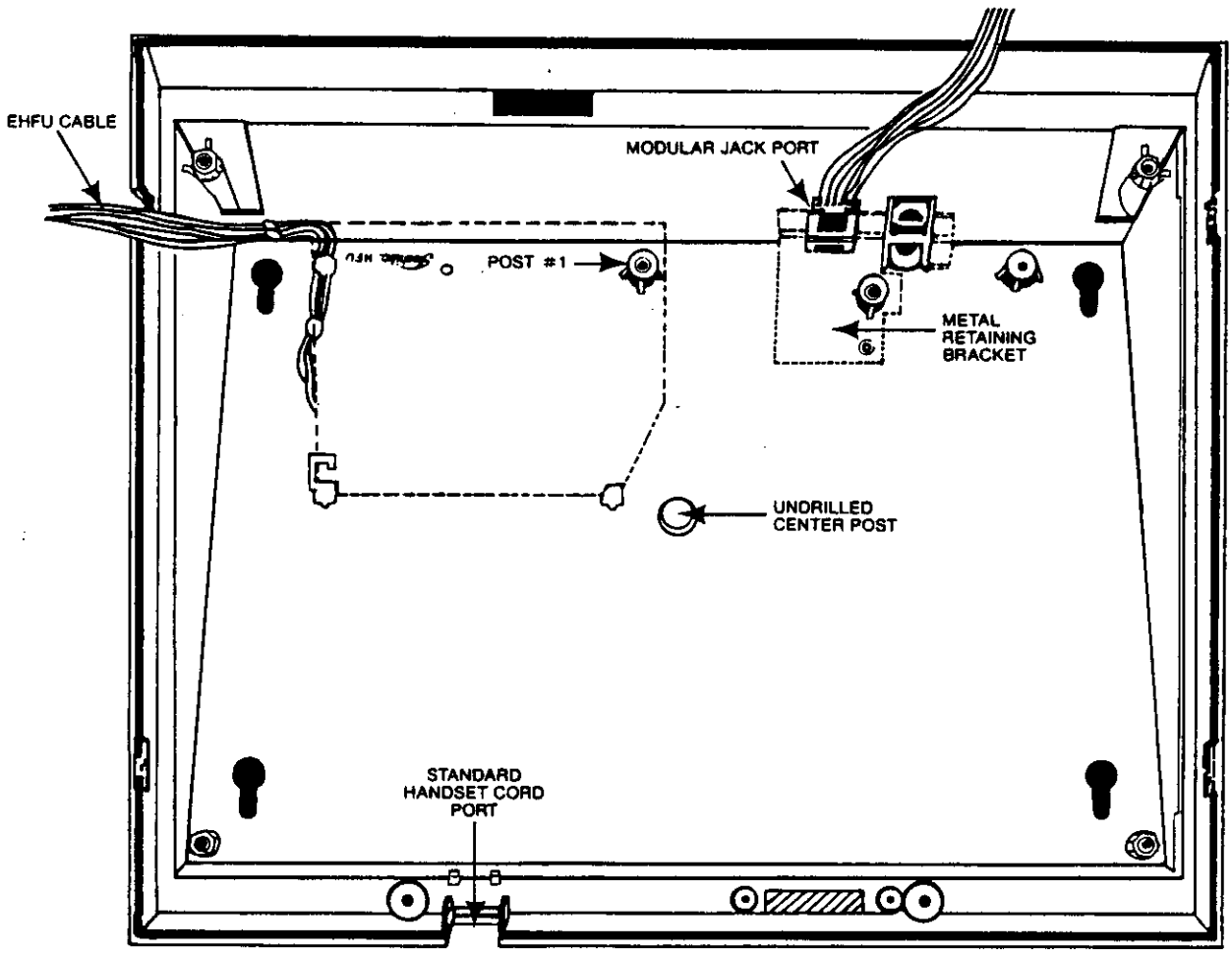

FIGURE 2—PLACEMENT OF EHFU PCB IN EKTD

2.2.1 Place the EHFU PCB in the EKTD case as shown in **Figure 2**. Using the self-tapping screw provided with the EHFU PCB, secure the PCB to support post #1. Drape the EHFU cable over the left edge of the EKTD case as shown in **Figure 2**. If either an EHIU or ESIU PCB is installed, drape its cable over the left edge of the EKT case.

2.2.2 If the EHFU PCB is to be installed in an EKTW, position it as shown in **Figure 3**. Use the self-tapping screw provided with the EHFU PCB, to secure the PCB to support post #1. Drape the EHFU connector cable and handset cord over the sides of the EKTW case as shown in **Figure 3.**

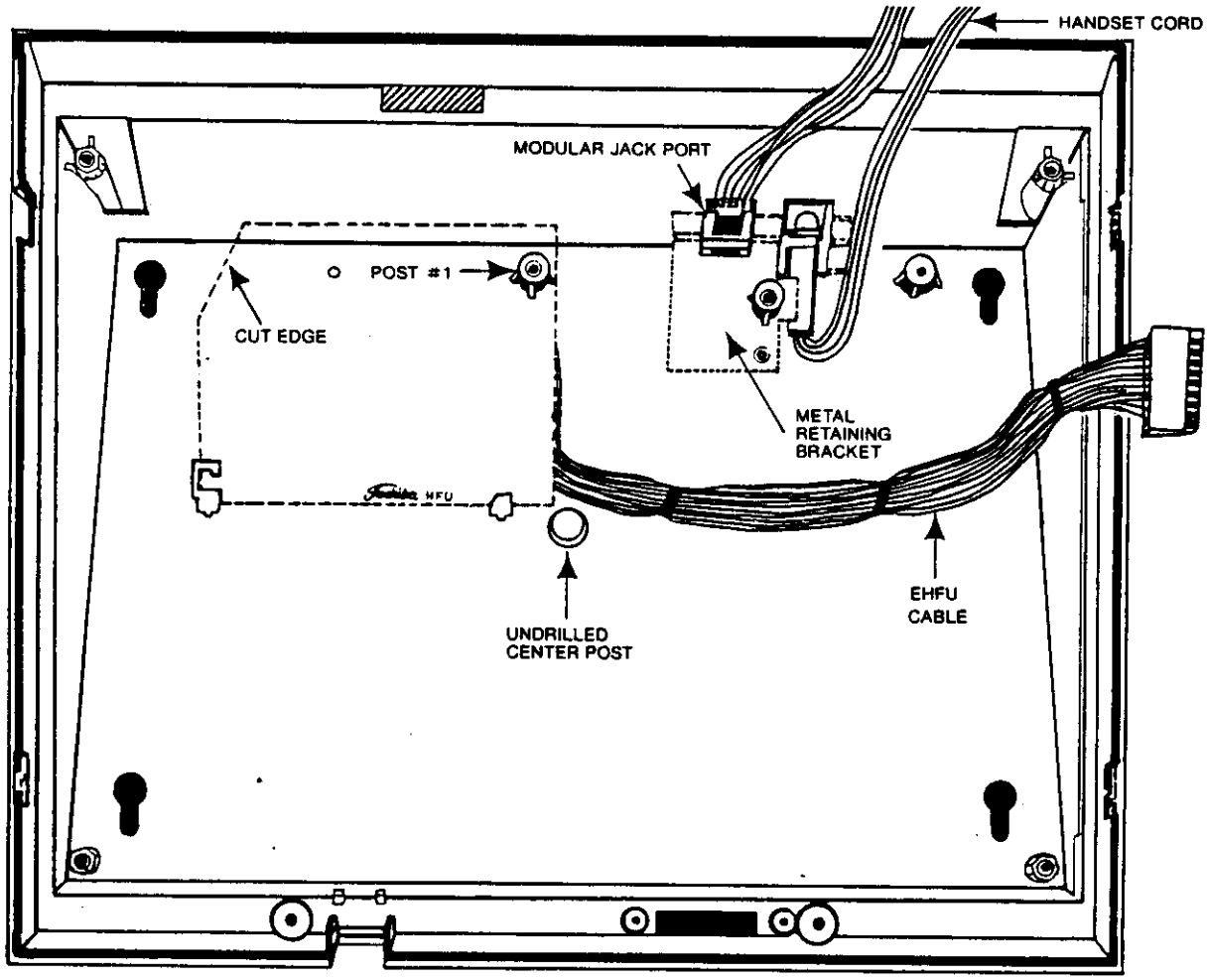

FIGURE 3—PLACEMENT OF EHFU PCB IN EKTW

3. CONNECTION OF EHFU TO EKT

3.1 Replace the metal shielding plate and the EKT PCB in the EKT case.

3.2 Connect the EHFU connector cable to the P1 connector. See **Figure 1**. If either an EHIU or an ESIU is present, reconnect its cable to the P3 connector.

3.3 Secure the EKT PCB and the metal shielding plate with the four self-tapping screws originally removed.

3.4 Re-connect the handset spade-tips (connector color codes are printed beside the terminals). **See Figure 1**. (For "J1" EKT's, see **Figure 4**.)

3.5 Re-connect the built-in speaker to the P2 connector. See **Figure 1**.

3.6 The "NO HFU" strapping plug must be moved to pins (2) and (3) on the EKT PCB for the hands-free functions to operate. See **Figure 1** for the location of the "NO HFU" strapping pins on "J4" and later EKT's. The "NO HFU" arrows printed on the EKT PCB, point to pins (1) and (2). If the lot number of the EKT is "J1," proceed to paragraph 3.6.2.

3.6.1 On lot number "J2" and "J3" EKT's, the "NO HFU" label on the EKT PCB is in a slightly different position. Proceed to paragraph 3.7.

3.6.2 Lot number "J1" EKT's do not have "NO HFU" strapping pins. "J1" EKT PCB's are equipped with a soldered wire strap labeled "SP" shown in **Figure 4**. This strap must be cut for the hands-free feature to function.

3.7 Replace the main top cover and the handset well.

3.8 Secure the covers with the four captive screws located underneath the front and rear lips of the EKT case.

3.9 Plug the modular plug into its jack in the back of the EKT and test the EKT's functions, including hands-free operation.

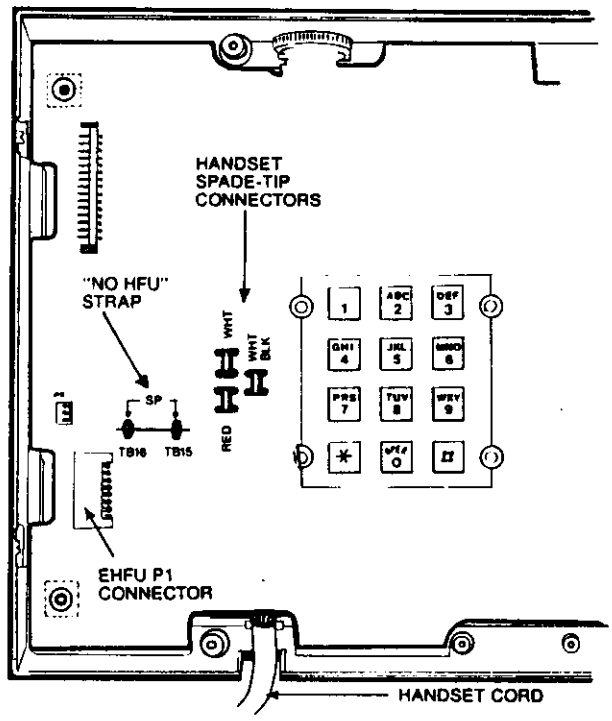

FIGURE 4—LOCATION OF "NO HFU" STRAP ON LOT NUMBER "J1" EKT

SECTION 100-004-237
ISSUE 3, OCTOBER 1980

Strata III

ESIU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

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LIST OF FIGURES

1. GENERAL

1.1 The Electronic Speakerphone Interface Unit (ESIU) is an optional printed circuit board (PCB) which provides interfacing between the STRATA III Electronic Key Telephone (EKT) and an external speakerphone unit, when installed in the EKT. It also provides the required interfacing for an automatic dialer unit.

1.2 The ESIU can be used to connect either an external speakerphone or an automatic dialer or both to an EKT.

1.3 "J1" to "J7" lot number EKT's are equipped with a twelve pin ESIU connector. This will require modification of the cable connector and soldering of wires to the EKT PCB. EKT's with lot numbers beginning with "A" and "J8" and later EKT's are equipped with a fifteen pin ESIU connector and do not require modification.

NOTE: The lot number appears on the bottom of the EKT.

1.4 EQUIPMENT SUPPLIED WITH THE ESIU KIT

- ESIU PCB
- ESIU Connector cable (black female connectors on each end)
- 3 x 10 self-tapping screw
- $\frac{3}{8}$ inch machine screw with lock washer
- $\frac{3}{8}$ x $\frac{7}{16}$ inch cable cover insert
- Tie-wrap with securing eyelet
- Tie-wrap (no eyelet)
- Four wire cable with spade-tips.

1.5 SUPPLEMENTARY EQUIPMENT TO BE SUPPLIED BY INSTALLER

1.5.1 For installation of an external speakerphone

- Northern Telecom Companion 2® or other compatible external speakerphone unit
- 2012B Transformer with two wire insulated cable, 22 AWG to 26 AWG. Standard in-door jacketed telephone cable (quad) may be used
- Two nylon cable tie-wraps.

1.5.2 For installation of an automatic dialer:

- ATC TeleDialer® 32T or other compatible automatic dialer.

1.6 Suggested tools for normal installation:

- Phillips screwdriver
- Small flat-blade screwdriver
- Medium size pair of diagonal wire cutters.

1.7 Additional tools suggested for installation in "J1" to "J7" EKT's:

- Soldering iron (40 watts or less)
- Needle nose pliers.

1.8 To determine if an ESIU has already been installed in an EKT, without opening the case, turn it face down and check the right upper "key hole." If an ESIU has been installed an "S" will be visible in the keyhole. See **Figure 1**.

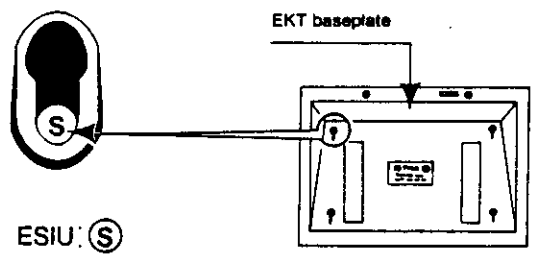

FIGURE 1 — INDICATION OF ESIU IN EKT

CAUTION: THE 110 VAC TRANSFORMER FOR THE EXTERNAL SPEAKERPHONE AND THE AUTOMATIC DIALER, IF INSTALLED, SHOULD NOT BE PLUGGED IN UNTIL ALL WIRING IS COMPLETE. ALSO, INSTALLATION AND REPAIR PERSONNEL SHOULD BE CAREFUL TO DISCHARGE ANY STATIC CHARGES COLLECTED ON THEIR PERSONS BY TOUCHING A WELL GROUNDED SOURCE, SUCH AS A RADIATOR, BEFORE OPENING AN EKT OR HANDLING THE ESIU PSB.

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SECTION 100-004-500
ISSUE 1, MARCH 1979

Strata III

PRIMARY ELECTRONIC KEY SERVICE UNIT

MAINTENANCE PROCEDURES

REVISION PAGES

Page	Revision No.	Date
Table of Contents	1	January 1981
6	1	January 1981
8	1	January 1981
22	1	January 1981
53	1	January 1981
56	1	January 1981

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LIST OF TABLES

1. GENERAL

1.1 This section describes the maintenance procedures used for the diagnosis of faults in the STRATA III Key Telephone System. Faults are classified and then cleared by replacing apparatus and performing operational tests in a sequence prescribed by the fault clearing flow charts in section 6.

2. FAULT CLASSIFICATION

2.1 A fault classification flow chart is provided to insure that fault clearing is pursued in a logical sequence. (Flow chart 6.1).

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

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

	FLOWCHART NUMBER
• Newly installed system faults	6.1
• Fault classification	6.2
• Power faults	6.3
• DSS faults	6.4
• BLF faults	6.5
• Single station faults	6.6
• Cable faults	6.7
• C.O. key/LED faults	6.8
• C.O. line ringing faults	6.9
• C.O. line transmission faults	6.10
• Hold/PRLs key faults	6.11
• Intercom key/LED faults	6.12
• Intercom ringing/tone faults	6.13
• Intercom transmission faults	6.14
• Hands-free answer-back faults	6.15
• Group/external page faults	6.16
• Music on hold faults	6.17

2.3.1 Flow charts are numbered in accordance with the fault being dealt on the (whole number appearing after the first decimal point) and sequentially within the fault catagory (whole number appearing after the second decimal point).

3. FAULT CLEARING PROCEDURES

3.1 Before attempting to clear any fault, care should be taken to ensure that the fault is within the STRATA III system and not caused by associated external equipment such as wiring, MOH source, etc.

3.2 Faults in the STRATA III are cleared by the replacement of Printed Circuit Boards (PCBs), EKTs or Power Supplies as instructed in the fault clearing flow charts.

3.3 Four symbols are used in the flow charts. These symbols are identified in Figure 1.

3.4 The flow charts are sequentially arranged to permit rapid localization of faults within the STRATA III. All fault clearing must begin with Fault Classification flow chart (6.2) which is arranged in the recommended fault locating sequence.

3.5 The following precautions must be observed when handling PCBs.

DO NOT—drop the PCB
DO NOT—stack the PCBs on top of another
DO NOT—handle the PCB without discharging yourself by touching the EKSU.
DO NOT—touch PCB contacts with your fingers

IMPORTANT: IF THE FAULT IS NOT CLEARED BY THE SUBSTITUTION OF A PCB, THE ORIGINAL PCB MUST BE REINSERTED IN THE CONNECTOR.

4. RETURN OF DEFECTIVE APPARATUS

4.1 When defective STRATA III apparatus is shipped for repair the apparatus must be packed in a suitable container.

4.2 Information tags describing the nature of the defect should be attached to the defective apparatus. The tags should be attached to the front of the PCBs with string (not wire!) allowing the tag to remain attached during the test and repair process.

4.3 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.

4.4 NEVER WRITE ON THE APPARATUS!

5. PRINTED CIRCUIT BOARD DESCRIPTION

5.1 To assist in the general understanding of the STRATA III Key Telephone System, the following paragraphs provide an explanation of each PCB and its role in system operation. Figure 5 shows their relationship in block diagram form.

5.1.1 EPRU

5.1.1.1 The EPRU interfaces the STRATA III EKSU with the +24V DC from the EPSA (external Power Supply) and the Music On Hold (MOH) program source. The faceplate of the EPRU is equipped with an ON/OFF switch which controls the 24V input, two red LED's which indicate the presence of the 24V and 12V outputs, and MOH level control.

5.1.1.2 Two fuses are mounted on the EPRU. The 24V input is protected by F1 and is delivered to the ESTU AND EBLU PCB's for powering of the EKT's and the EDSS. The +24V from F1 is also applied to a voltage regulator which provides +12V DC to various circuits in the EKSU. The +12V output is fused by F2.

5.1.1.3 The MOH jacks mounted on the rear of the EKSU are connected to an amplifier/limiter circuit on the EPRU where the signal level is controlled before it is delivered to the ECOU PCB's.

5.1.1.4 Jacks are provided on the EPRU for the mounting of two optional relays which have normally open contacts wired to the MR and NR terminals mounted on the rear of the EKSU. The K1 relay operates whenever a C.O. line is placed on hold and puts a short across the MR terminals. The MR terminals are intended to control the MOH source. Relay K2 operates whenever Night Transfer is engaged by the DSS operator and puts a short across the NR terminals. The NR terminals are intended to control auxiliary functions such as controlling the connection of an answering machine.

5.1.2 ECKU

5.1.2.1 The ECKU is the source of all STRATA III system timing. Various clock and counter signals necessary to synchronize the system logic are derived from the ECKU PCB. In addition, the C.O. Ring Tone and the 1200 Hz used for DSS ringing tone and 600 Hz used for intercom dial tone, ring back tone, busy tone, and warning tone originate on the ECKU. The "LED data" bit stream, which controls the status of the LED's on the EKT, is assembled on the ECKU PCB. Station information received from the ECOU and EINU PCB's is combined with timing information and then sent on to the EVCU PCB for eventual transmission to the EKT.

5.1.3 ESTU

5.1.3.1 The ESTU PCB contains four identical circuits, each of which serves as the interface between a STRATA III Electronic Key Telephone (EKT) and the EKSU.

5.1.3.2 Each EKT connects to its ESTU circuit via three cable pairs. One cable pair carries voice signals between the EKT and the EKSU, the second pair carries LED DATA from the EKSU to the EKT, and the third pair carries KEY and hook switch DATA from the EKT to the EKSU.

5.1.3.3 When an EKT originates a call, the ESTU circuit detects the Off Hook and "Key" signals and cooperates with the ECKU and ECOU (or EINU) to set up a voice path through the EXPU network to the appropriate ECOU (or EINU) PCB. A current source on the ESTU, which is under the control of the EKT hook switch signal, is activated to keep the EXPU crosspoints switched on after the "Key" signal is removed. The "Key" signal is removed when the EKT user releases the key but the Off Hook signal remains until the EKT user goes on-hook. When the EKT user goes on-hook it is detected by the ESTU which deactivates the current source allowing the EXPU crosspoints to switch off and release the voice path.

5.1.3.4 If, during a C.O. line call, the EKT user operates the Hold key the ESTU detects the Hold key signal and sends a signal to the ECOU PCB. The ECOU responds to the Hold signal by maintaining the C.O. line seizure after the EXPU crosspoints are released.

5.1.3.5 The PRLS key operation is also detected by the ESTU. The PRLs signal is relayed

to the ECKU via the ECOU and the ECKU releases the privacy on that C.O. line to allow another station to enter the line.

5.1.4 ECOU

5.1.4.1 The ECOU contains two identical circuits to interface two Central Office Lines, and is the interface between the STRATA III system and the telephone network.

5.1.4.2 When an EKT user operates a C.O. Key the ECOU cooperates with the ESTU & ECKU to operate crosspoints in the EXPU which forms a speech path. The ECOU recognizes this request and presents a line seizure to the C.O. The C.O. returns dial tone which is passed from the ECOU, through the EXPU and ESTU, to the EKT. The EKT user then proceeds to dial. When the EKT goes on-hook, the EXPU crosspoints are released and the ECOU releases the C.O. seizure.

5.1.4.3 A hold circuit is provided on the ECOU. The Hold key signal is transmitted from the EKT to the ESTU and on, via the EXPU, to the ECOU. The ECOU responds to the Hold signal by continuing the C.O. line seizure after the EXPU crosspoints have released.

5.1.4.4 Operations of the PRLs key by an EKT is detected by the ECOU. The PRLS signal is then passed on to the ECKU which releases the privacy on that one C.O. line to allow another station to be conferenced.

5.1.4.5 Incoming C.O. ringing is detected by the ECOU which then signals the appropriate station(s) via the EVCU. The station user answers the call by coming off hook and operating the C.O. line key. In response to the C.O. Key, the EXPU path is made and the ECOU seizes the C.O. line to "break" ringing and provide a voice path between the EKT and the C.O. Line.

5.1.4.6 An Automatic Release from Hold option on the ECOU will, when activated by Central Office Signaling cause the ECOU to release a "hold" C.O. line and go to its idle condition if a C.O. disconnect is detected.

5.1.4.7 The ECOU provides station information to the ECKU for the generation of the EKT LED Data stream to the EKT.

5.1.5 EXPU

5.1.5.1 The EXPU PCB(s) form the primary voice network in the STRATA III. Each EXPU PCB provides a potential voice path between eight (8) stations (two ESTU PCBs) and the twelve (12) C.O. lines (6 ECOU PCBs) and the two (2) intercom lines (1 EINU) and the DSS circuit (EDSU) which may be equipped in the primary EKSU.

5.1.5.2 The EXPU consists of a single stage, balanced, SCR crosspoint network which is controlled by EKT key data in combination with logic located on the ESTU and ECOU and timing derived from the ECKU.

5.1.5.3 The EXPU provides privacy on all voice paths until a conference request is made. Operation of the PRLS key on the EKT connected to a particular C.O. line causes a privacy release signal to be generated from the ECKU which in turn allows another station to enter that line.

5.1.6 EINU

5.1.6.1 The EINU PCB contains the two intercom paths used in the STRATA III primary EKSU.

5.1.6.2 When an EKT user operates an ICM key, the EINU circuit cooperates with the ESTU and ECKU to operate the crosspoints in the EXPU. This forms a voice path between the EKT and one circuit of the EINU.

5.1.6.3 The EINU contains a hunting circuit used to assign the register (ERGU) to the requesting EINU circuit. If the ERGU is idle, the EKT user receives dial tone from the ERGU via the EINU. If the ERGU is busy, the EINU transmits busy tone to the caller.

5.1.6.4 The EINU circuit is used for the entire duration of an intercom call and provides status information to the ECKU for generations of the LED DATA stream to the EKTs.

5.1.7 ERGU

5.1.7.1 The ERGU contains one register circuit and serves both intercom circuits on the EINU.

5.1.7.2 When an EKT user operates an ICM key, a voice path is formed from the EKT, through the ESTU, EXPU, and EINU to the ERGU (assuming the ERGU was idle). The ERGU returns dial tone to the caller and then decodes the DTMF signals as the EKT user dials.

5.1.7.3 When the ERGU has decoded the called station number the voice path is extended through the EVCU to the called EKT. A "warning" or "splash" tone is sent from the ERGU to the called EKT, (the caller also hears a burst of tone from the ERGU) followed by the caller's voice (or continuous ringing depending on the option selected). If the called station is equipped with Hands-free Answer-back (EHFU PCB), a control signal inserted in the LED DATA stream by the ERGU activates the talk-back capability. A hands-free conversation can proceed until the ERGU times out and releases the connection or the calling party disconnects.

5.1.7.4 If the called station user operates the ICM key, the ERGU and EVCU are released and the conversation proceeds via the EXPU and EINU using the EKT handset.

5.1.8 EVCU

5.1.8.1 The EVCU contains a single stage, non-balanced MOS crosspoint network and provides the secondary voice network in the STRATA III system. Each EVCU PCB provides a potential voice path to connect eight (8) stations (2 ESTU PCBs) to the ERGU or the C.O. ringing tone source (ECKU). The DSS uses the same ringing/paging path as the ECOU's with the DSS having higher priority.

5.1.8.2 The ERGU has a dedicated path through the EVCU to each station. The ERGU path is used for intercom ringing/voice paging and is held along with the ERGU for the duration of a hands-free call. When the called station operates his ICM key, the EVCU and ERGU are released and the conversation proceeds via the EXPU and EINU using the EKT handset.

5.1.9 EDSU

5.1.9.1 The EDSU PCB provides a dedicated voice path between the DSS Station (#10 EKT) and the called station. When the DSS Station user is talking to a C.O. line and operates a station's key on the DSS console, the EBLU sends a signal via the ESTU (of the DSS Station) and the EXPU to the ECOU to place the C.O. line on hold. The EBLU also causes the proper EXPU crosspoints to operate to establish a voice path between the DSS Station and the EDSU.

5.1.9.2 The EDSU sends ringback tone to the DSS Station and "Splash tone" to the called station. The "Splash tone" is sent to the called station via a voice path through the EVCU established by a signal from the EBLU. An "Auto Preference" circuit in the EDSU allows the called station to answer by coming off-hook without any operation of keys on the called EKT.

5.1.9.3 When a DSS call has been answered the voice path is established from the DSS Station through the originating ESTU, EXPU, EDSU, EVCU, and called ESTU to the called EKT.

5.1.10 EBLU

5.1.10.1 The EBLU PCB contains much of the circuitry necessary and decodes KEY DATA from the DSS console. When an extension key is operated the EBLU sends a "hold" signal to the ECOU PCB and also sets up the EXPU voice path between the DSS Station and the EDSU PCB. The EBLU also selects the path through the EVCU to the called station and then controls the tones sent to the DSS Station and called station by the EDSU. When the All Call Key is operated on the DSS console the EBLU causes the All Call Amplifiers to be switched into the EDSU voice path.

5.1.10.2 The EBLU receives station bus/idle status information from the EVCU and transmits it, along with NT LED data, to the DSS console and/or the Busy Lamp Fold.

5.1.10.3 Logic for the C.O. signaling transfer is located on the EBLU PCB and is controlled by the NT Key on the DSS console.

5.1.11 EILU

5.1.11.1 The EILU is an optional PCB which is used to provide the DSS Station with special "I Hold" and "I Use" illumination and a special audio/visual "Operator Recall" indicator. When the EILU is used, lines placed on hold by the DSS Station will flash at a rate of 240 IPM in contrast to the normal rate of 120 IPM. The "Operator Recall" function provided by the EILU causes the DSS operator to be signaled whenever a call placed on hold by the DSS remains unattended after 45 seconds. The recall signal consists of a 1200 Hz tone interrupted at a rate of 1 second on 1 second off and the C.O. line LED flashing at a rate of 4 Hz while the recall tone is on (1 sec) and 2 Hz when the recall tone is off (1 sec).

5.1.11.2 The "I Use" illumination allows a line connected to the DSS Station to be distinguished by two short (125 ms) interruptions every 2 seconds. "I illumination" appears only at the DSS Station.

5.1.12 EGPU

5.1.12.1 The EGPU PCB provides the STRATA III system with All Call, Group Page, and External Page options on intercom calls.

5.1.12.2 If the KSU is equipped with an EGPU PCB, the voice path for an intercom call is as follows:

Originating EKT—ESTU—EXPU—EINU—ERGU—EGPU—EVCU—ESTU—called EKT.

5.1.12.3 When an intercom call is originated and a normal station number is dialed, the callers voice is transmitted directly through the EGPU to EVCU and ESTU and on to the EKT. If a group code 81, 82, 83 is dialed, an amplifier on the EGPU is switched into the voice circuit and the callers voice is transmitted, via the EVCU and ESTU's, to the speakers of all EKT's assigned to that group.

5.1.12.4 If the All Call code 80 is dialed, the amplifier on the EGPU is switched in and the callers voice is transmitted, via the EVCU and ESTU's, to the speaker of all EKT's connected to groups 1, 2, and 3.

5.1.12.5 Dialing the external Page code 89 causes the callers voice to be switched through a power amplifier on the EGPU to the 600 Ω and 8 Ω terminals located at the bottom rear of the KSU.

5.1.13 EHFU

5.1.13.1 The EHFU PCB is an optional PCB that is mounted in the EKT to give the station user the ability to give a hands-free reply to a voice page. A control bit inserted in the LED Data stream by the ERGU activates the EHFU during an incoming voice page. The voice switching circuit in the EHFU causes the EKT speaker to alternately function as a microphone or speaker.

6. FAULT IDENTIFICATION AND ELIMINATION PROCEDURES

6.1 NEWLY INSTALLED SYSTEM FAULTS

6.1.1 Newly installed STRATA III systems may exhibit confusing fault symptoms due to station wiring errors. The following procedures should be followed to "debug" the system.

6.1.2 Visually inspect the wiring and correct any wiring errors.

6.1.3 If the system exhibits power faults (LED fuse indicators off) these faults should be cleared first. (Refer to Table A and Flow chart 6.3)

6.1.4 If more than one EKT is exhibiting faults remove all but the following PCBs from the EKSU:

- ESTU #1
- EXPU #1
- ECOU #1
- ECKU
- EPRU

IMPORTANT: IF AN EDSU, EBLU, EILU, OR EGPU IS REMOVED FROM THE EKSU, BE CERTAIN THE BACKPLANE STRAPS (IDENTIFIED IN **TABLES B, C, D, and E**) ARE PLACED ON THE APPROPRIATE EKSU BACKPLANE CONNECTORS. IF AN **EASU** PCB IS INSTALLED, **DO NOT PLACE THESE STRAPS ON THE EKSU BACKPLANE**, REFER TO SECTION 100-004-280.

6.1.5 Test each EKT (10, 11, 12, and 13) on their ability to originate and receive calls on the CO lines. If more than one fails, remove the necessary bridging clips on the MDF to disconnect EKTs until only one faulty EKT remains.

6.1.6 Clear the fault with the EKT following the procedure for a single station fault. (Refer to Flow chart 6.6.)

6.1.7 When the first EKT fault has been cleared, add bridging clips to activate another EKT. Proceed to clear the fault as above.

6.1.8 When all stations on ESTU #1 are working properly repeat the procedure by adding ESTU #2.

6.1.9 Add ESTUs and EXPUs to the maximum configuration required, clearing faults as they appear.

6.1.10 When all ESTU and EXPUs are installed and tested, start adding ECOU PCBs, clearing faults as they appear. (See Flow chart 6.8 for origination faults and Flow chart 6.9 for ringing faults).

6.1.11 When all EKTs are functioning properly with all CO lines, add the following PCBs to the EKSU:

- EINU
- ERGU
- EVCU(s)

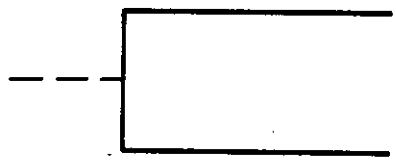
6.1.12 Test intercom operation and clear any faults refering to the ICM KEY/LED or ICM ringing fault clearing procedures.

6.1.13 Add system options one at a time. Refer to the appropriate procedure to clear any faults that appear.

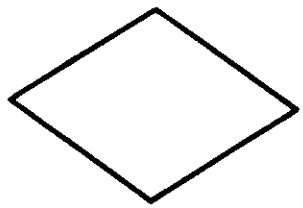
6.1.14 When all features have been added, perform a complete system test to verify correct operation.

START AND END OF
A FLOW CHART SEQUENCE

IMPORTANT NOTES
AFFECTING THE FAULT
CLEARING PROCEDURE



QUESTION TO BE ANSWERED
YES OR NO



TO/FROM SPECIFIC FLOWCHART (FC)

PROGRESSION TO OR FROM
ANOTHER FLOWCHART LOCATION.
LETTER WILL DENOTE EXACT ENTRANCE
OR EXIT POINT

STATEMENT OF A
REQUIRED ACTION

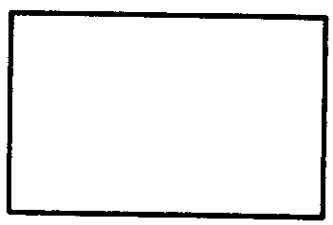


FIGURE 1—FLOWCHART SYMBOLS

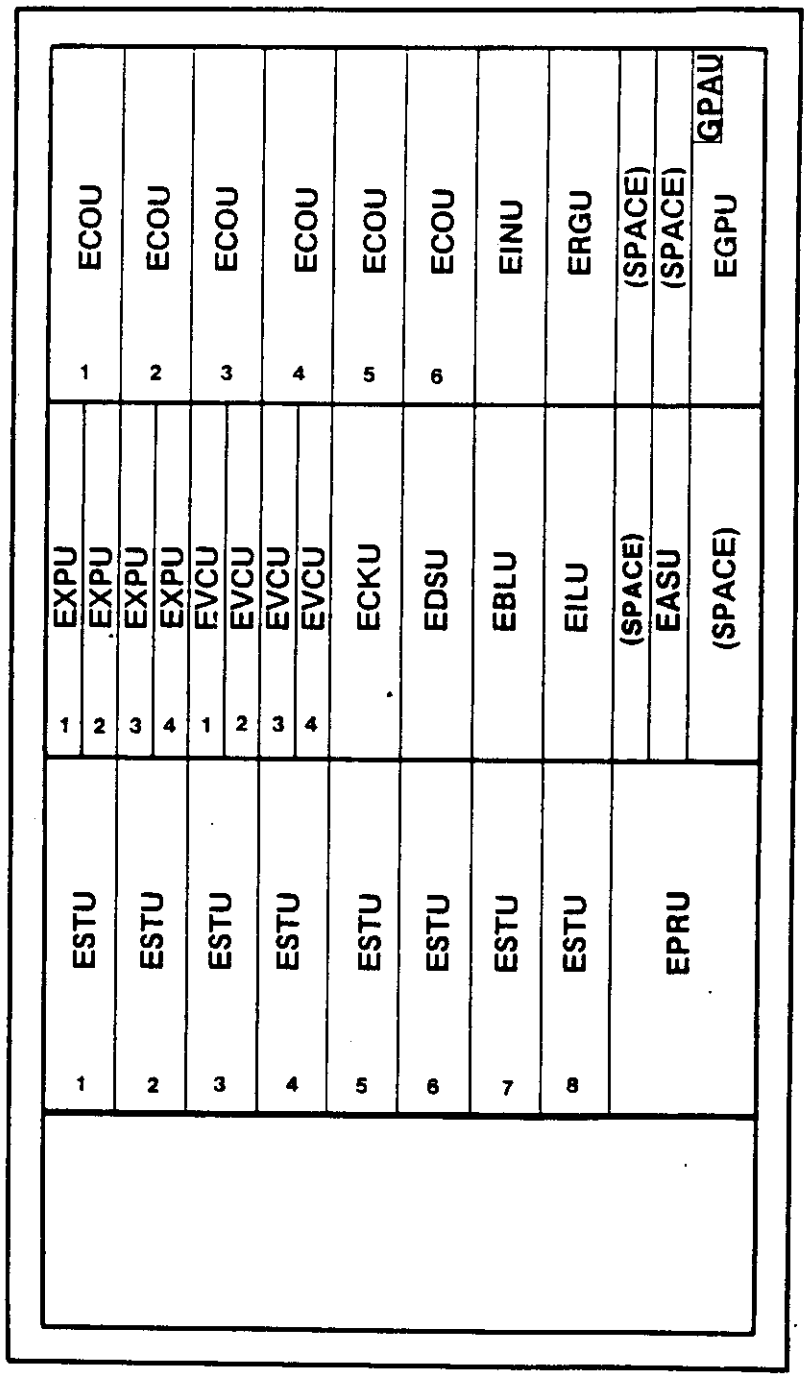


FIGURE 2—EKSU FRONT VIEW

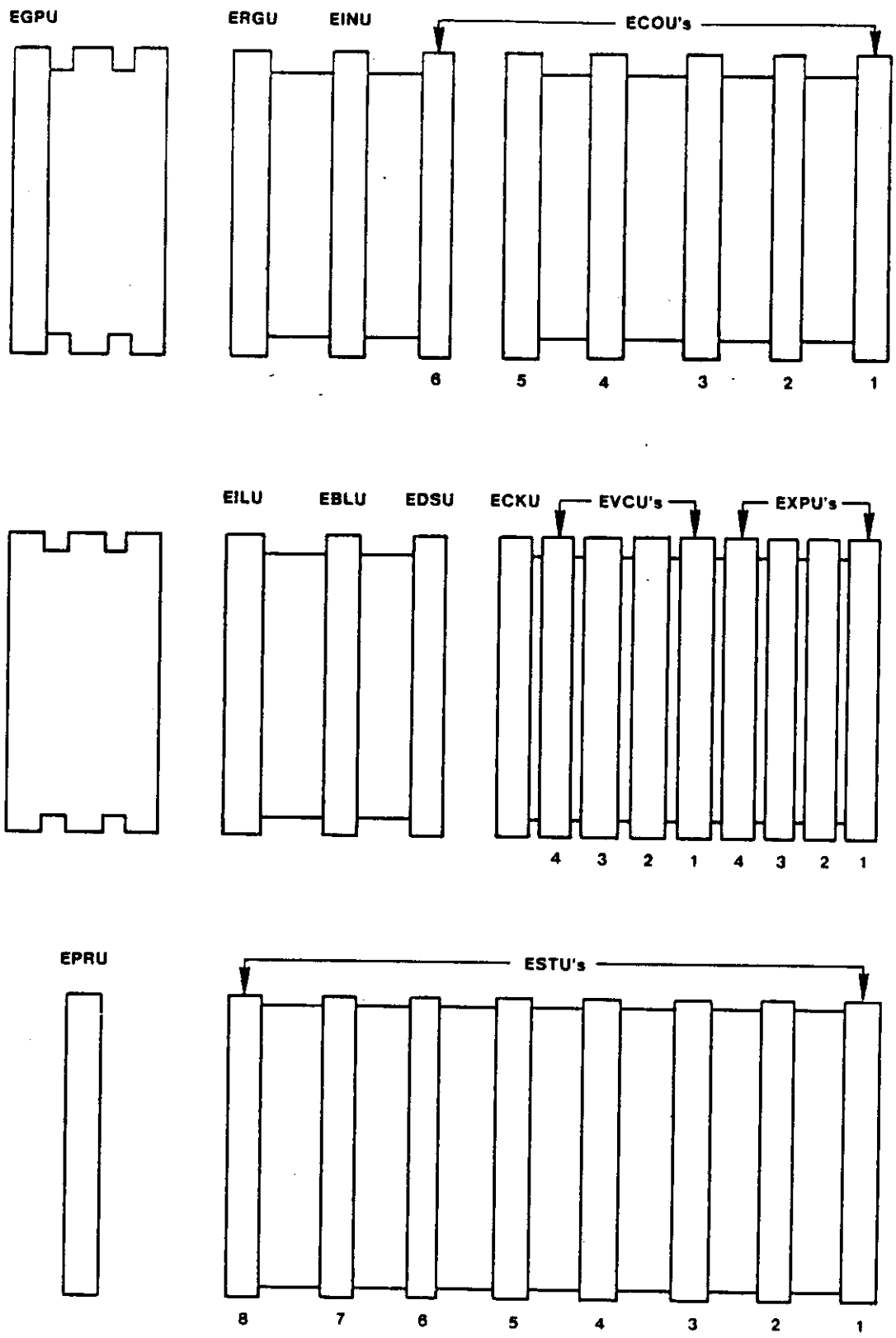


FIGURE 3 – EKSU REAR VIEW

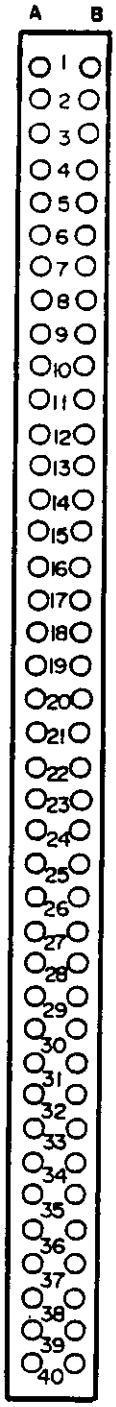


FIGURE 4—PCB CONNECTOR PIN NUMBERING

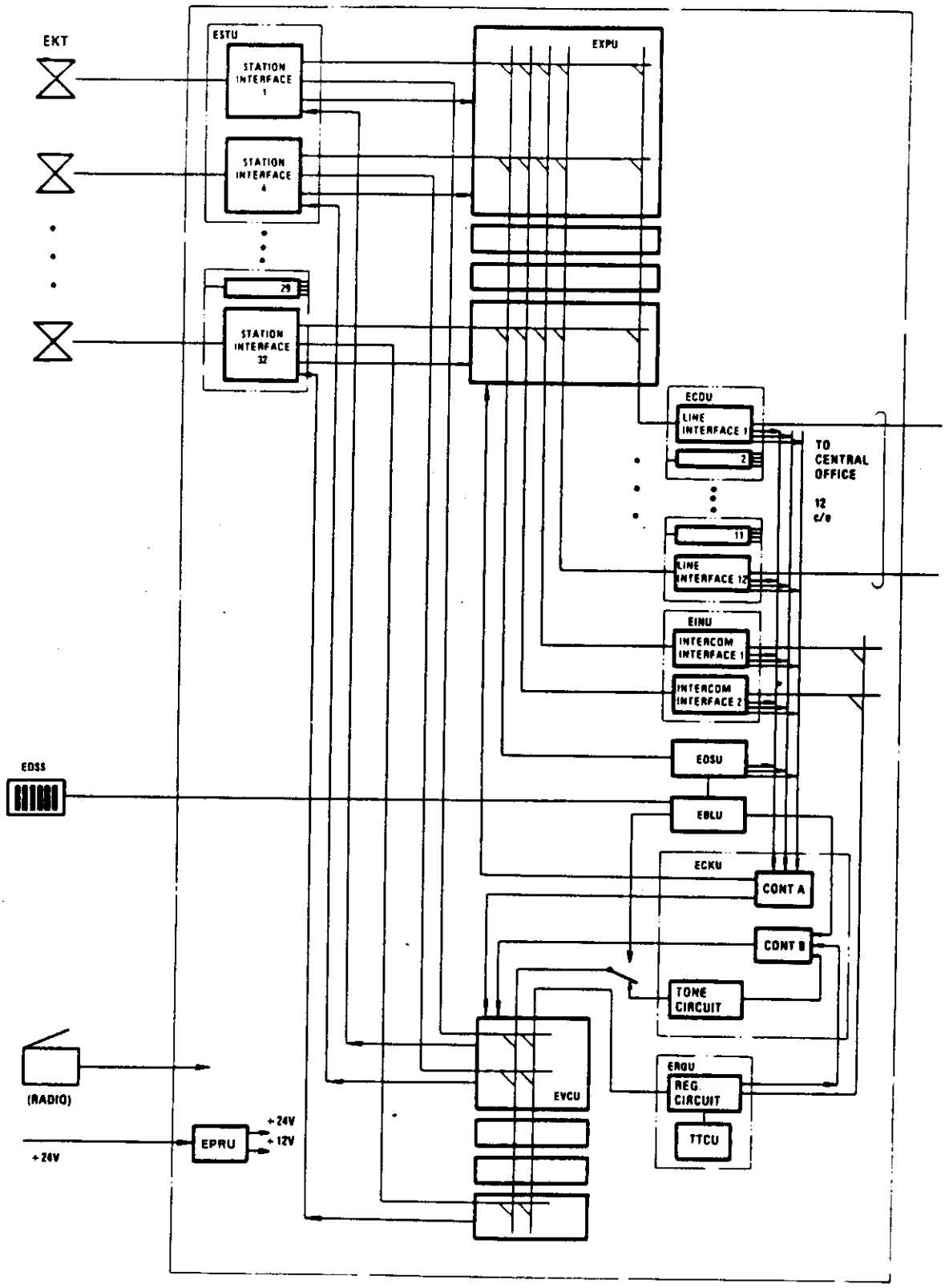
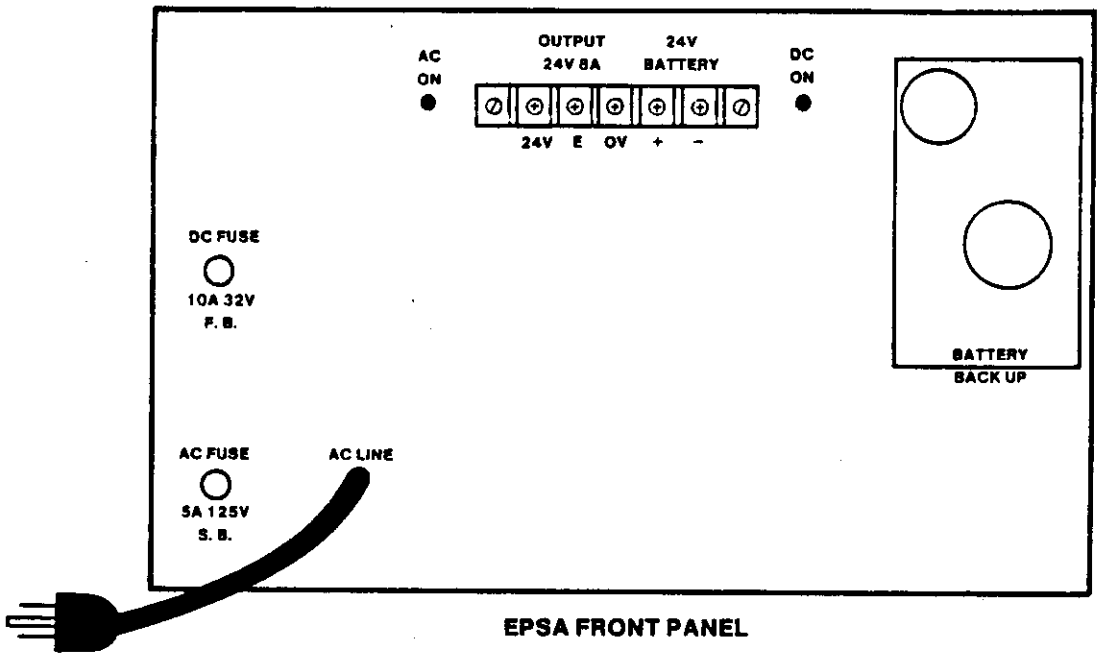
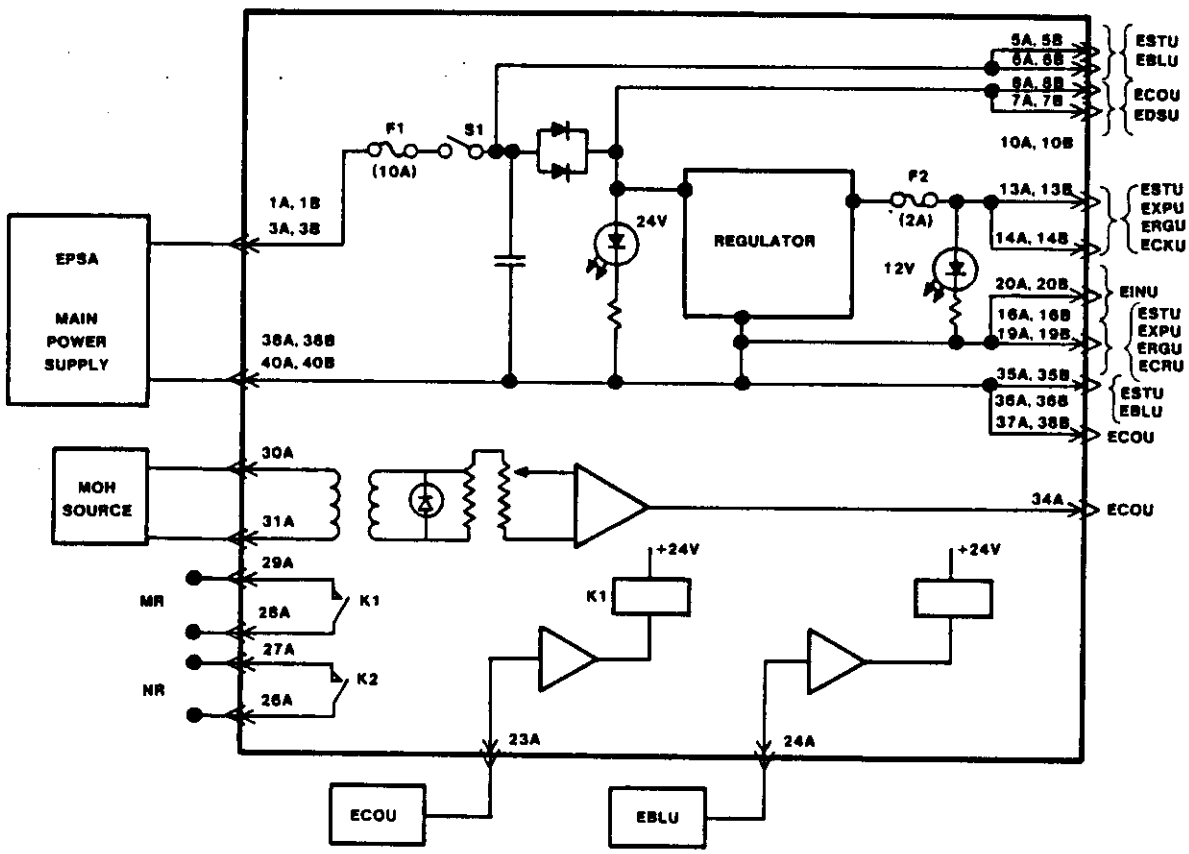


FIGURE 5—SYSTEM BLOCK DIAGRAM



EPSA FRONT PANEL



EPRU BLOCK DIAGRAM

FIGURE 6—POWER EQUIPMENT

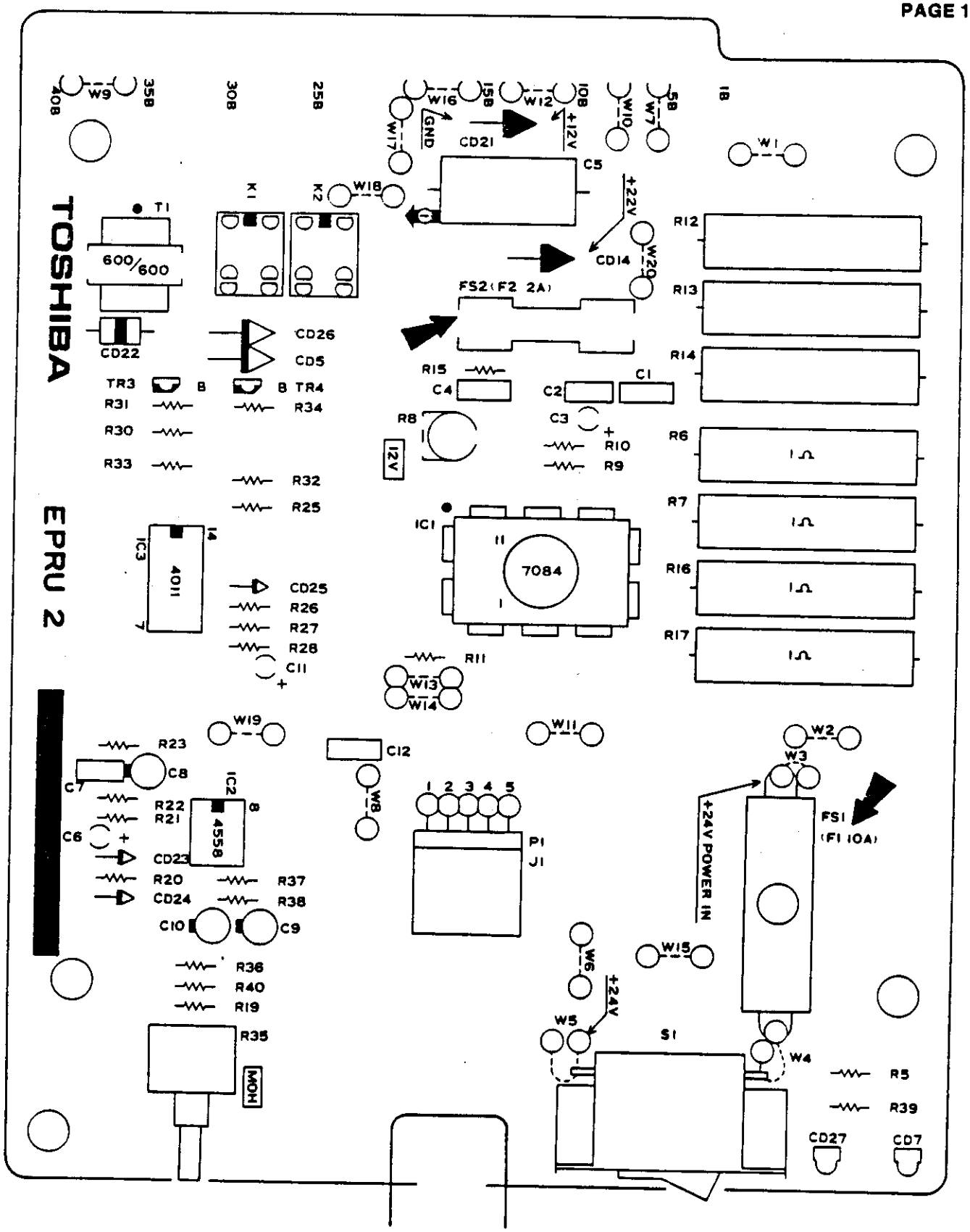


FIGURE 6a—EPRU—PHYSICAL LAYOUT

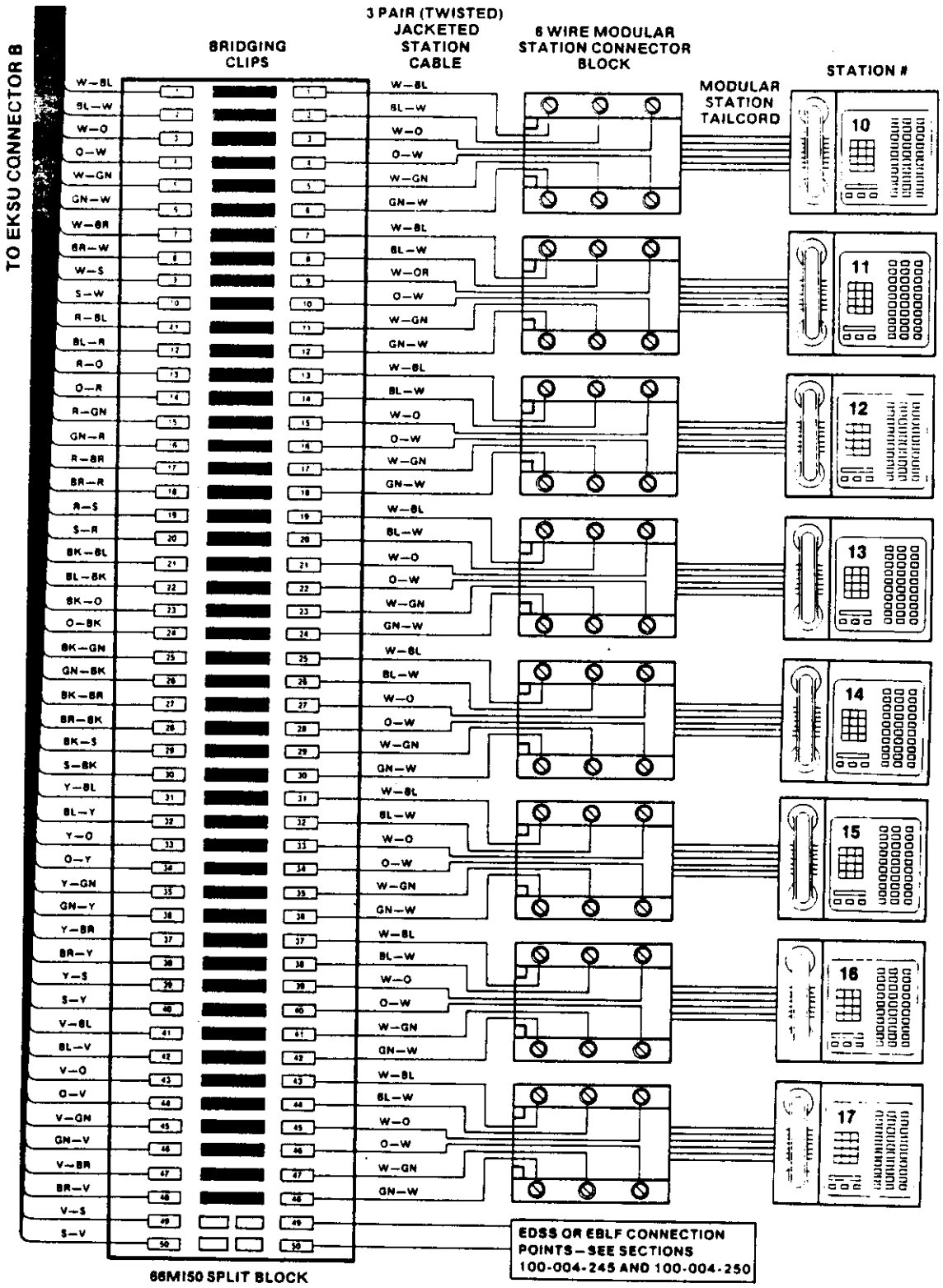


FIGURE 7A – MDF BLOCK 'B' CONNECTION DIAGRAM

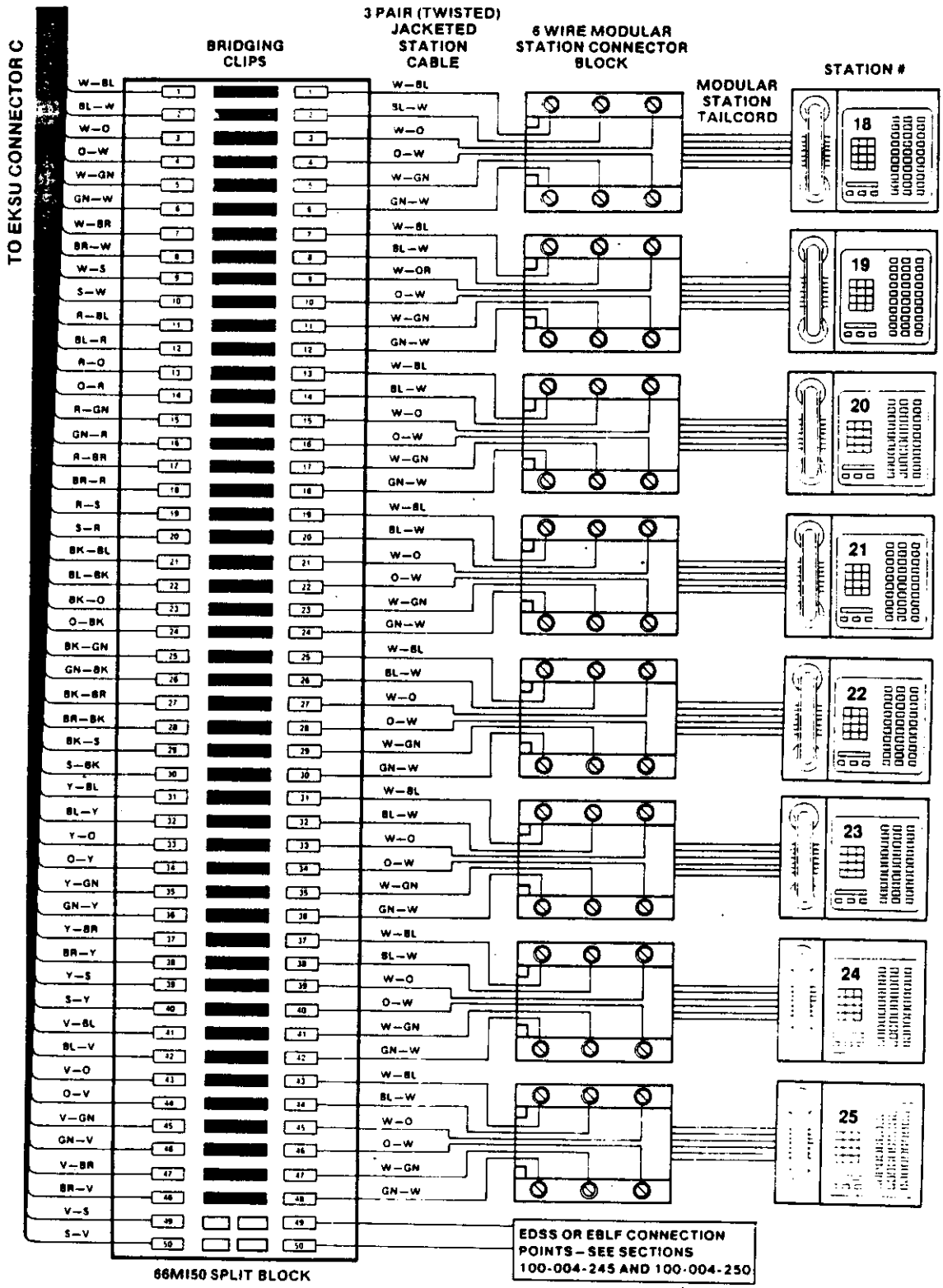


FIGURE 7B – MDF BLOCK 'C' CONNECTION DIAGRAM

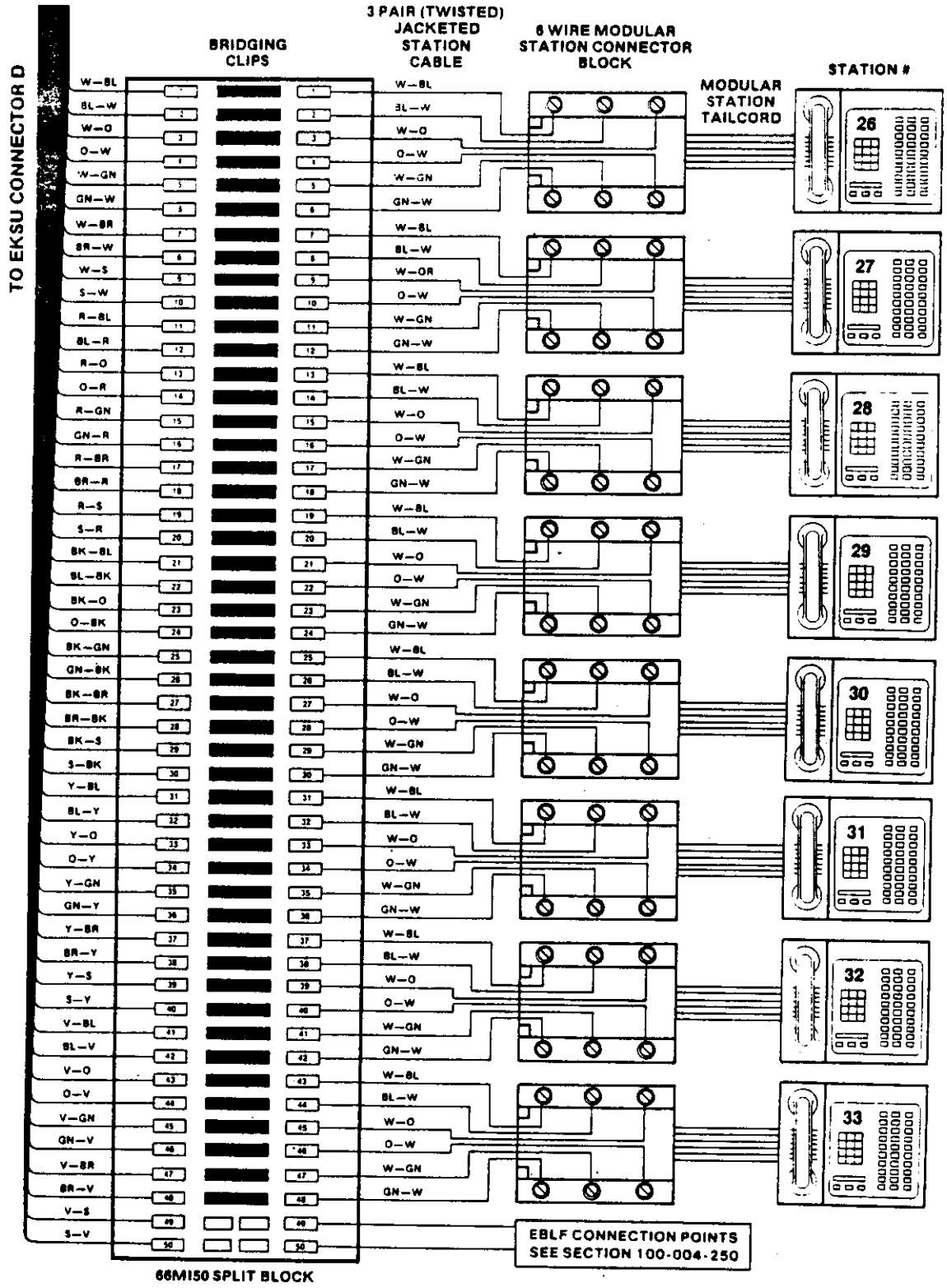


FIGURE 7C—MDF BLOCK 'D' CONNECTION DIAGRAM

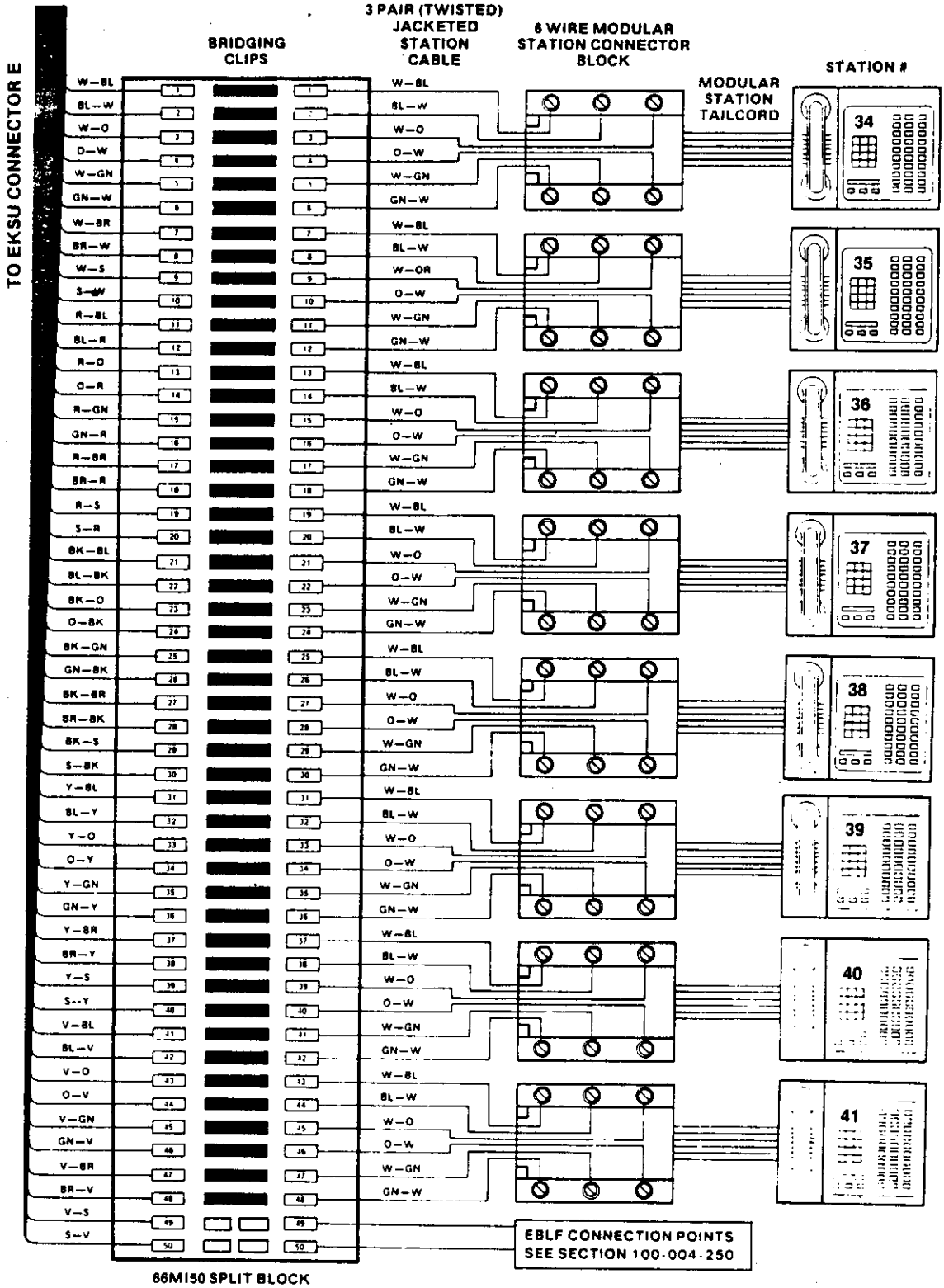


FIGURE 7D—MDF BLOCK 'E' CONNECTION DIAGRAM

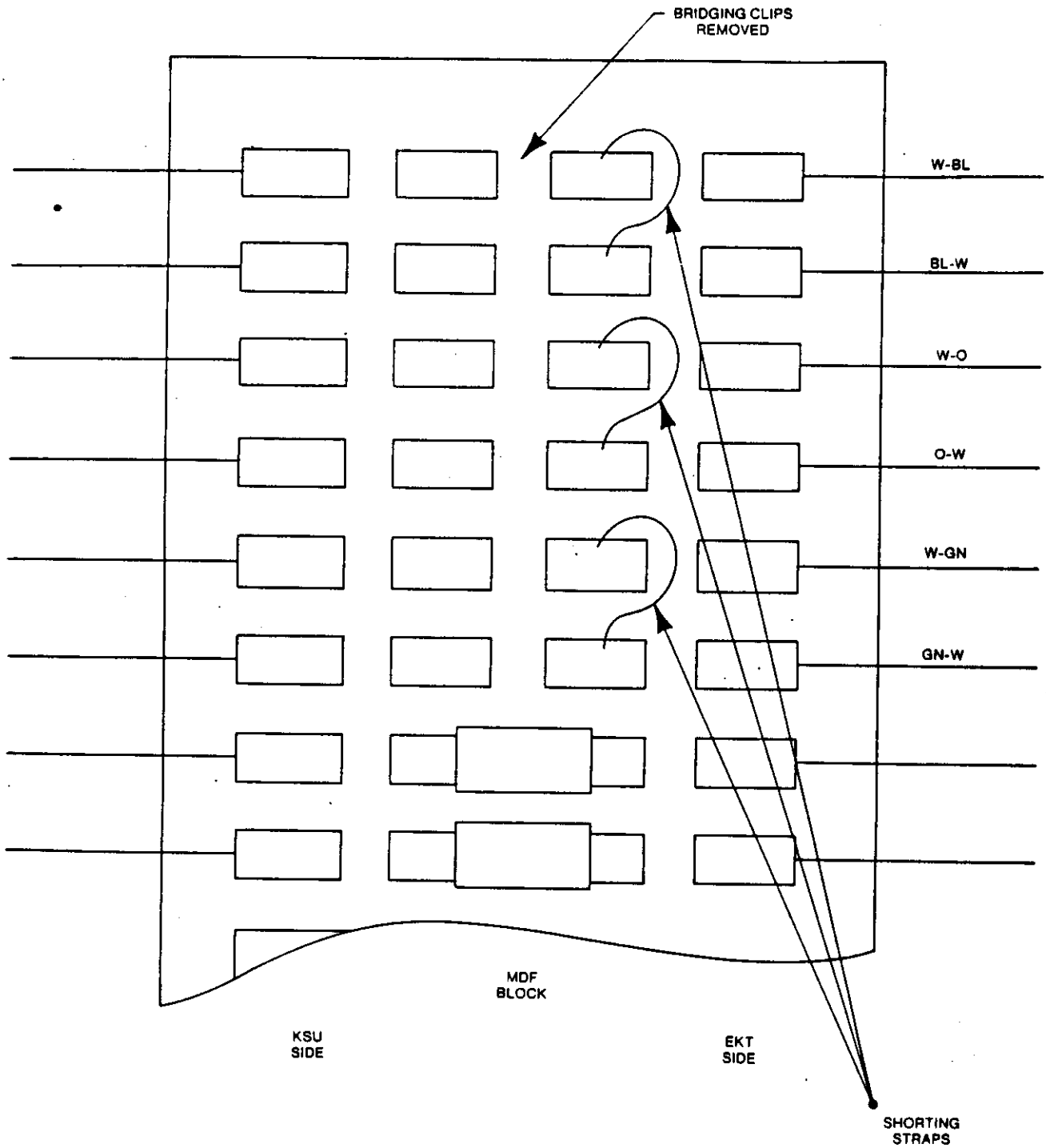


FIGURE 8—CABLE TEST EXAMPLE

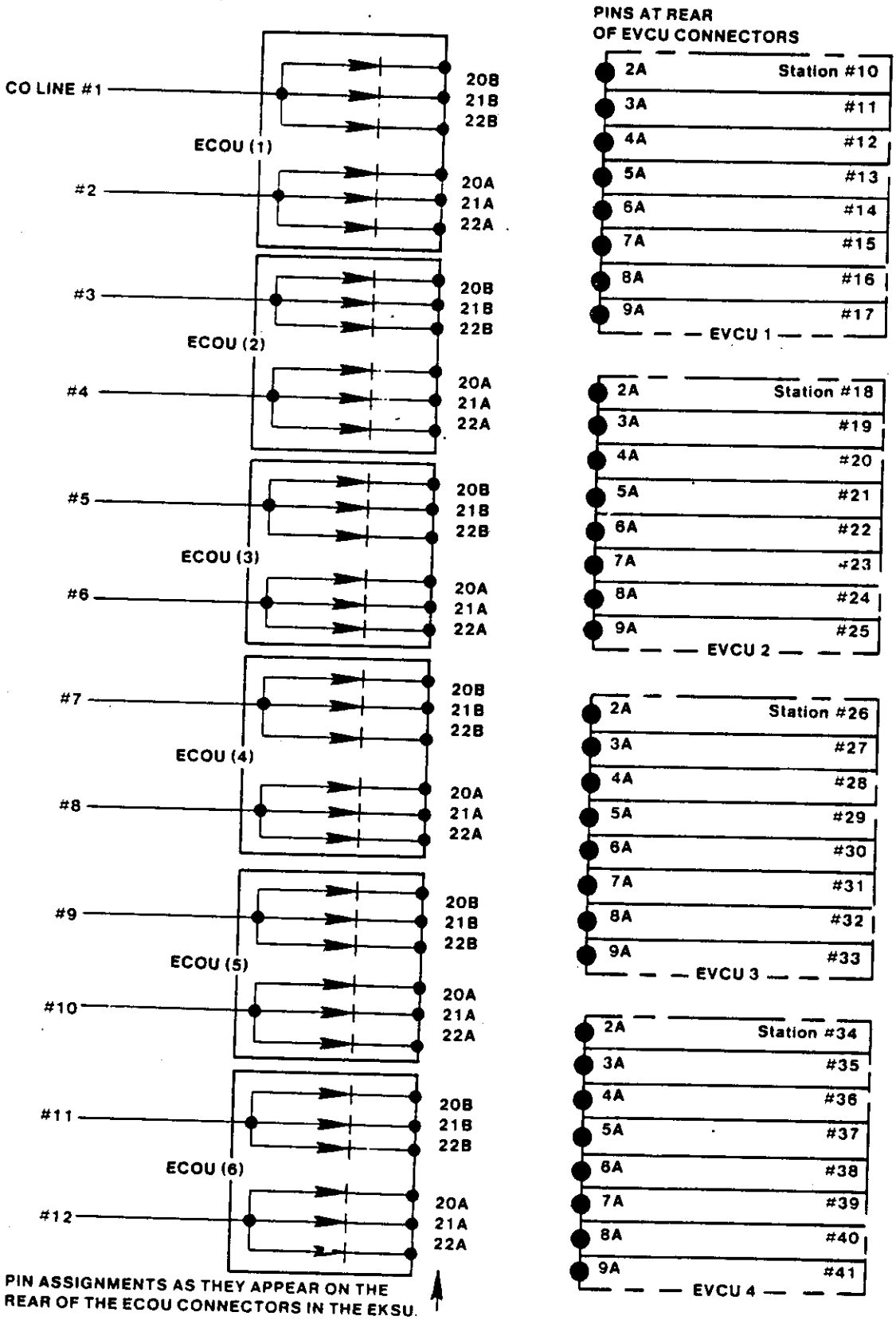


FIGURE 9—C.O. RINGING ASSIGNMENT PINS-NO TRANSFER

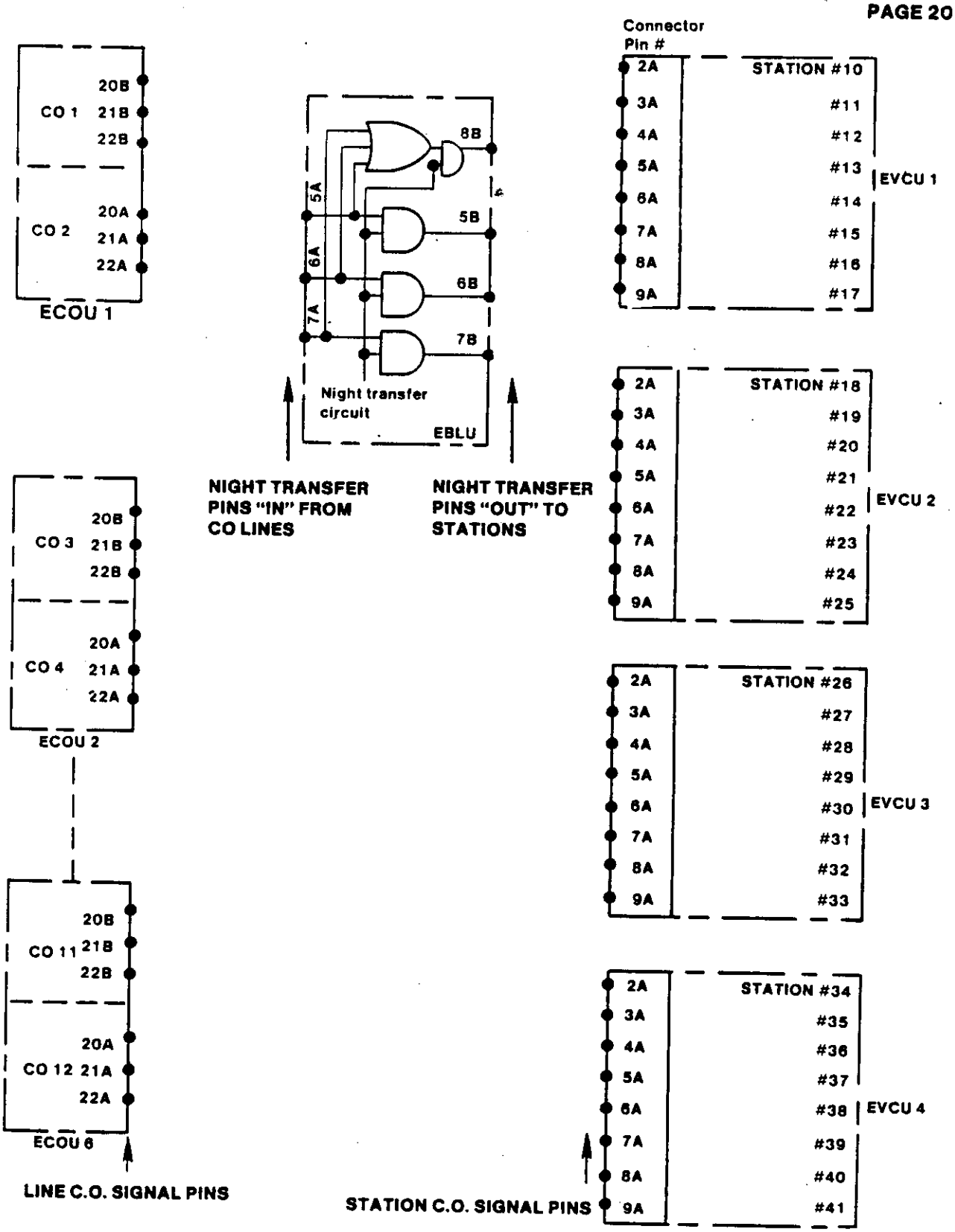


FIGURE 10—C.O. RINGING ASSIGNMENT PINS WITH TRANSFER

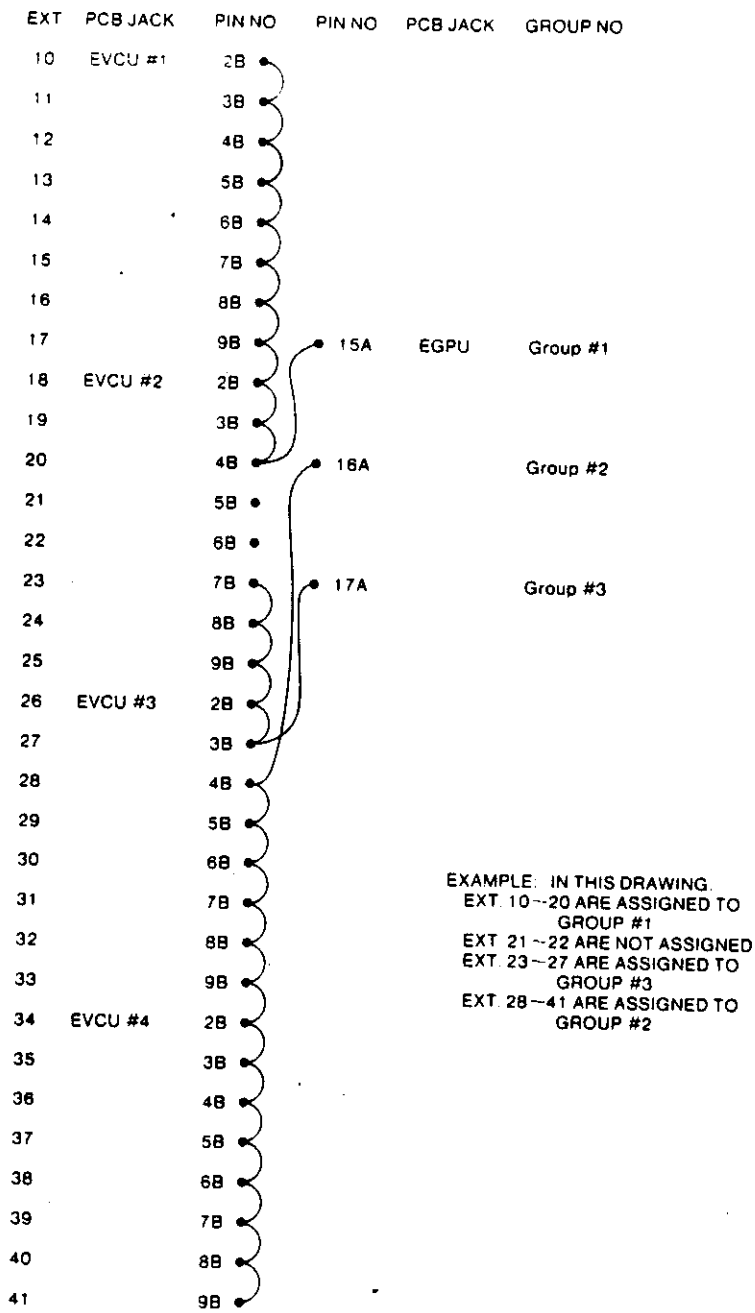


FIGURE 11 – EXAMPLE OF GROUP PAGING ASSIGNMENT

TABLE A—POWER SUPPLY VOLTAGE TEST POINTS

VOLTAGE	TEST POINT	TOLERANCE AC	TOLERANCE BAT
+24V MAIN	EPRU CONNECTOR PIN 1A, 1B (+24V) 40A, 40B (OV)	23-25.5	21-27
+24V ST, BLU	EPRU CONNECTOR PIN 5A, 5B (+24V) 6A, 6B (+24V) 20A, 20B (OV)	23-25.5	21-27
+24V COU, DSU	EPRU CONNECTOR PIN 7A, 7B (+24V) 8A, 8B (+24V) 20A, 20B (OV)	23-25.5	21-27
+12V	EPRU CONNECTOR PIN 10A, 10B (+12V) 20A, 20B (OV)	11.4-12.6	11.4-12.6

PROCEDURE

Connect negative (−) meter lead to the OV pin and the positive (+) meter lead to the +24 or +12 pins.

NOTE: A.C. input tolerance 90-130VAC.

TABLE B—EDSU STRAPPING

EDSU STRAPPING	
EDSU Installed	EDSU not Installed
None	EDSU Socket 8A--8B 9A--9B 5A--5B 6A--6B

TABLE C—EILU STRAPPING

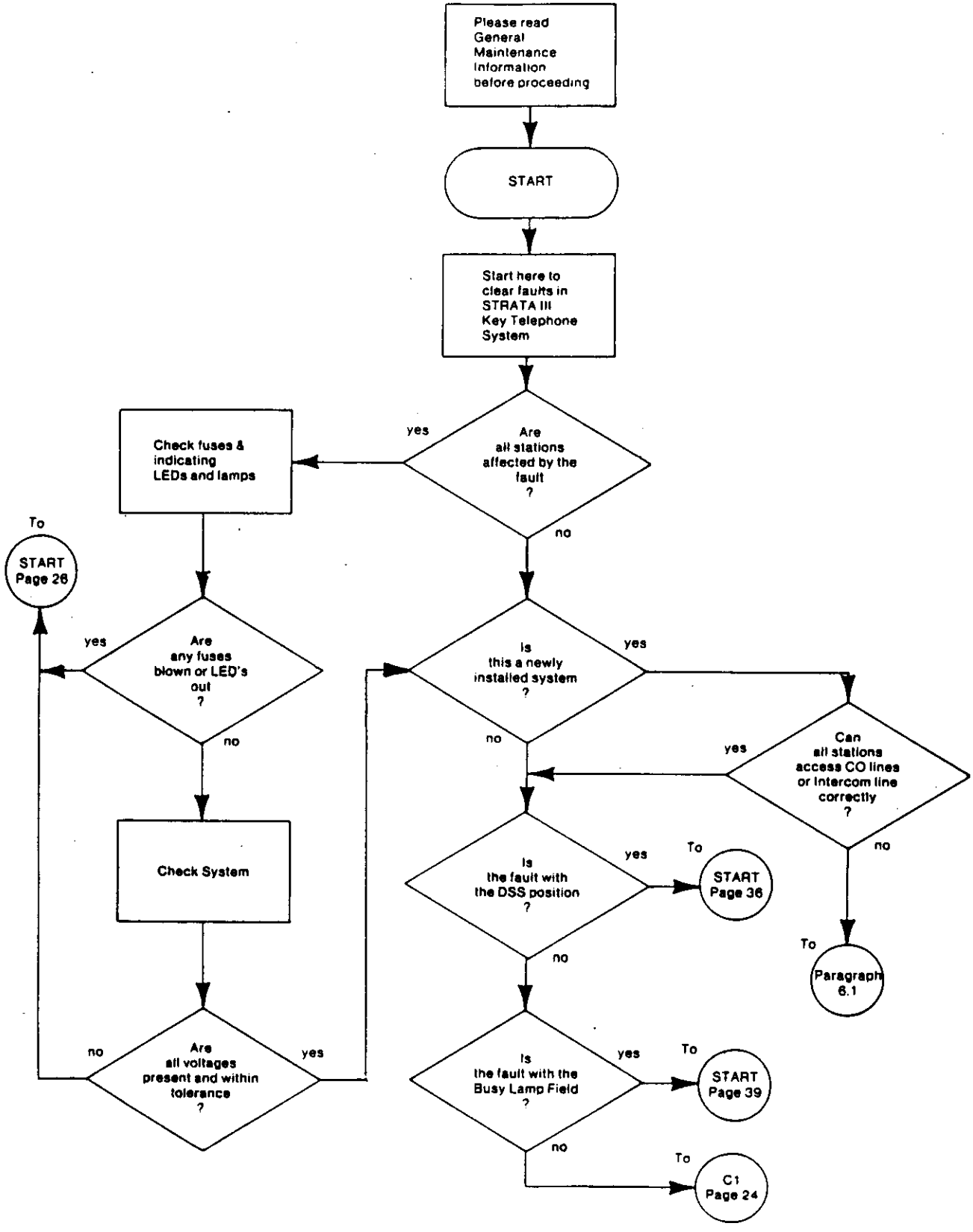
EILU STRAPPING	
EILU Installed	EILU not Installed
None	EILU Socket 21A--21B 22A--22B

TABLE D—EGPU STRAPPING

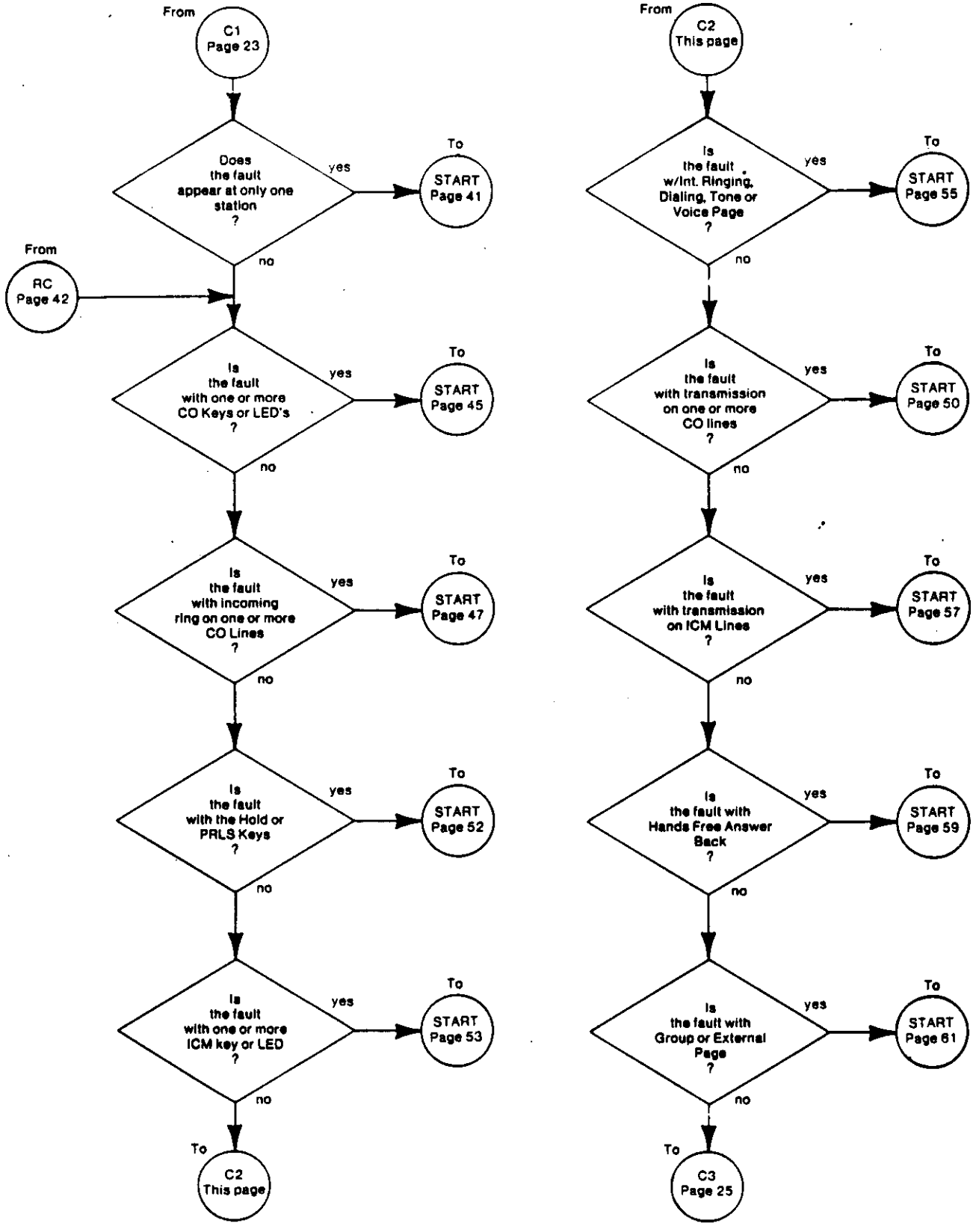
EGPU STRAPPING	
EGPU Equipped	EGPU not Equipped
No Straps	EGPU Jack Pin 5A-5B 6A-6B 7A-7B 20A-20B

TABLE E - EBLU STRAPPING

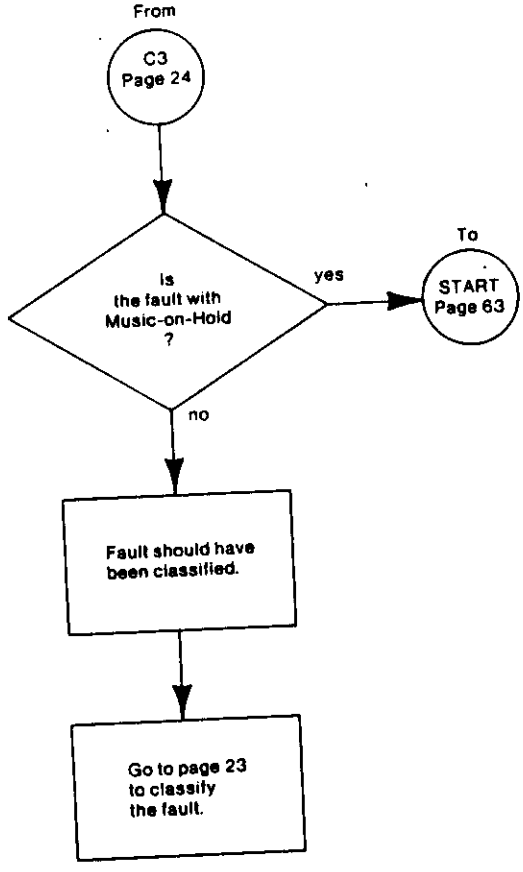
EBLU STRAPPING	
EBLU Equipped	EBLU not Equipped
No Straps	Strap EBLU Connector Pins 5A - 8B



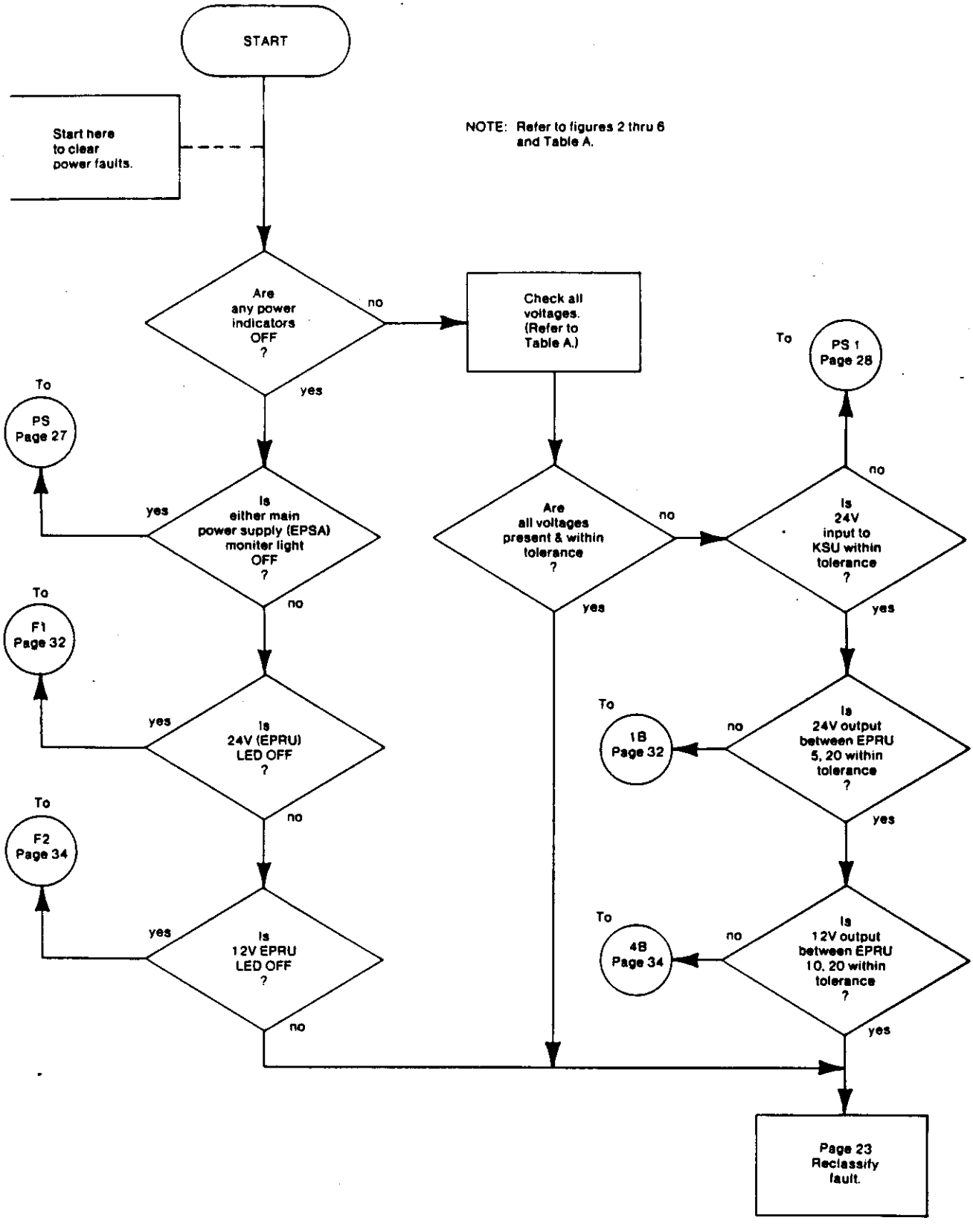
FLOW CHART 6.2—FAULT CLASSIFICATION



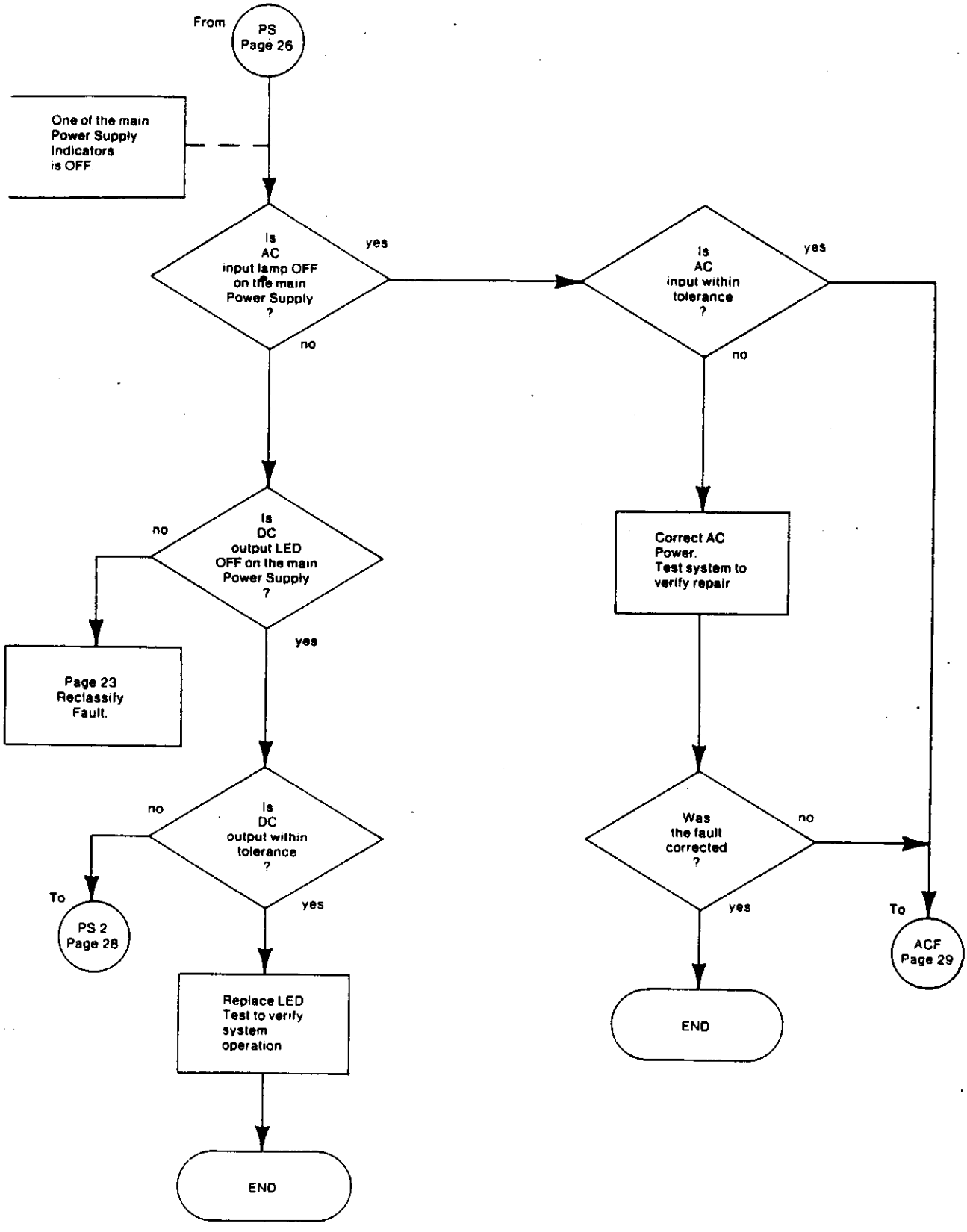
FLOW CHART 6.2.1 — FAULT CLASSIFICATION (Cont)



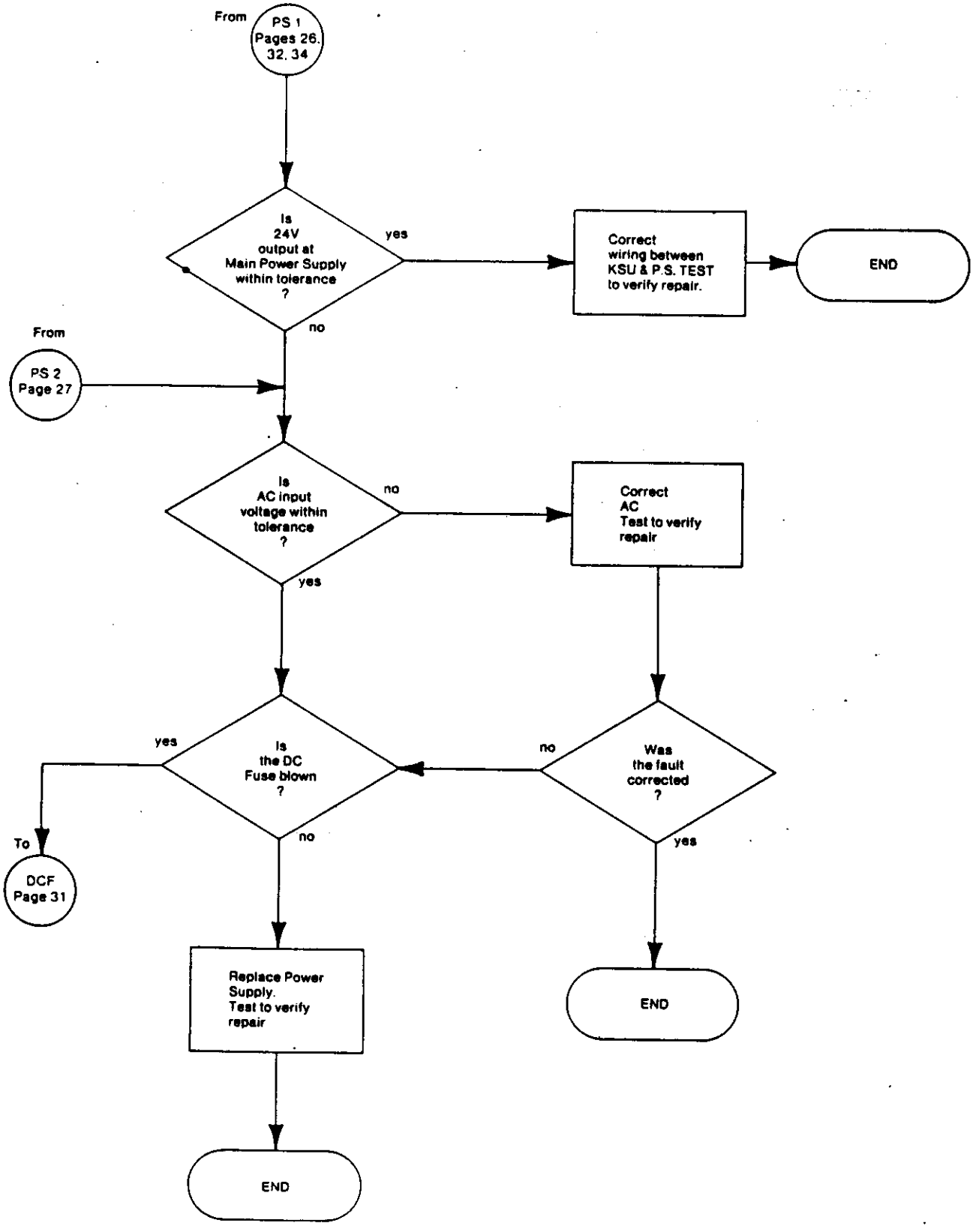
FLOW CHART 6.2.2—FAULT CLASSIFICATION (Cont)



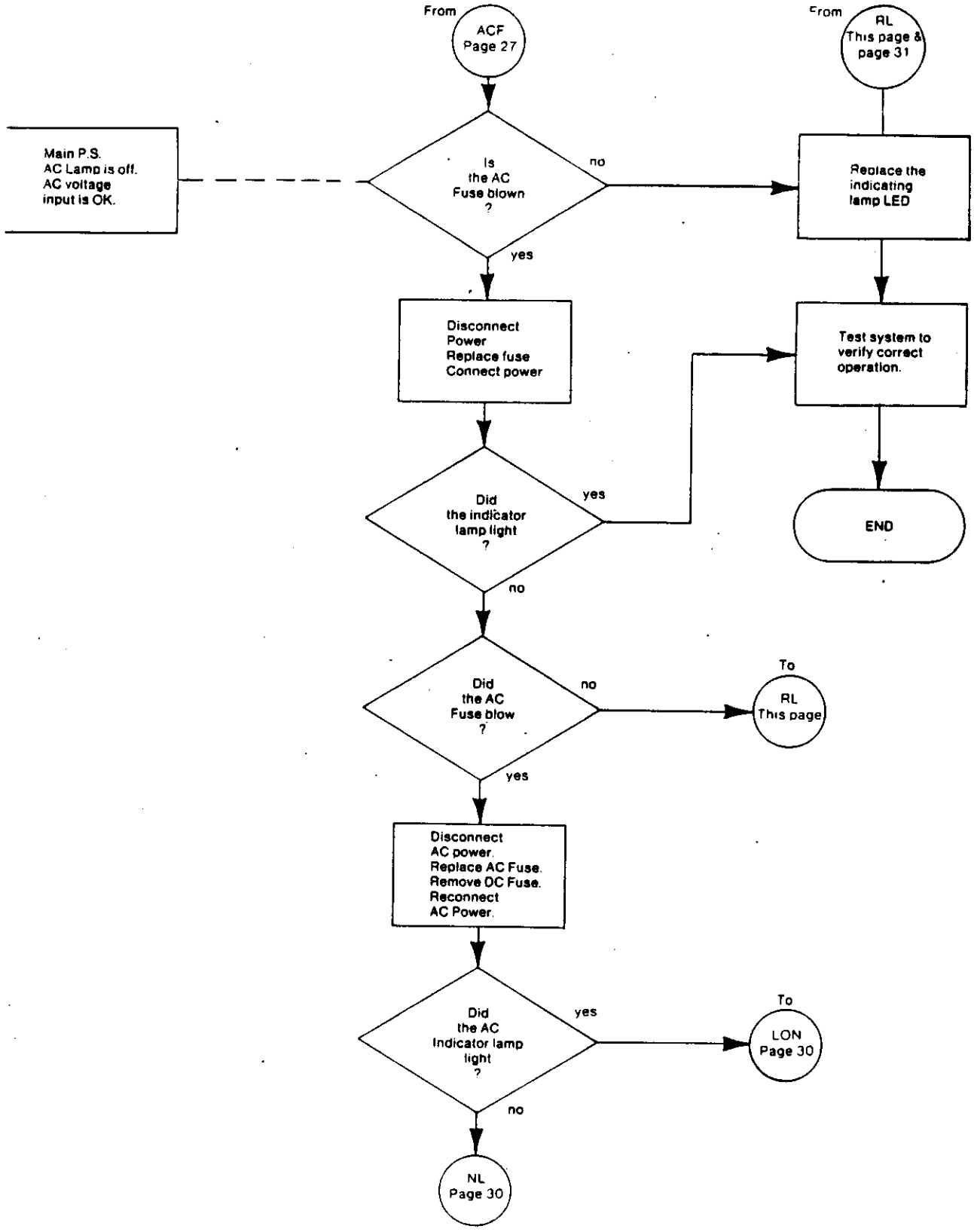
FLOW CHART 6.3—POWER FAULTS



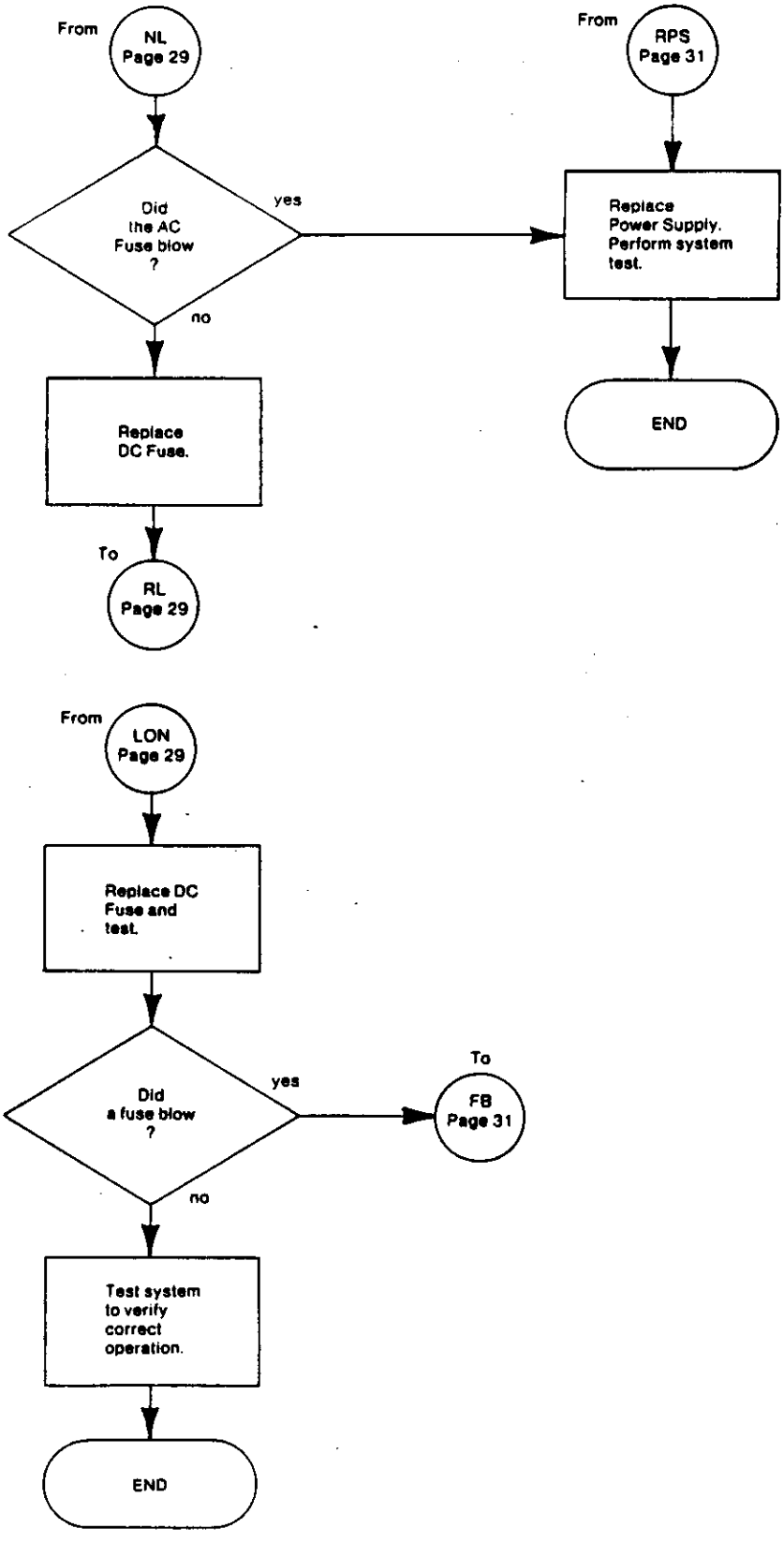
FLOW CHART 6.3.1 – POWER FAULTS (Cont)



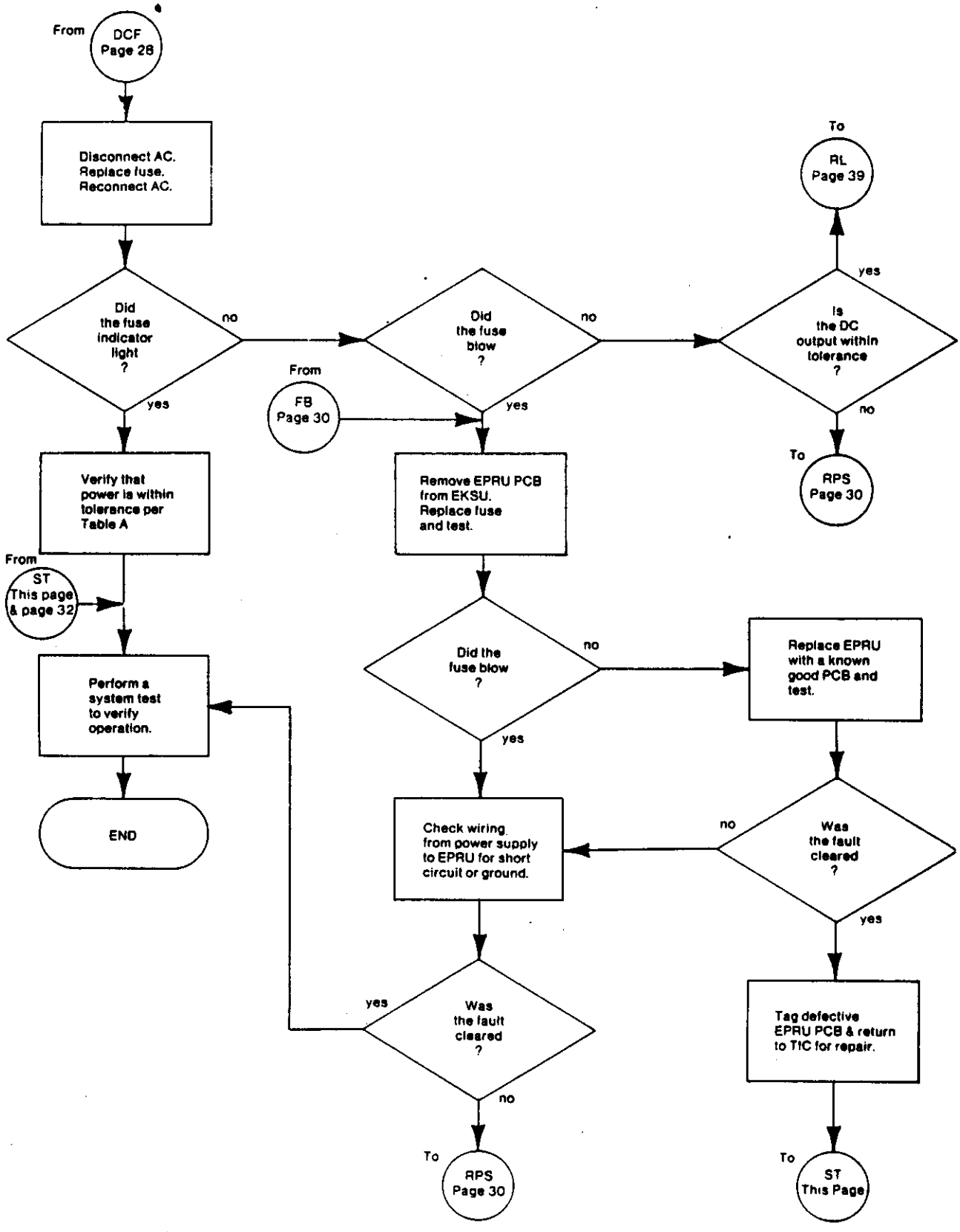
FLOW CHART 6.3.2—POWER FAULTS (Cont)



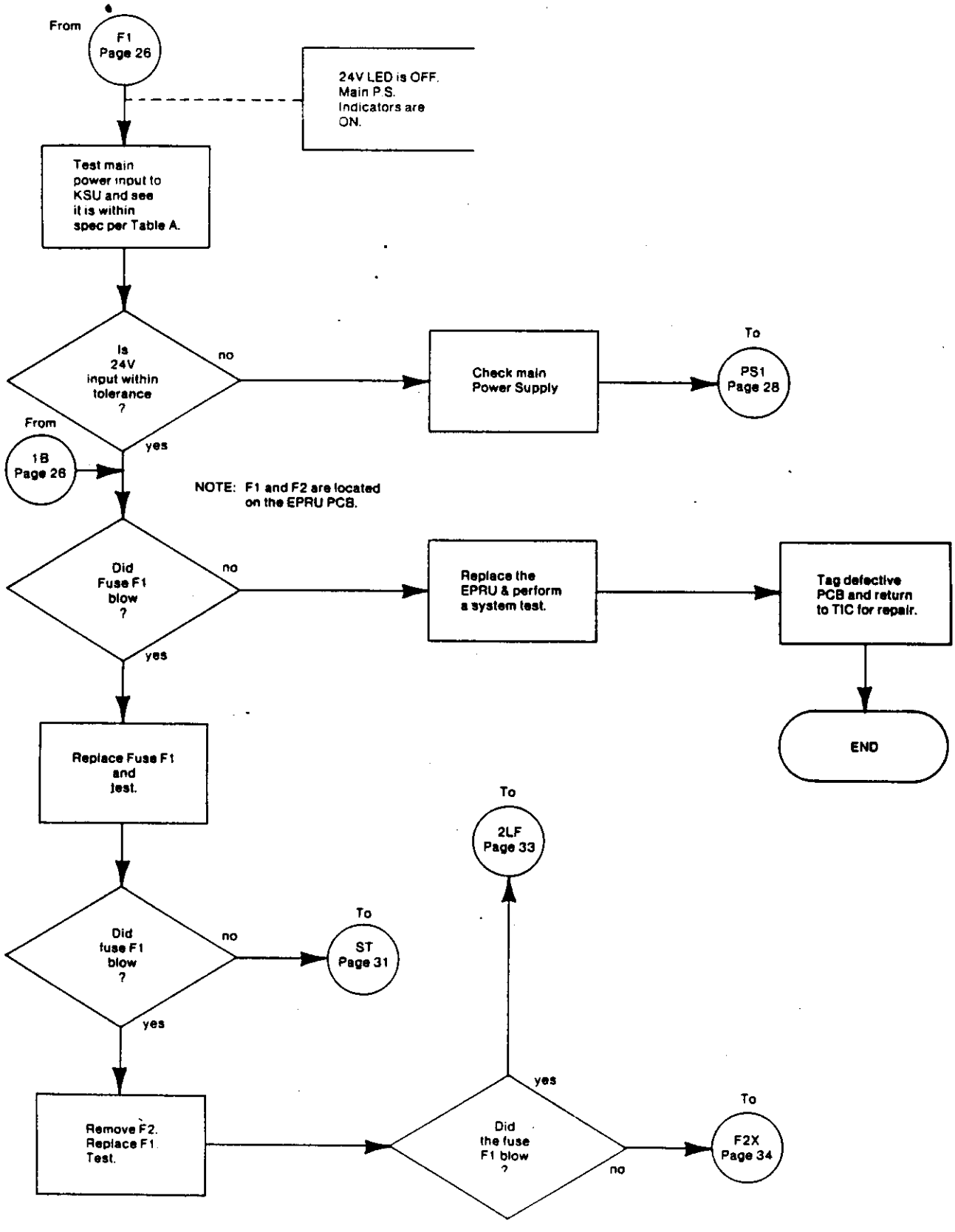
FLOW CHART 6.3.3—POWER FAULTS (Cont)



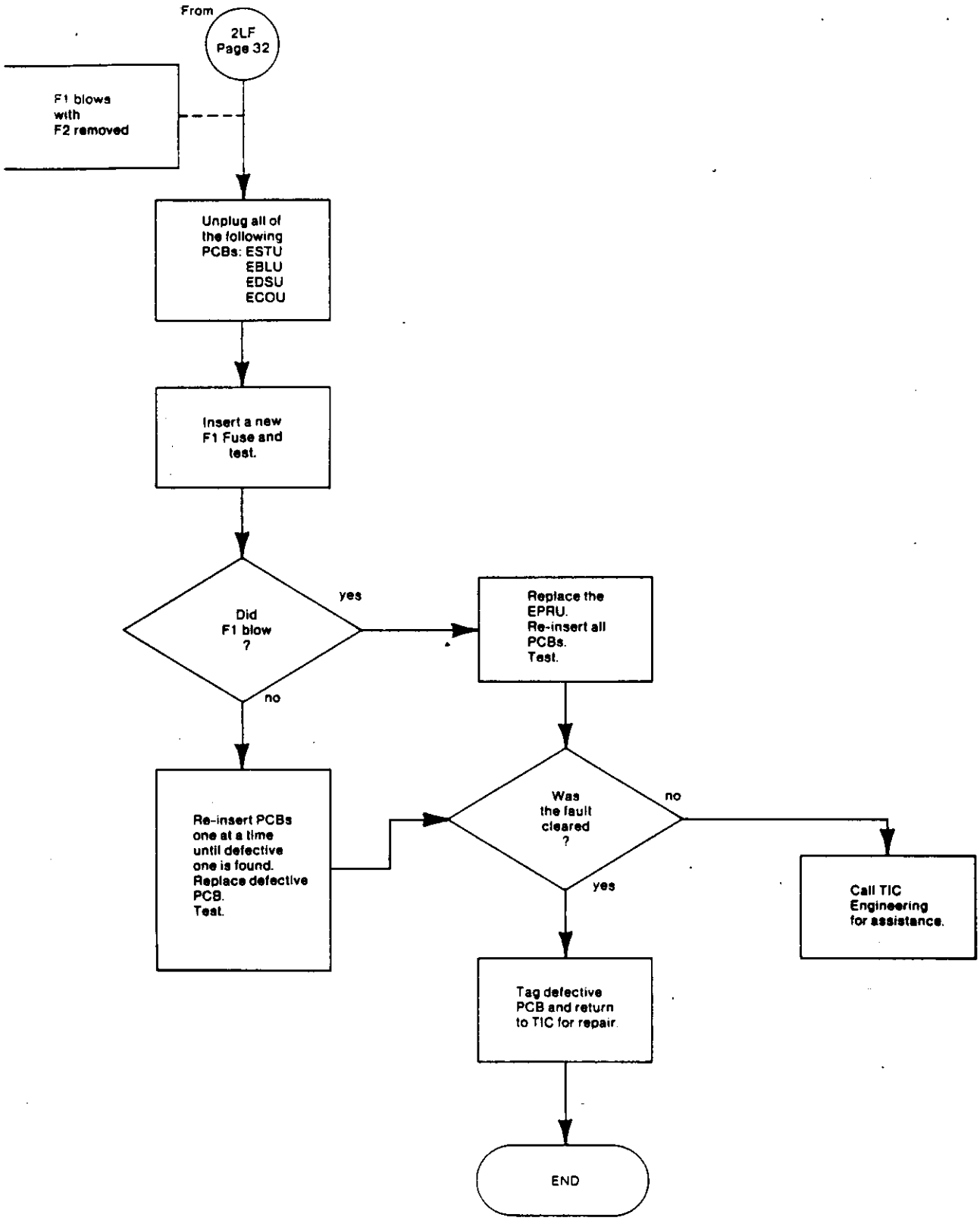
FLOW CHART 6.3.4—POWER FAULTS (Cont)



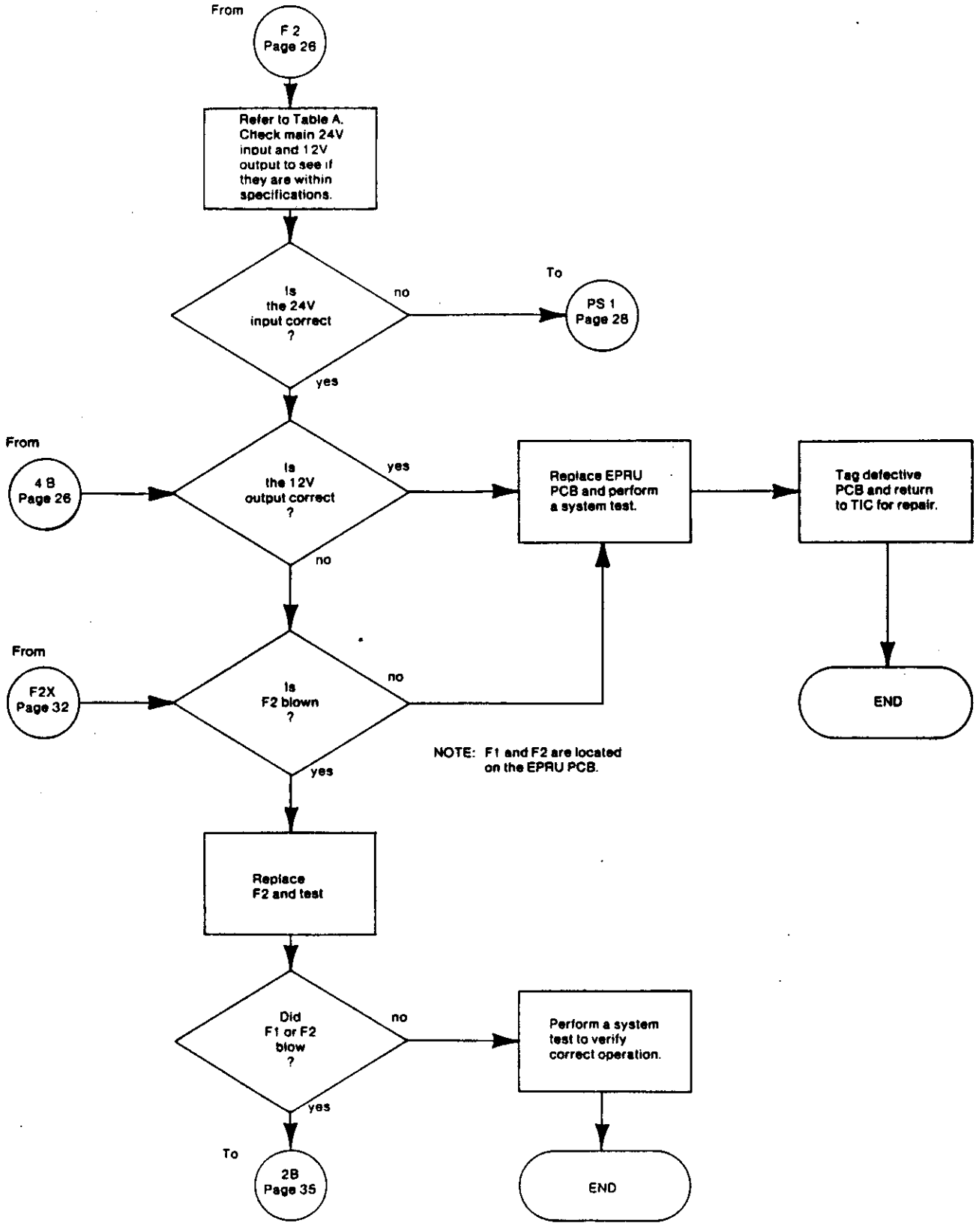
FLOW CHART 6.3.5—POWER FAULTS (Cont)



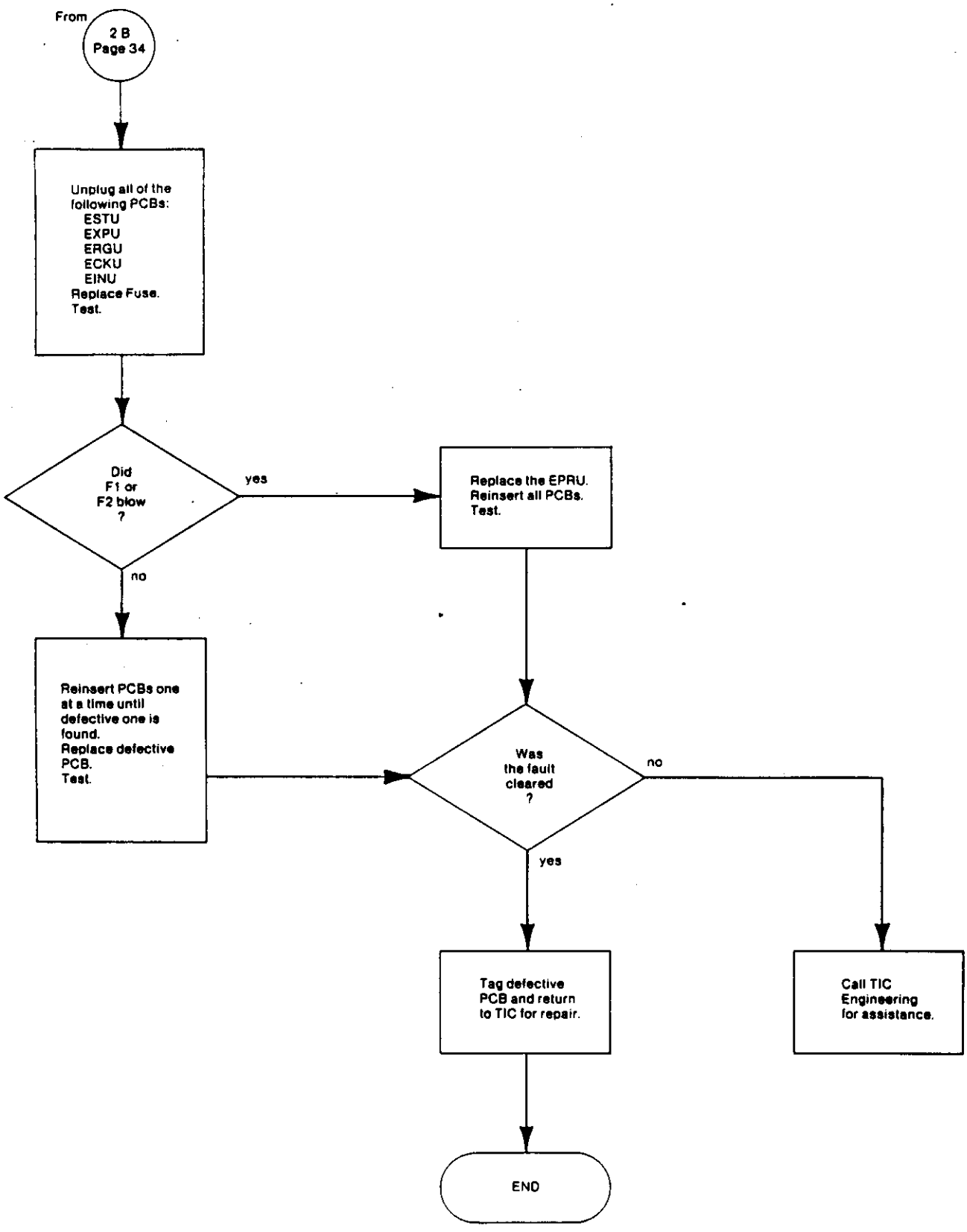
FLOW CHART 6.3.6—POWER FAULTS (Cont)



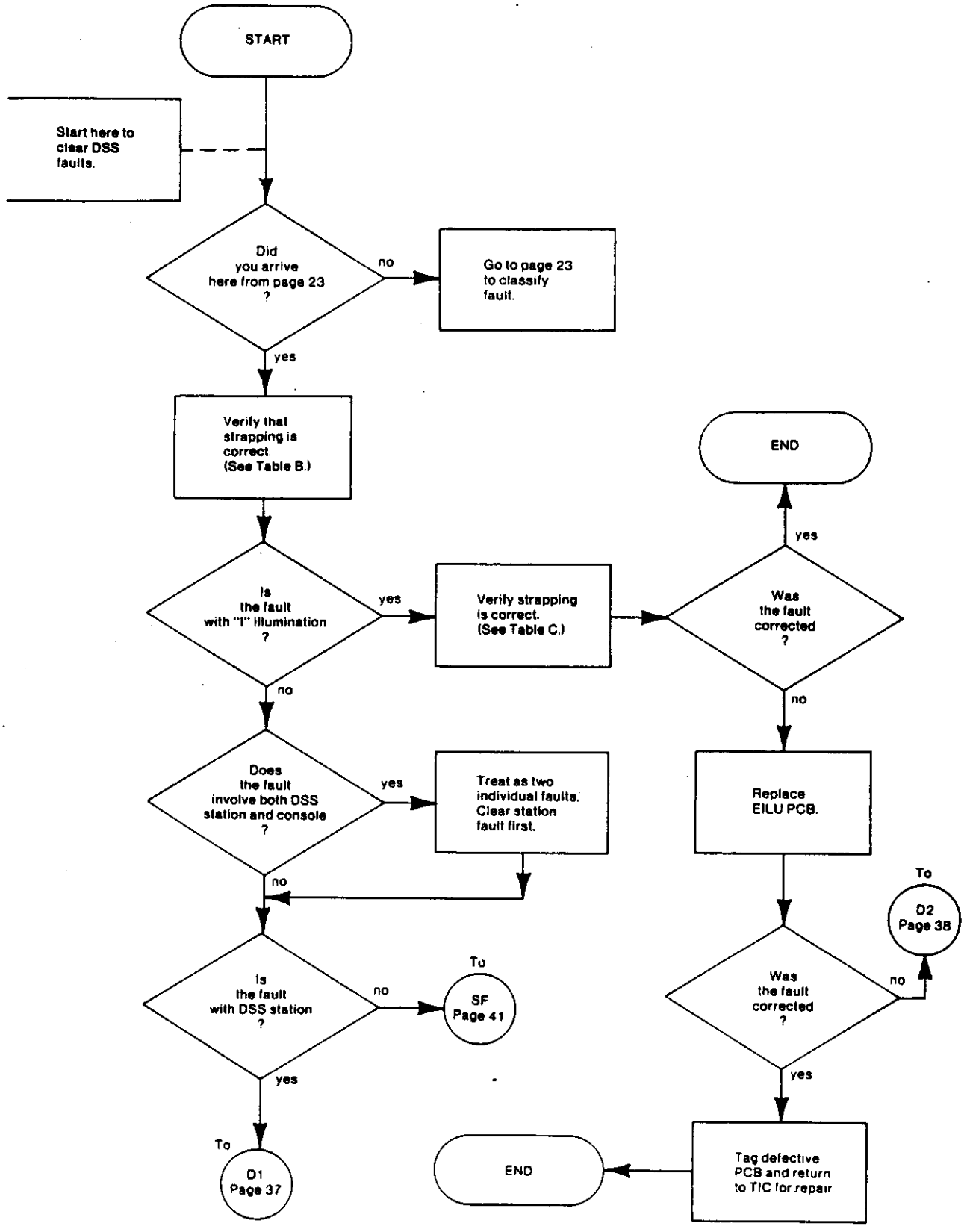
FLOW CHART 6.3.7—POWER FAULTS (Cont)



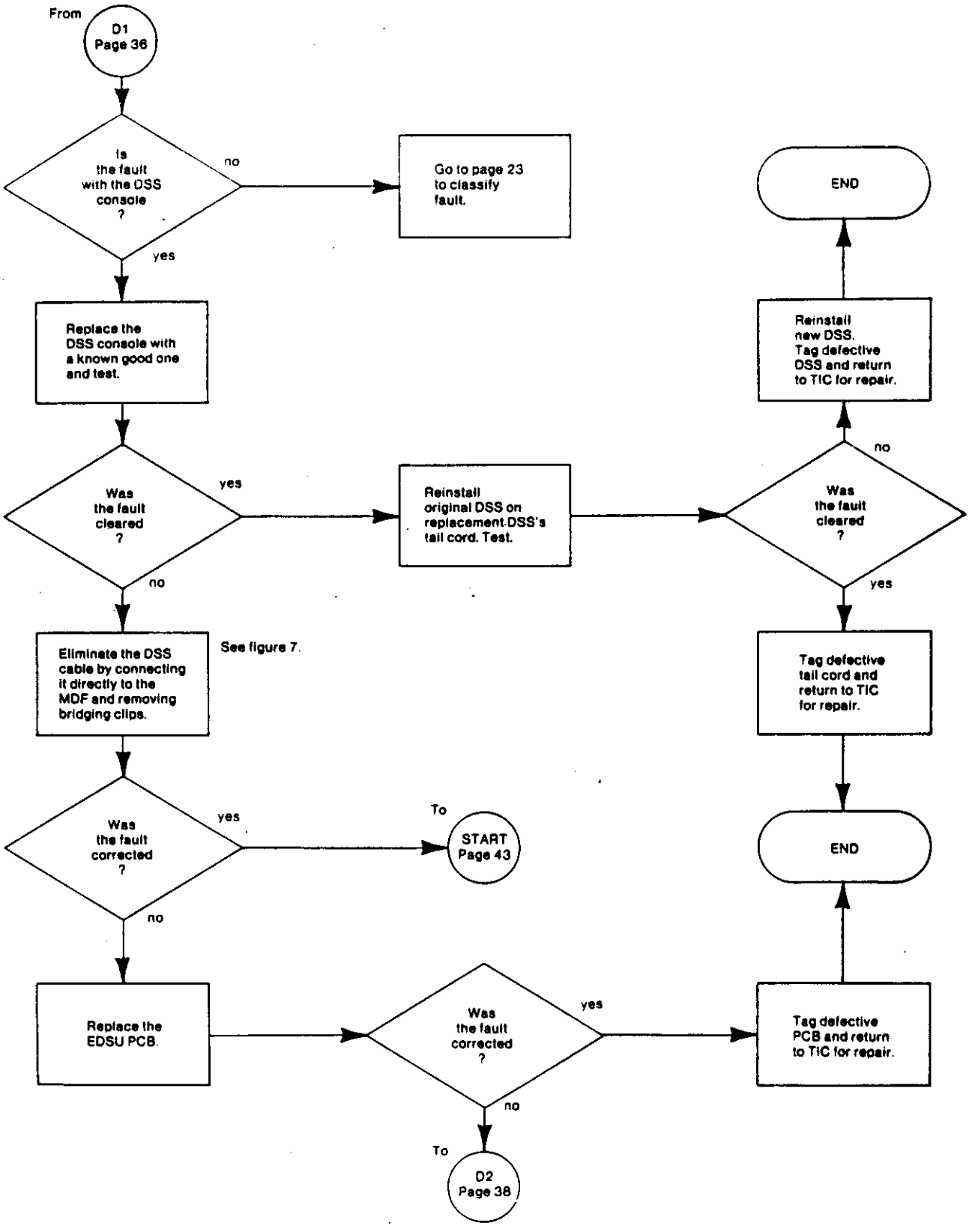
FLOW CHART 6.3.8—POWER FAULTS (Cont)



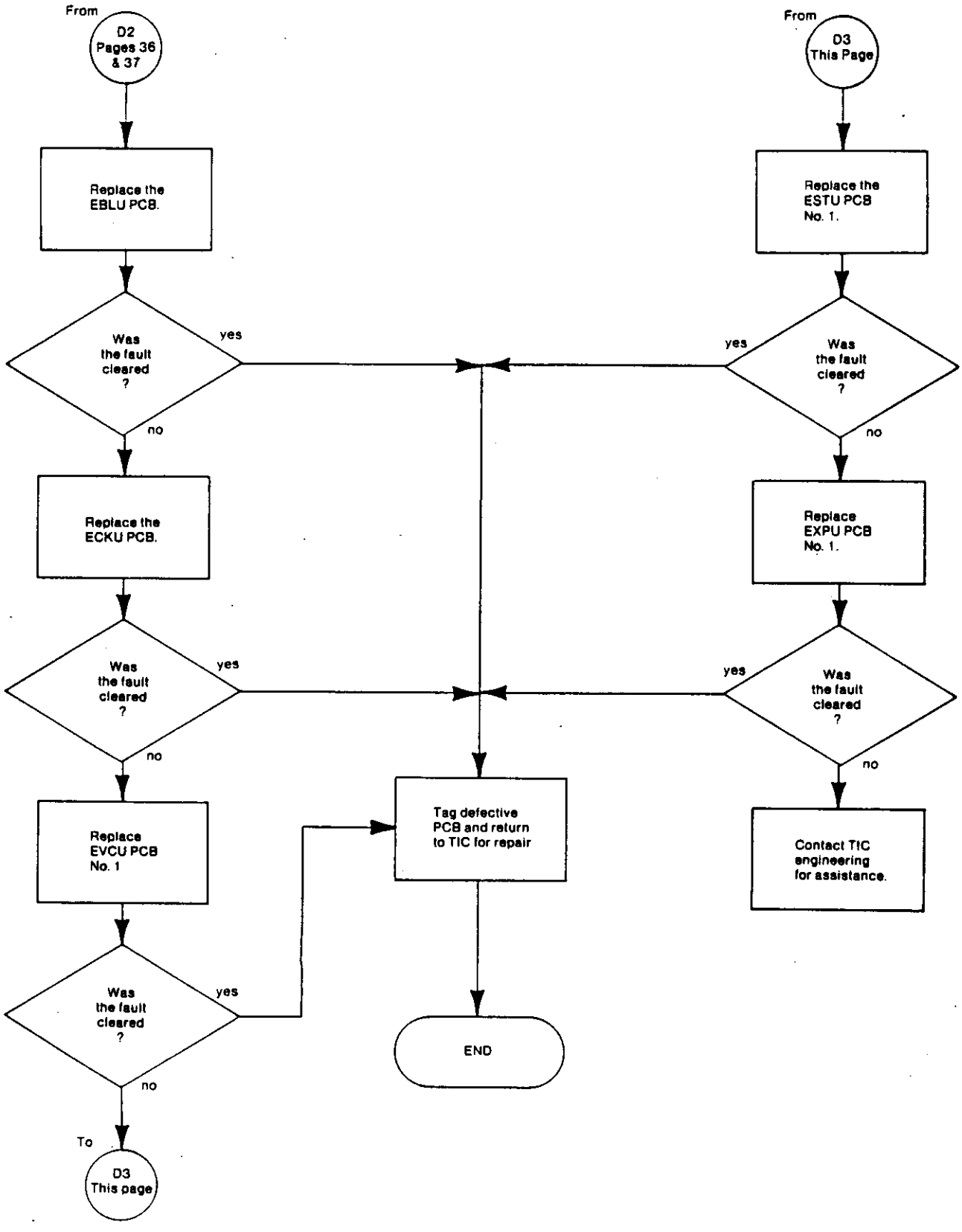
FLOW CHART 6.3.9—POWER FAULTS (Cont)



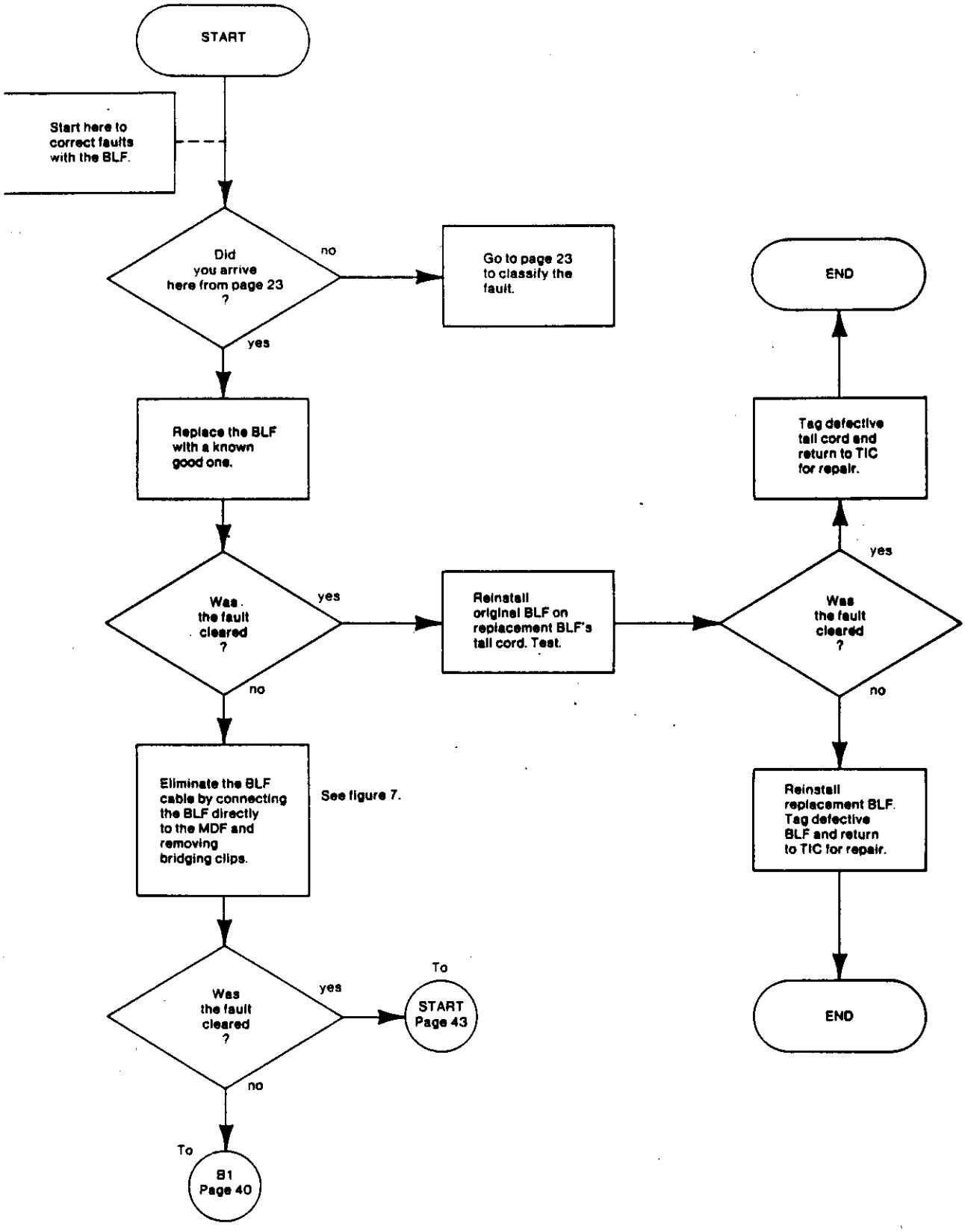
FLOW CHART 6.4—DSS FAULTS



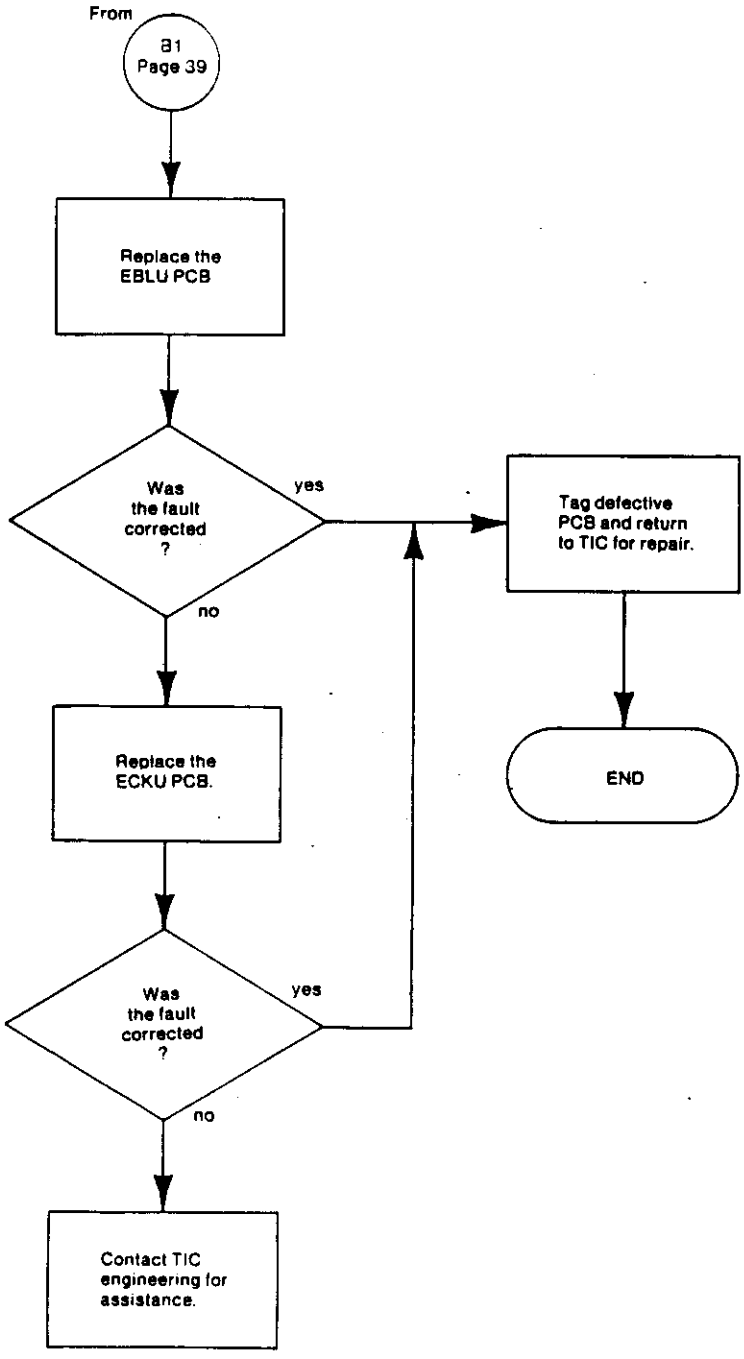
FLOW CHART 6.4.1 – DSS FAULTS (Cont)



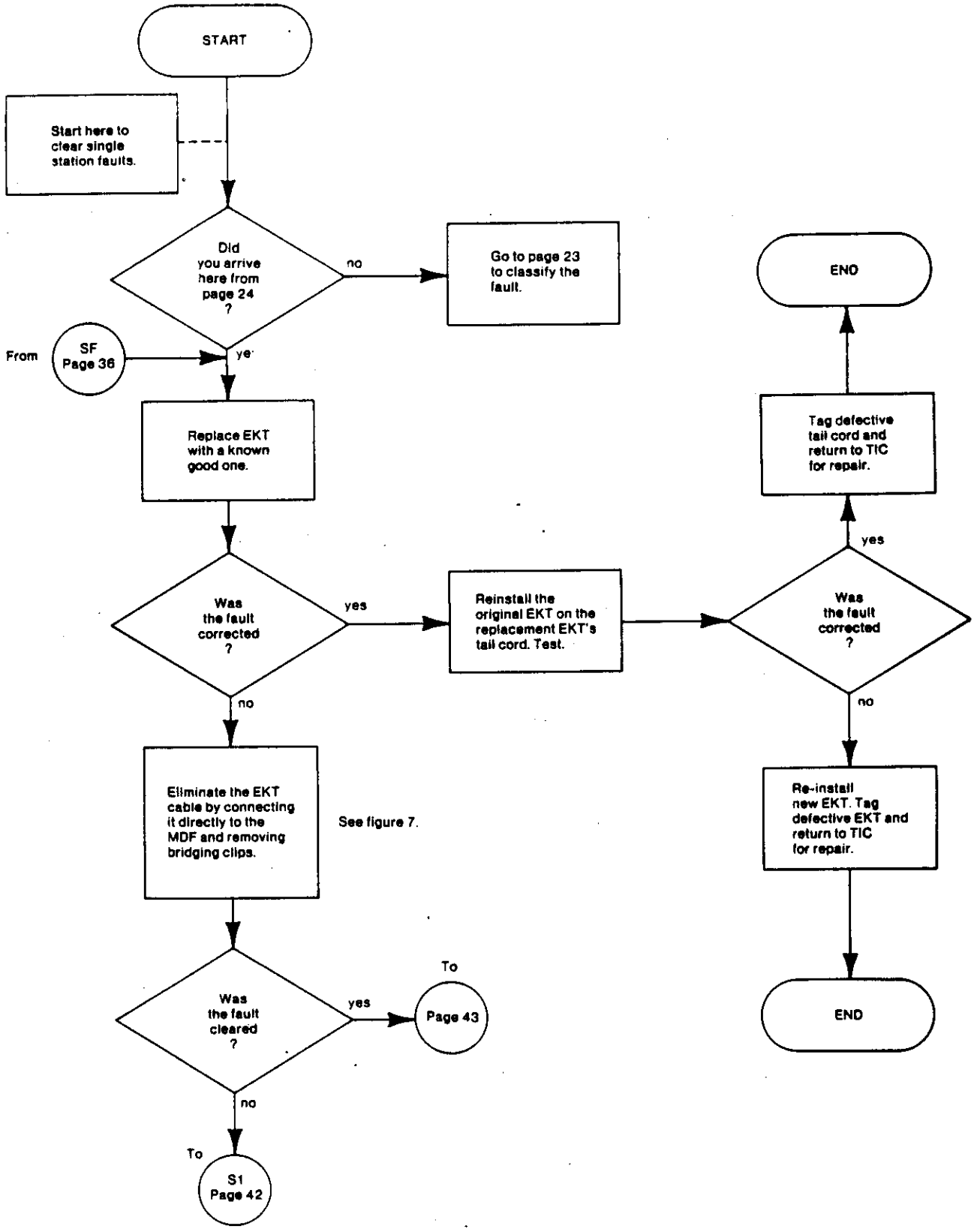
FLOW CHART 6.4.2—DSS FAULTS (Cont)



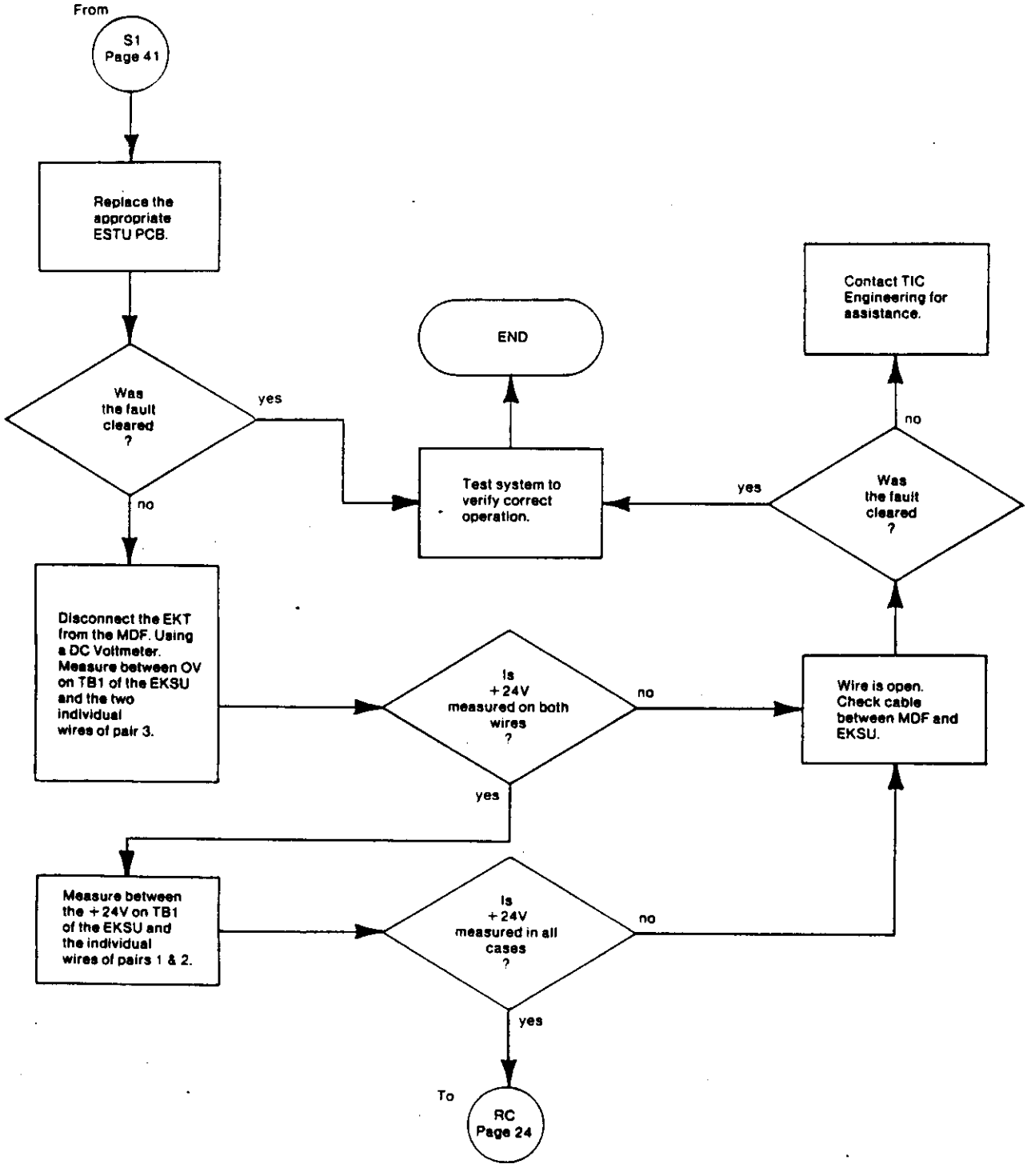
FLOW CHART 6.5—BLF FAULTS



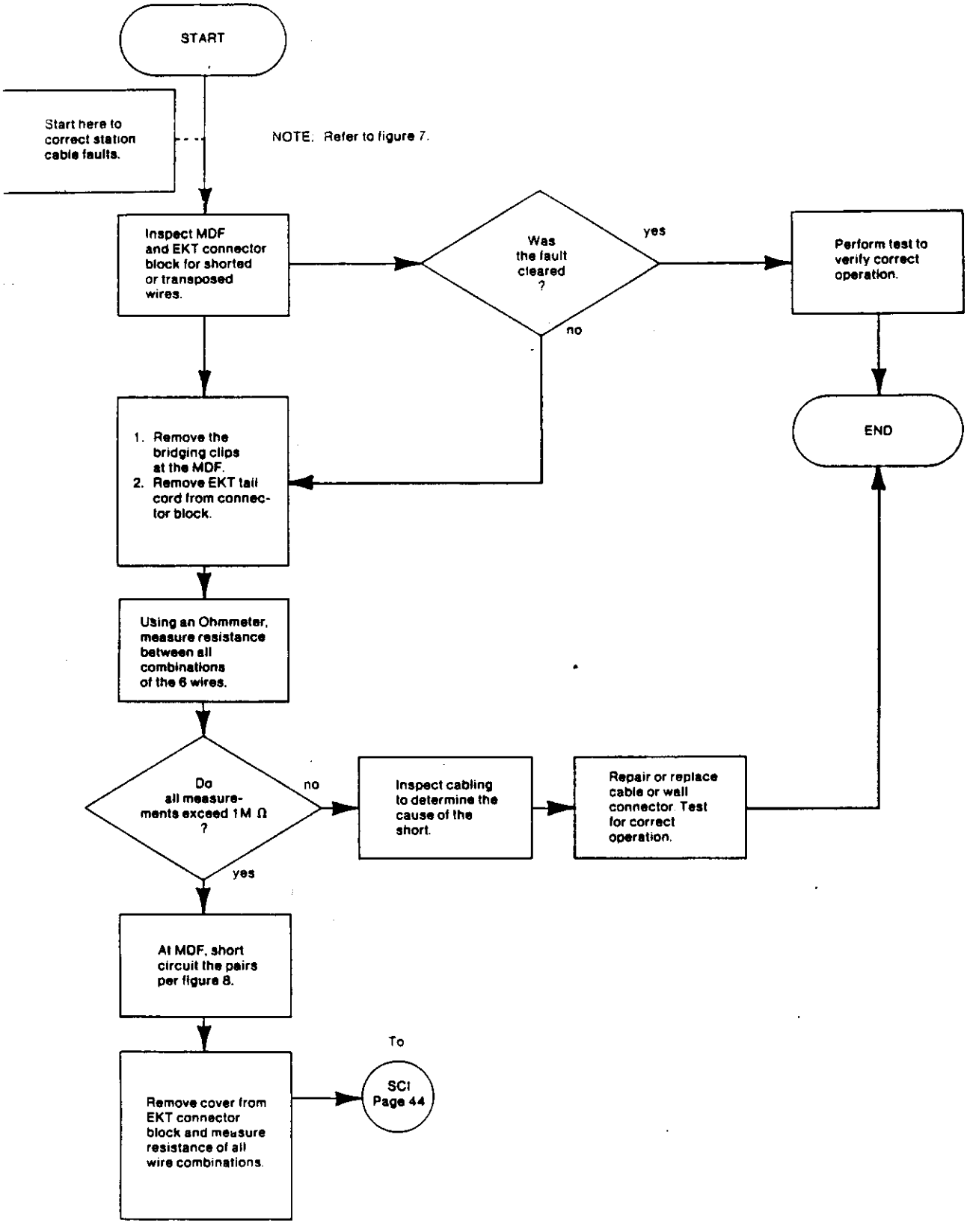
FLOW CHART 6.5.1 – BLF FAULTS (CONT)



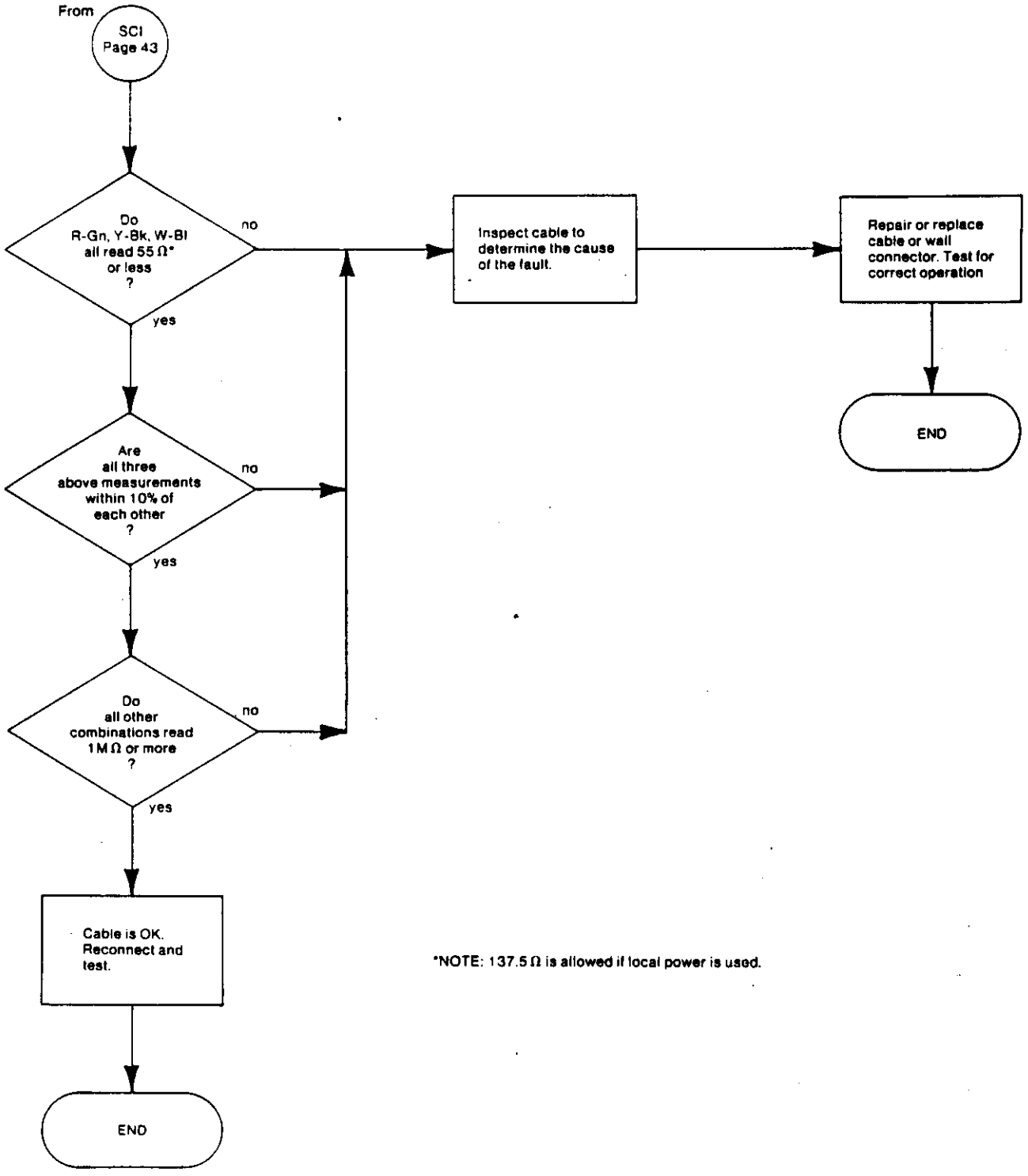
FLOW CHART 6.6—SINGLE STATION FAULTS



FLOW CHART 6.6.1 – SINGLE STATION FAULTS (CONT)

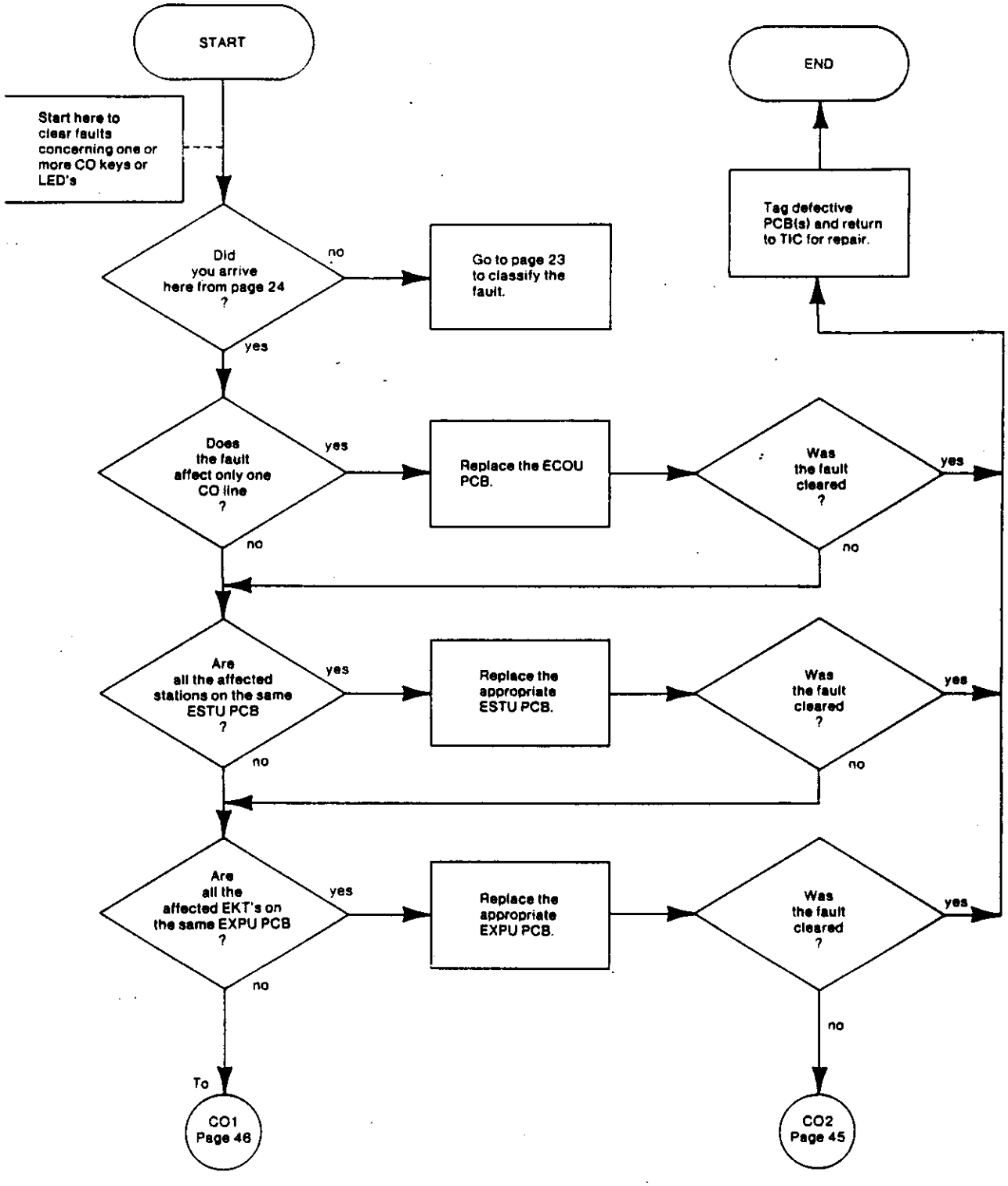


FLOW CHART 6.7—CABLE FAULTS

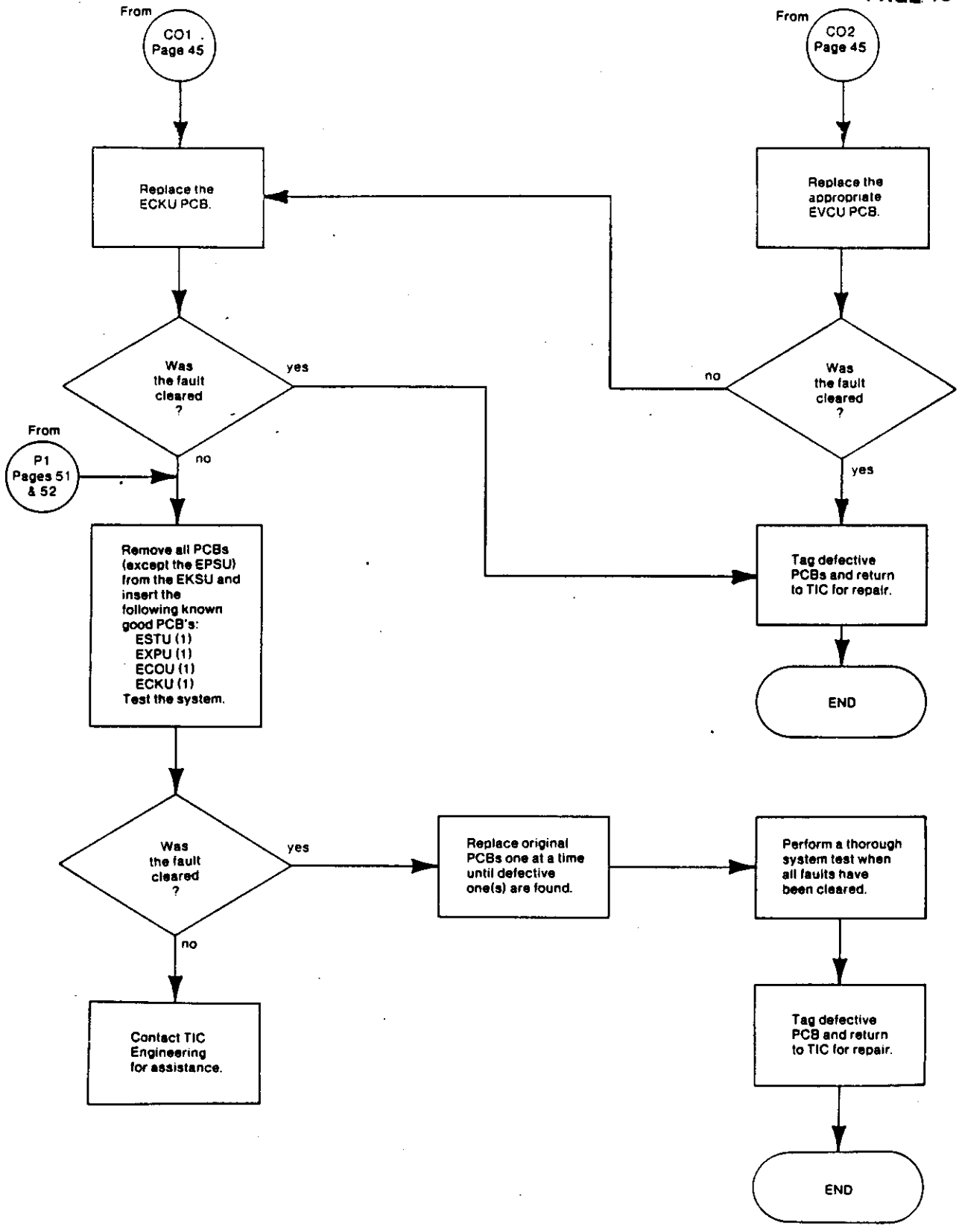


*NOTE: 137.5 Ω is allowed if local power is used.

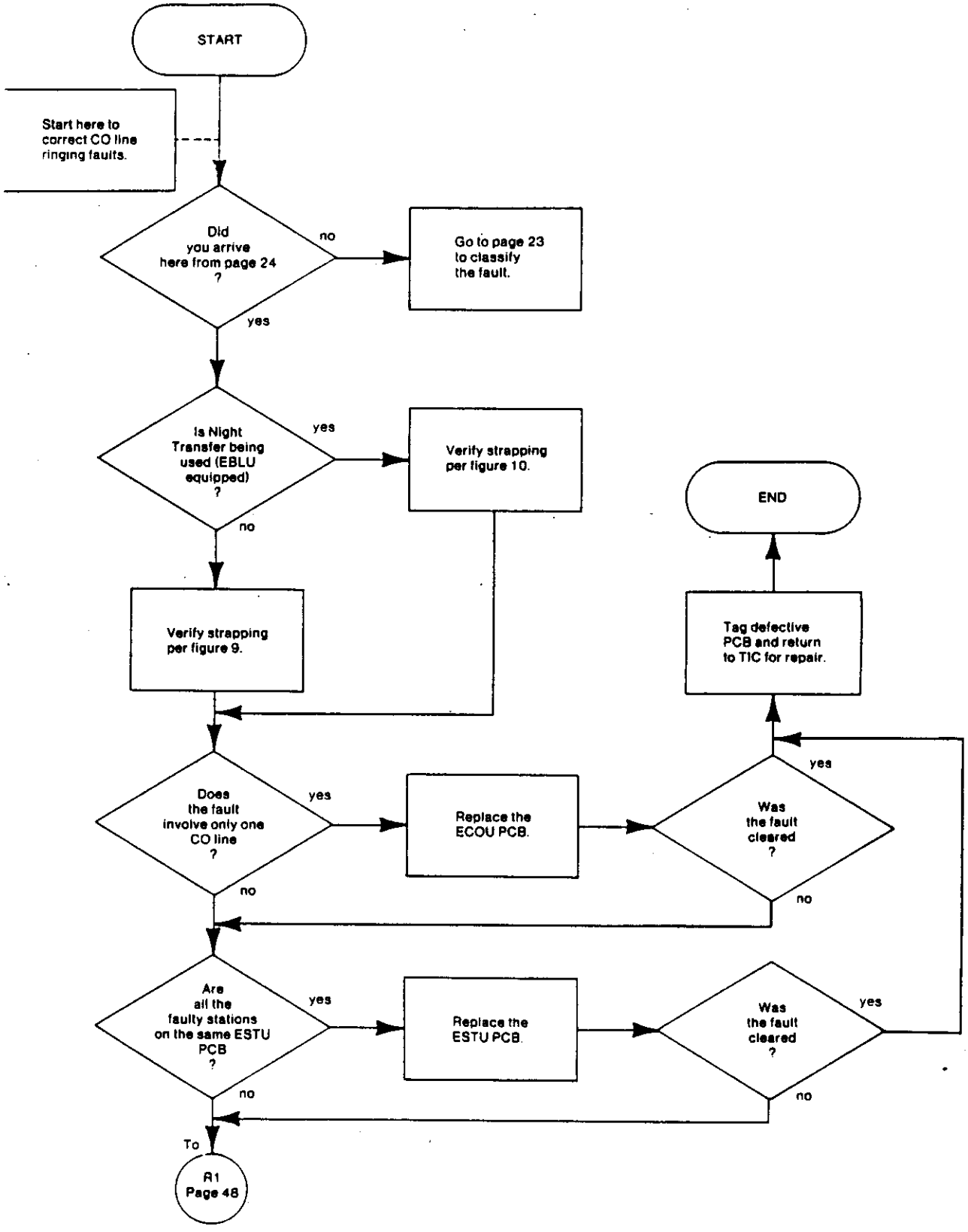
FLOW CHART 6.7.1 – CABLE FAULTS (Cont)



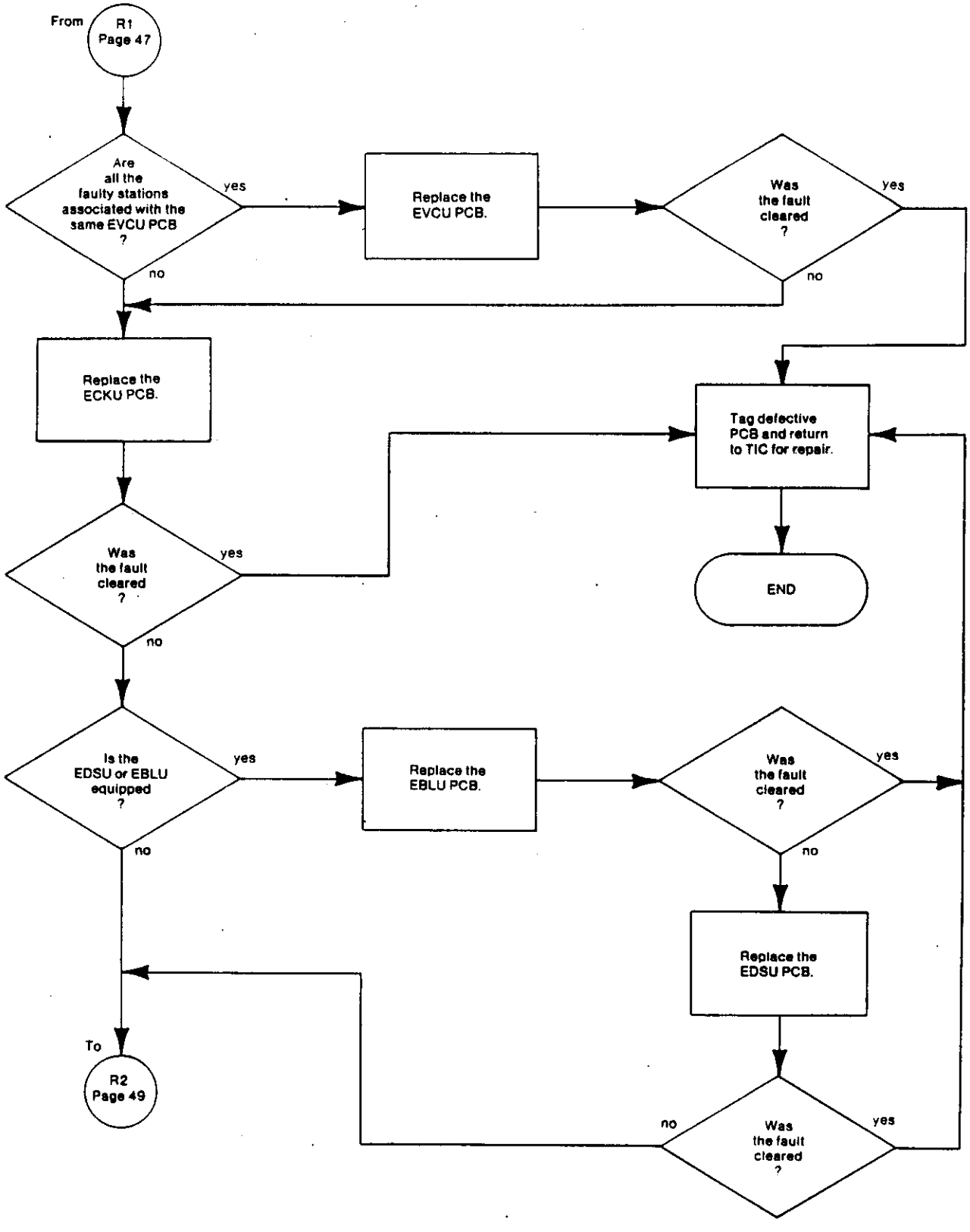
FLOW CHART 6.8—C.O. KEY/LED FAULTS



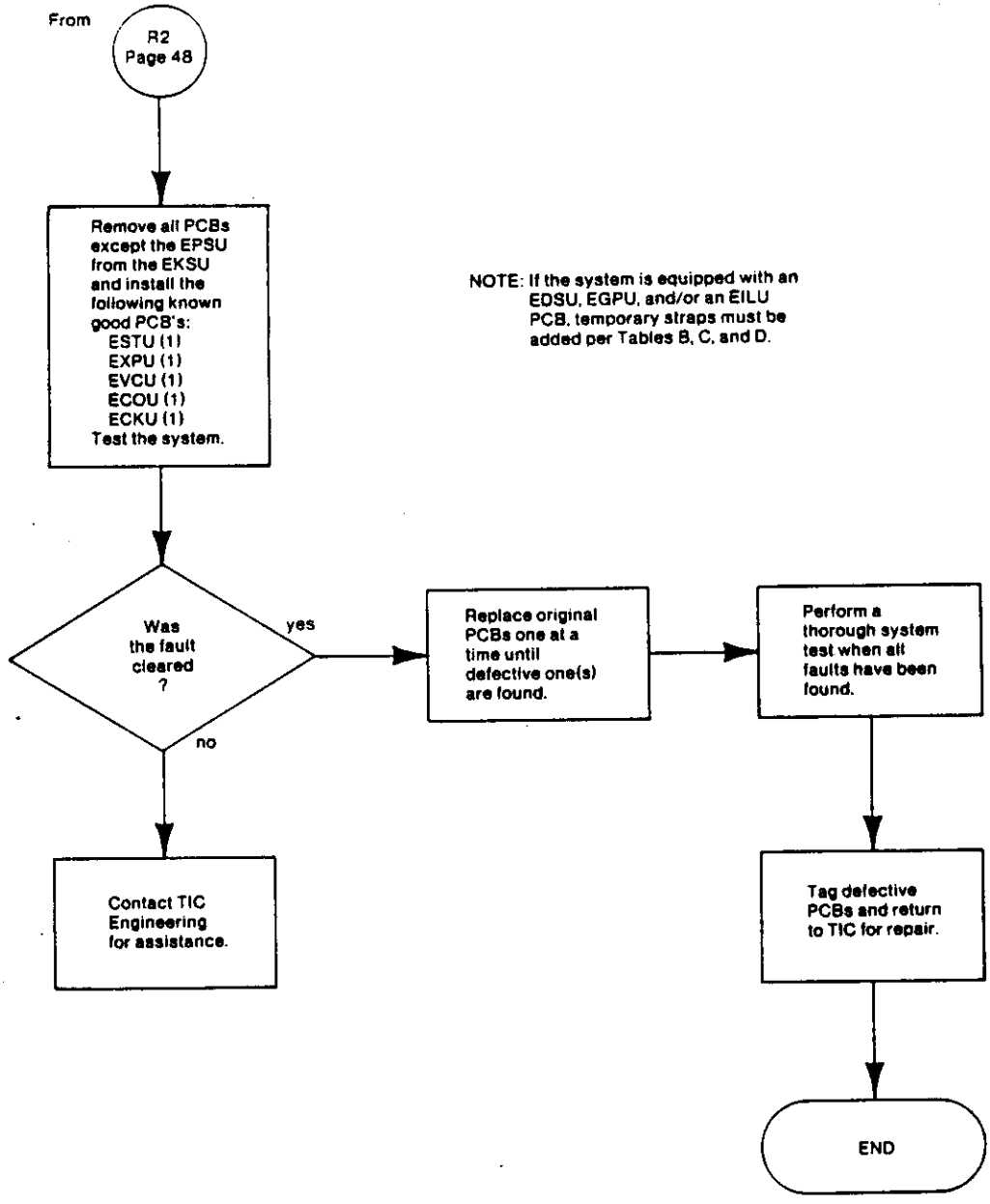
FLOW CHART 6.8.1 – C.O. KEY/LED FAULTS (Cont)



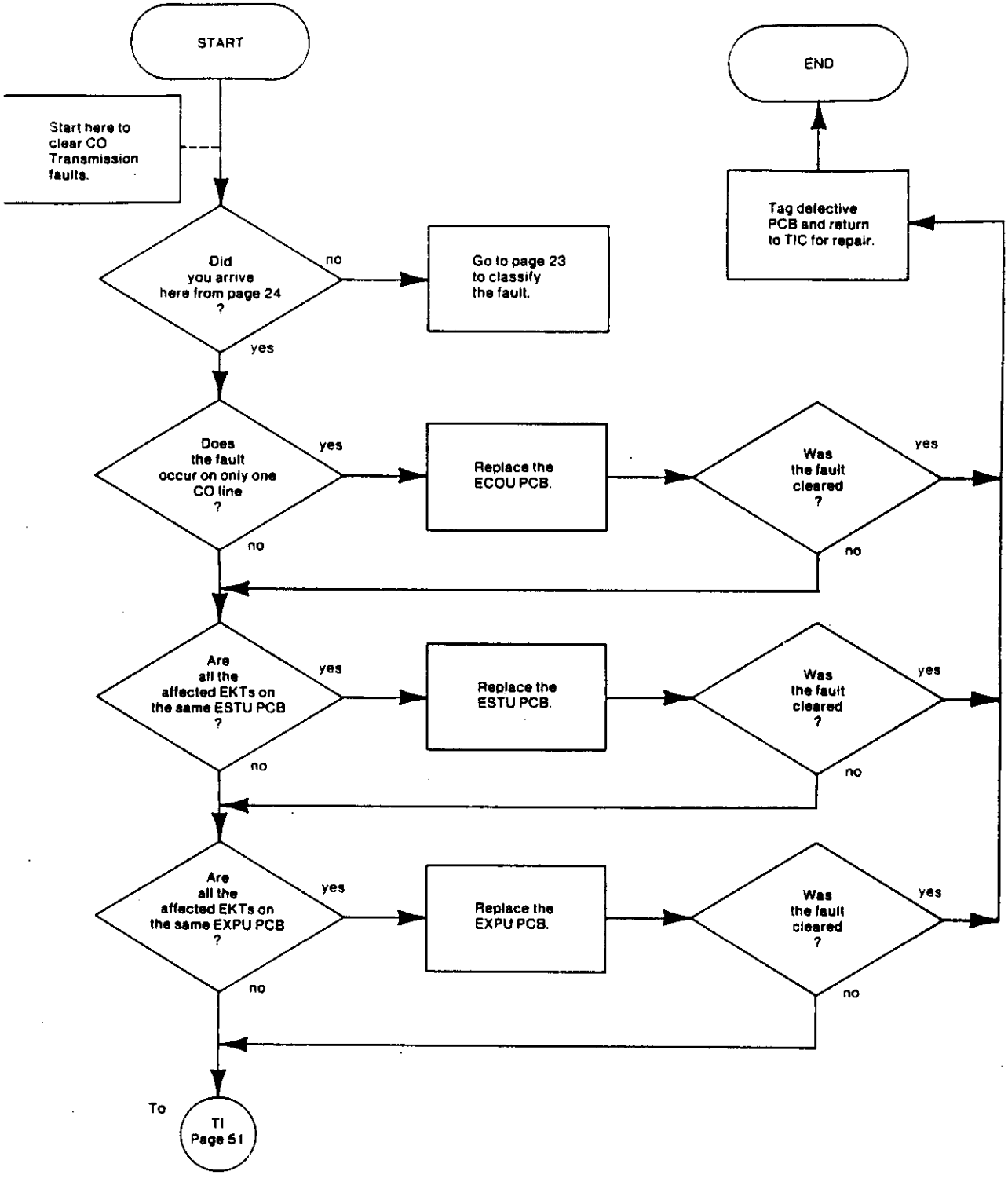
FLOW CHART 6.9—C.O. LINE RINGING FAULTS



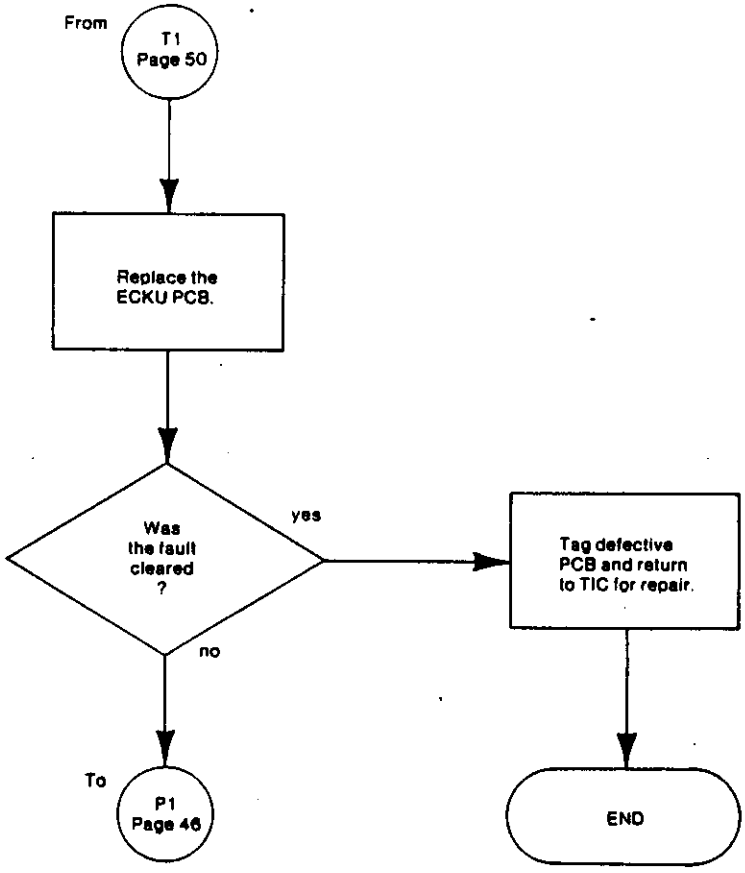
FLOW CHART 6.9.1 – C.O. LINE RINGING FAULTS (Cont)



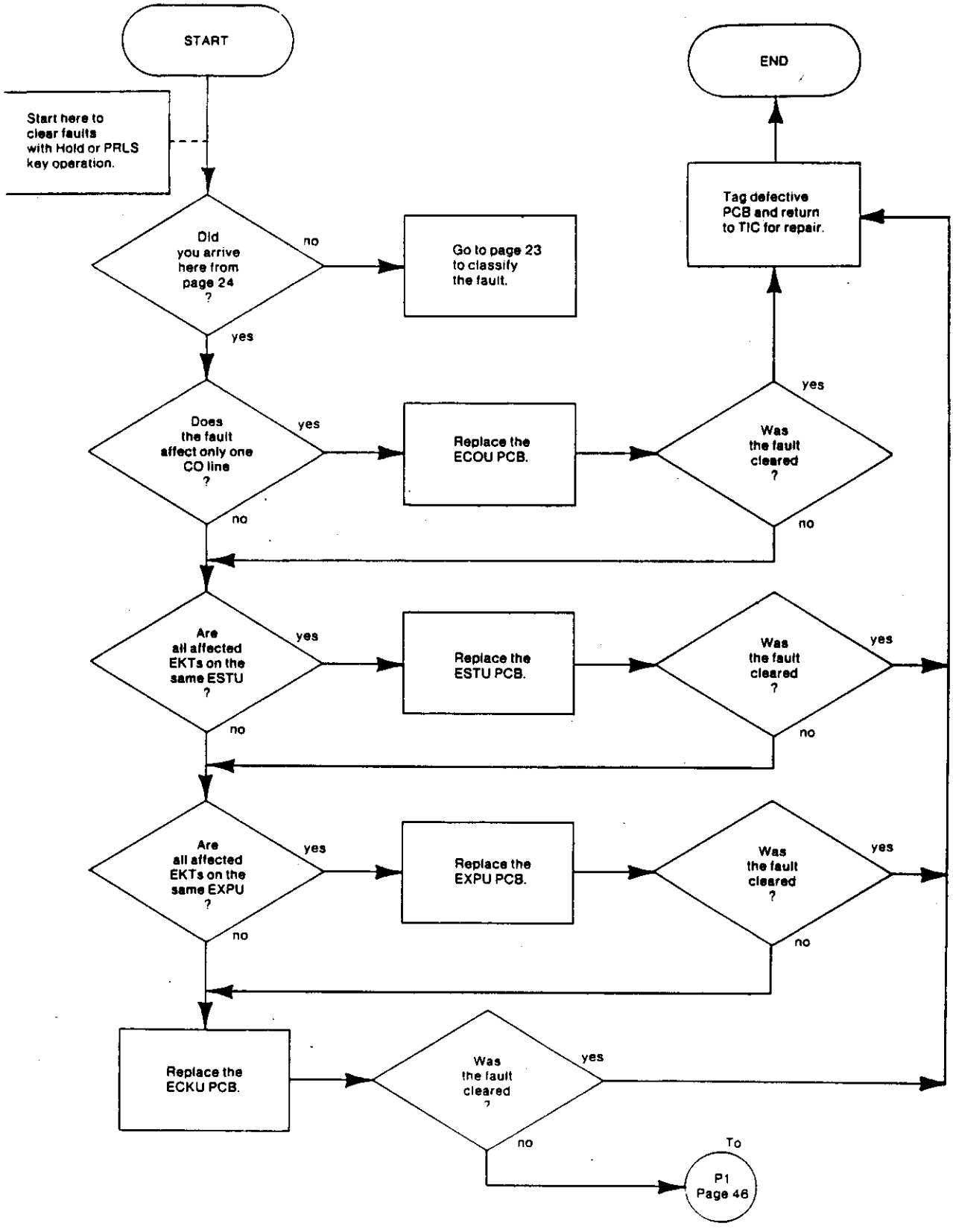
FLOW CHART 6.9.2—C.O. LINE RINGING FAULTS (Cont)



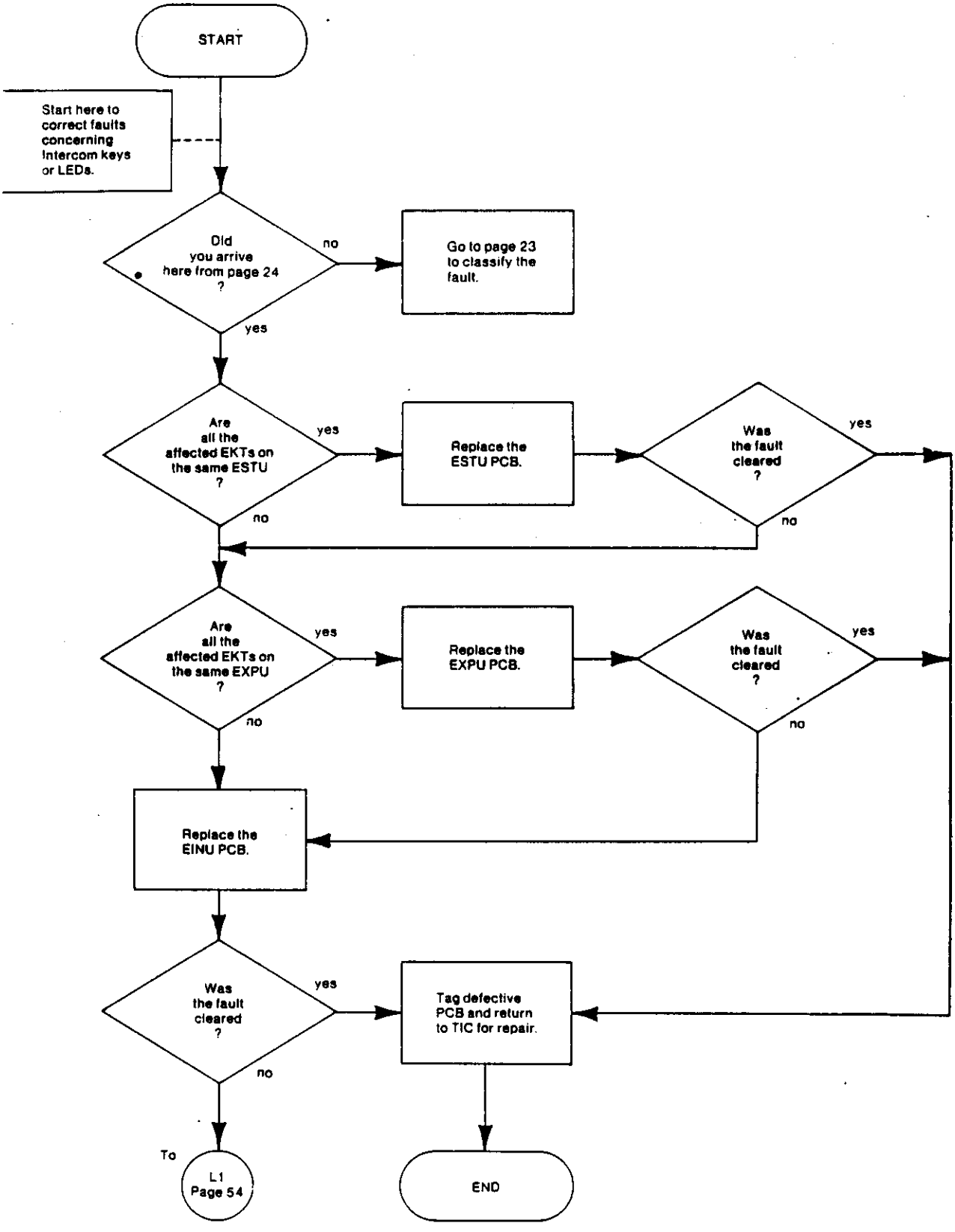
FLOW CHART 6.10—LINE TRANSMISSION FAULTS



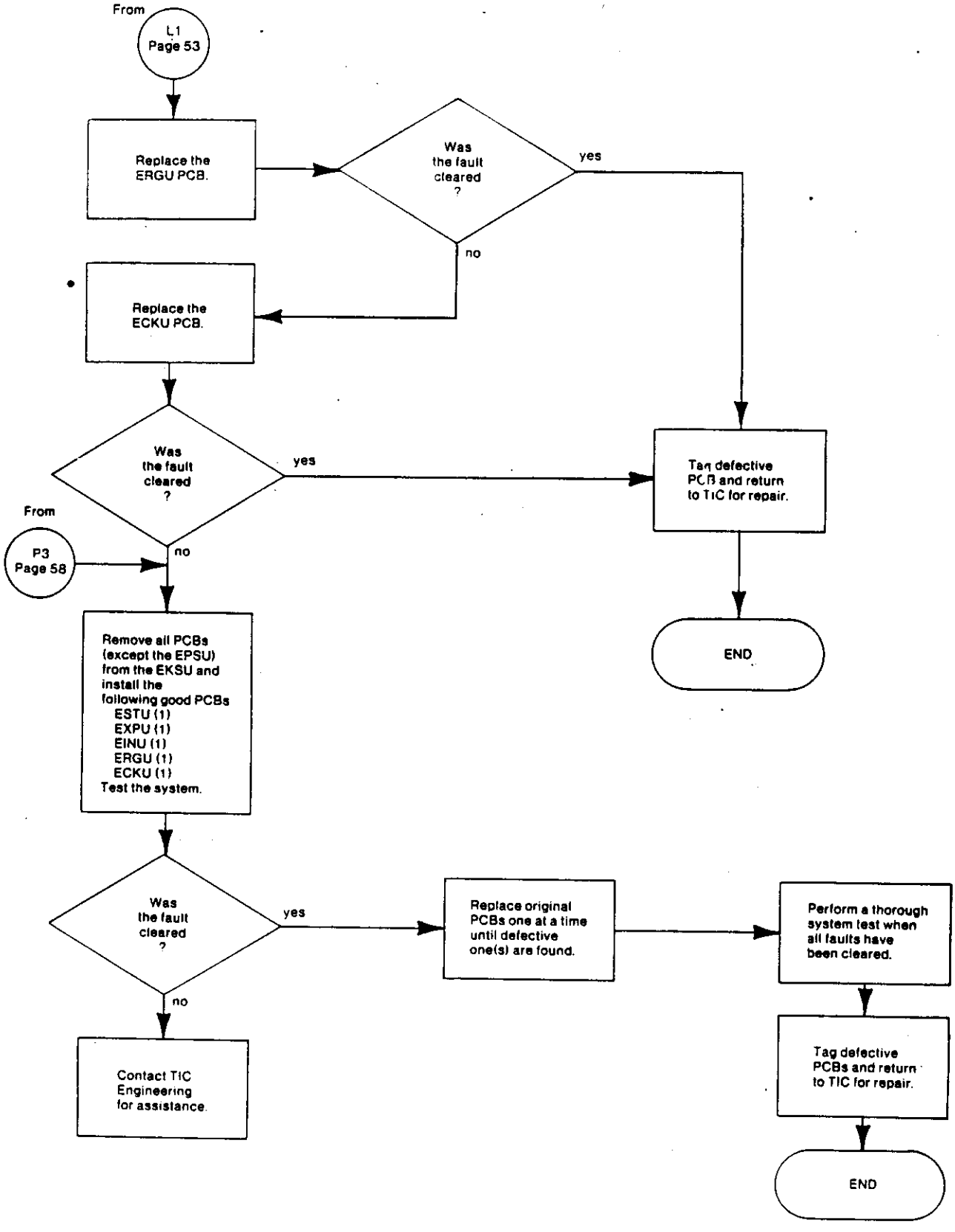
FLOW CHART 6.10.1 — LINE TRANSMISSION FAULTS (Cont)



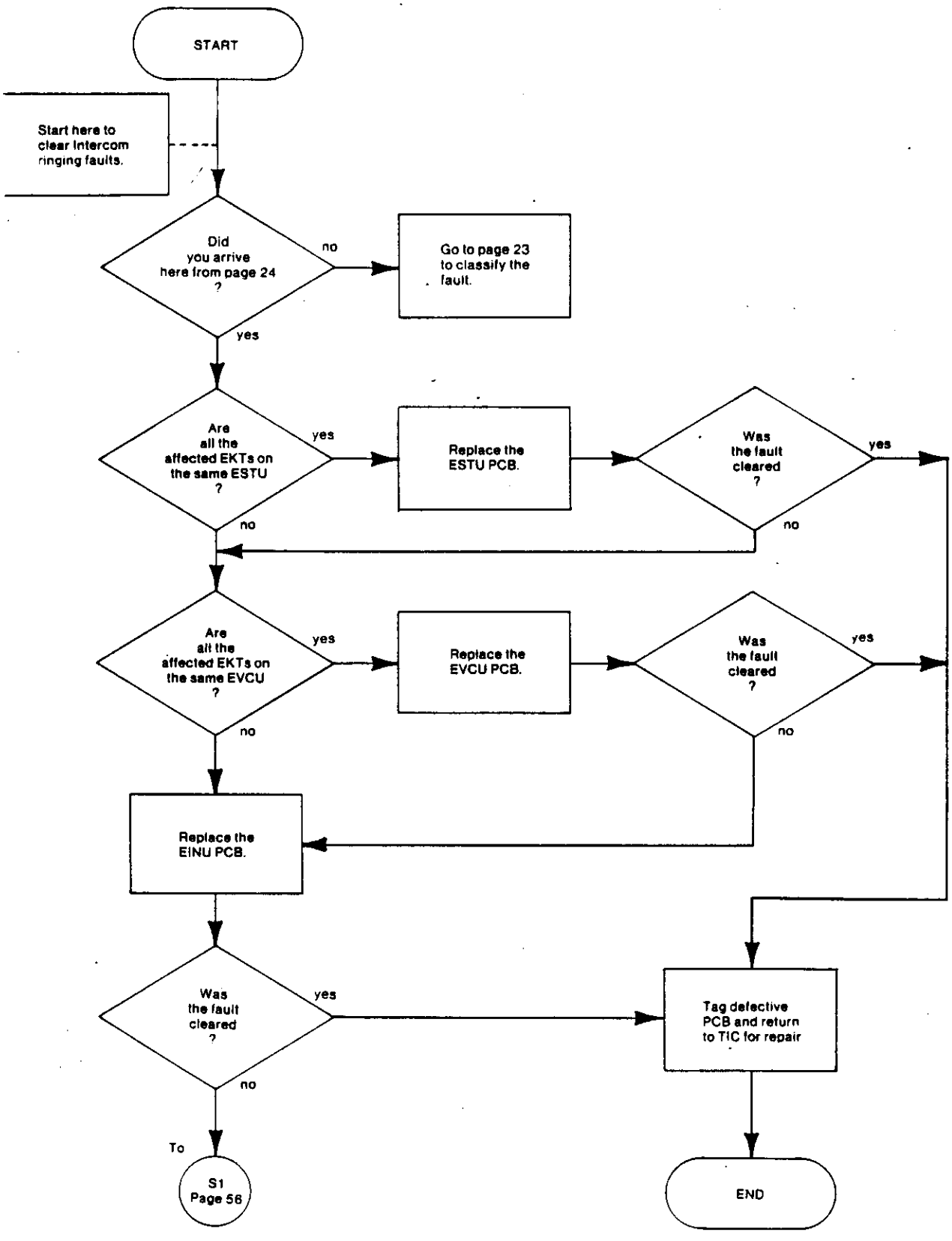
FLOW CHART 6.11—HOLD/PRLS FAULTS



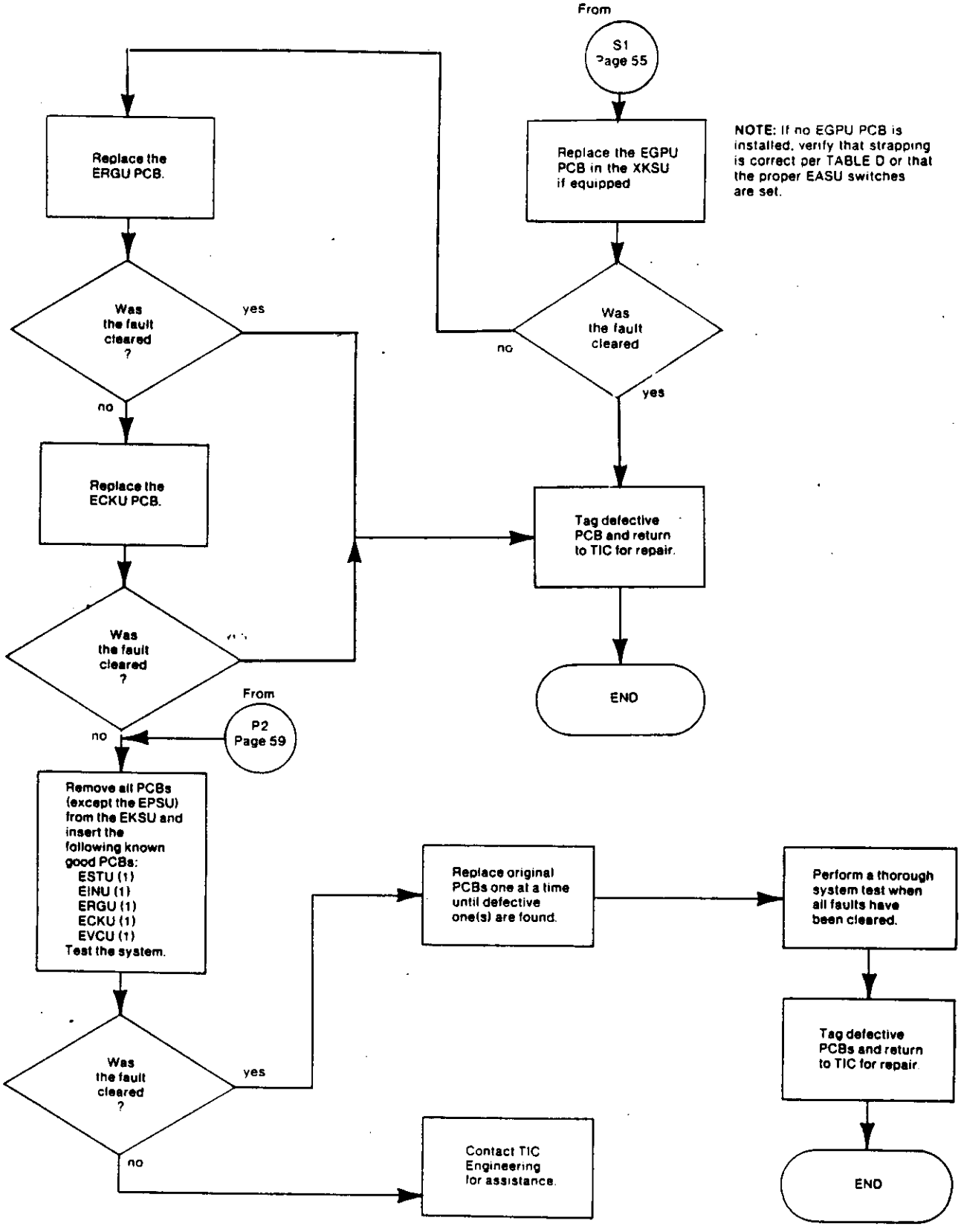
FLOW CHART 6.12—INTERCOM KEY/LED FAULTS



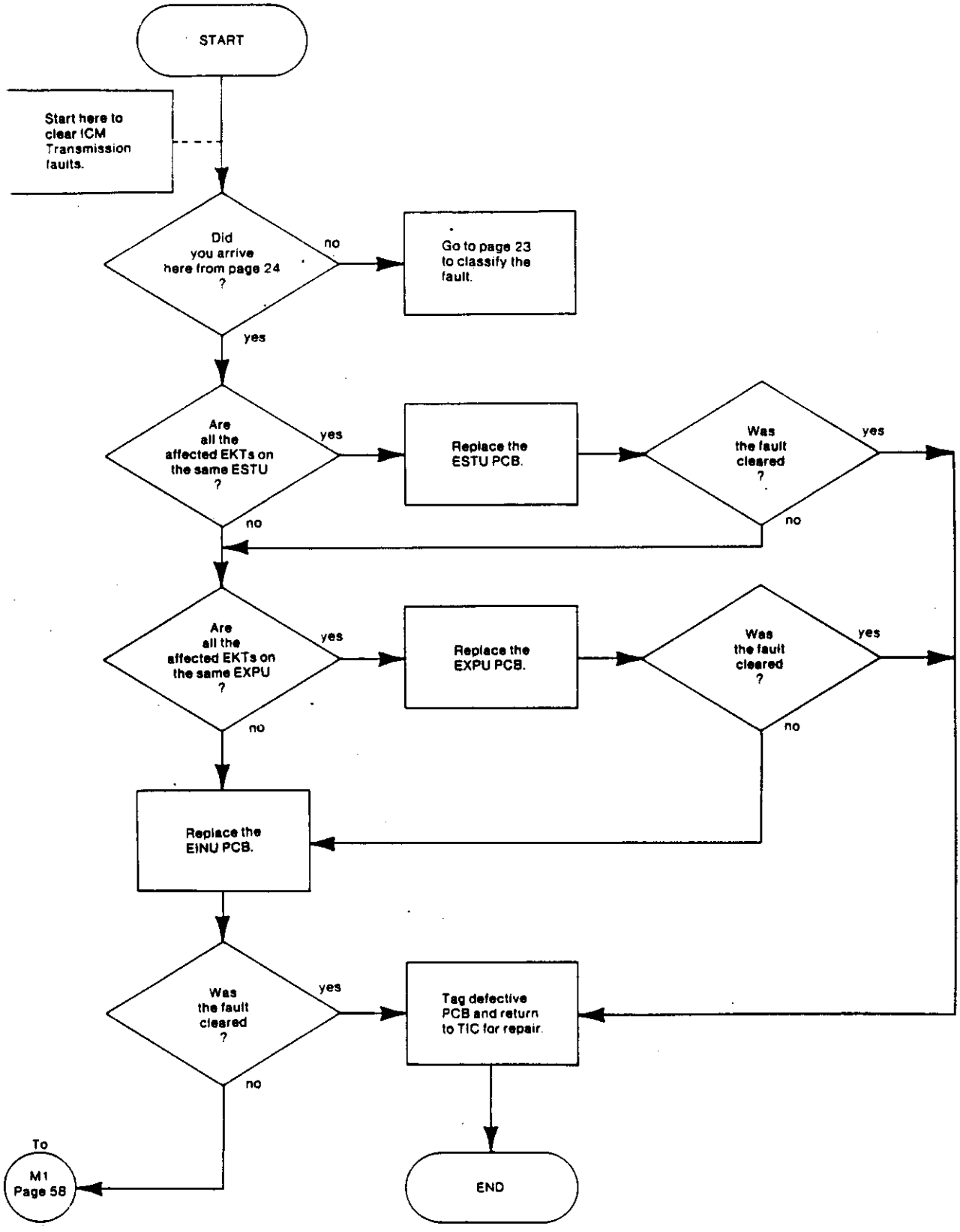
FLOW CHART 6.12.1 — INTERCOM KEY/LED FAULTS (Cont)



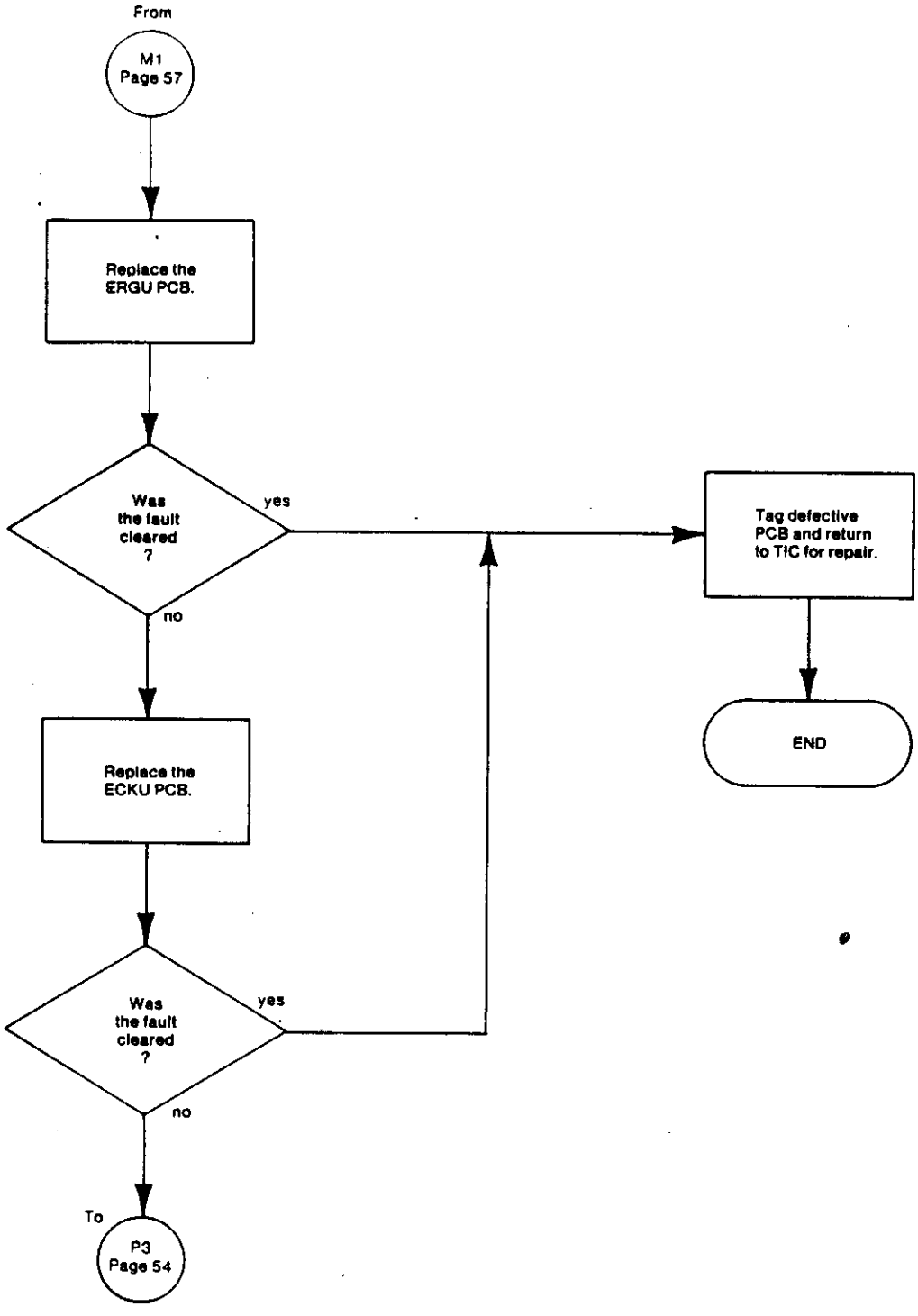
FLOW CHART 6.13—INTERCOM RINGING/TONE FAULTS



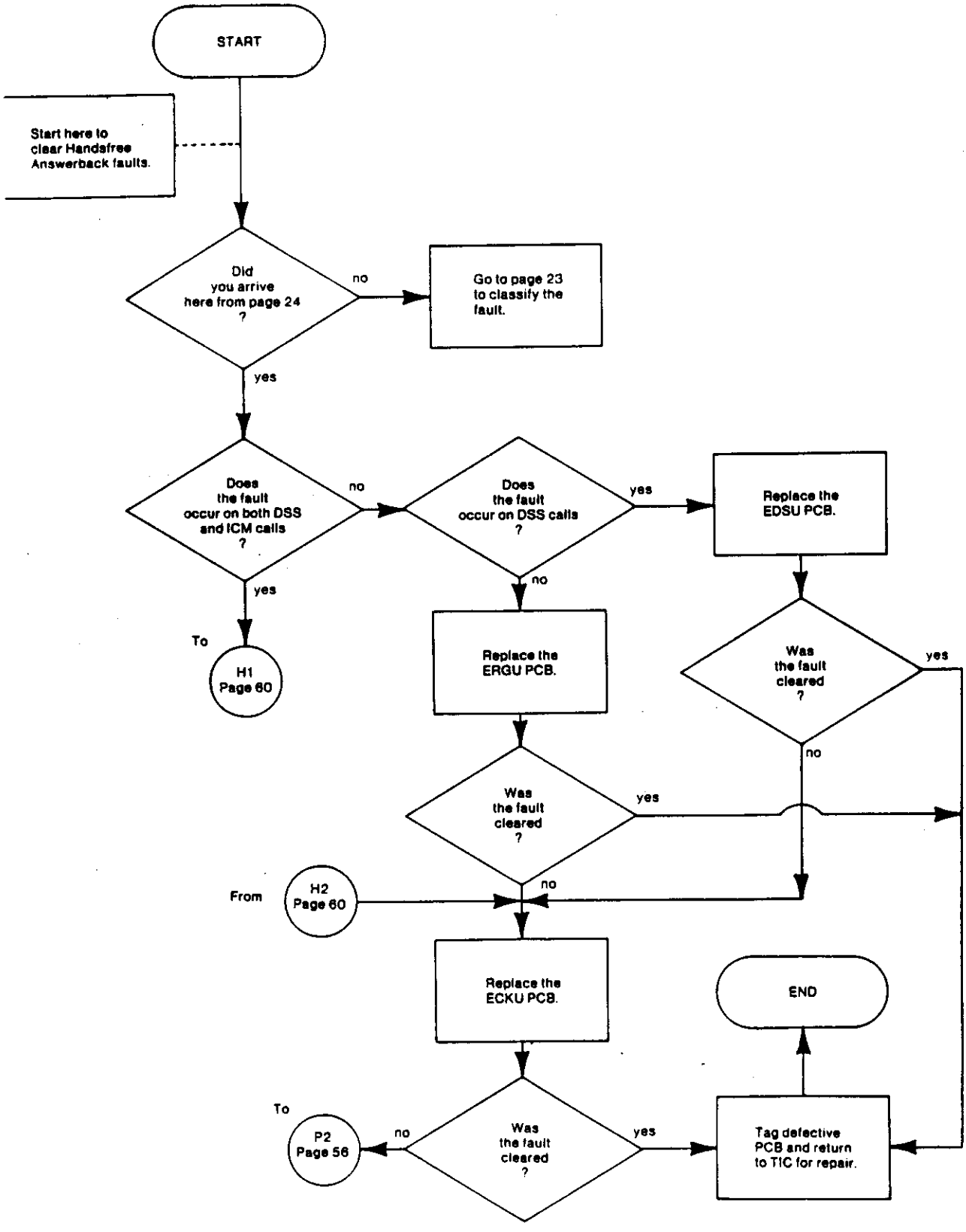
FLOW CHART 6.13.1 – INTERCOM RINGING/TONE FAULTS (Cont)



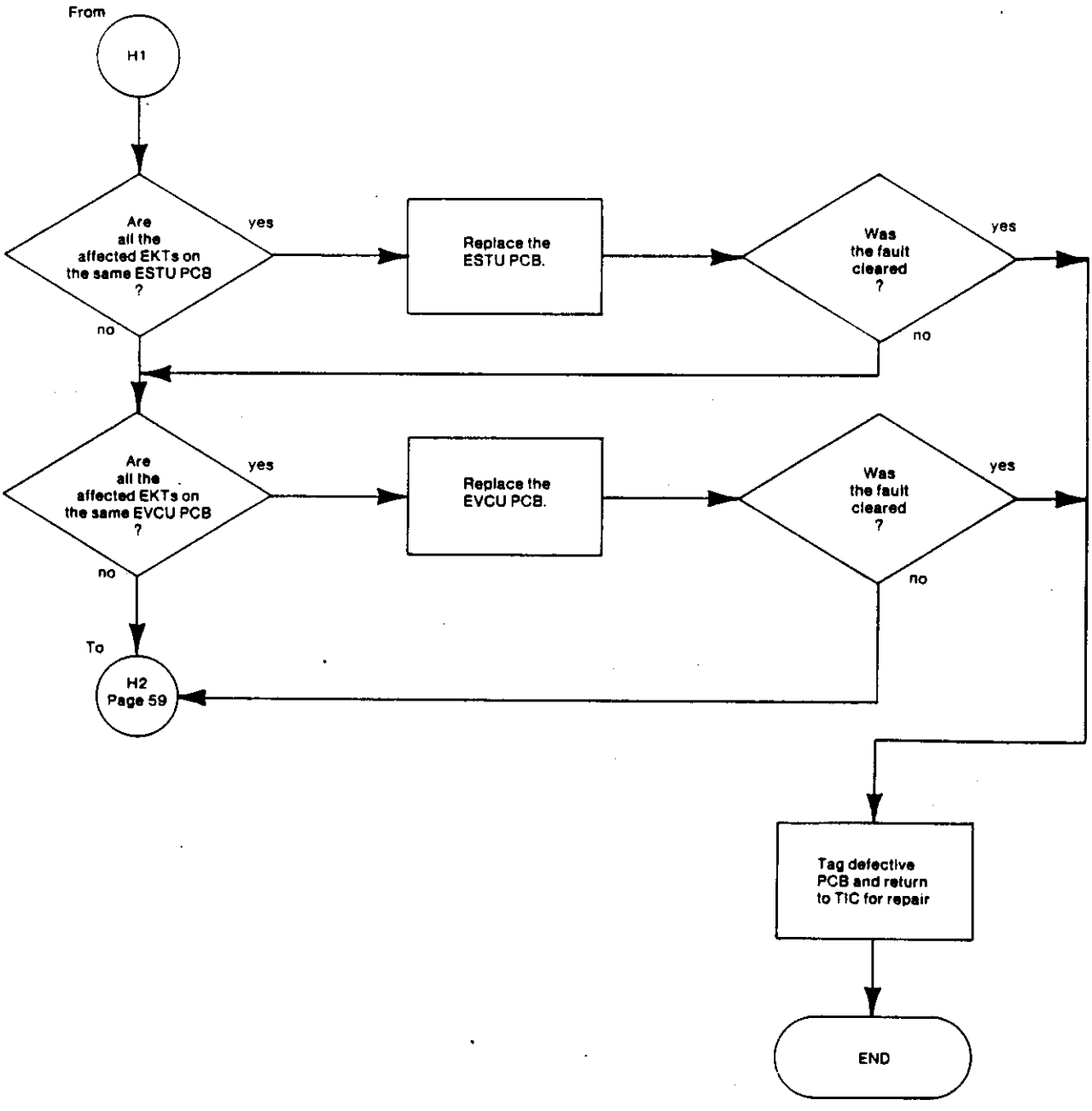
FLOW CHART 6.14—INTERCOM TRANSMISSION FAULTS



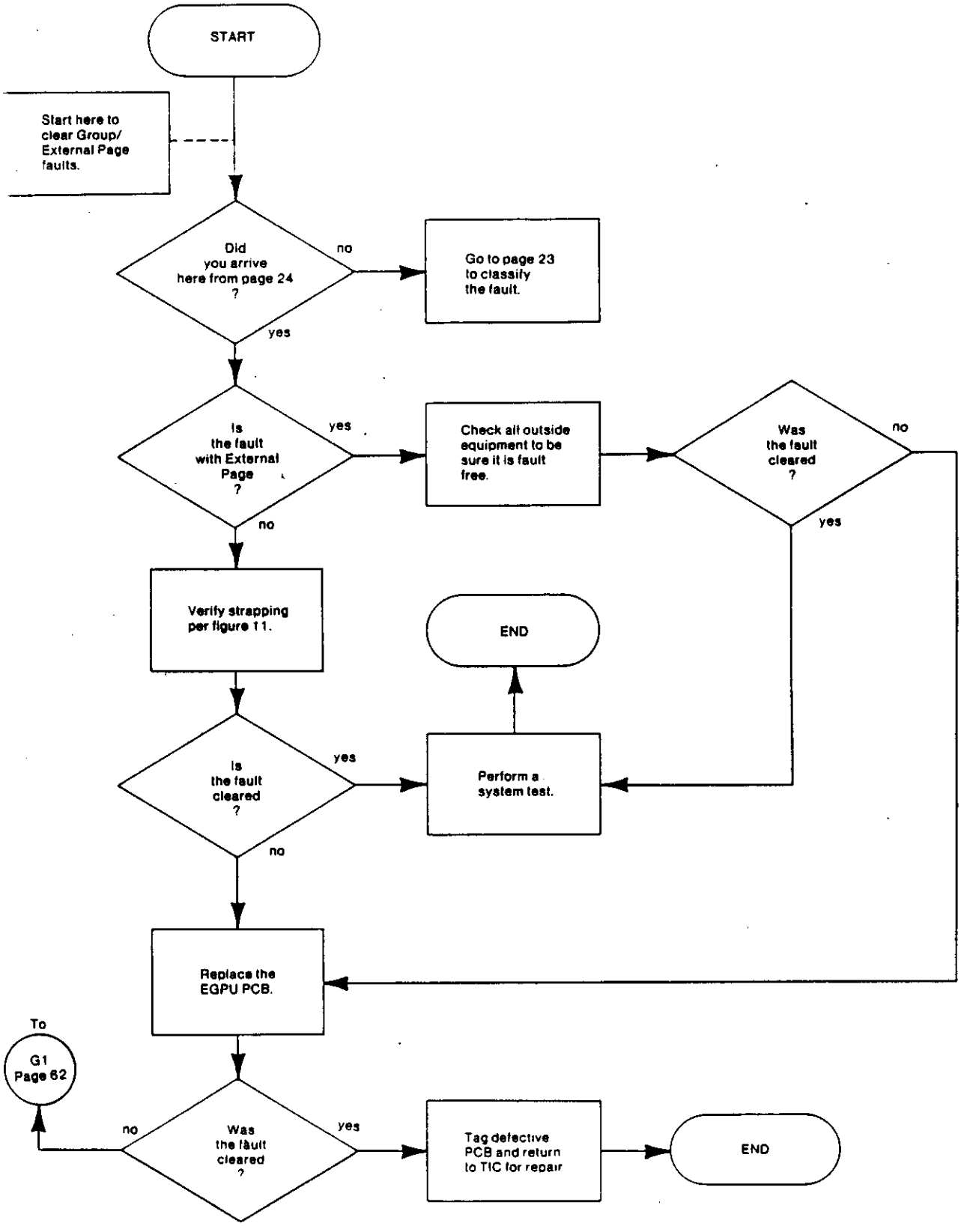
FLOW CHART 6.14.1 — INTERCOM TRANSMISSION FAULTS (Cont)



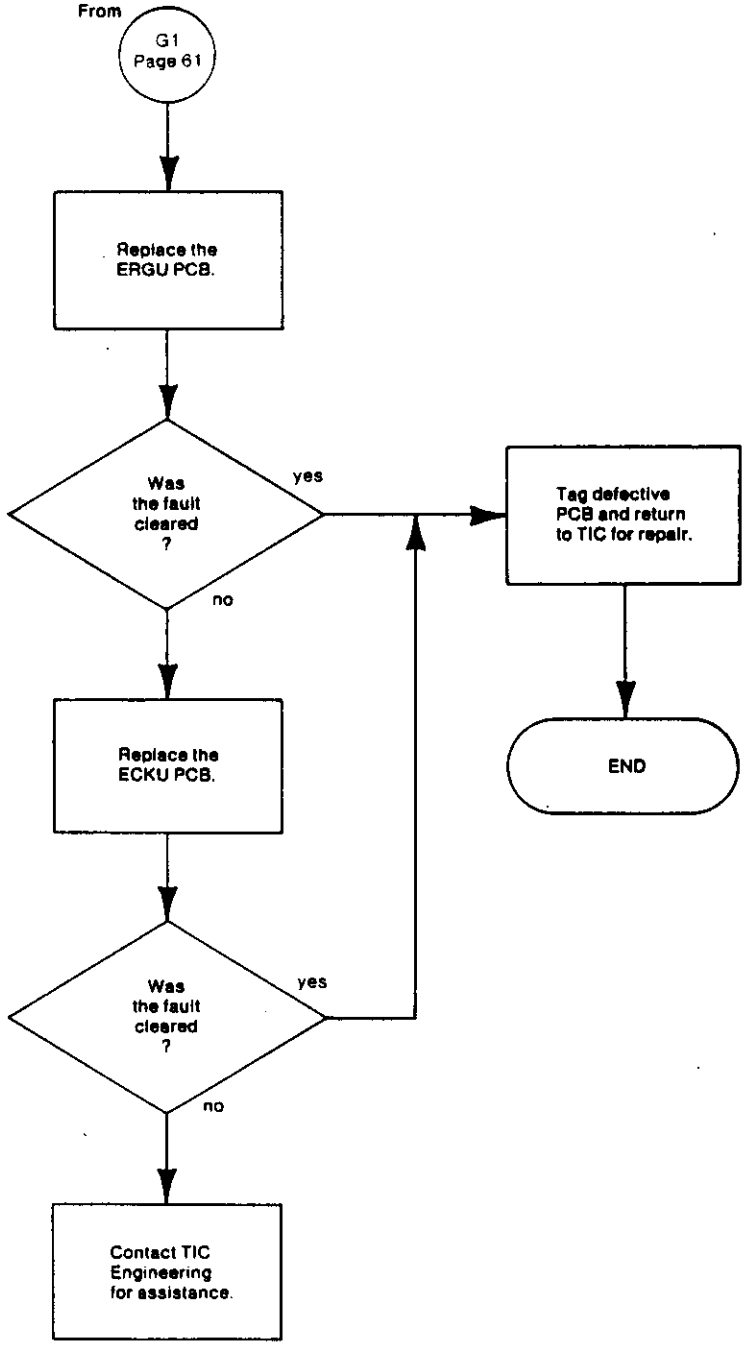
FLOW CHART 6.15—HANDS-FREE ANSWER-BACK FAULTS



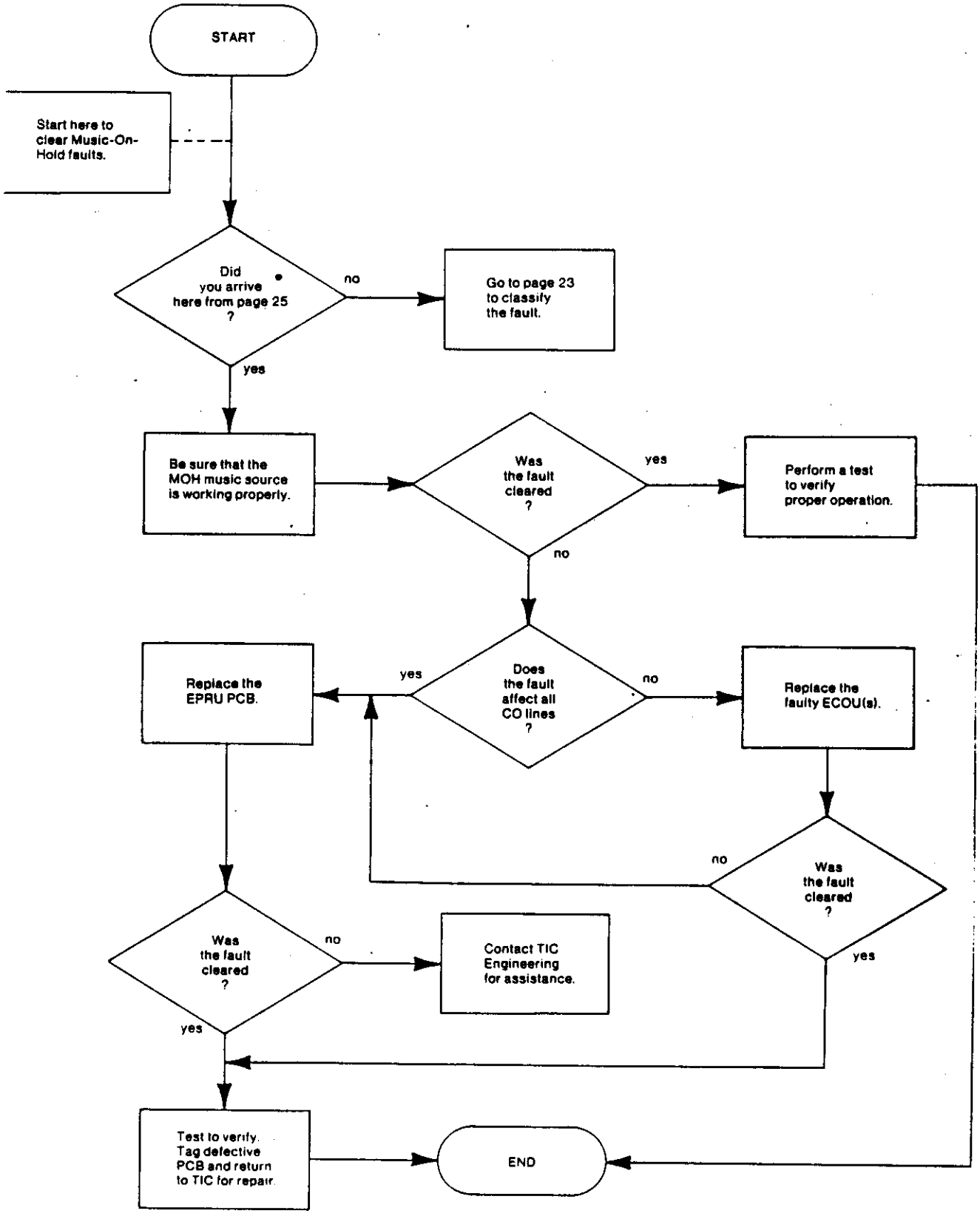
FLOW CHART 6.15.1—HANDS-FREE ANSWER-BACK FAULTS (Cont)



FLOW CHART 6.16—GROUP/EXTERNAL PAGE FAULTS



FLOW CHART 6.16.1 — GROUP/EXTERNAL PAGE FAULTS (Cont)



FLOW CHART 6.17—MUSIC-ON-HOLD FAULTS

SECTION 100-004-510
ISSUE 1, OCTOBER 1980

Strata III

EXPANDED ELECTRONIC KEY SERVICE UNIT

MAINTENANCE PROCEDURES

REVISION PAGES

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1. GENERAL

1.1 This section describes the maintenance procedures used for the diagnosis of faults in the Expanded STRATA III Key Telephone System. Faults are classified and then cleared by replacing apparatus and performing operational tests in a sequence prescribed by the fault clearing flow charts in section 6.

2. FAULT CLASSIFICATION

2.1 A fault classification flow chart is provided to insure that fault clearing is pursued in a logical sequence. (Flow chart 6.1).

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

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

	FLOW CHART NUMBER
• Fault classification	6.1
• Newly installed system faults	6.2
• Power faults	6.3
• DSS faults	6.4
• BLF faults	6.5
• Single station faults	6.6
• Cable faults	6.7
• C.O. key/LED faults	6.8
• C.O. line ringing faults	6.9
• C.O. line transmission faults	6.10
• Hold/PRLS key faults	6.11
• Intercom key/LED faults	6.12
• Intercom ringing tone faults	6.13
• Intercom transmission faults	6.14
• Hands-free answer-back faults	6.15
• Group/external page faults	6.16
• Music on hold faults	6.17

3. FAULT CLEARING PROCEDURES

3.1. Before attempting to clear any fault, care should be taken to ensure that the fault is within the STRATA III system and not caused by associated external equipment such as wiring, MOH source, etc.

3.2 Faults in the STRATA III are cleared by the replacement of Printed Circuit Boards (PCBs), EKTs or Power Supplies as instructed in the fault clearing flow charts.

3.3 Four symbols are used in the flow charts. These symbols are identified in Figure 1.

3.4 The flow charts are sequentially arranged to permit rapid localization of faults within the STRATA III system. All fault clearing must begin with Fault Classification flow chart (6.1) which is arranged in the recommended fault locating sequence.

3.5 The following precautions must be observed when handling PCBs.

DO NOT—drop the PCB
DO NOT—stack one PCB on top of another
DO NOT—handle a PCB without discharging any static electricity from your person by touching the grounded KSU.
DO NOT—touch PCB contacts with your fingers

IMPORTANT: IF THE FAULT IS NOT CLEARED BY THE SUBSTITUTION OF A PCB, THE ORIGINAL PCB MUST BE REINSERTED IN THE KSU.

4. RETURN OF DEFECTIVE APPARATUS

4.1 When defective STRATA III apparatus is shipped for repair the apparatus must be packed in a suitable anti-static container.

4.2 Information tags describing the nature of the defect should be attached to the defective apparatus. The tags should be attached to the front of the PCBs with string (not wire!) allowing the tag to remain attached during the test and repair process.

4.3 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.

4.4 NEVER WRITE ON THE APPARATUS!

5. PRINTED CIRCUIT BOARD DESCRIPTION

5.1 To assist in the general understanding of the STRATA III Key Telephone System, the following paragraphs provide an explanation of each PCB and its role in system operation. Figure 7 shows their relationship in block diagram form.

5.1.1 EPRU

5.1.1.1 The EPRU interfaces the STRATA III EKSU with the + 24V DC from the EPSA (external Power Supply) and the Music On Hold (MOH) program source. The faceplate of the EPRU is equipped with an ON/OFF switch which controls the 24V input, two red LED's which indicate the presence of the 24V and 12V outputs, and MOH level control.

5.1.1.2 Two fuses are mounted on the EPRU. The 24V input is protected by F1 and is delivered to the ESTU AND EBLU PCB's for powering of the EKT's and the EDSS. The + 24V from F1 is also applied to a voltage regulator which provides + 12V DC to various circuits in the EKSU. The + 12V output is fused by F2.

5.1.1.3 The MOH jacks mounted on the rear of the EKSU are connected to an amplifier/limiter circuit on the EPRU where the signal level is controlled before it is delivered to the ECOU PCB's.

5.1.1.4 Jacks are provided on the EPRU for the mounting of two optional relays which have normally open contacts wired to the MR and NR terminals mounted on the rear of the EKSU. The K1 relay operates whenever a C.O. line is placed on hold and puts a short across the MR terminals. The MR terminals are intended to control the MOH source. Relay K2 operates whenever Night Transfer is engaged by the DSS operator and puts a short across the NR terminals. The NR terminals are intended to control auxiliary functions such as controlling the connection of an answering machine.

5.1.2 ECKU

5.1.2.1 The ECKU is the source of all STRATA III system timing. Various clock and counter signals necessary to synchronize the system logic are derived from the ECKU PCB. In addition, the C.O. Ring Tone and the 1200 Hz used for DSS ringing tone and 600 Hz used for intercom dial tone, ring back tone, busy tone, and warning tone originate on the ECKU. The "LED data" bit stream, which controls the status of the LED's on the EKT, is assembled on the ECKU PCB. Status information received from the ECOU and EINU PCB's is combined with timing information and then sent on to the EVCU PCB for eventual transmission to the EKT.

5.1.2.2 A second ECKU PCB is supplied with the expansion XKSU package and must be installed in the XKSU to provide previously mentioned data and data timing for expansion stations 42 through 59. Data synchronization between the EKSU and the XKSU is achieved by establishing a "master/slave" relationship between the two ECKUs with the ECKU installed in the EKSU functioning as the system master.

5.1.3 ESTU

5.1.3.1 The ESTU PCB contains four identical circuits, each of which serves as the interface between a STRATA III Electronic Key Telephone (EKT) and the EKSU.

5.1.3.2 Each EKT connects to its ESTU circuit via three cable pairs. One cable pair carries voice signals between the EKT and the EKSU, the second pair carries LED DATA from the EKSU to the EKT, and the third pair carries KEY and hook switch DATA from the EKT to the EKSU.

5.1.3.3 When an EKT originates a call, the ESTU circuit detects the Off Hook and "Key" signals and cooperates with the ECKU and ECOU (or EINU) to set up a voice path through the EXPU network to the appropriate ECOU (or EINU) PCB. A current source on the ESTU, which is under the control of the EKT hookswitch signal, is activated to keep the EXPU crosspoints switched on after the "Key" signal is removed. The "Key" signal is removed when the EKT user releases the key but the Off Hook signal remains until the EKT user goes on-hook. When the EKT user goes on-hook it is detected by the ESTU which deactivates the current source allowing the EXPU crosspoints to switch off and release the voice path.

5.1.3.4 If, during a C.O. line call, the EKT user operates the Hold key the ESTU detects the Hold key signal and sends a signal to the ECOU PCB. The ECOU responds to the Hold signal by maintaining the C.O. line seizure after the EXPU crosspoints are released.

5.1.3.5 The PRLS key operation is also detected by the ESTU. The PRLS signal is relayed to the ECKU via the ECOU and the ECKU releases the privacy on that C.O. line to allow another station to enter the line.

5.1.4 ECOU

5.1.4.1 The ECOU contains two identical circuits to interface two Central Office Lines, and is the interface between the STRATA III system and the telephone network.

5.1.4.2 When an EKT user operates a C.O. Key the ECOU cooperates with the ESTU & ECKU to operate crosspoints in the EXPU which forms a speech path. The ECOU recognizes this request and presents a line seizure to the C.O. The C.O. returns dial tone which is passed from the ECOU, through the EXPU and ESTU, to the EKT. The EKT user then proceeds to dial. When the EKT goes on-hook, the EXPU crosspoints are released and the ECOU releases the C.O. seizure.

5.1.4.3 A hold circuit is provided on the ECOU. The Hold key signal is transmitted from the EKT to the ESTU and on, via the EXPU, to the ECOU. The ECOU responds to the Hold signal by continuing the C.O. line seizure after the EXPU crosspoints have released.

5.1.4.4 Operation of the PRLS key by an EKT is detected by the ECOU. The PRLS signal is then passed on to the ECKU which releases the privacy on that one C.O. line to allow another station to be conferenced.

5.1.4.5 Incoming C.O. ringing is detected by the ECOU which then signals the appropriate station(s) via the EVCU. The station user answers the call by coming off hook and operating the C.O. line key. In response to the C.O. Key, the EXPU path is made and the ECOU seizes the C.O. line to "break" ringing and provide a voice path between the EKT and the C.O. Line.

5.1.4.6 An Automatic Release from Hold option on the ECOU will, when activated by Central Office Signaling cause the ECOU to release a "hold" C.O. line and go to its idle condition if a C.O. disconnect is detected.

5.1.4.7 The ECOU provides status information to the ECKU for the generation of the EKT LED Data stream to the EKT.

5.1.5 EXPU

5.1.5.1 The EXPU PCB(s) form the primary voice network in the STRATA III. Each EXPU PCB, in an unexpanded system, provides a potential voice path between eight (8) stations and the twelve (12) C.O. lines and the two (2) intercom lines and the DSS circuit which may be installed in the primary EKSU.

5.1.5.2 In an expanded system the requirement for EXPU PCB's per 8 stations is doubled. In addition to the requirement of an EXPU in the EKSU for each group of eight (8) stations serviced by the EKSU, an additional EXPU per station group must be installed in the XKSU if the XKSU stations are to access the additional C.O. lines, ICM lines, and other functions provided by the XKSU.

5.1.5.3 In addition to the EXPU PCB's required to permit stations serviced by the EKSU to access XKSU circuitry, two (2) EXPU PCB's must be installed in the XKSU for each group of eight (8) expansion stations to be serviced by the XKSU. One EXPU PCB is required for the XKSU stations to have cross point access to EKSU functions, while the second EXPU PCB is needed to provide cross point access to XKSU functions.

5.1.5.4 The EXPU consists of a single stage, balanced, SCR crosspoint network which is controlled by EKT key data in combination with logic located on the ESTU and ECOU and timing derived from the ECKU.

5.1.5.5 The EXPU provides privacy on all voice paths until a conference request is made. Operation of the PRLS key on the EKT connected to a particular C.O. line causes a privacy release signal to be generated from the ECKU which in turn allows another station to enter that line.

5.1.6 EINU

5.1.6.1 The EINU PCB provides circuitry for two intercom paths, when inserted in the STRATA III EKSU or XKSU.

5.1.6.2 When an EKT user operates an ICM key, the EINU circuit cooperates with the ESTU and ECKU to operate the crosspoints in the EXPU. This forms a voice path between the EKT and one circuit of the EINU.

5.1.6.3 The EINU contains a hunting circuit used to assign the register (ERGU) to the requesting EINU circuit. If the ERGU is idle, the EKT user receives dial tone from the ERGU via the EINU. If the ERGU is busy, the EINU transmits busy tone to the caller.

5.1.6.4 The EINU circuit is used for the entire duration of an intercom call and provides status information to the ECKU for generation of the LED DATA stream to the EKTs.

5.1.7 ERGU

5.1.7.1 The ERGU contains one register circuit and serves both intercom circuits on an EINU. One ERGU is necessary per EINU.

5.1.7.2 When an EKT user operates an ICM key, a voice path is formed from the EKT, through the ESTU, EXPU, and EINU to the associated ERGU, (provided the ERGU is idle). The ERGU returns dial tone to the caller and then decodes the DTMF signals as the EKT user dials.

5.1.7.3 When the ERGU has decoded the called station number the voice path is extended through the EVCU and ESTU to the called EKT. A "warning" or "splash" tone is sent from the ERGU to the called EKT, (the caller also hears a burst of tone from the ERGU) followed by the caller's voice (or continuous ringing depending on the option selected). If the called station is equipped with Hands-free Answer-back (EHFU PCB), a control signal inserted in the LED DATA stream by the ERGU activates the talk-back capability. A hands-free conversation can proceed until the ERGU times out and releases the connection or the calling party disconnects.

5.1.7.4 If the called station user operates the ICM key, the ERGU and EVCU are released and the conversation proceeds via the EXPU and EINU using the EKT handset.

5.1.8 EVCU

5.1.8.1 The EVCU contains a single stage, non-balanced MOS crosspoint network and provides the secondary voice network in the STRATA III system. Each EVCU PCB provides a potential voice path to connect eight (8) stations (2 ESTU PCBs) to the ERGU or the C.O. ringing tone source (ECKU). The DSS uses the same ringing/paging path as the ECOU's with the DSS having higher priority.

5.1.8.2 The ERGU has a dedicated path through the EVCU to each station. The ERGU path is used for intercom ringing/voice paging and is held along with the ERGU for the duration of a hands-free call. When the called station operates his ICM key, the EVCU and ERGU are released and the conversation proceeds via the EXPU and EINU using the EKT handset.

5.1.9 EDSU

5.1.9.1 If an EDSS is present in the system, an EDSU PCB must be installed in the EKSU. The EDSU PCB provides a dedicated voice path between the DSS Station and the called station.

5.1.9.2 The EDSU sends ringback tone to the DSS Station and "Splash tone" to the called station. The "Splash tone" is sent to the called station via a voice path through the EVCU established by a signal from the EBLU. An "Auto Preference" circuit in the EDSU allows the called station to answer by coming off-hook without any operation of keys on the called EKT.

5.1.9.3 When a DSS call has been answered the voice path is established from the DSS Station through the originating ESTU, EXPU, EDSU, EVCU, and called ESTU to the called EKT.

5.1.10 EBLU

5.1.10.1 If an EDSS or EBLF is present in the system, an EBLU PCB must be installed in the EKSU. The EBLU PCB contains much of the circuitry necessary to announce outside calls from the DSS console to a selected station via the EDSU PCB. The EBLU contains circuitry necessary for the decoding of key data from the DSS consoles.

5.1.10.2 When an extension key is operated the EBLU sends a "hold" signal to the ECOU PCB and also sets up the EXPU voice path between the DSS Station and the EDSU PCB. The EBLU also selects the path through the EVCU to the called station and then controls the tones sent to the DSS Station and called station by the EDSU. When the All Call Key is operated on the DSS console the EBLU causes the All Call Amplifiers to be switched into the EDSU voice path.

5.1.10.3 The EBLU receives station busy/idle status information from the EVCU and transmits it, along with NT LED data, to the DSS console and/or the Busy Lamp Field.

5.1.10.4 Logic for the C.O. signaling transfer is located on the EBLU PCB and is controlled by the NT Key on the DSS console.

5.1.11 EILU

5.1.11.1 The EILU is an optional PCB which is used to provide the DSS Station with special "I Hold" and "I Use" illumination and a special audio/visual "Operator Recall" indicator. When the EILU is used, lines placed on hold by the DSS Station will flash at a rate of 240 IPM in contrast to the normal rate of 120 IPM. The "Operator Recall" function provided by the EILU causes the DSS operator to be signaled whenever a call placed on hold by the DSS remains unattended after 45 seconds. The recall signal consists of a 1200 Hz tone interrupted at a rate of 1 second on 1 second off and the C.O. line LED flashing at a rate of 4 Hz while the recall tone is on (1 sec) and 2 Hz when the recall tone is off (1 sec).

5.1.11.2 The "I Use" illumination allows a line connected to the DSS Station to be distinquished by two short (125 ms) interruptions every 2 seconds. "I illumination" appears only at the DSS Station.

5.1.12 EGPU

5.1.12.1 The EGPU PCB provides the STRATA III system with All Call, Group Page, and External Page options on intercom calls. In an expanded system, a second EGPU PCB must be installed in the XKSU if extensions 42 through 61 are to be included in a Group Page Zone, or if intercom paths 3 and 4 are to provide Group Page, All Call, or External Paging options.

5.1.12.2 If the KSU is equipped with an EGPU PCB, the voice path for an intercom call is as follows:

Originating EKT—ESTU—EXPU—EINU—ERGU—EGPU—EVCU—ESTU—called EKT.

5.1.12.3 When an intercom call is originated and a normal station number is dialed, the callers voice is transmitted directly through the EGPU to EVCU and ESTU and on to the EKT. If a group code 81, 82, 83 is dialed, an amplifier on the EGPU is switched into the voice circuit and the callers voice is transmitted, via the EVCU and ESTU's, to the speakers of all EKT's assigned to that group.

5.1.12.4 If the All Call code 80 is dialed, the amplifier on the EGPU is switched in and the callers voice is transmitted, via the EVCU and ESTU's, to the speaker of all EKT's connected to groups 1, 2, and 3.

5.1.12.5 Dialing the external Page code 89 causes the callers voice to be switched through a power amplifier on the EGPU to the 600 Ω or 8 Ω terminals located at the bottom rear of the KSU.

5.1.13 GPAU

5.1.13.1 The GPAU PCB mounts directly onto the EGPU PCB. It provides a dip switch, strapping terminals, and logic for assigning stations for group paging. The GPAU is optional and, if it is not used, Group Paging assignment can still

be made by strapping on the EKSU and XKSU back-planes.

5.1.14 EHFU

5.1.14.1 The EHFU PCB is an optional PCB that is mounted in the EKT to give the station user the ability to give a hands-free reply to a voice page. A control bit inserted in the LED Data stream by the ERGU activates the EHFU during an incoming voice page. The voice switching circuit in the EHFU causes the EKT speaker to alternately function as a microphone or speaker.

5.1.15 EASU

5.1.15.1 The EASU is an optional PCB that provides an alternative to option strapping on the system back-plane. When the EASU is used, assignments such as C.O. line ringing and station restriction can be made on the EASU and then made active by inserting the PCB into the KSU. The EASU also provides test points for the 24 VDC and 12 VDC on its faceplate.

5.1.16 EIFU

5.1.16.1 The EIFU PCB is used in conjunction with the expansion cable (XCBL) and the XIFU PCB to interconnect the EKSU and XKSU. The logic signals extended between the two cabinets are provided with buffering and component protection on the EIFU and XIFU PCB's.

5.1.17 XIFU

5.1.17.1 see EIFU above.

5.1.18 XDLU

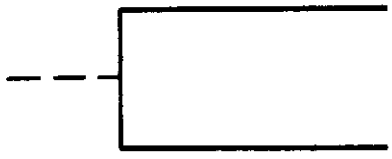
5.1.18.1 The XDLU provides the expansion system interface (XKSU) for a second DSS console and one BLF console.

6. FAULT IDENTIFICATION AND ELIMINATION PROCEDURES

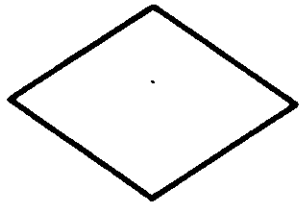
(Flow charts begin on page 28.)

START AND END OF
A FLOW CHART SEQUENCE

IMPORTANT NOTES
AFFECTING THE FAULT
CLEARING PROCEDURE

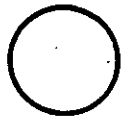


QUESTION TO BE ANSWERED
YES OR NO



TO/FROM SPECIFIC FLOW CHART (FC)

PROGRESSION TO OR FROM
ANOTHER FLOW CHART LOCATION.
LETTER WILL DENOTE EXACT ENTRANCE
OR EXIT POINT



STATEMENT OF A
REQUIRED ACTION

FIGURE 1 – FLOW CHART SYMBOLS

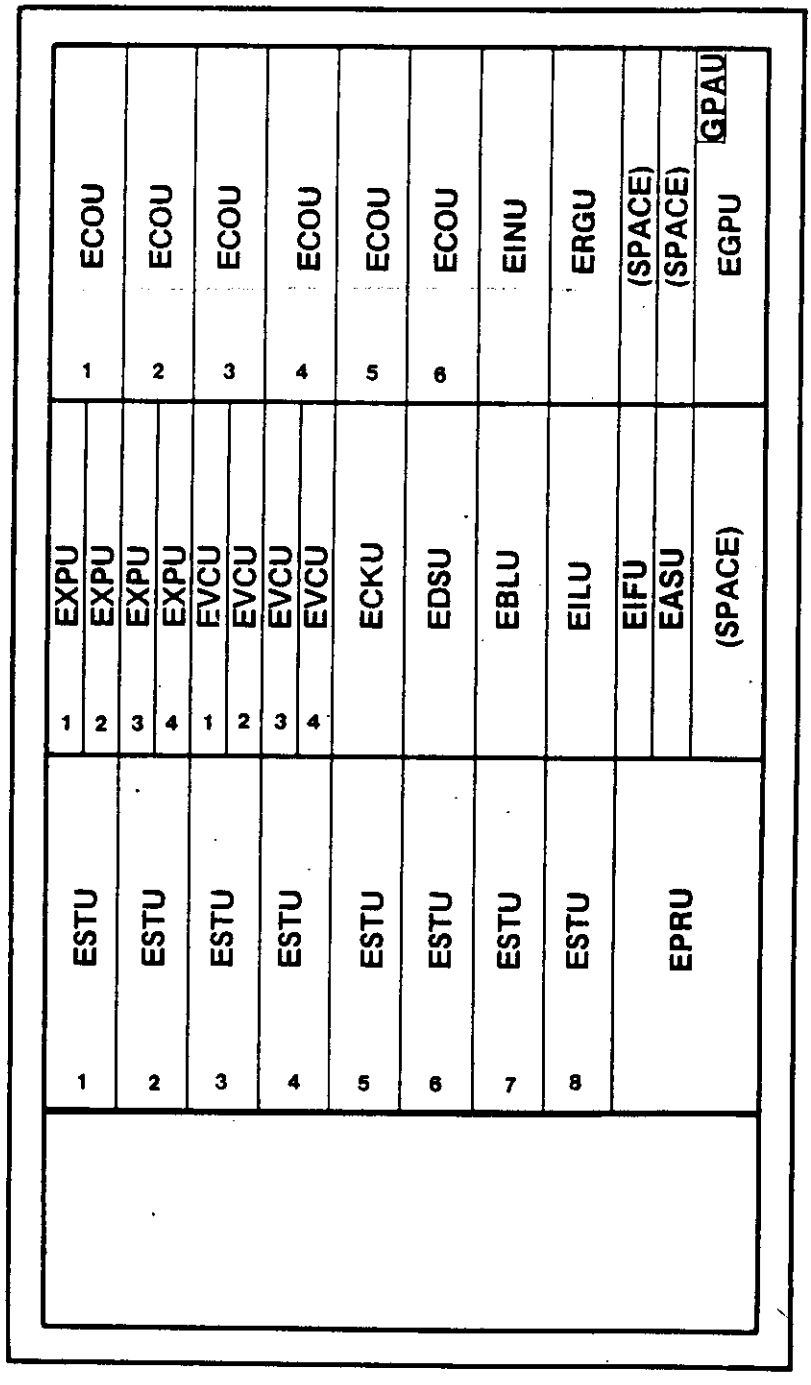


FIGURE 2—EKSU FRONT VIEW

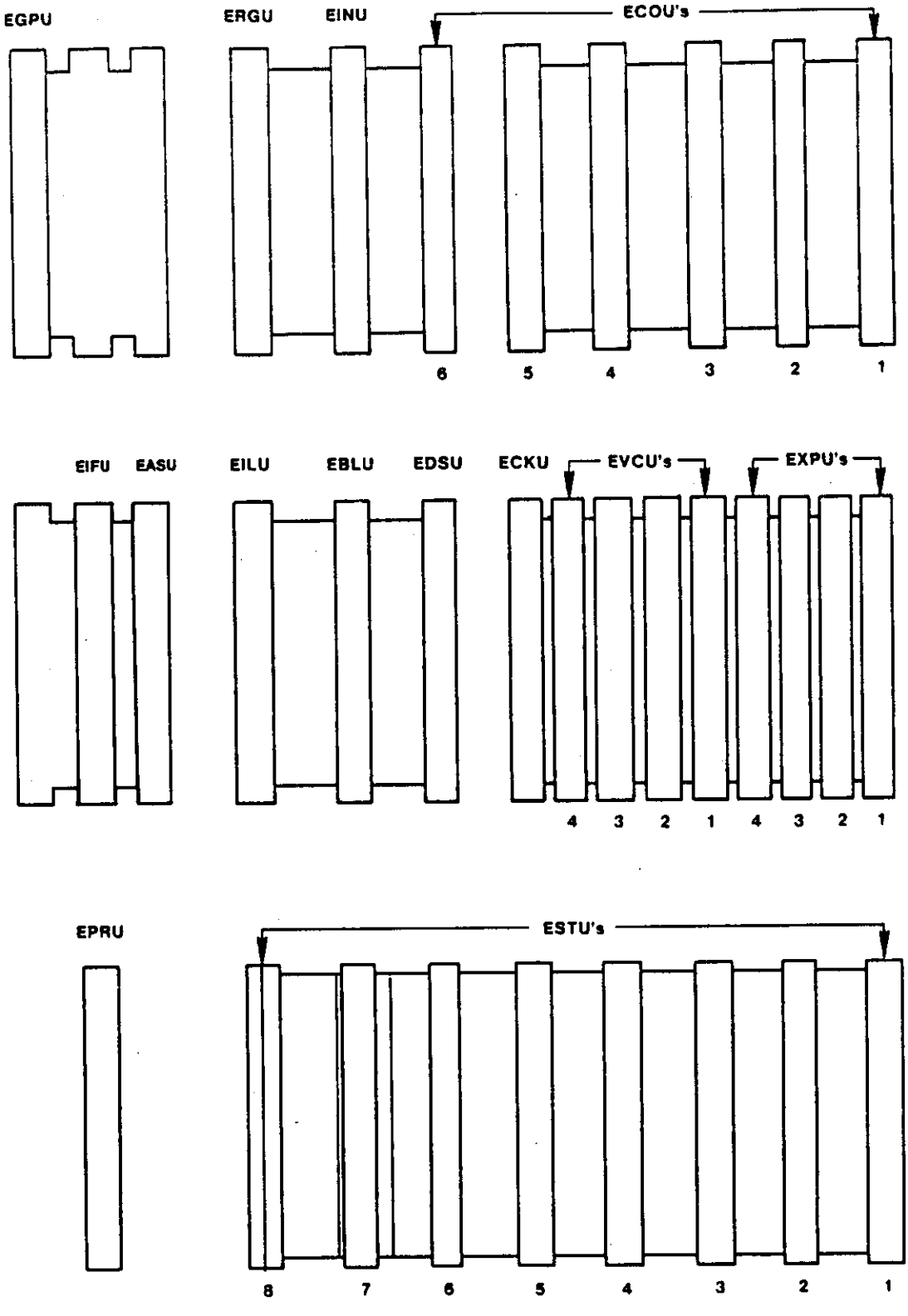


FIGURE 3—EKSU REAR VIEW

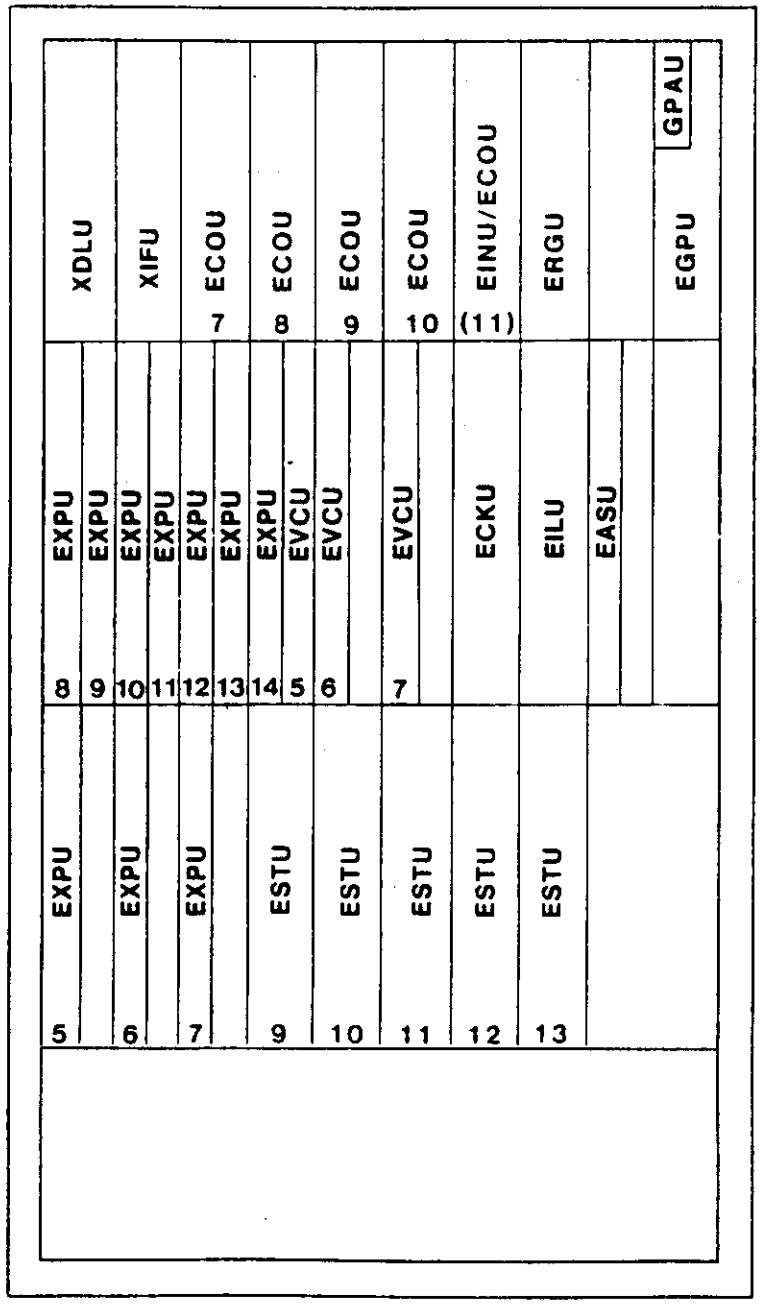


FIGURE 4—XKSU FRONT VIEW

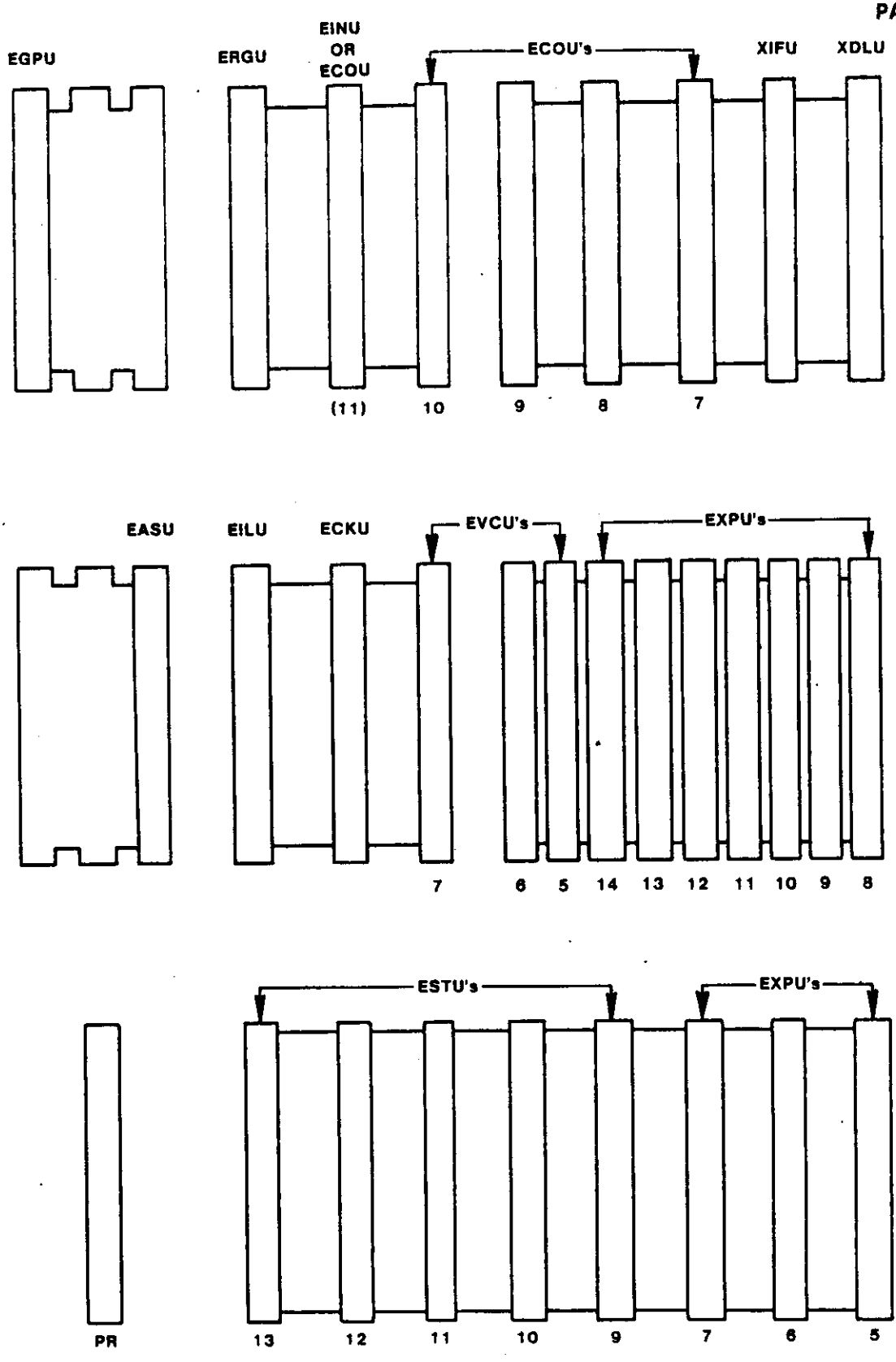


FIGURE 5—XKSU REAR VIEW

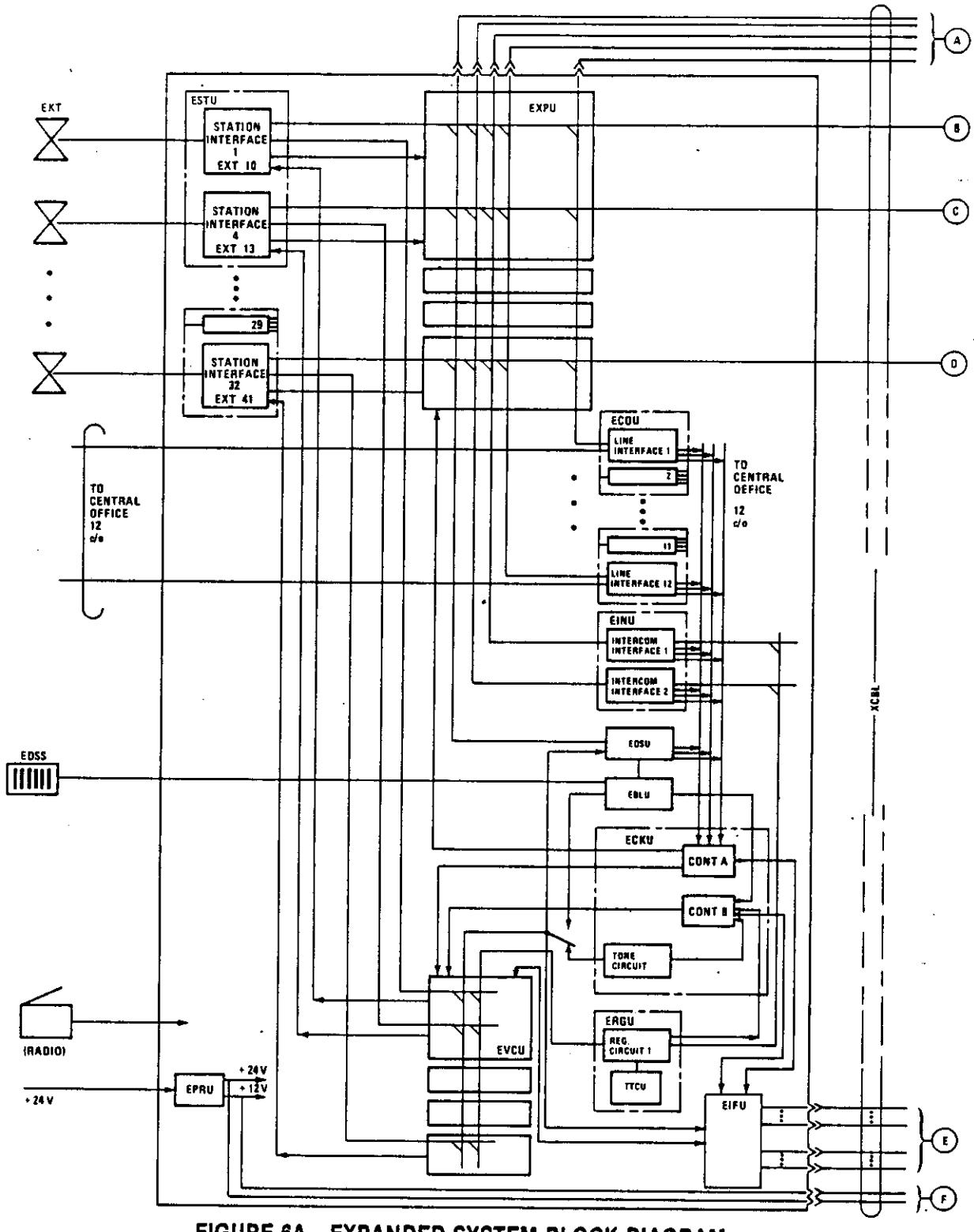


FIGURE 6A—EXPANDED SYSTEM BLOCK DIAGRAM

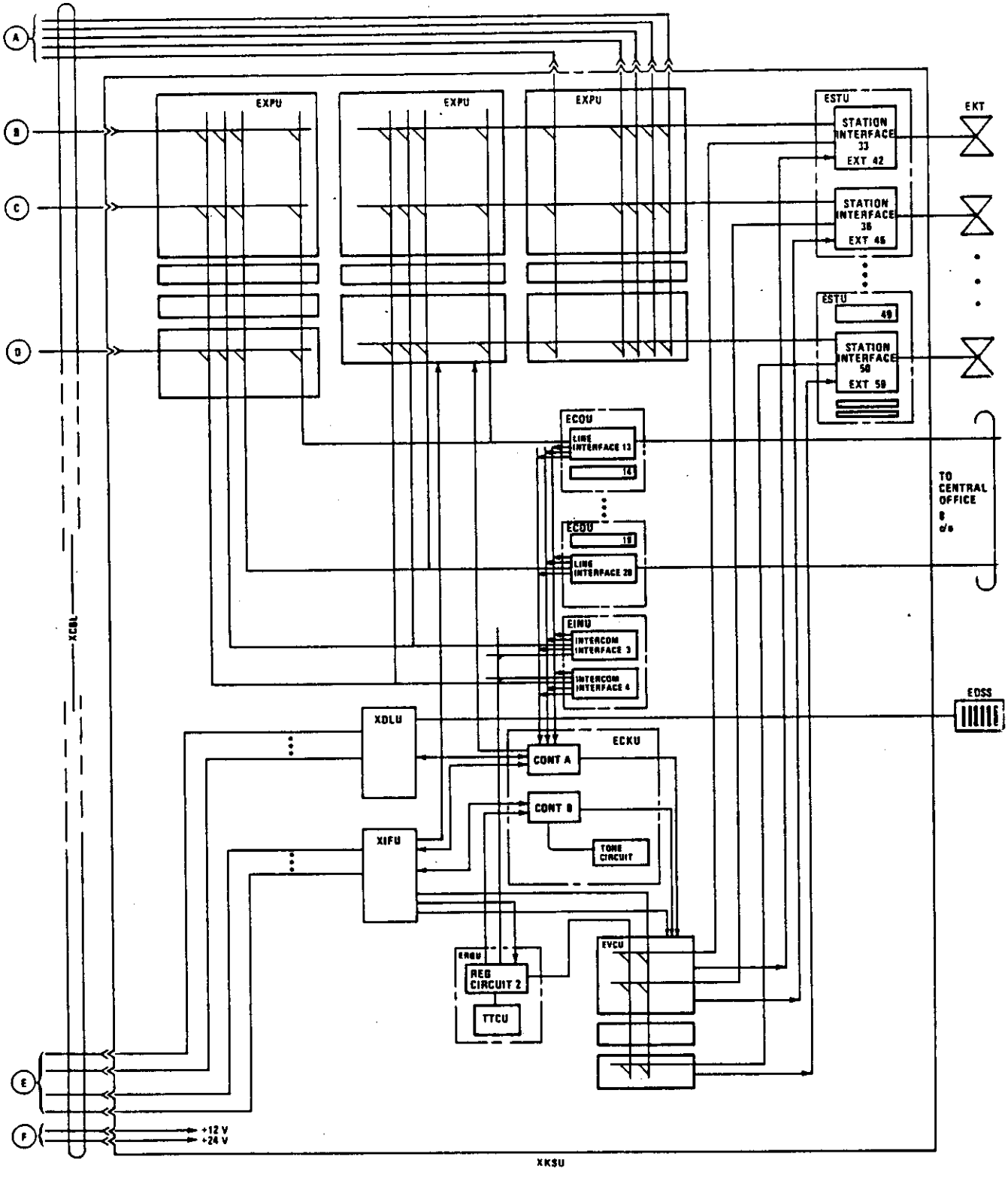
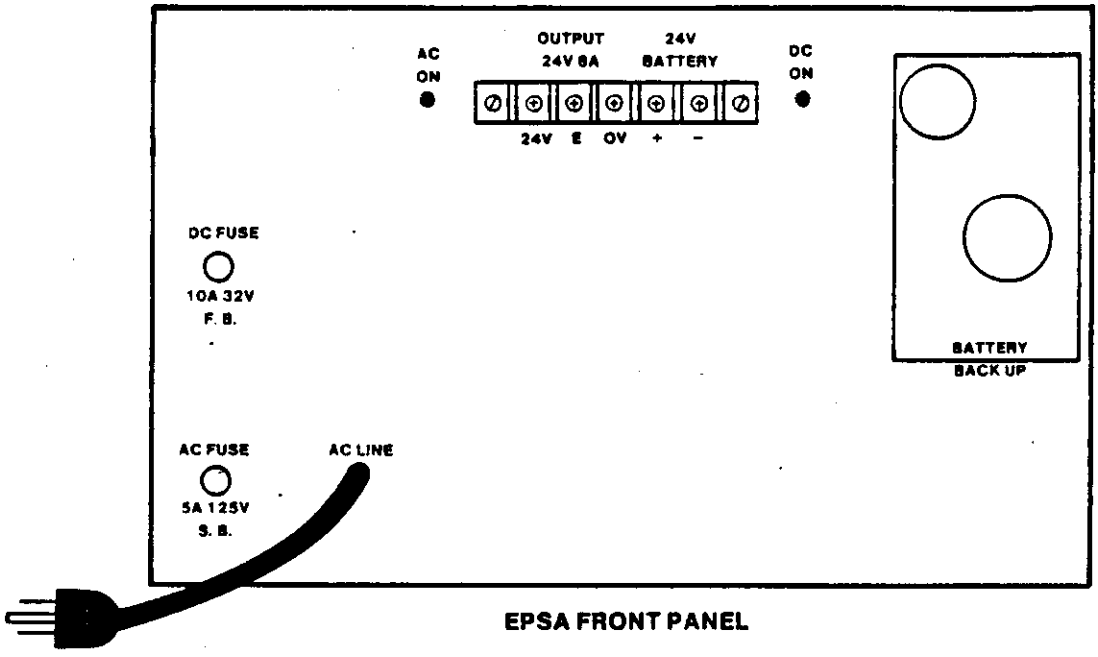
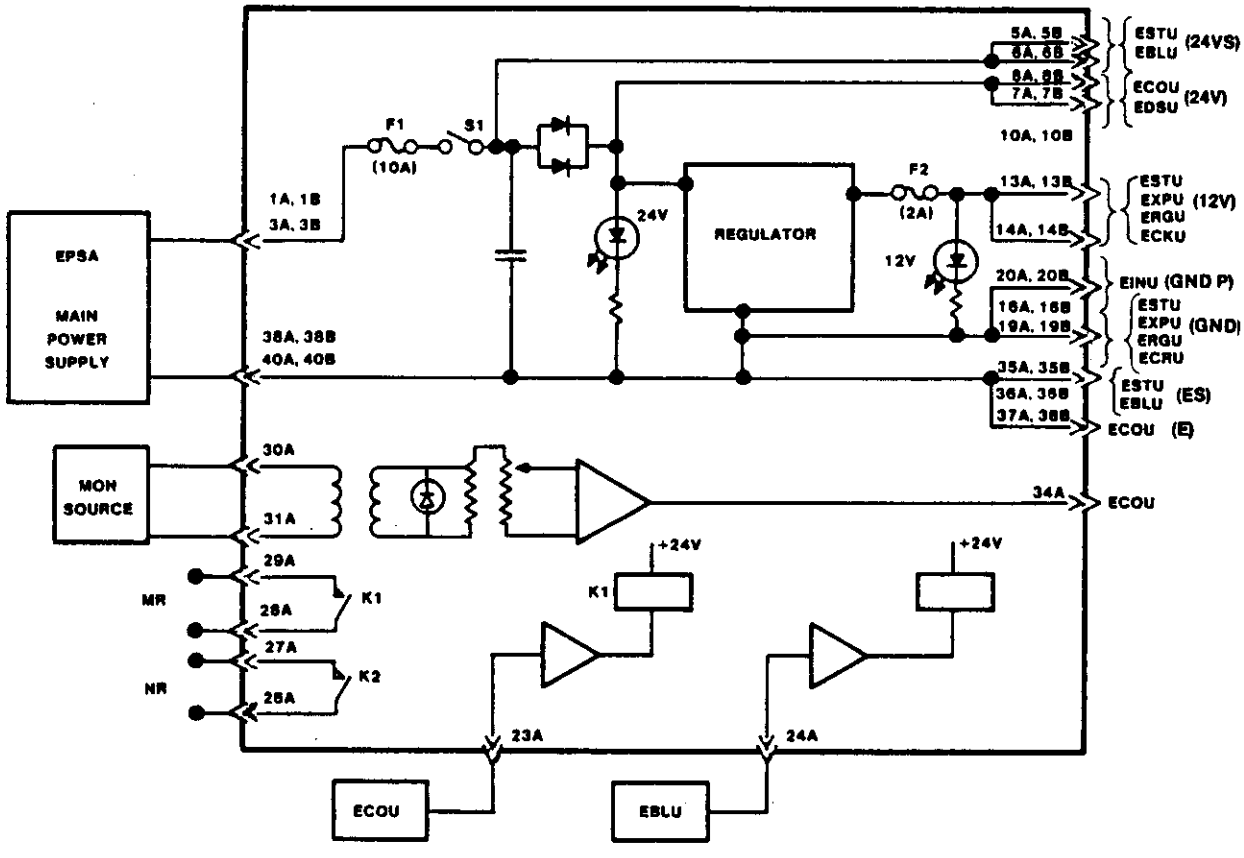


FIGURE 6B—EXPANDED SYSTEM BLOCK DIAGRAM



EPSA FRONT PANEL



EPRU BLOCK DIAGRAM

FIGURE 7—POWER EQUIPMENT

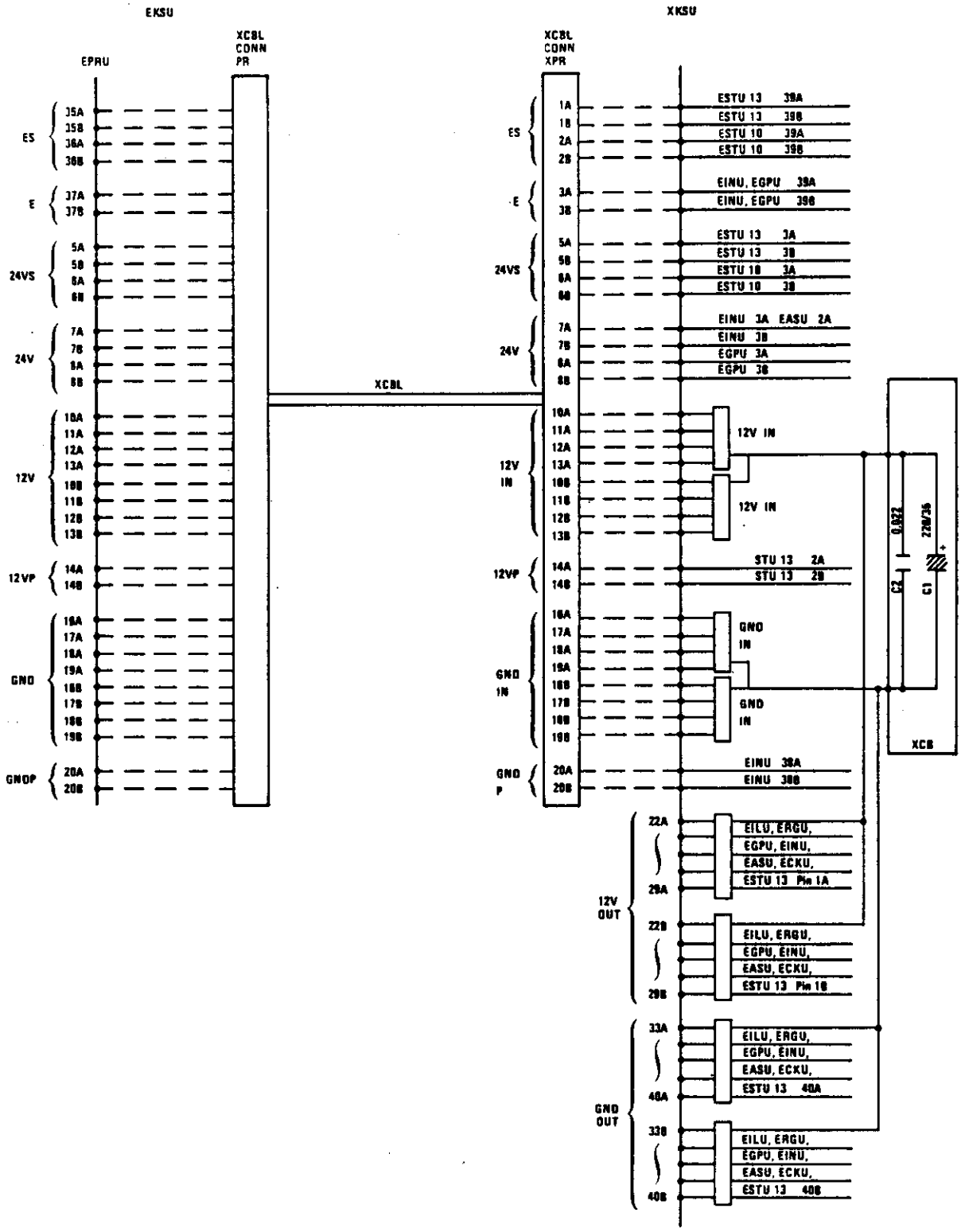


FIGURE 8-XKSU POWER DISTRIBUTION

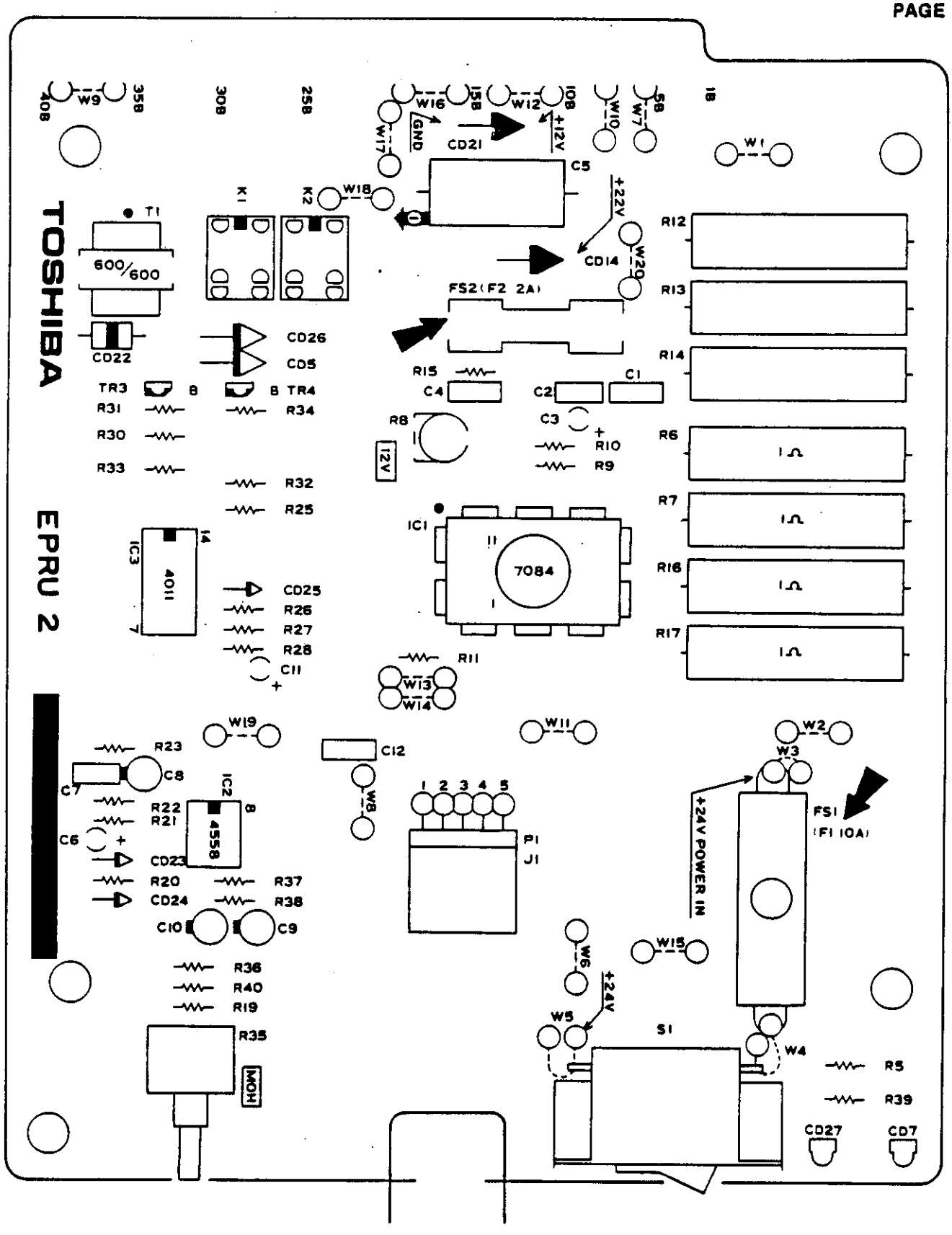


FIGURE 9—EPRU—PHYSICAL LAYOUT

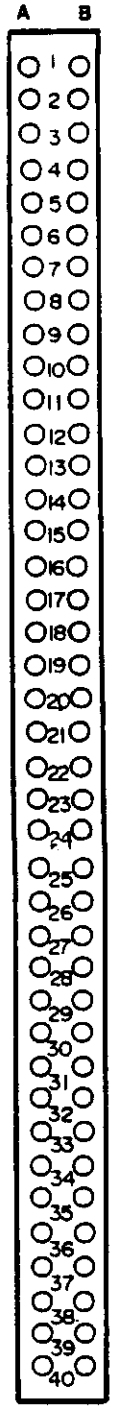


FIGURE 10—PCB CONNECTOR PIN NUMBERING

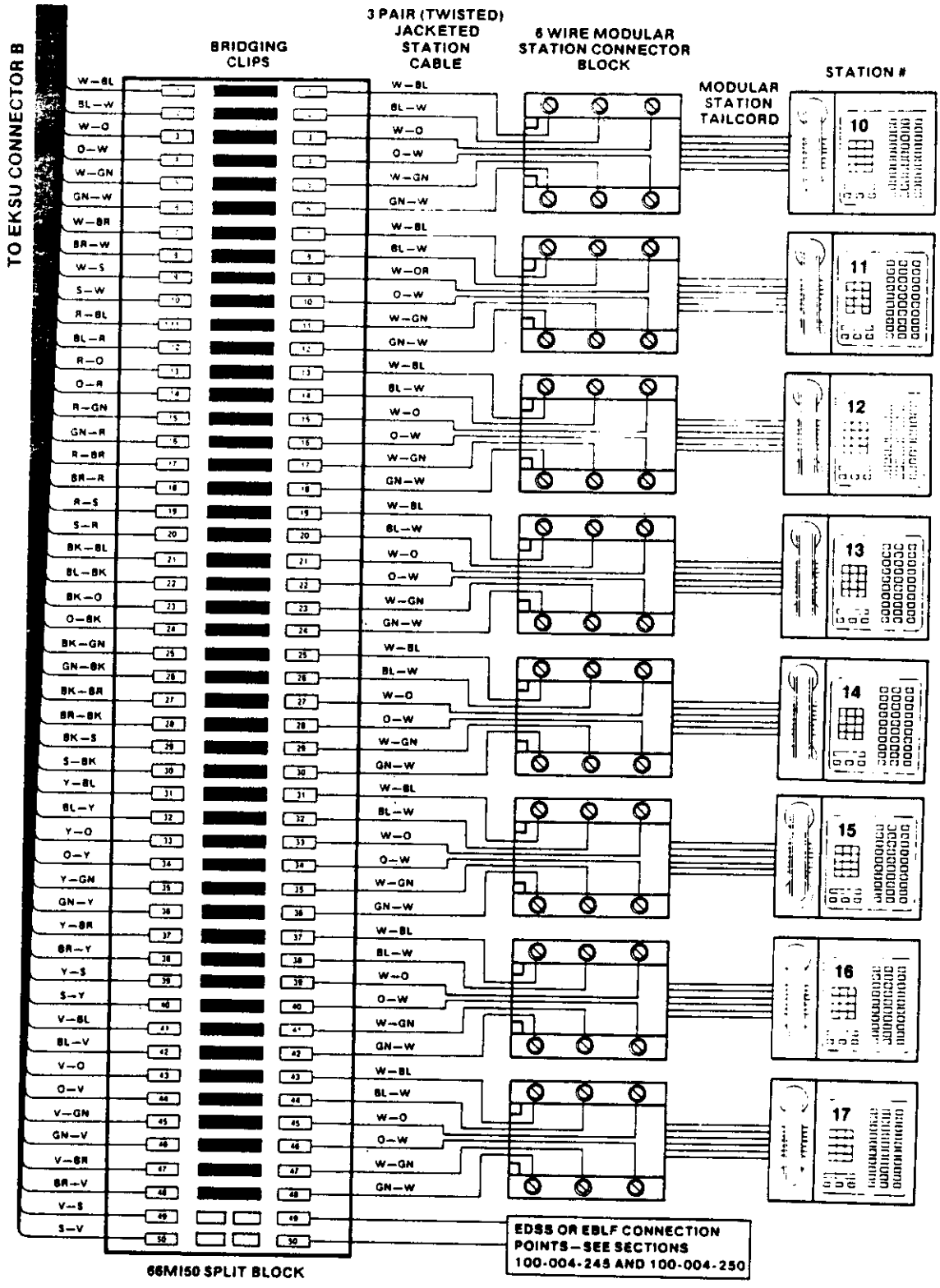


FIGURE 11A—MDF BLOCK 'B' CONNECTION DIAGRAM

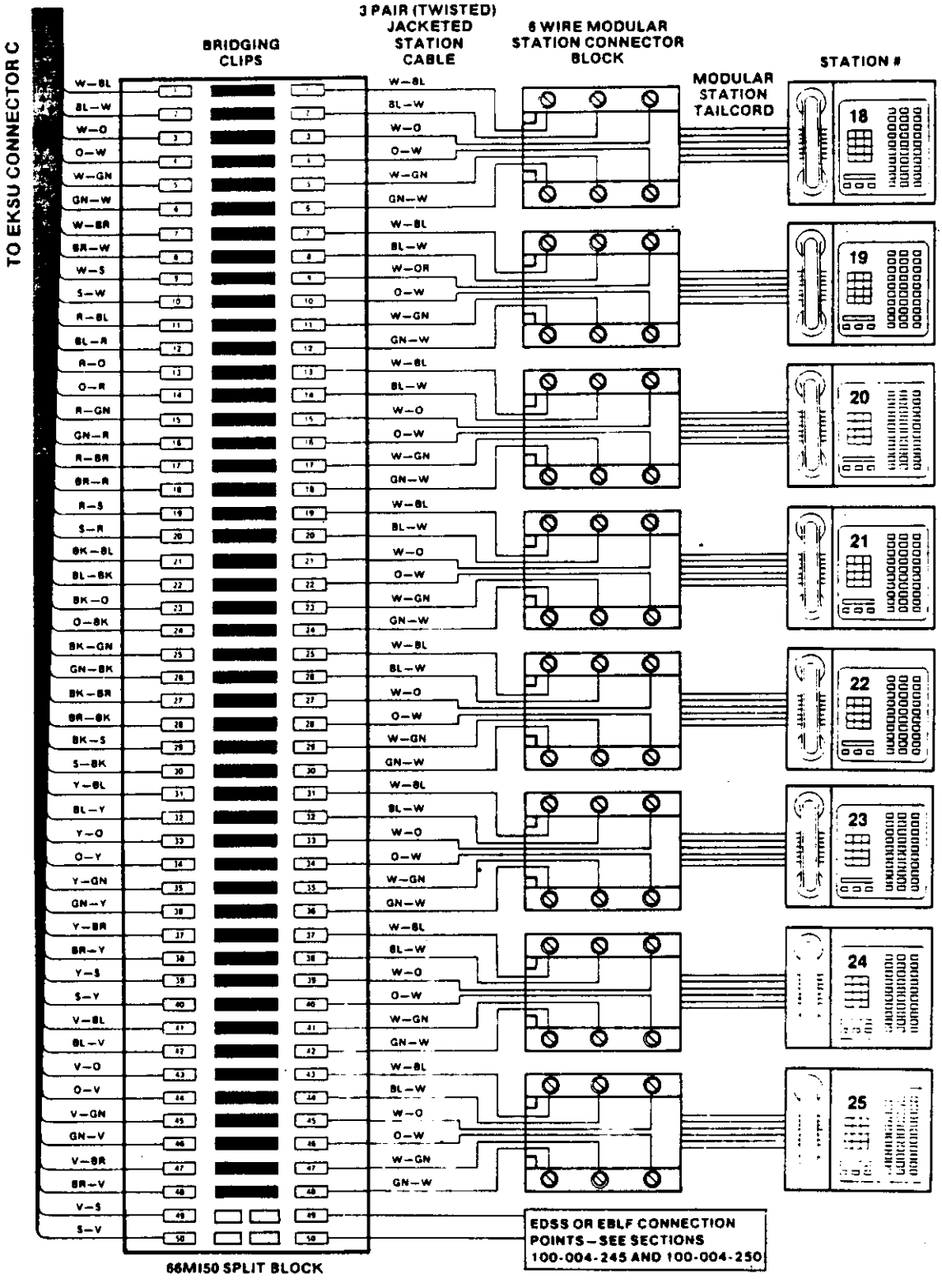


FIGURE 11B—MDF BLOCK 'C' CONNECTION DIAGRAM

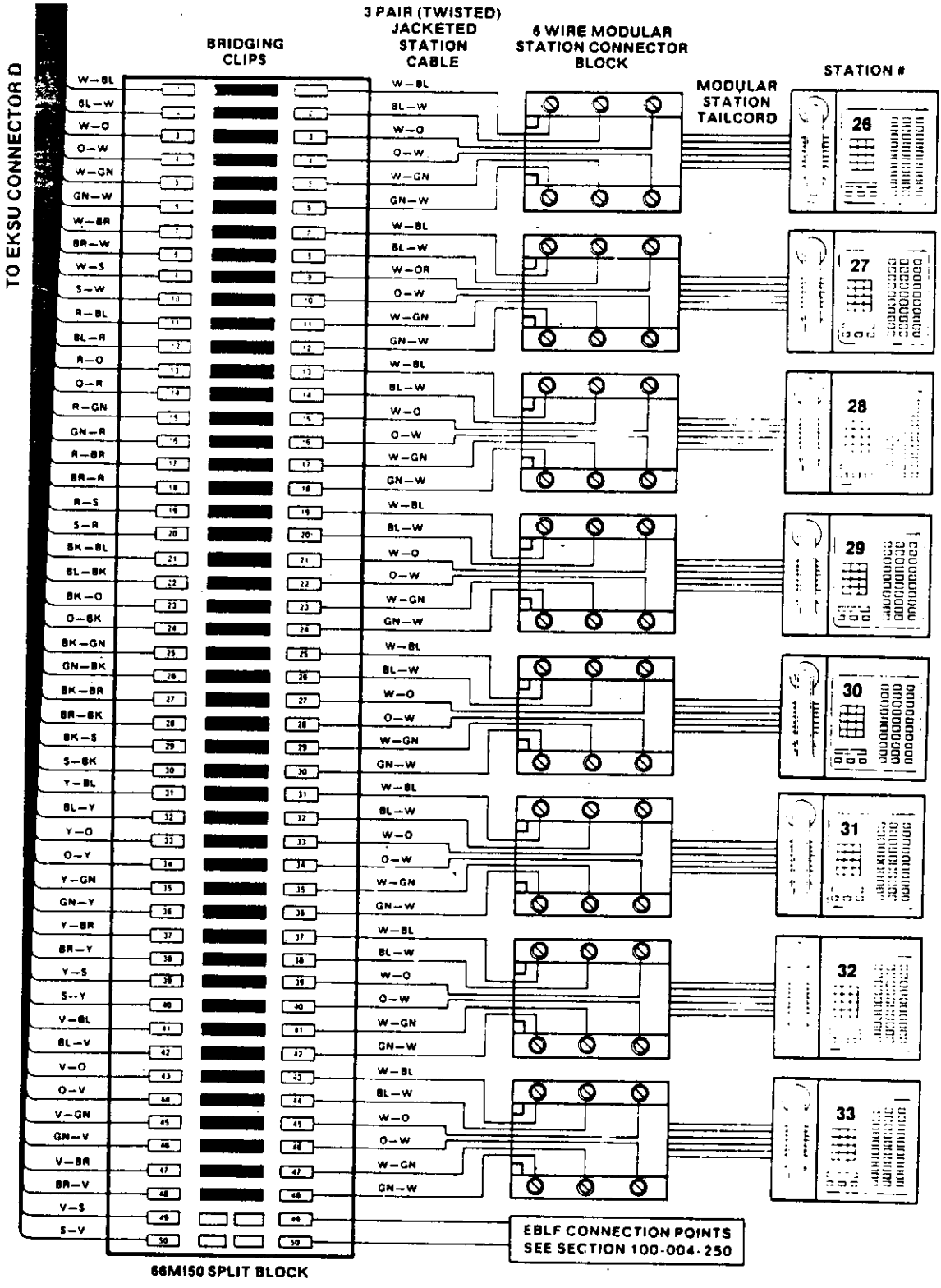


FIGURE 11C—MDF BLOCK 'D' CONNECTION DIAGRAM

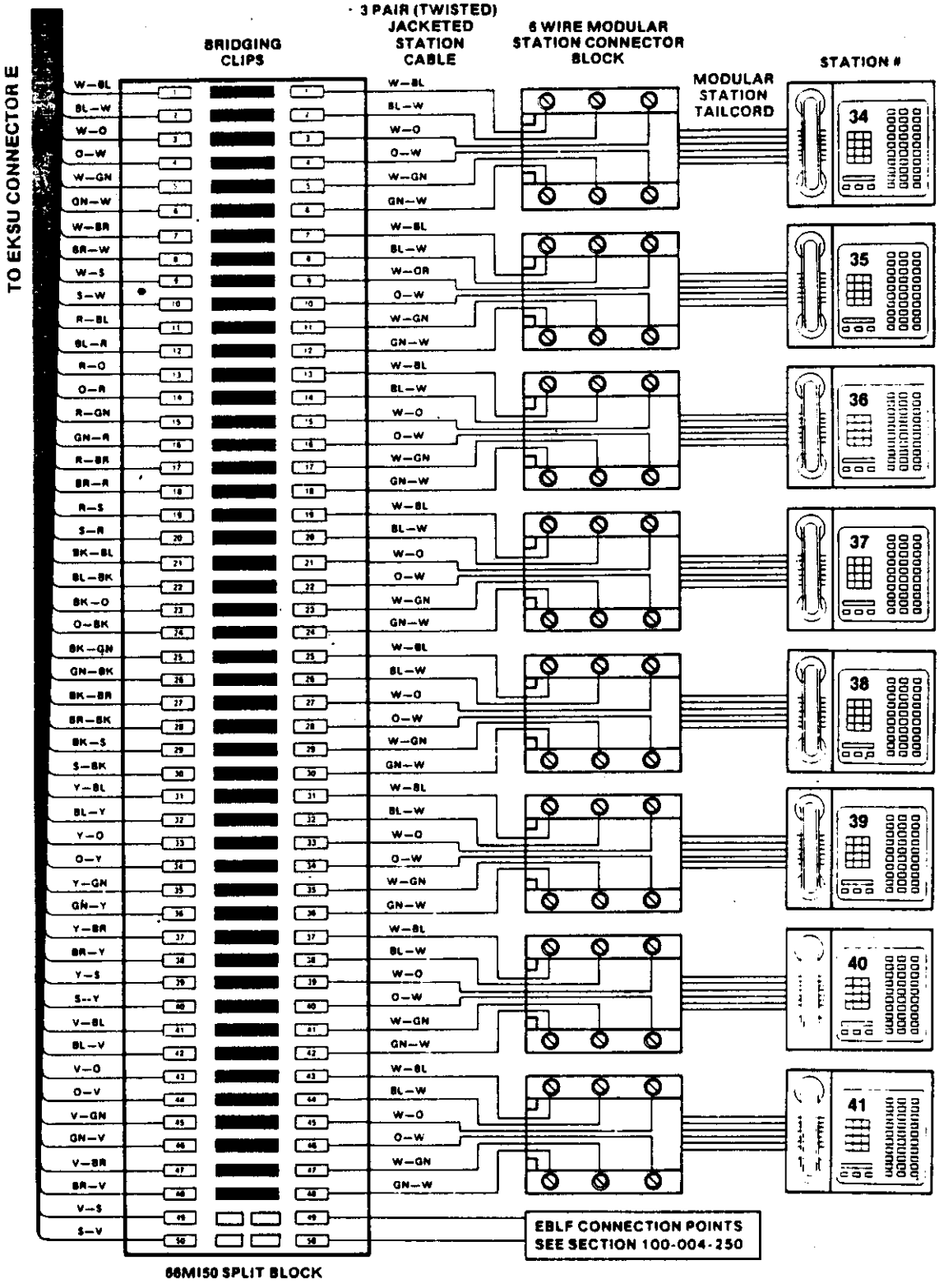


FIGURE 11D—MDF BLOCK 'E' CONNECTION DIAGRAM

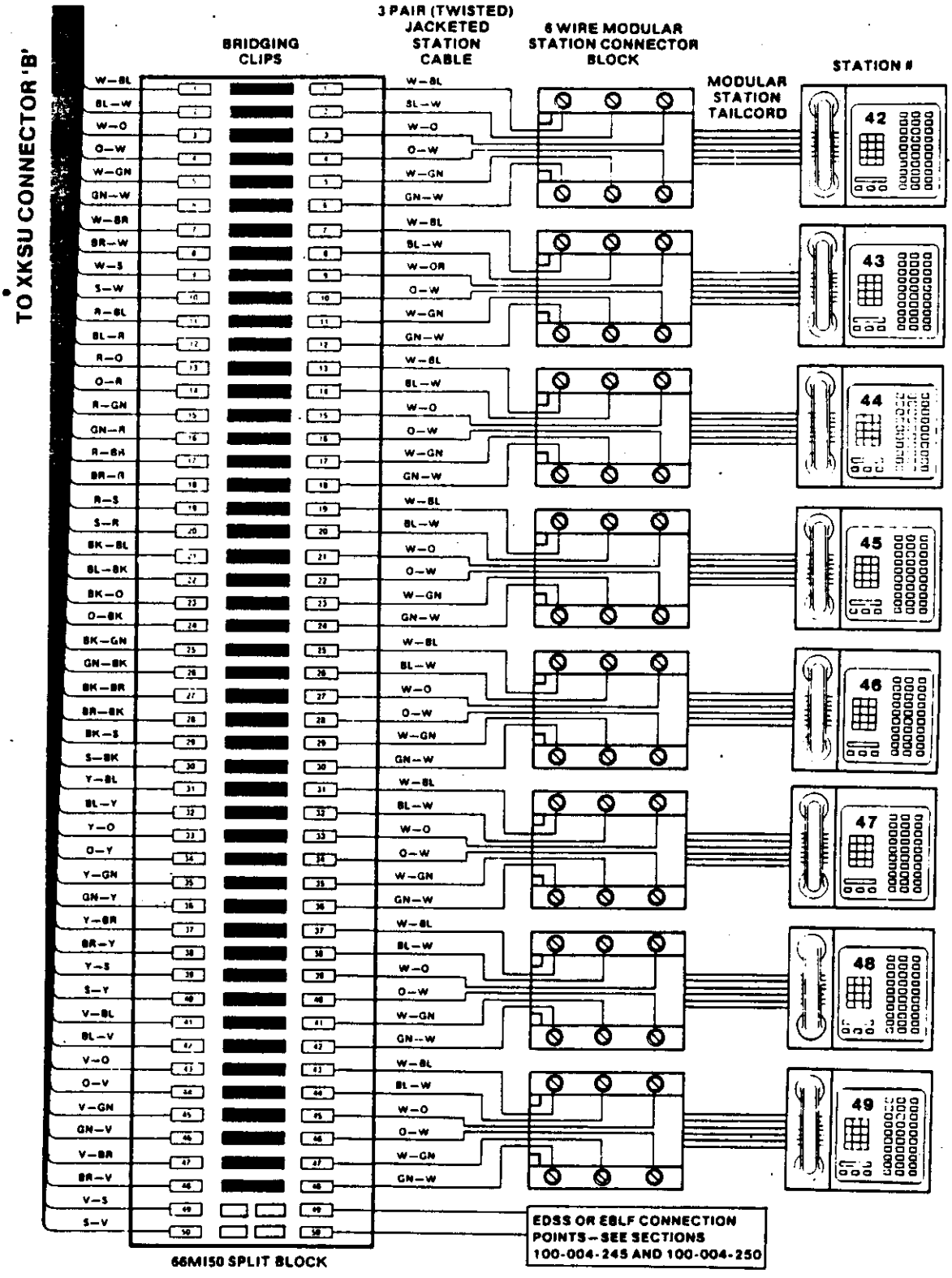


FIGURE 12A—XMDF BLOCK 'XB' CONNECTION DIAGRAM

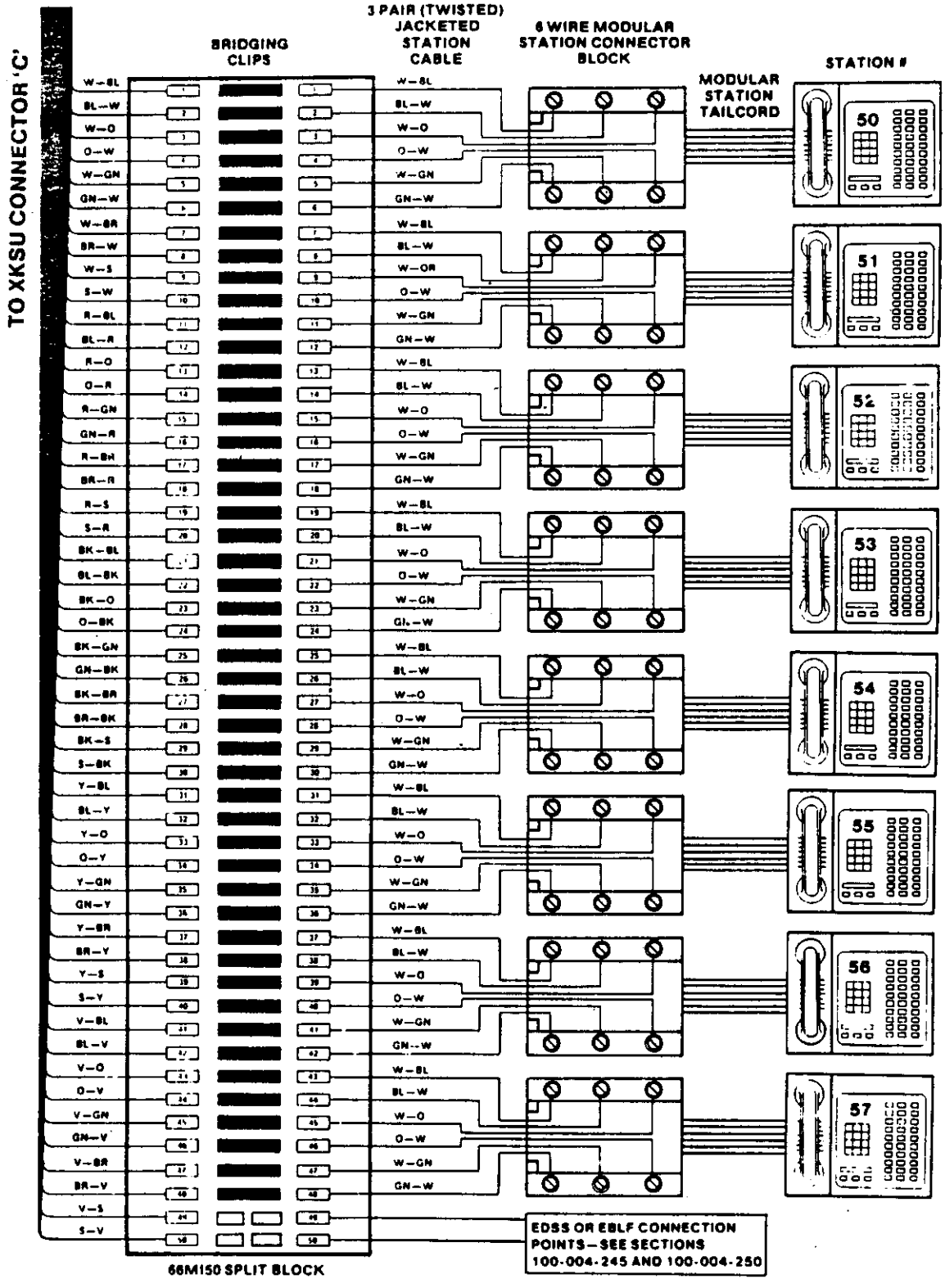


FIGURE 12B—XMDF BLOCK 'XC' CONNECTION DIAGRAM

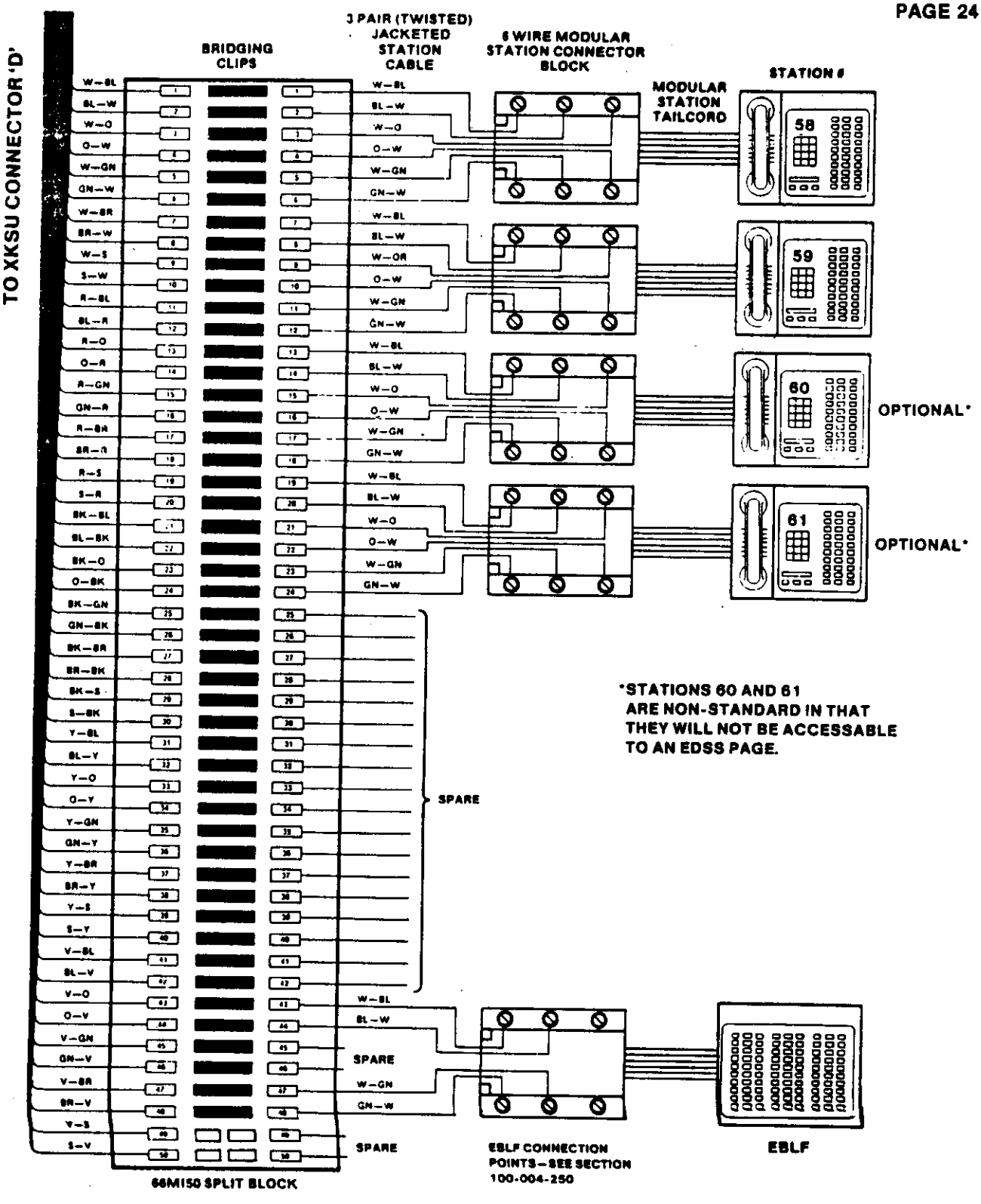


FIGURE 12C—XMDF BLOCK 'XD' CONNECTION DIAGRAM

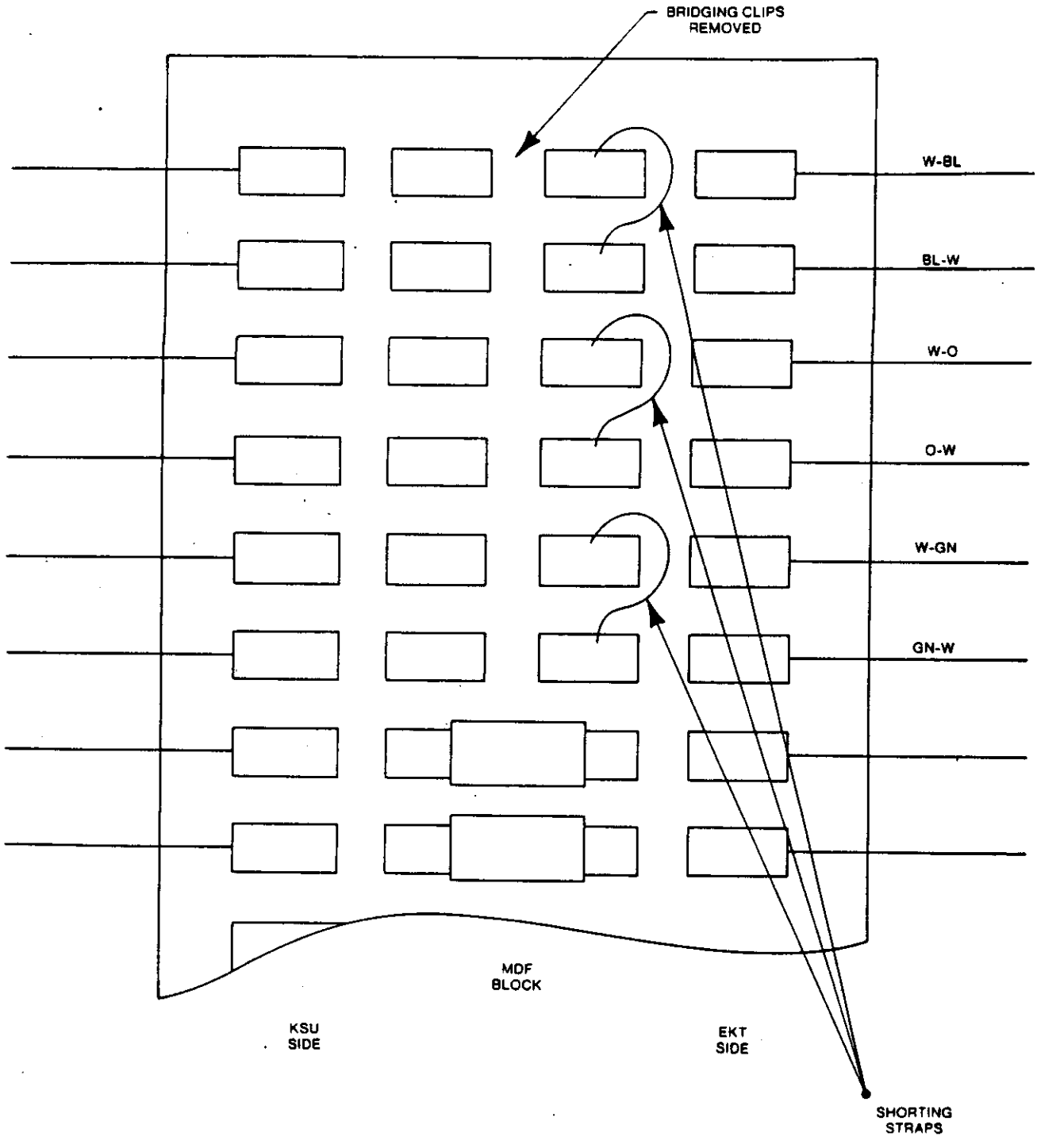


FIGURE 13—CABLE TEST EXAMPLE

TABLE A—POWER SUPPLY VOLTAGE TEST POINTS

VOLTAGE	EKSU TEST POINTS	TOLERANCE AC	TOLERANCE BAT
+24V MAIN	EPRU CONNECTOR PIN 1A, 1B (+24V) 40A, 40B (OV)	23 – 25.5	21 – 27
+24V ESTU EBLU	EPRU CONNECTOR PIN 5A, 5B (+24V) 6A, 6B (+24V) 20A, 20B (OV)	23 – 25.5	21 – 27
+24V ECOU EDSU	EPRU CONNECTOR PIN 7A, 7B (+24V) 8A, 8B (+24V) 20A, 20B (0V)	23 – 25.5	21 – 27
+12V	EPRU CONNECTOR PIN 10A, 10B (+12V) 20A, 20B (OV)	11.4 – 12.6	11.4 – 12.6
	XKSU TEST POINTS		
+24V ESTU	XPR CONNECTOR PIN 5A, 5B (+24V) 6A, 6B (+24V) 20A, 20B (OV)		
+24V EINU EGPU	XPR CONNECTOR PIN 7A, 7B (+24V) 8A, 8B (+24V) 20A, 20B (OV)		
+12V	XPR CONNECTOR PIN 10A, 10B (+12V) 20A, 20B (OV)		

PROCEDURE

Connect negative (–) meter lead to the OV pin and the positive (+) meter lead to the +24 or +12 pins.

NOTE: A.C. input tolerance 90 - 130 VAC. (57 - 63hz.)

TABLE B—DSS STRAPPING

EDSU STRAPPING	
EDSU Installed	EDSU not Installed
	EDSU Socket
No Straps	STRAP
	5A—5B 6A—6B 8A—8B 9A—9B

NOTE: See Section 100-004-280 if EASU PCB(s) are installed in the EKSU and XKSU.

XDLU STRAPPING	
XDLU Installed	XDLU not Installed
SI on EIFU	SI on EIFU
All Contacts Off	All Contacts On

2ND DSS STRAPPING	
2nd DSS installed at Ext. 42	2nd DSS not installed at Ext. 42
Strap 10A-10B on EASU socket	No strap

TABLE C—EILU STRAPPING

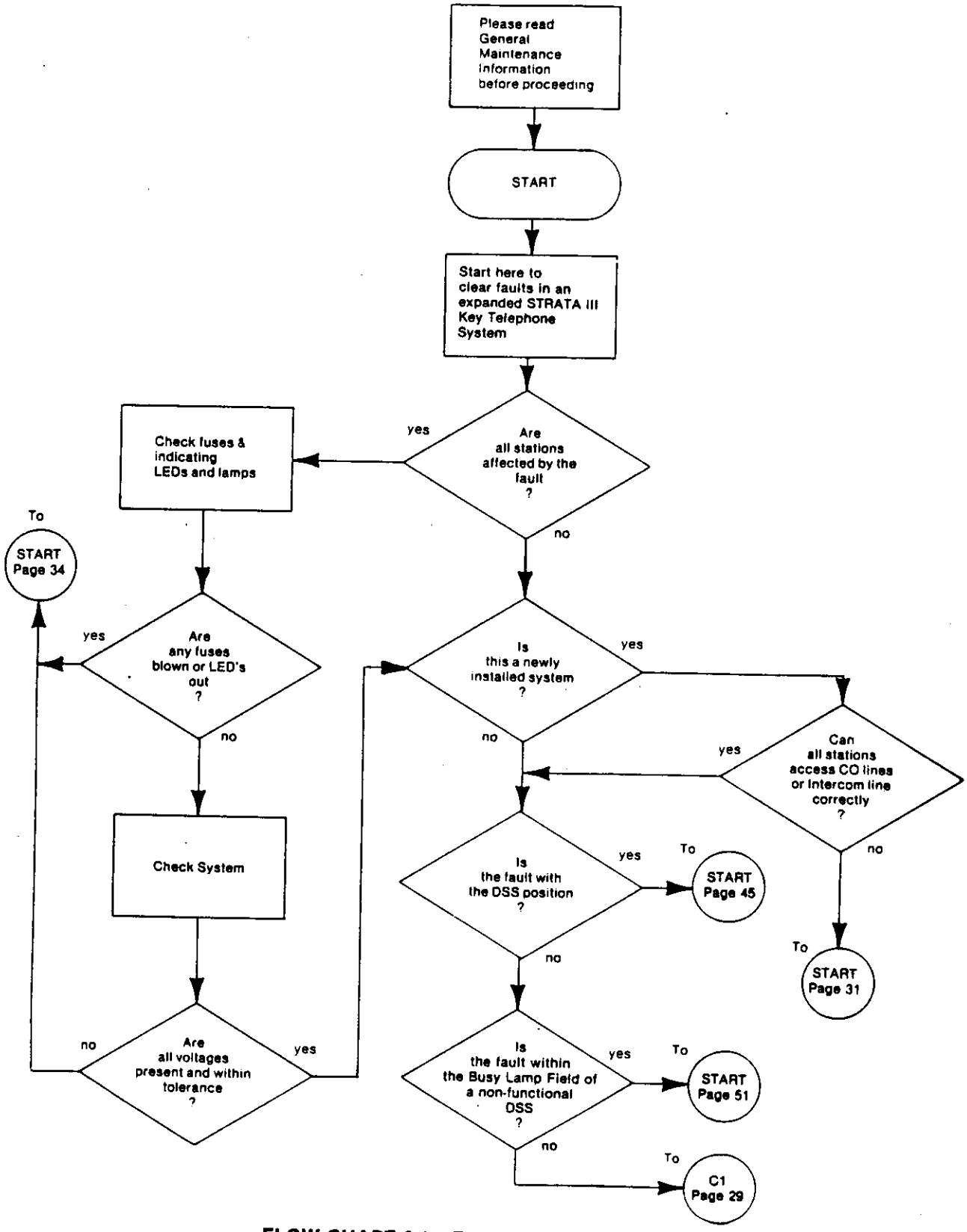
EILU STRAPPING	
EILU Installed	EILU not Installed
None	EILU Socket
	21A—21B 22A—22B

TABLE D—EGPU STRAPPING

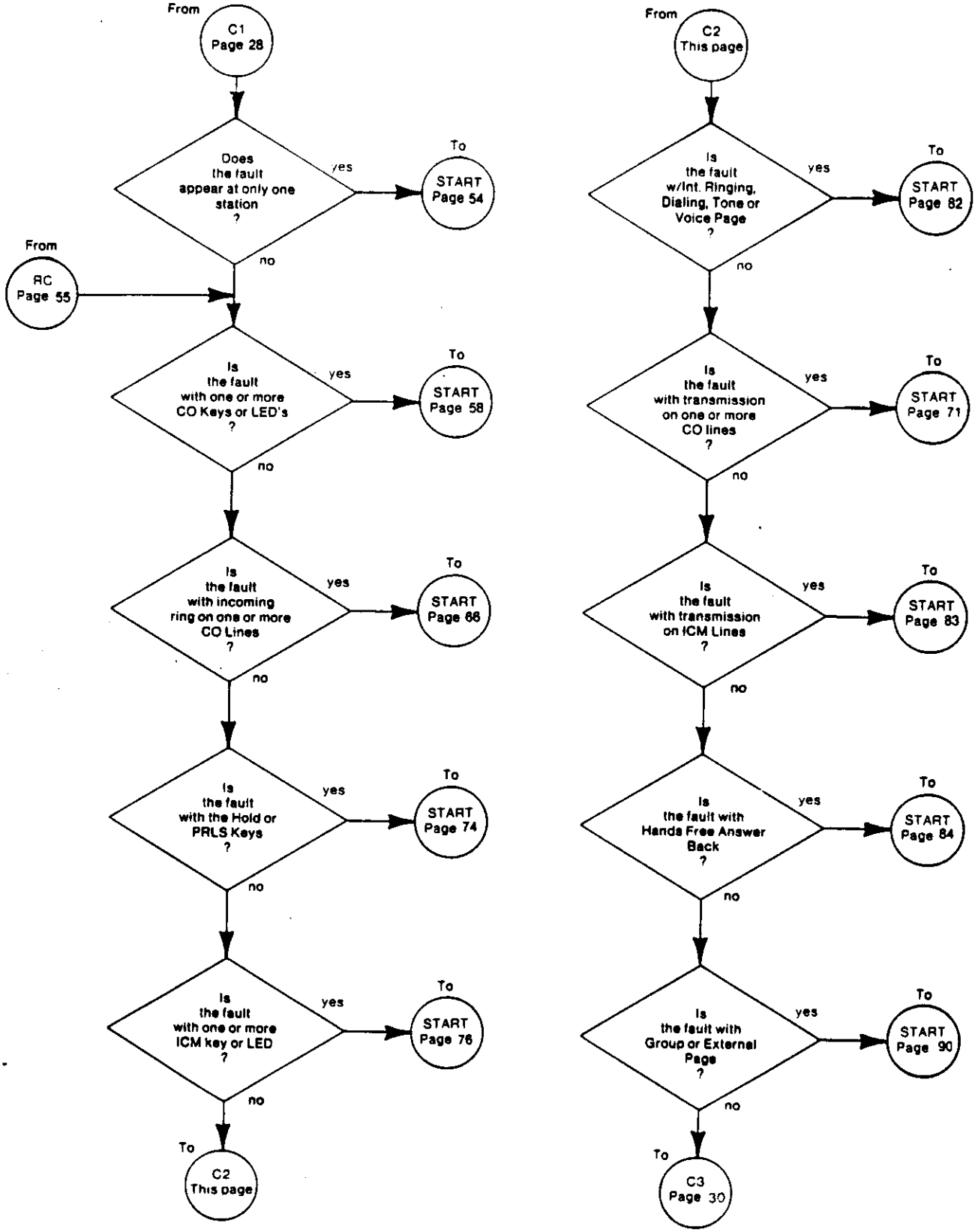
EGPU STRAPPING	
EGPU Equipped	EGPU not Equipped
No Straps	EGPU Jack Pin
	5A—5B 6A—6B 7A—7B 20A—20B

TABLE E - EBLU STRAPPING

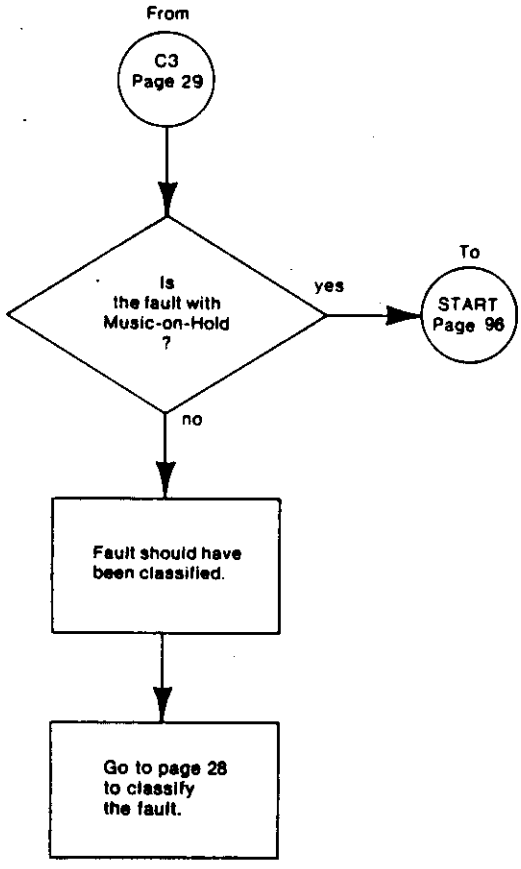
EBLU STRAPPING	
EBLU Equipped	EBLU not Equipped
No Straps	Strap EBLU Connector Pins
	5A - 8B



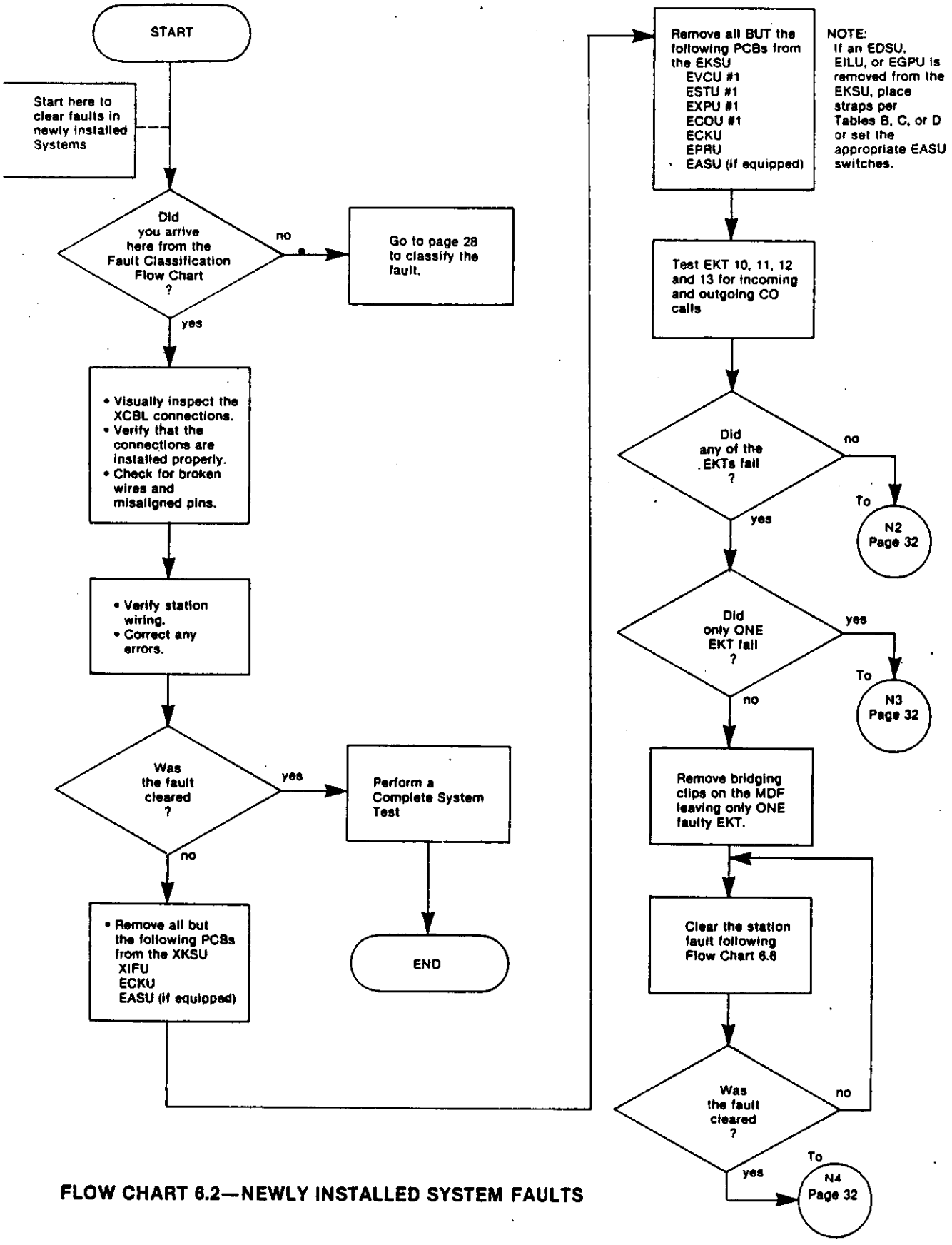
FLOW CHART 6.1—FAULT CLASSIFICATION



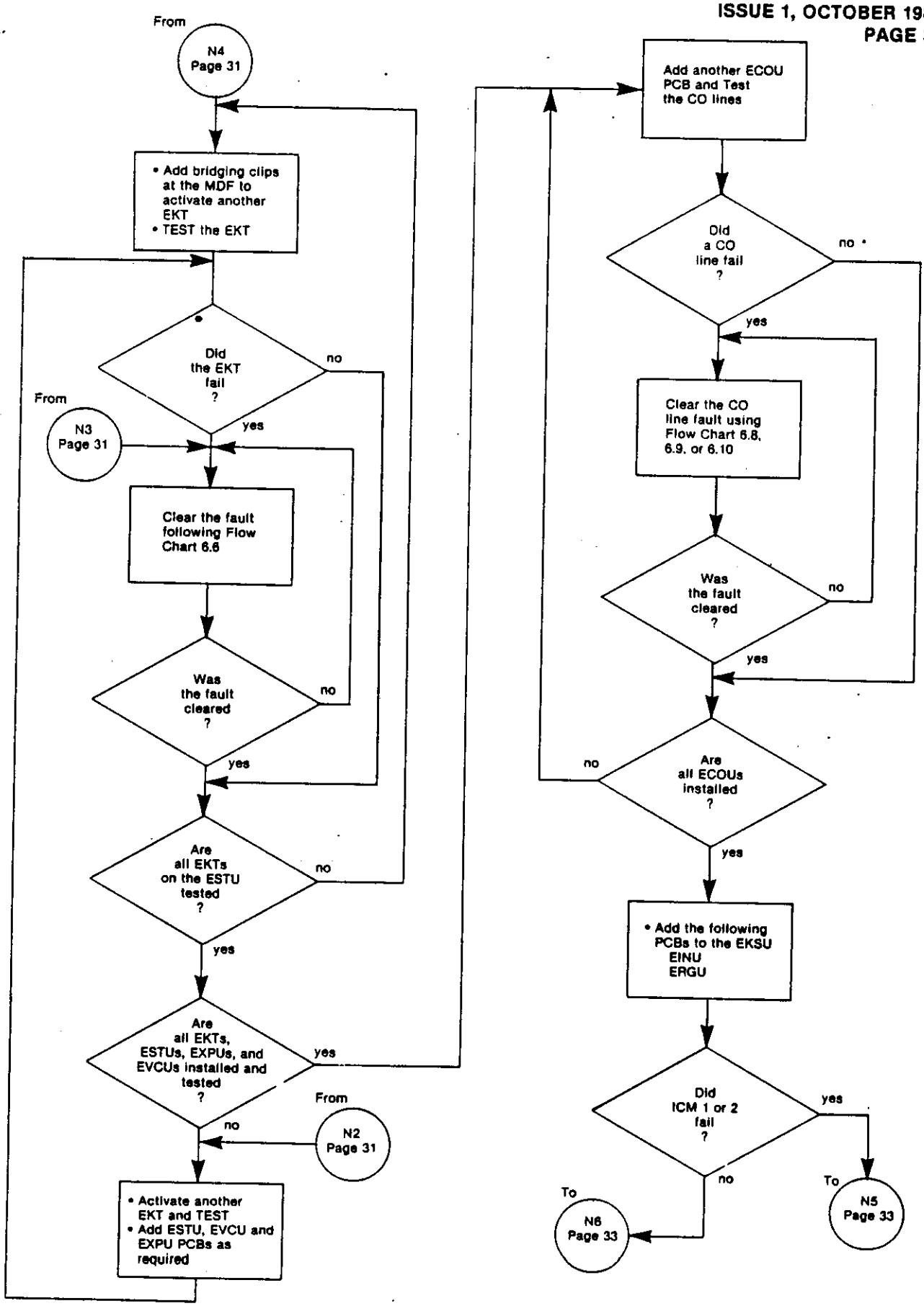
FLOW CHART 6.1.1—FAULT CLASSIFICATION (Cont)



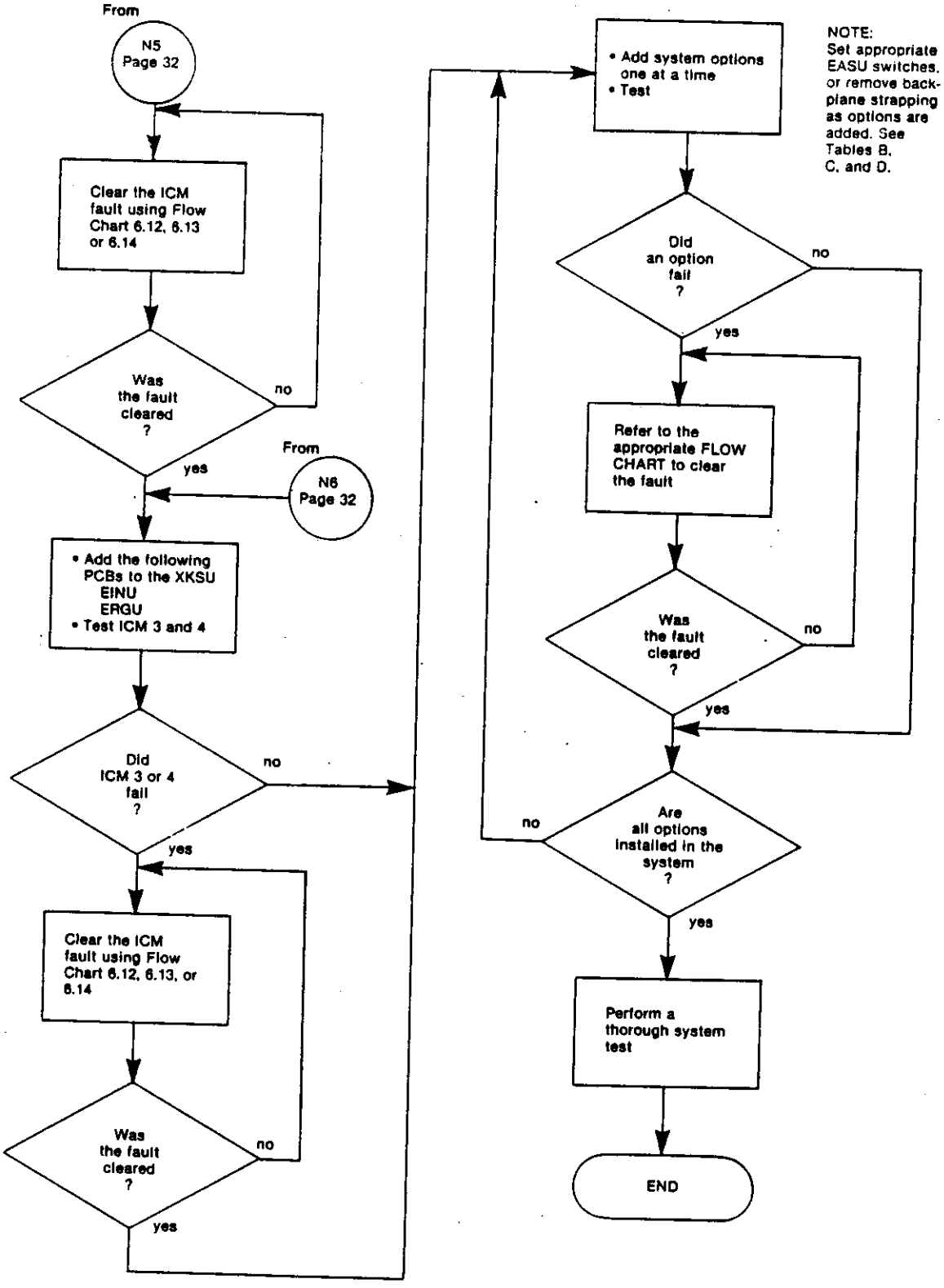
FLOW CHART 6.1.2—FAULT CLASSIFICATION (Cont)



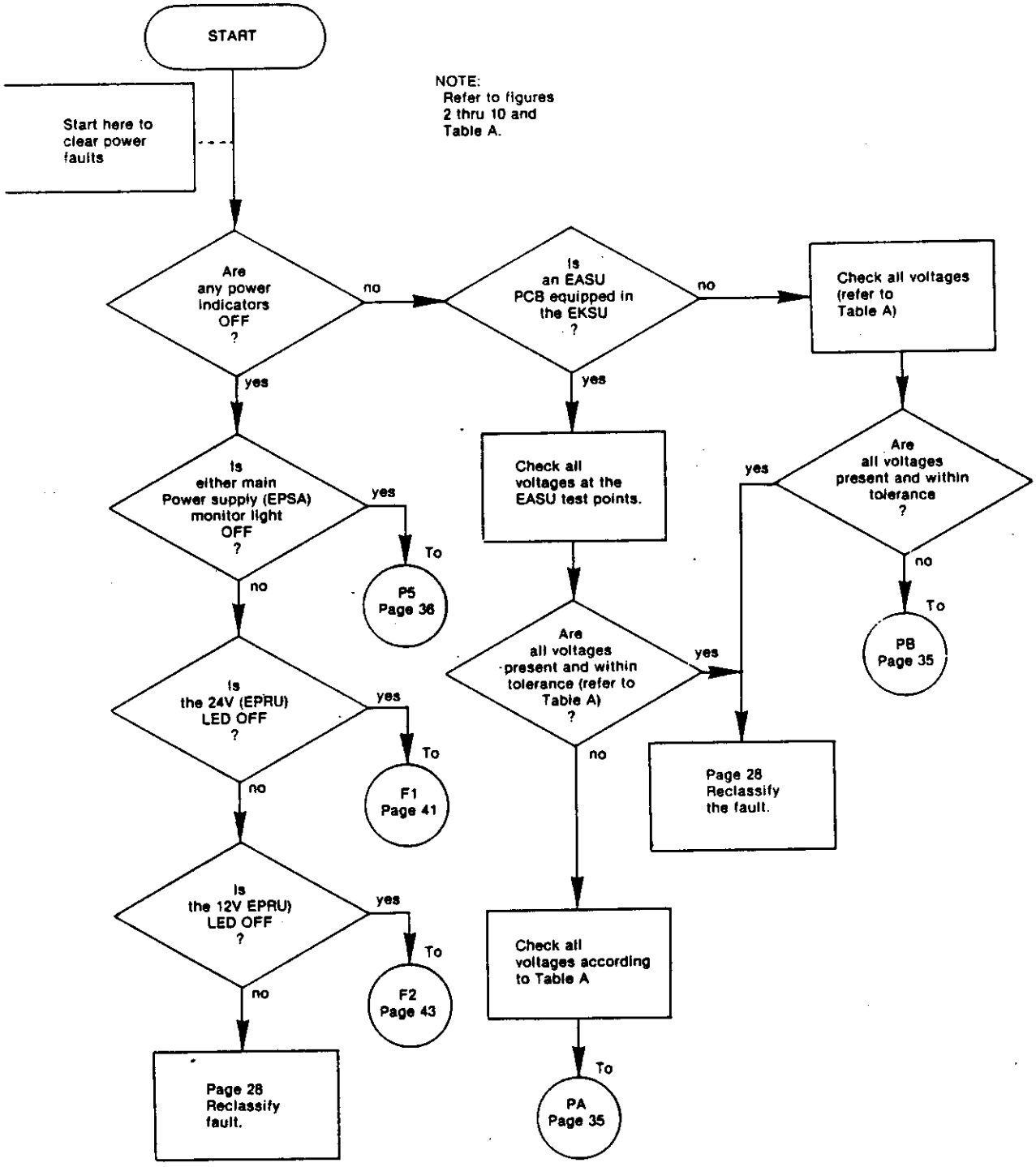
FLOW CHART 6.2—NEWLY INSTALLED SYSTEM FAULTS



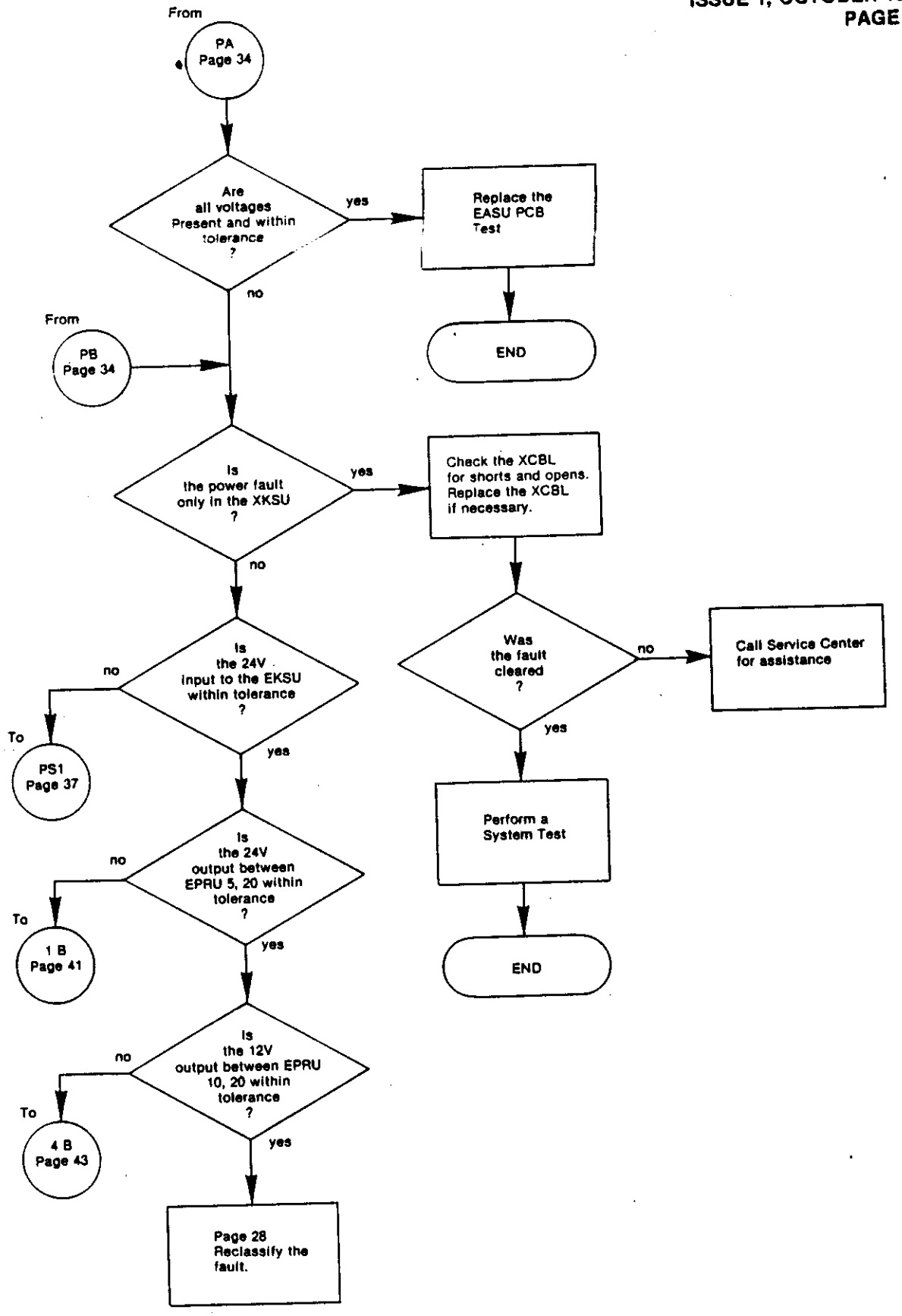
FLOW CHART 6.2.1—NEWLY INSTALLED SYSTEM FAULTS (Cont)



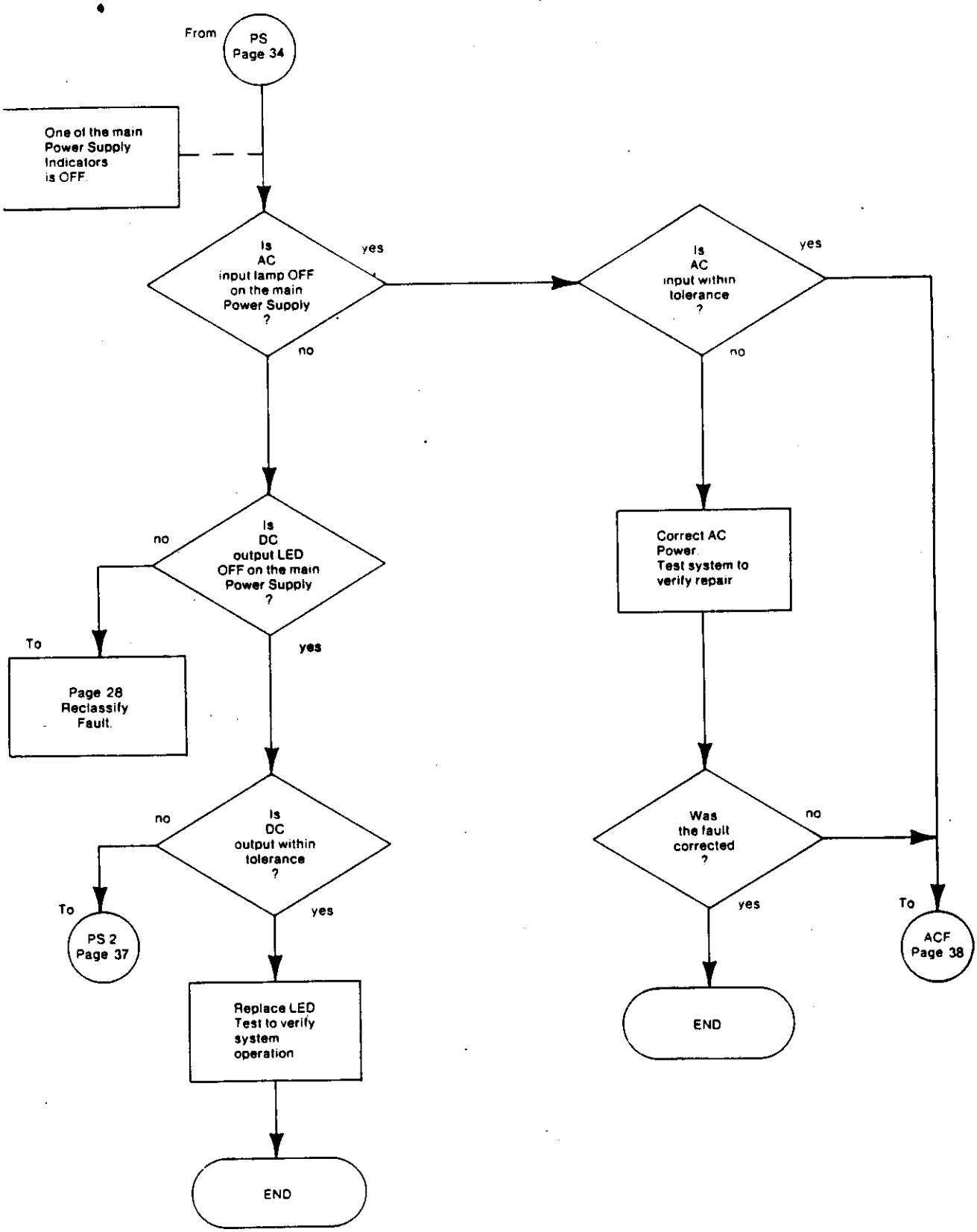
FLOW CHART 6.2.2—NEWLY INSTALLED SYSTEM FAULTS (Cont)



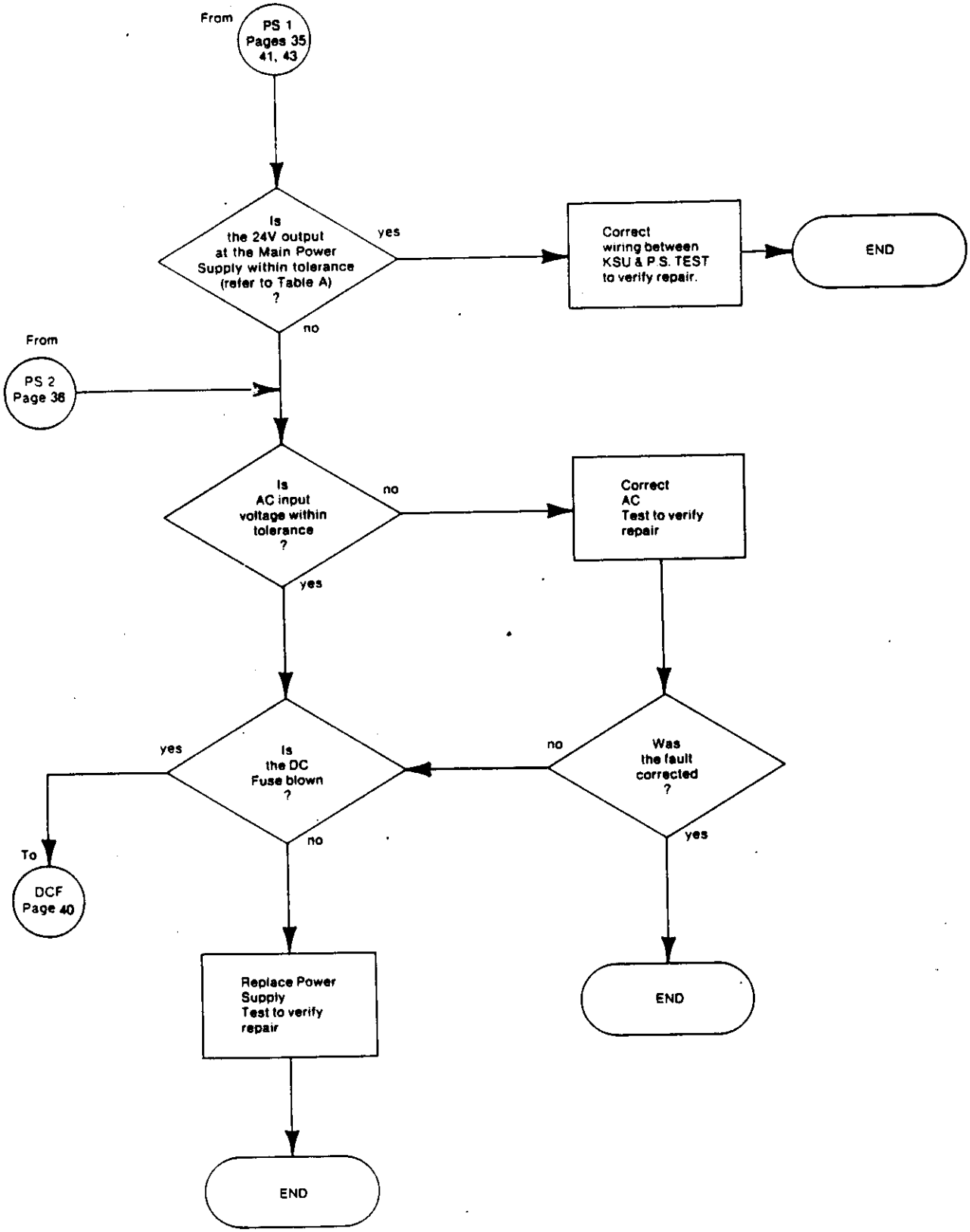
FLOW CHART 6.3—POWER FAULTS



FLOW CHART 6.3.1—POWER FAULTS (Cont)



FLOW CHART 6.3.2—POWER FAULTS (Cont)



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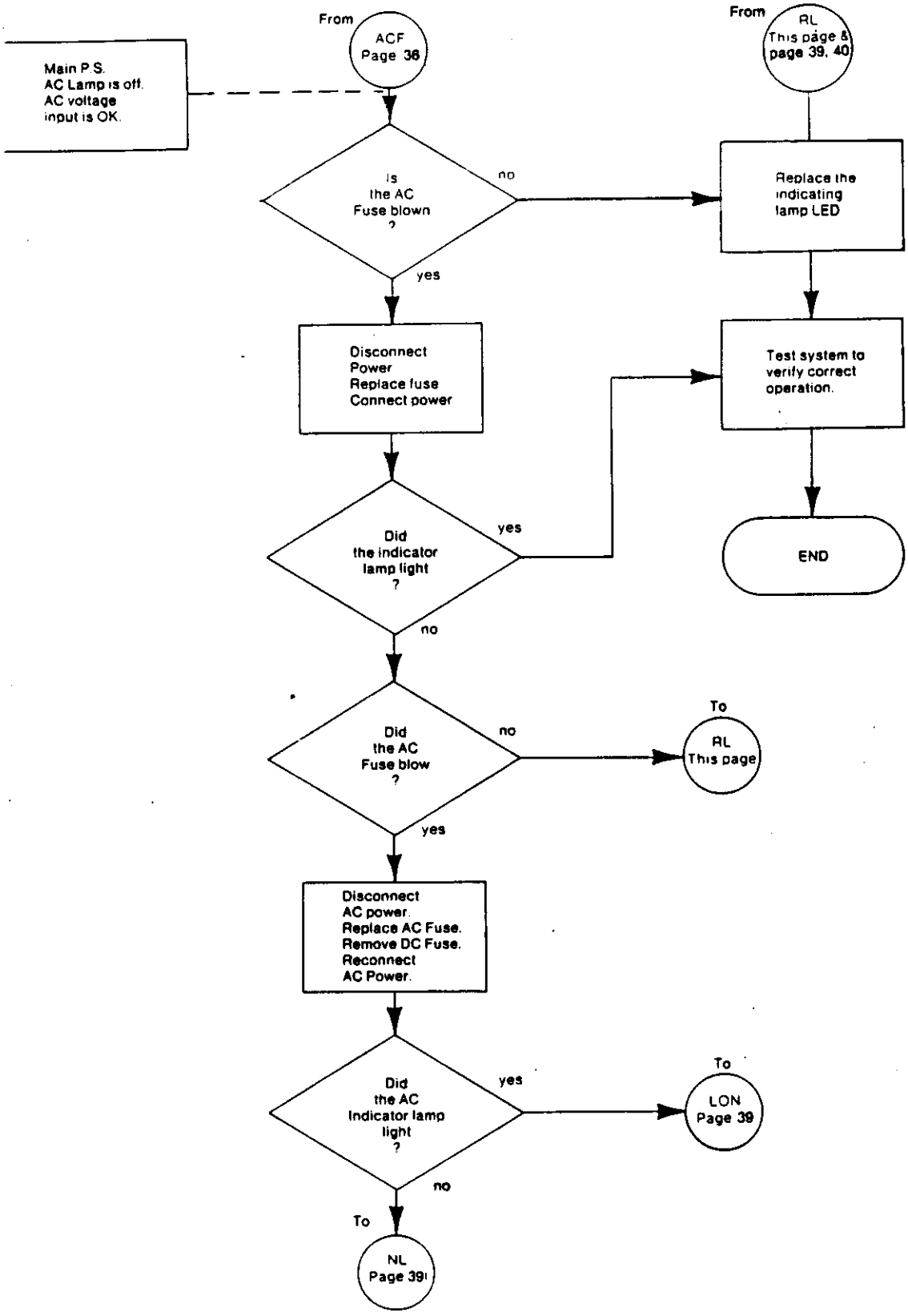

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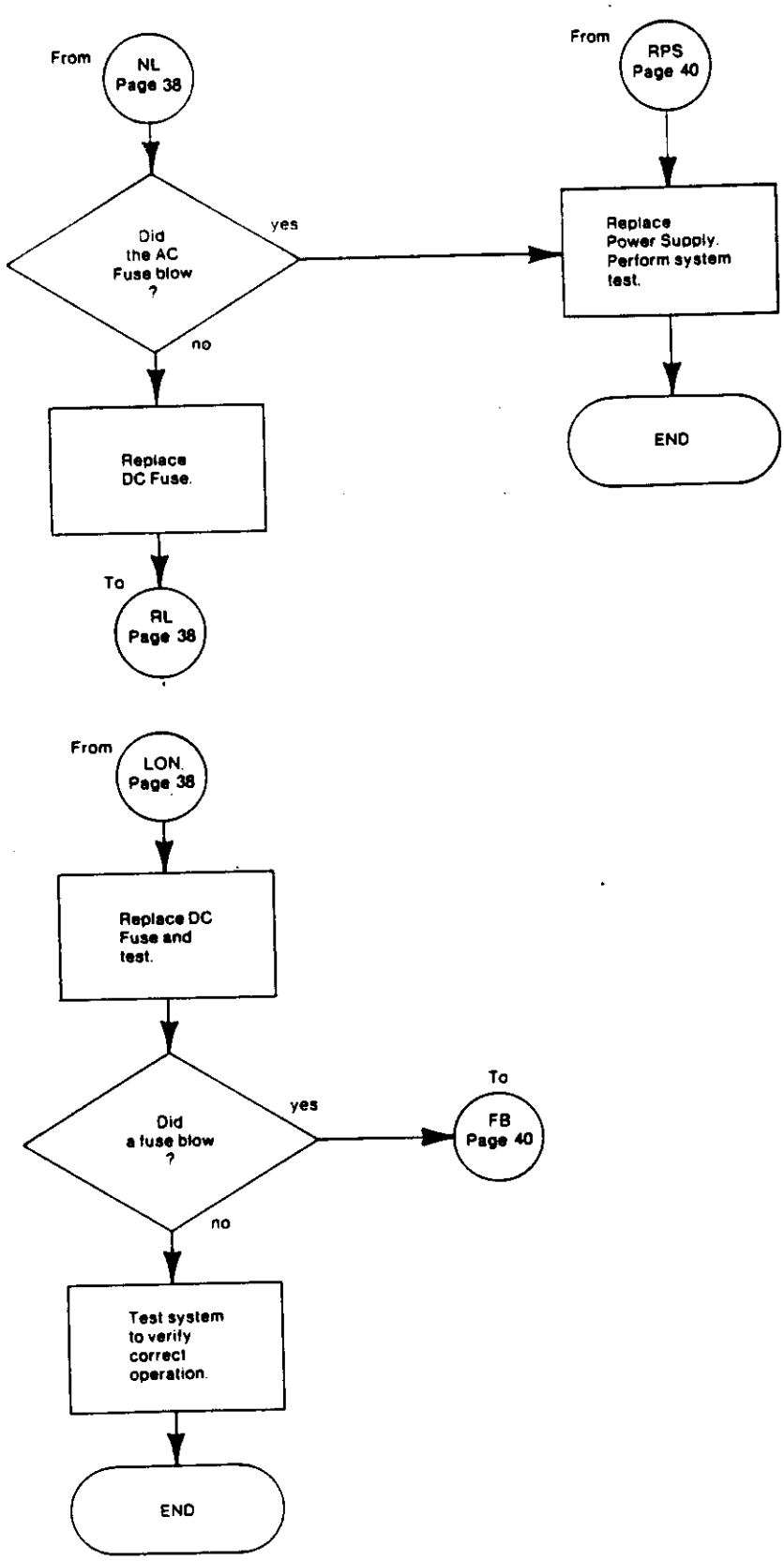
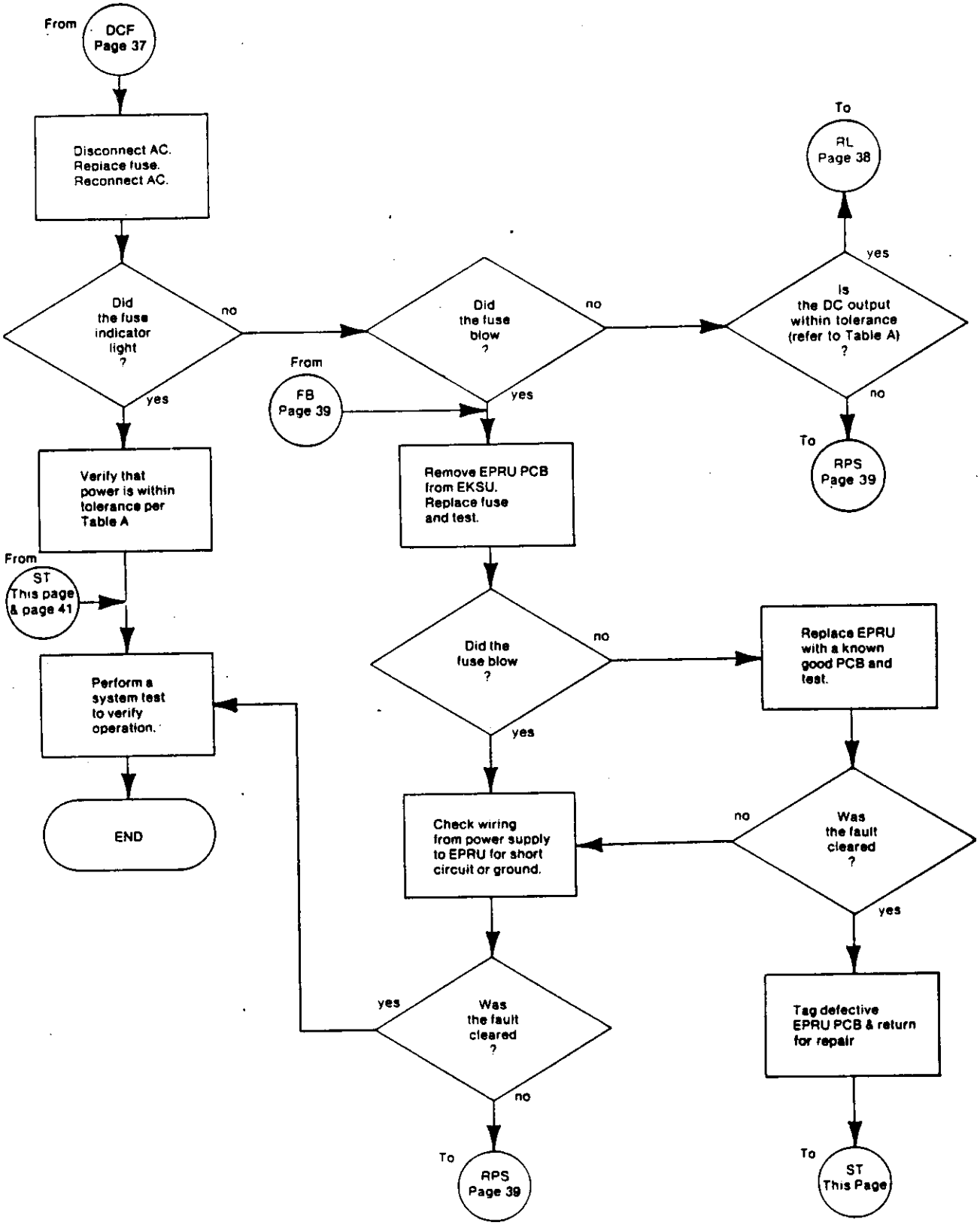
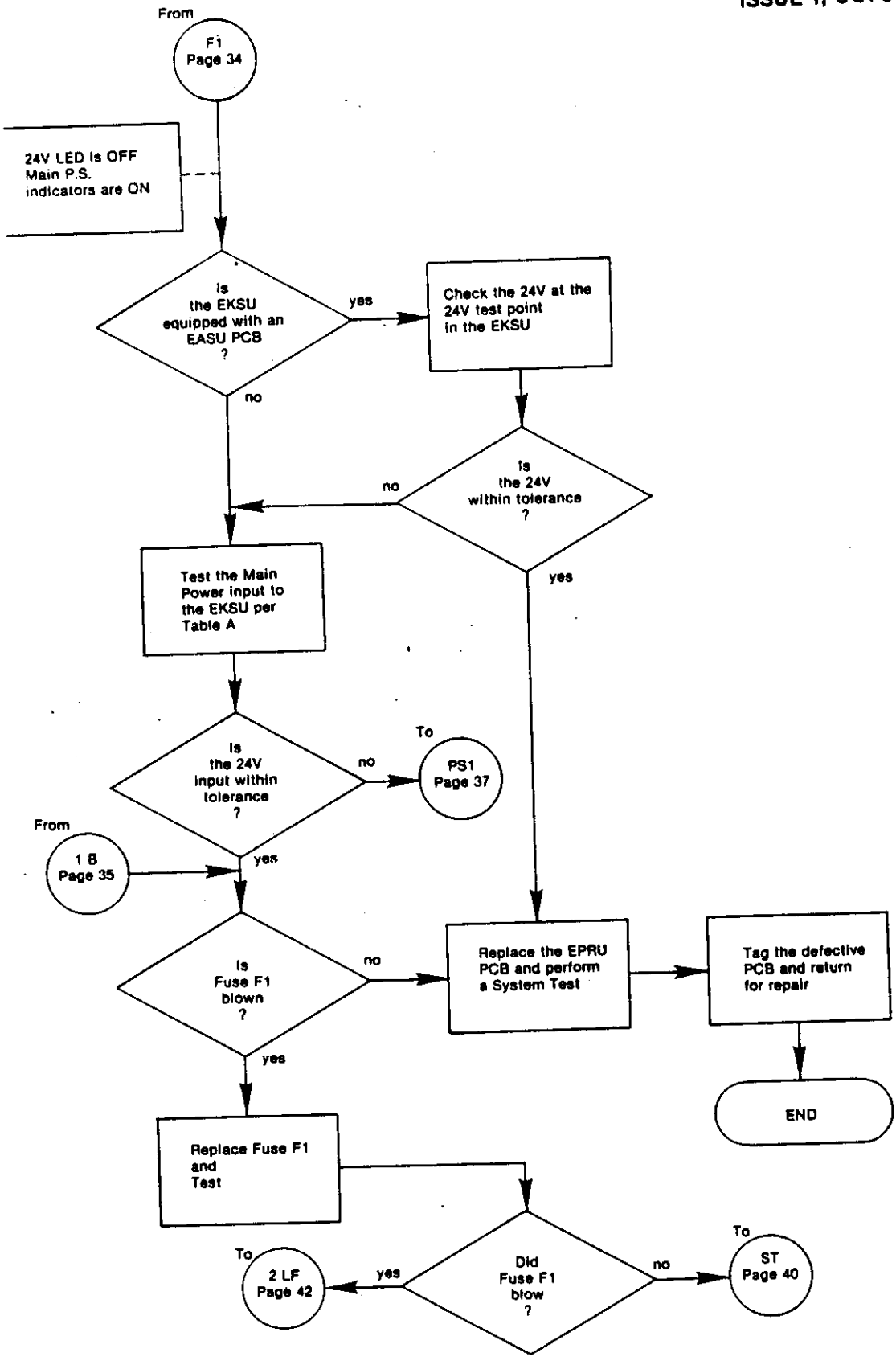


FLOW CHART 6.3.5—POWER FAULTS (Cont)



FLOW CHART 6.3.6 — POWER FAULTS (Cont)



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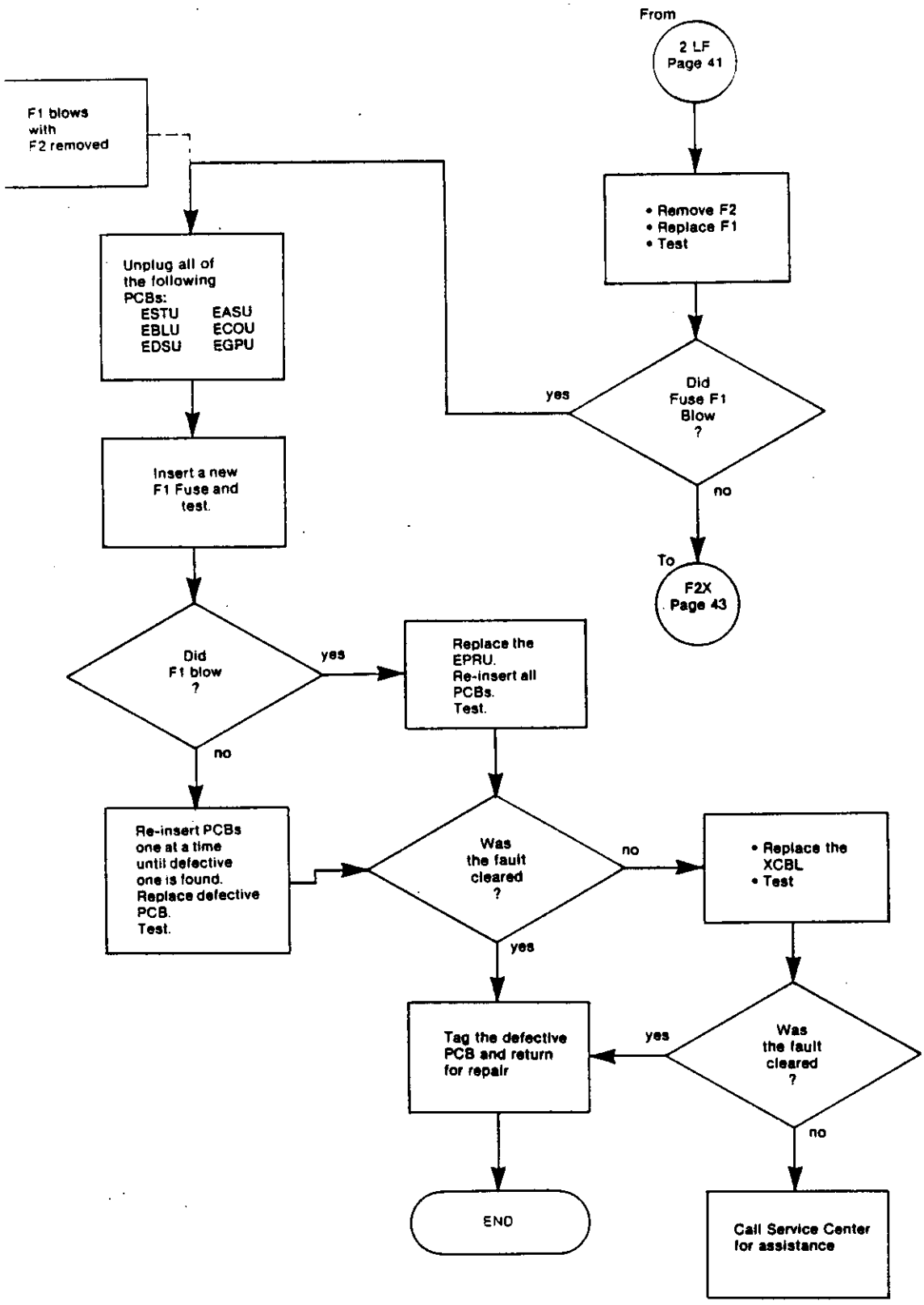
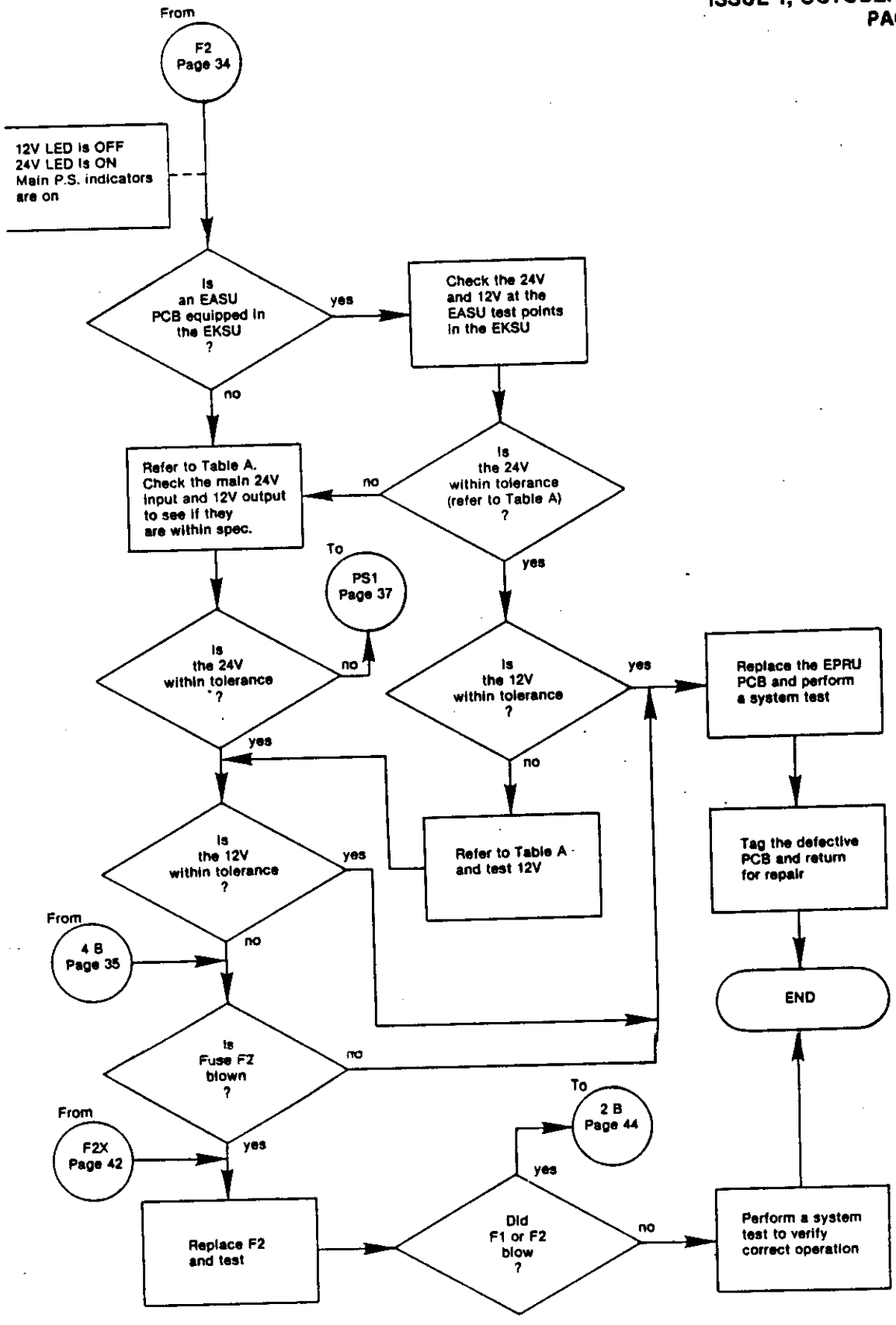


FLOW CHART 6.3.8—POWER FAULTS (Cont)



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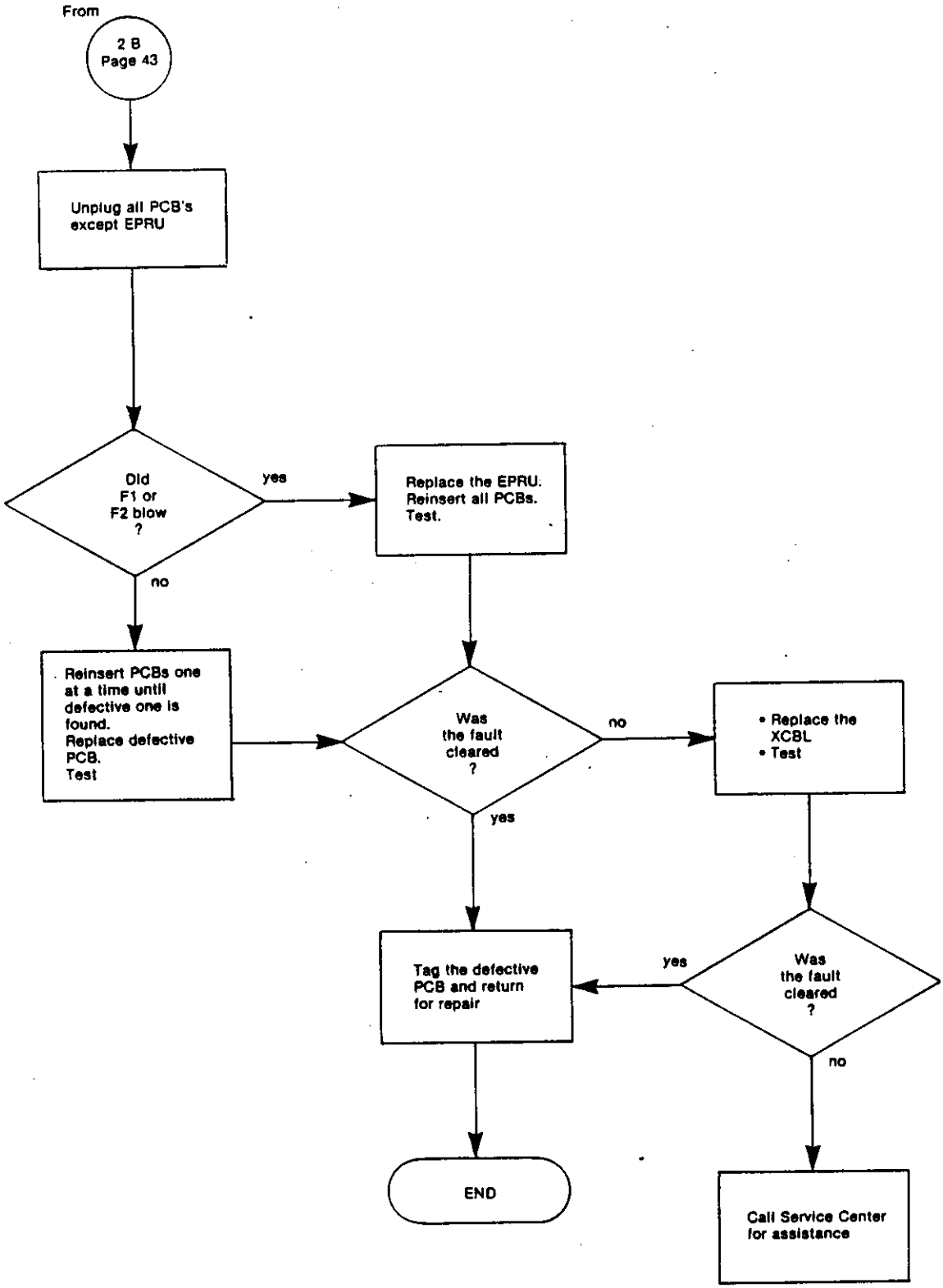

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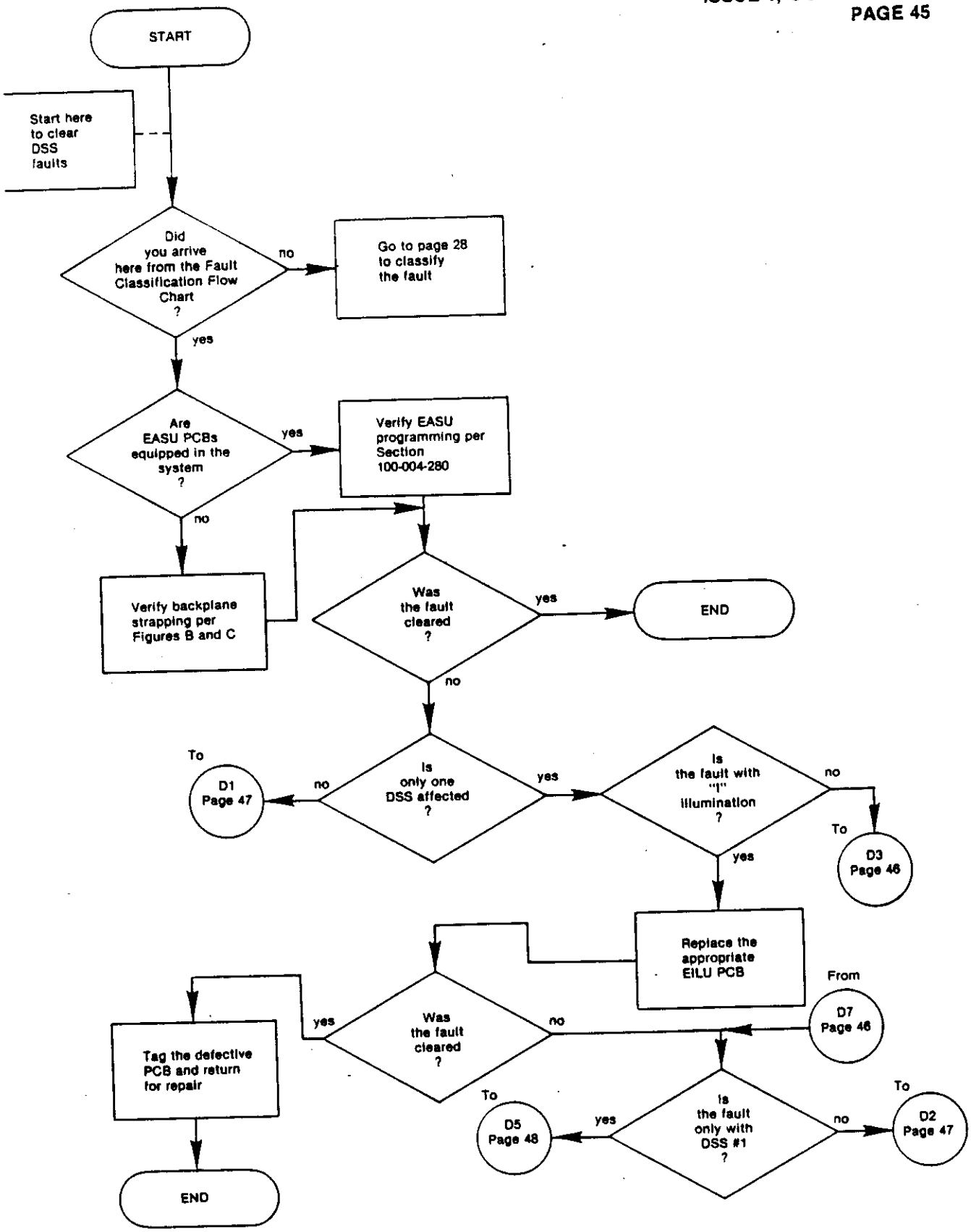
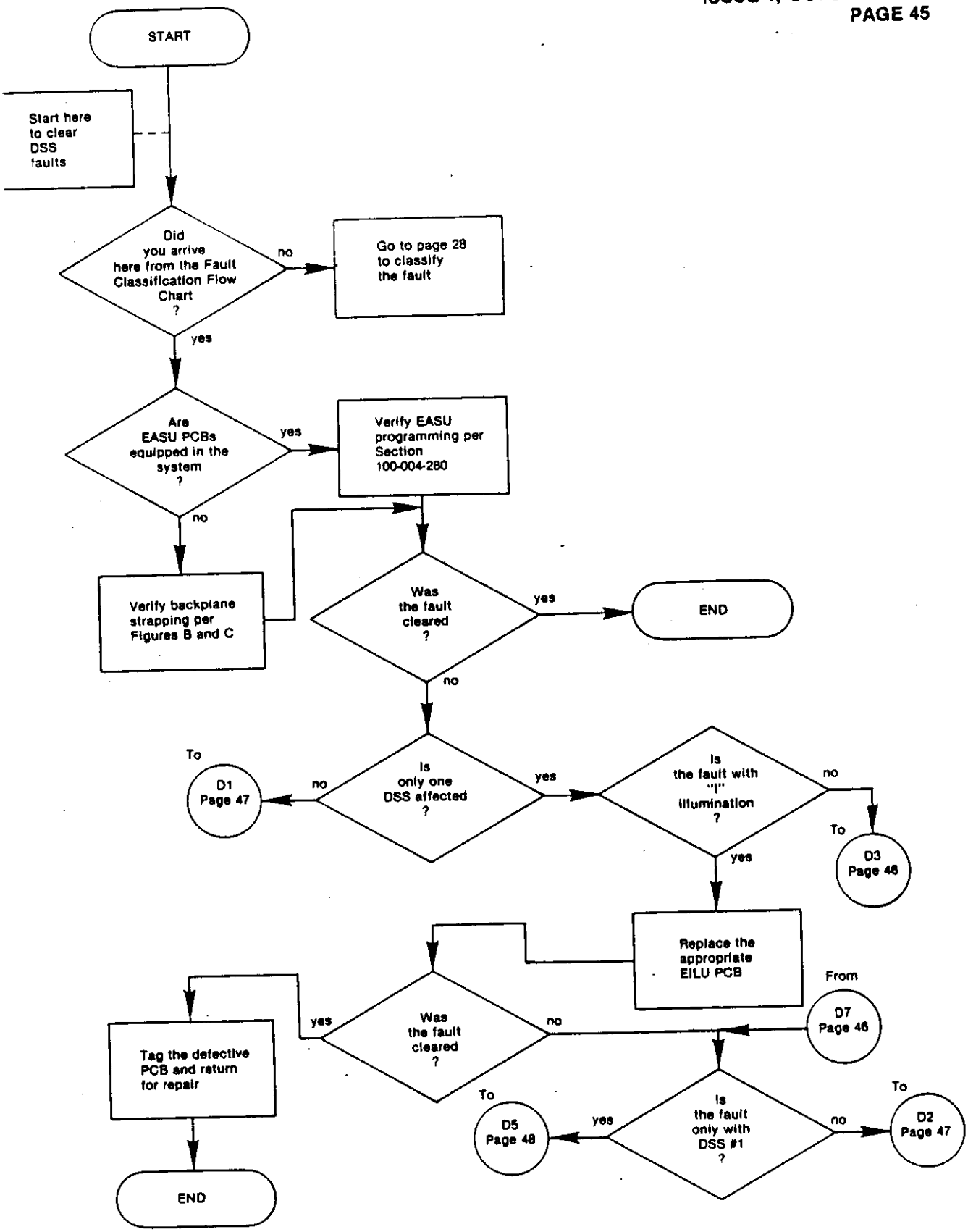


FLOW CHART 6.4—DSS FAULTS



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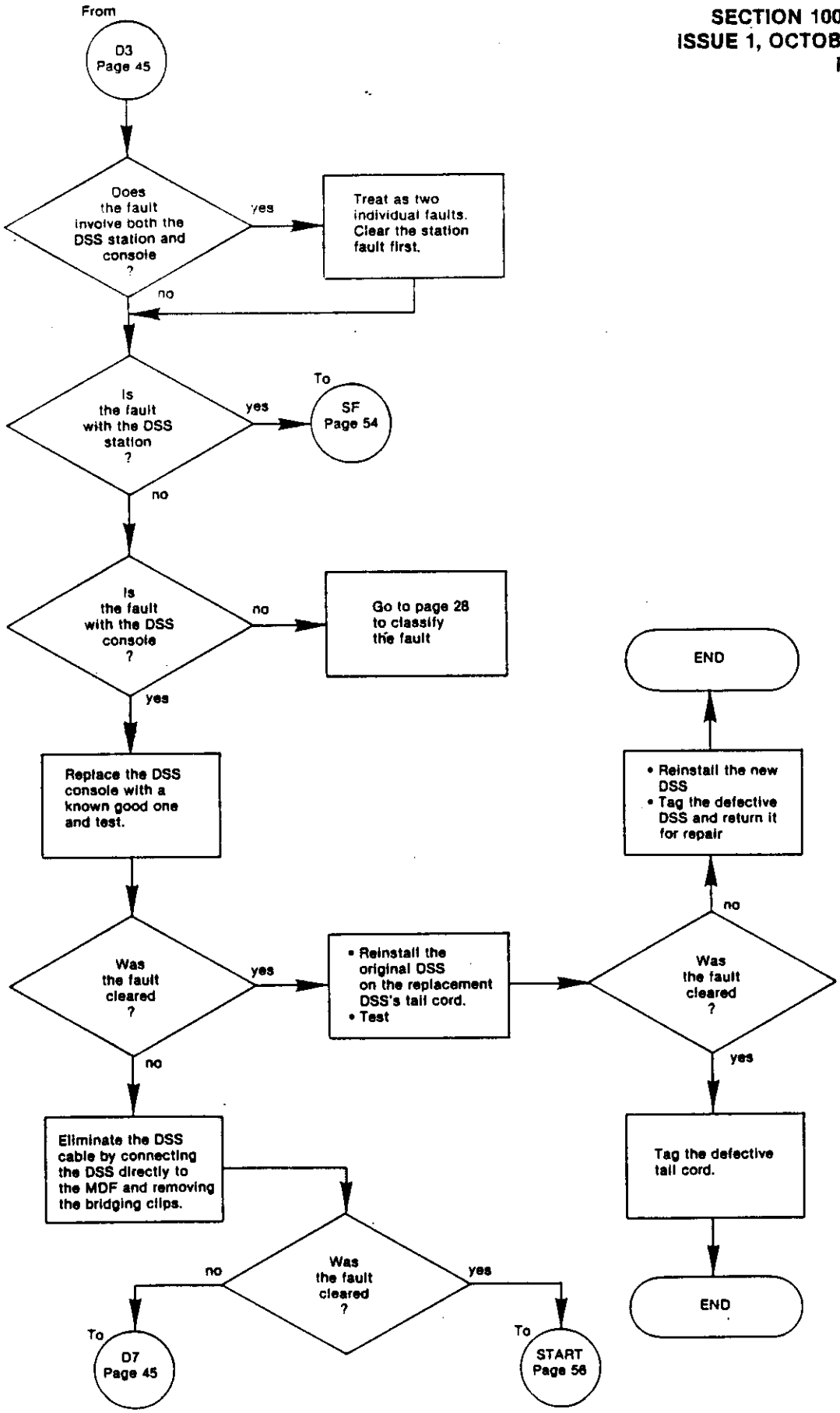
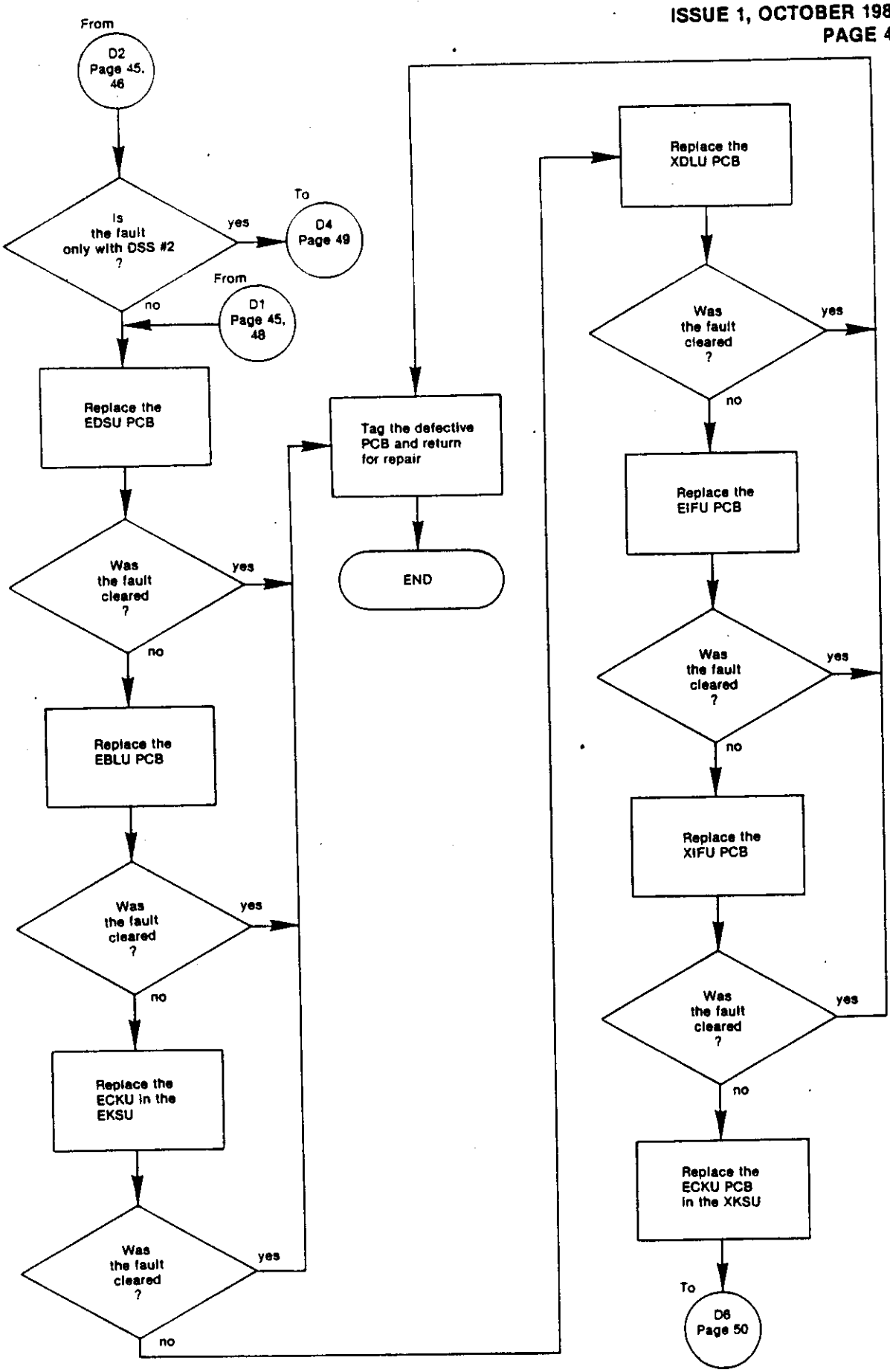


FLOW CHART 6.4.1—DSS FAULTS (Cont)



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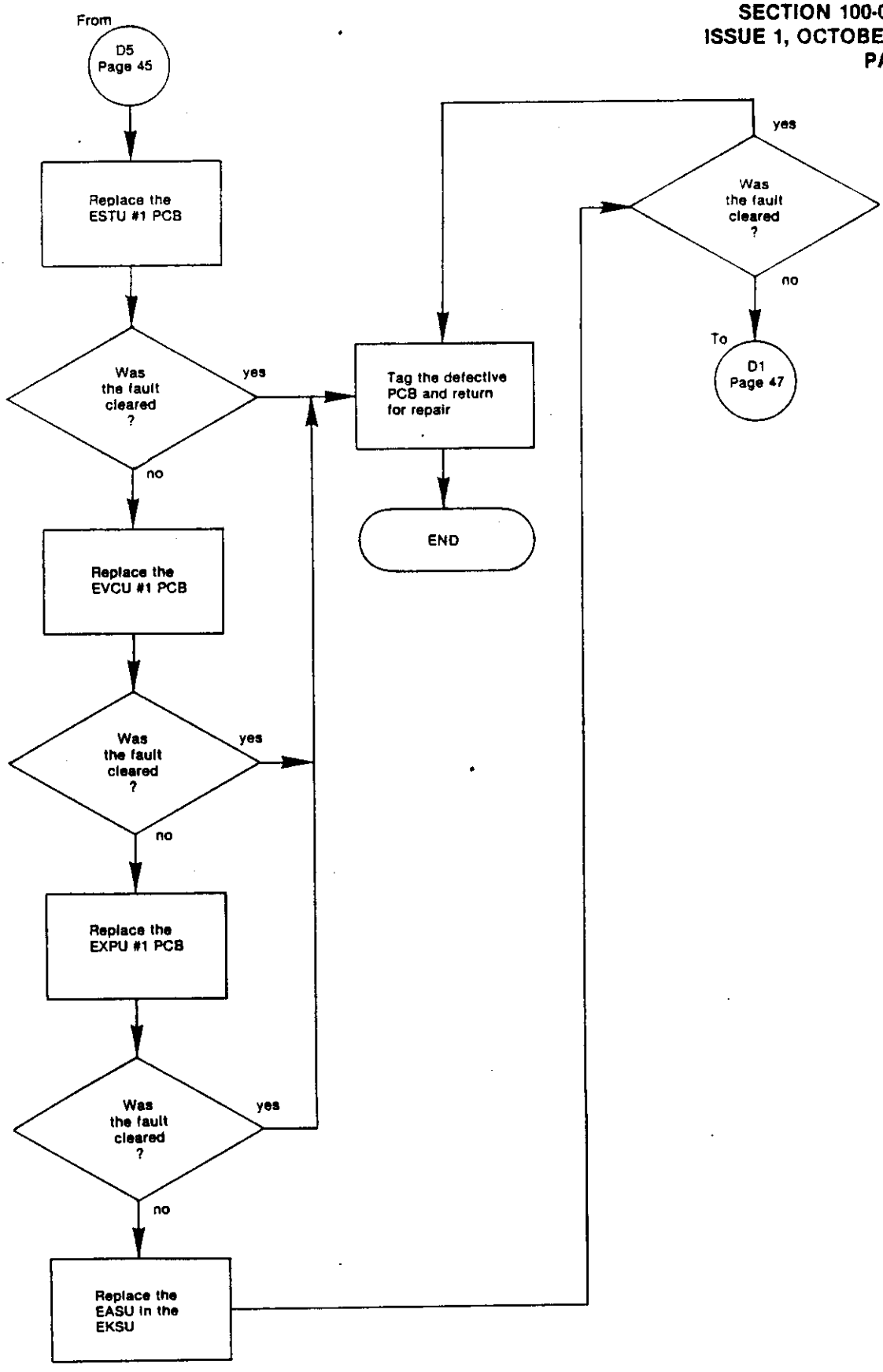

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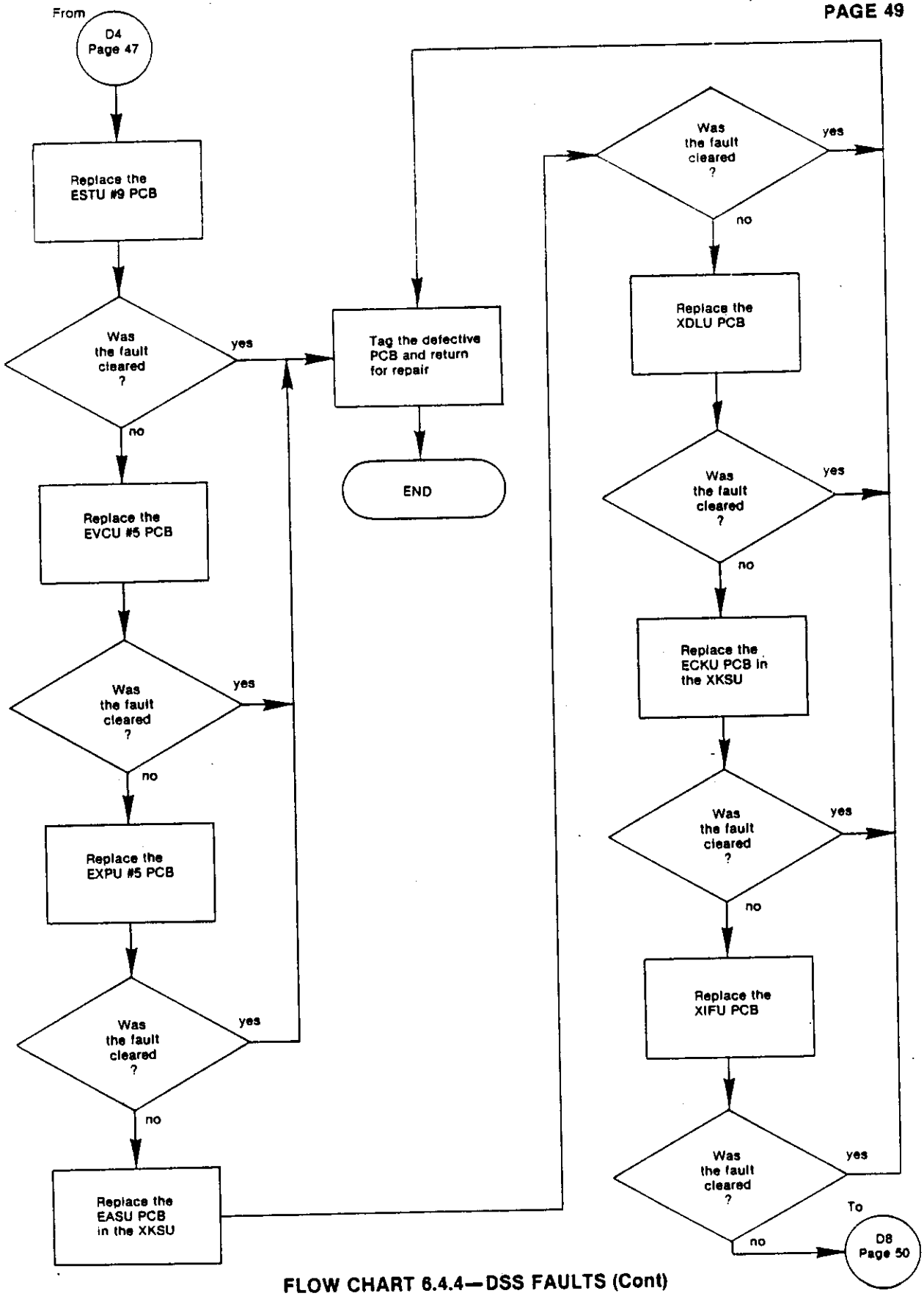

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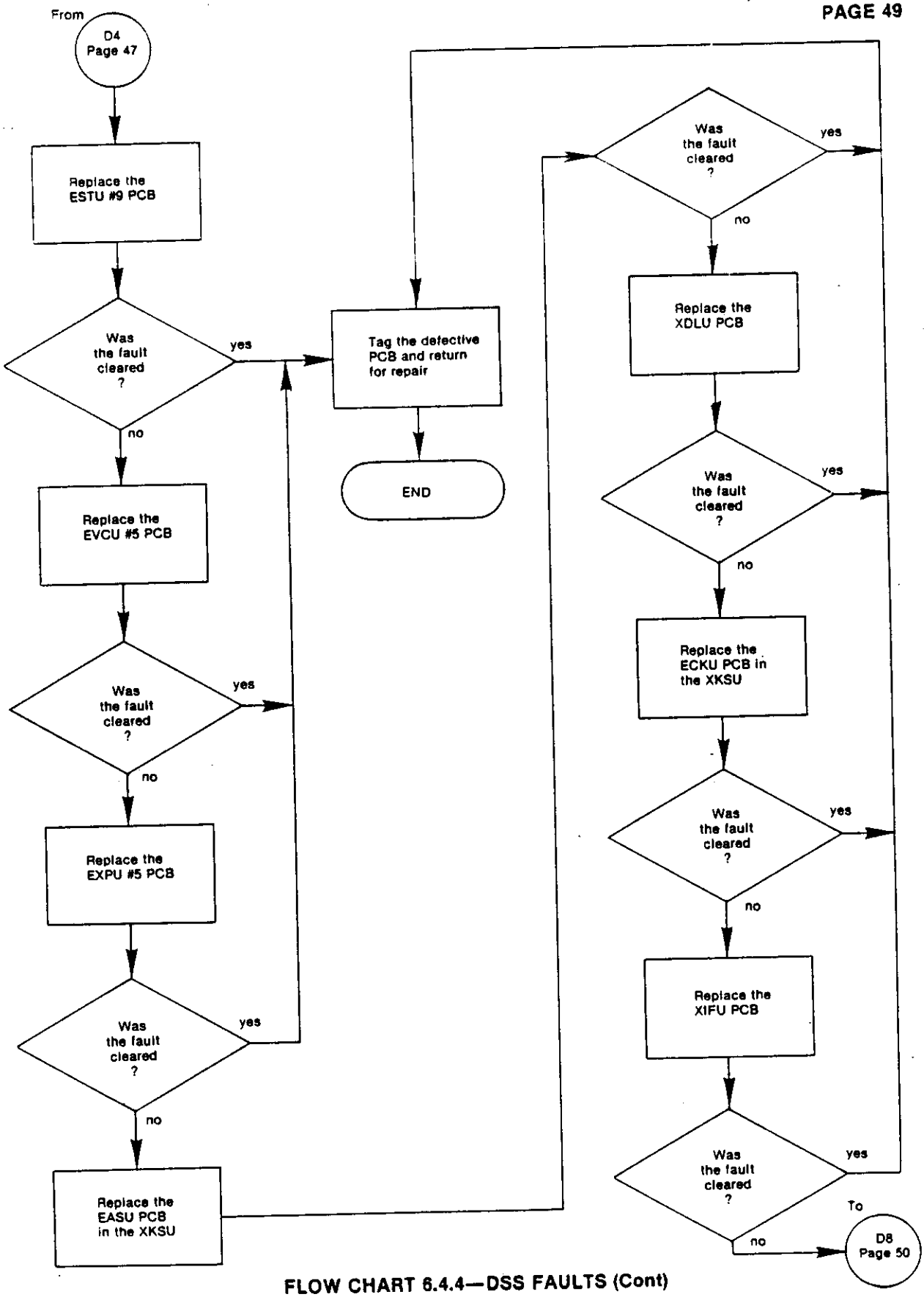

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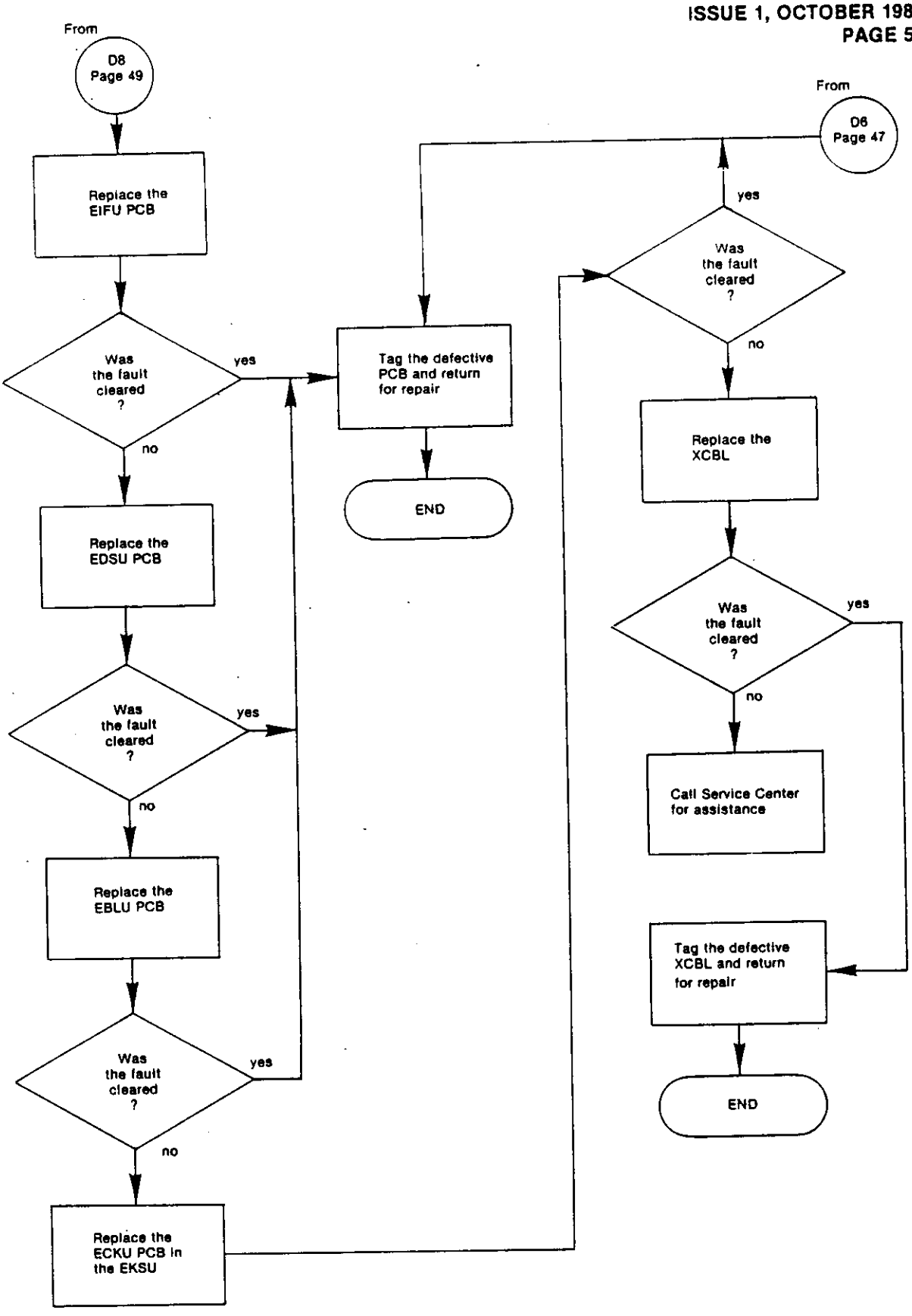

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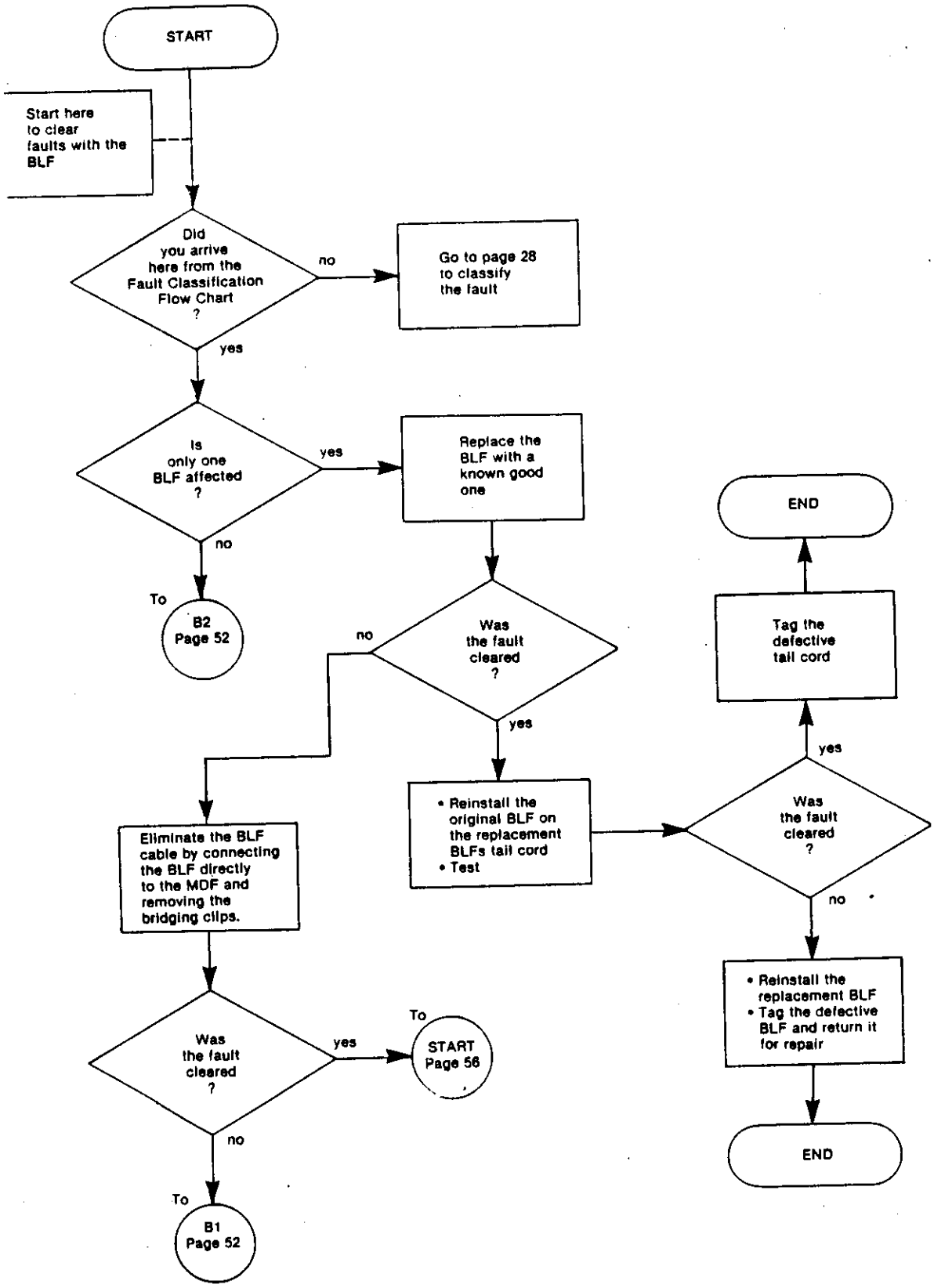
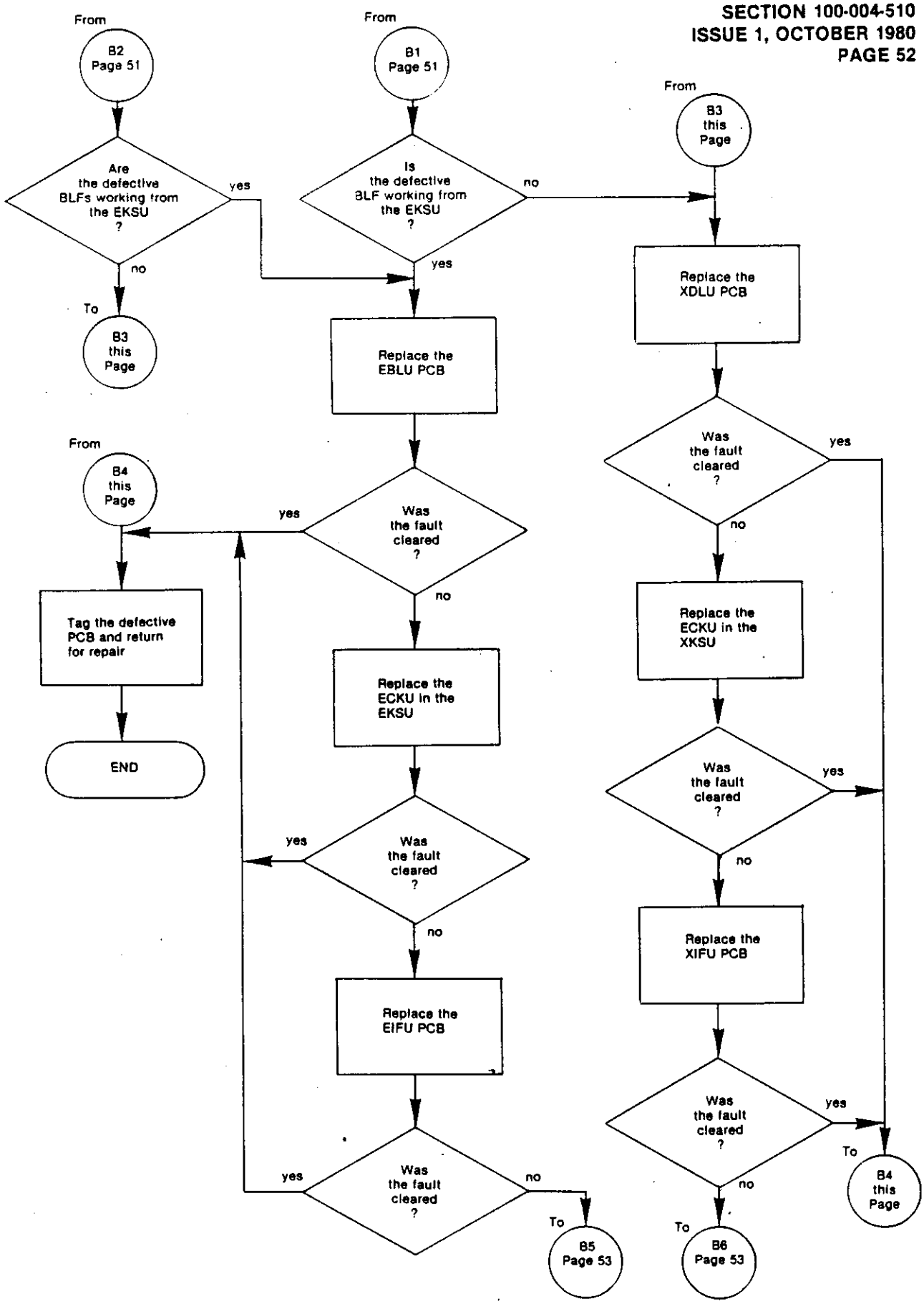
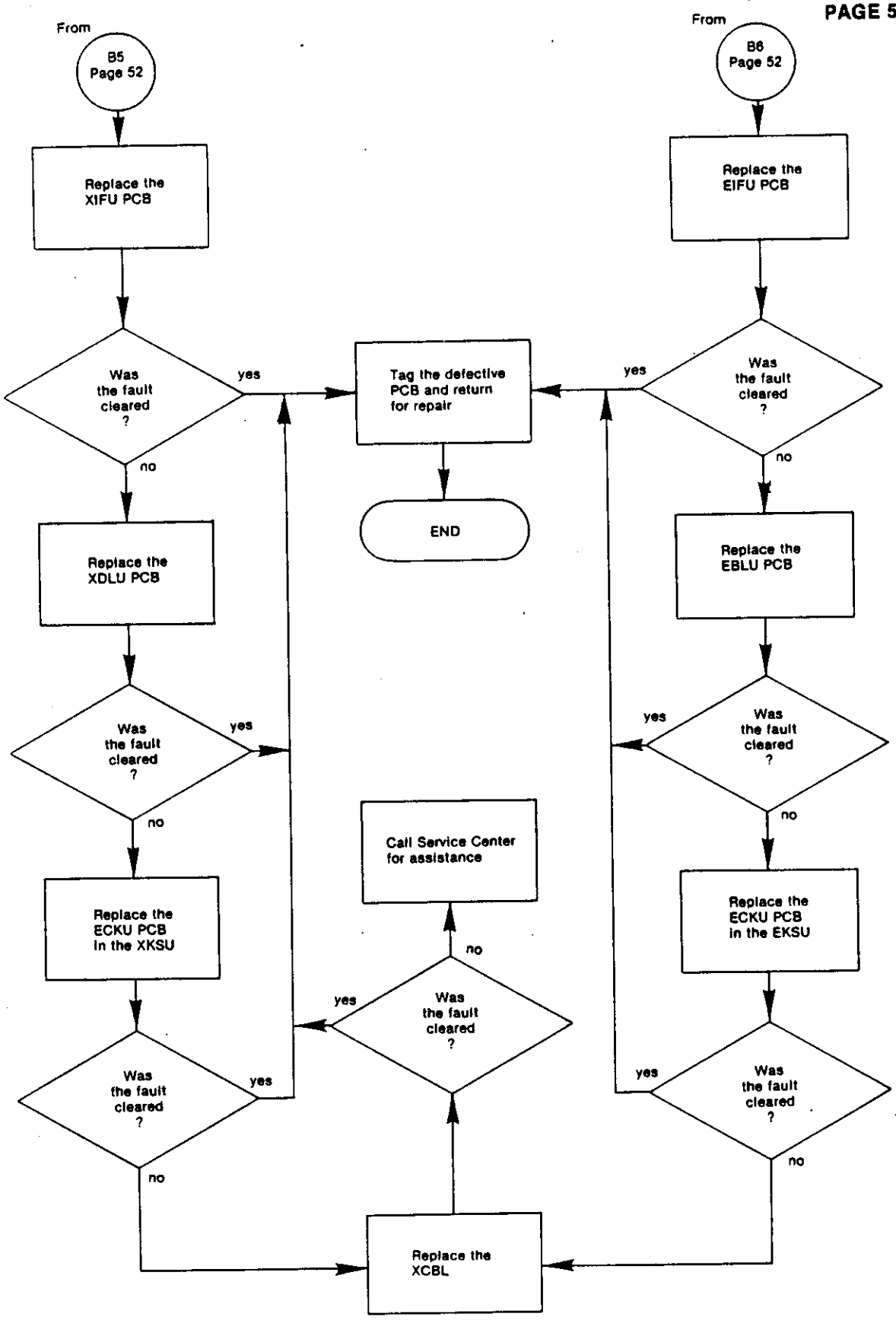


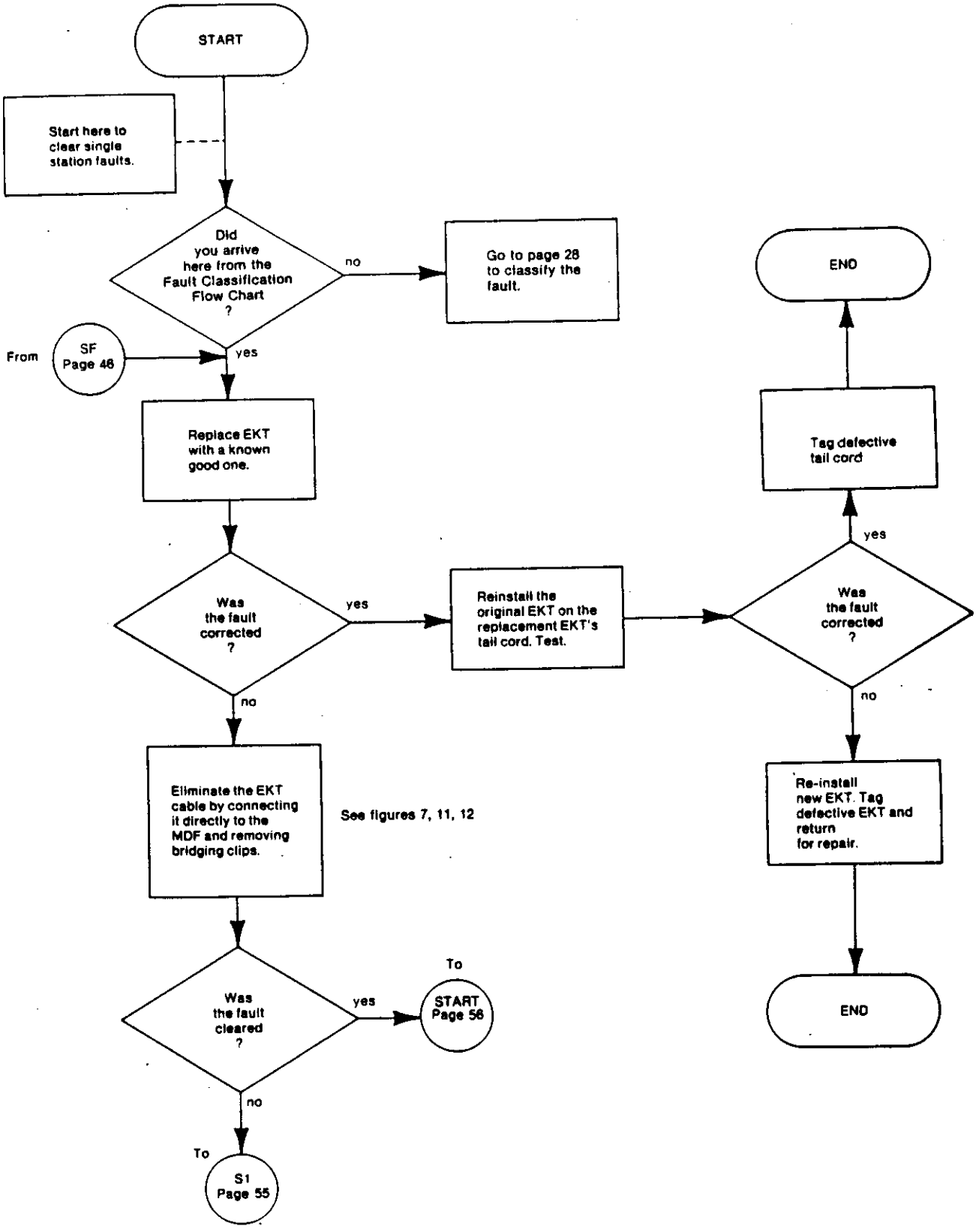
FLOW CHART 6.5—BLF FAULTS



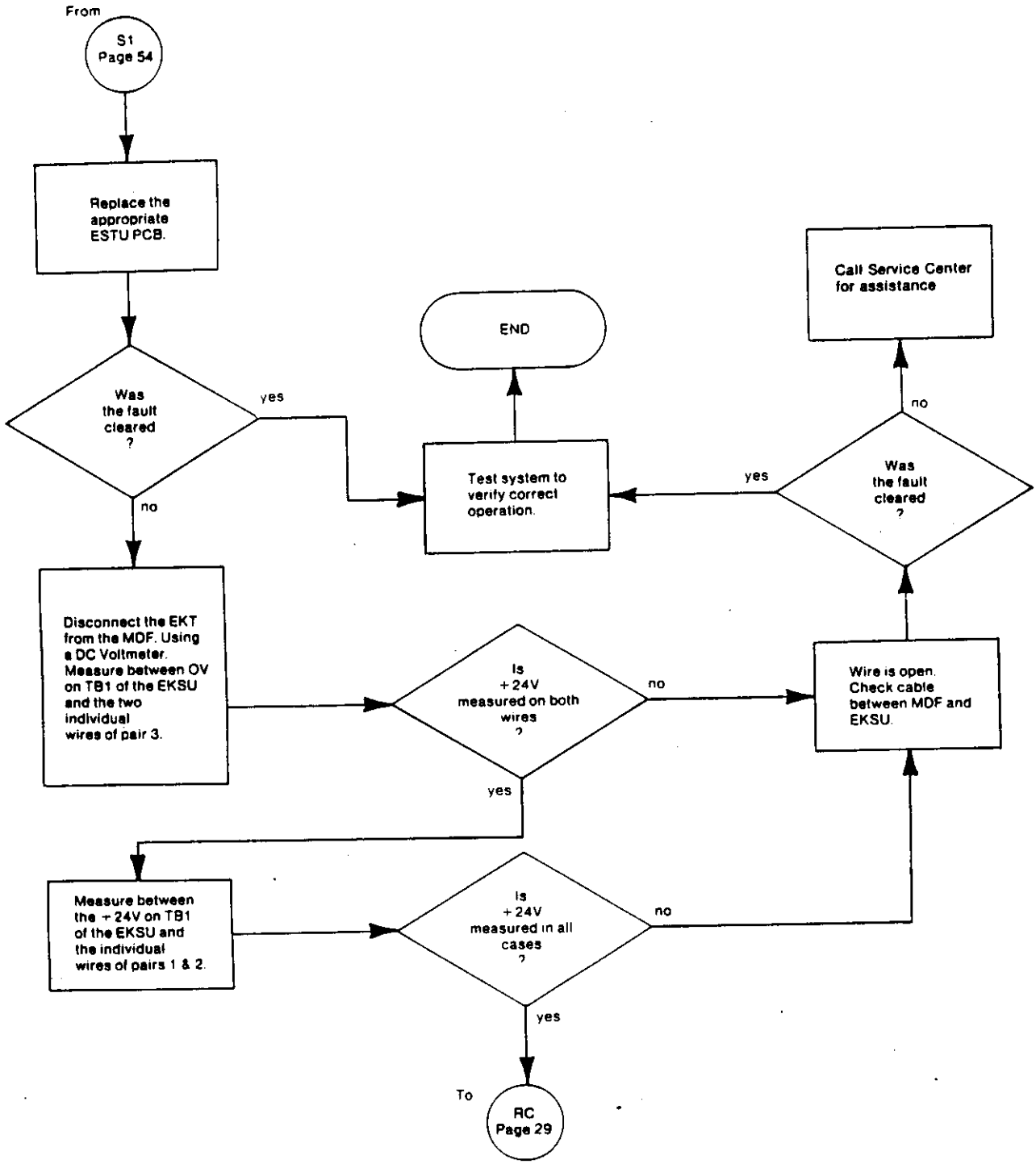
FLOW CHART 6.5.1—BLF FAULTS (Cont)



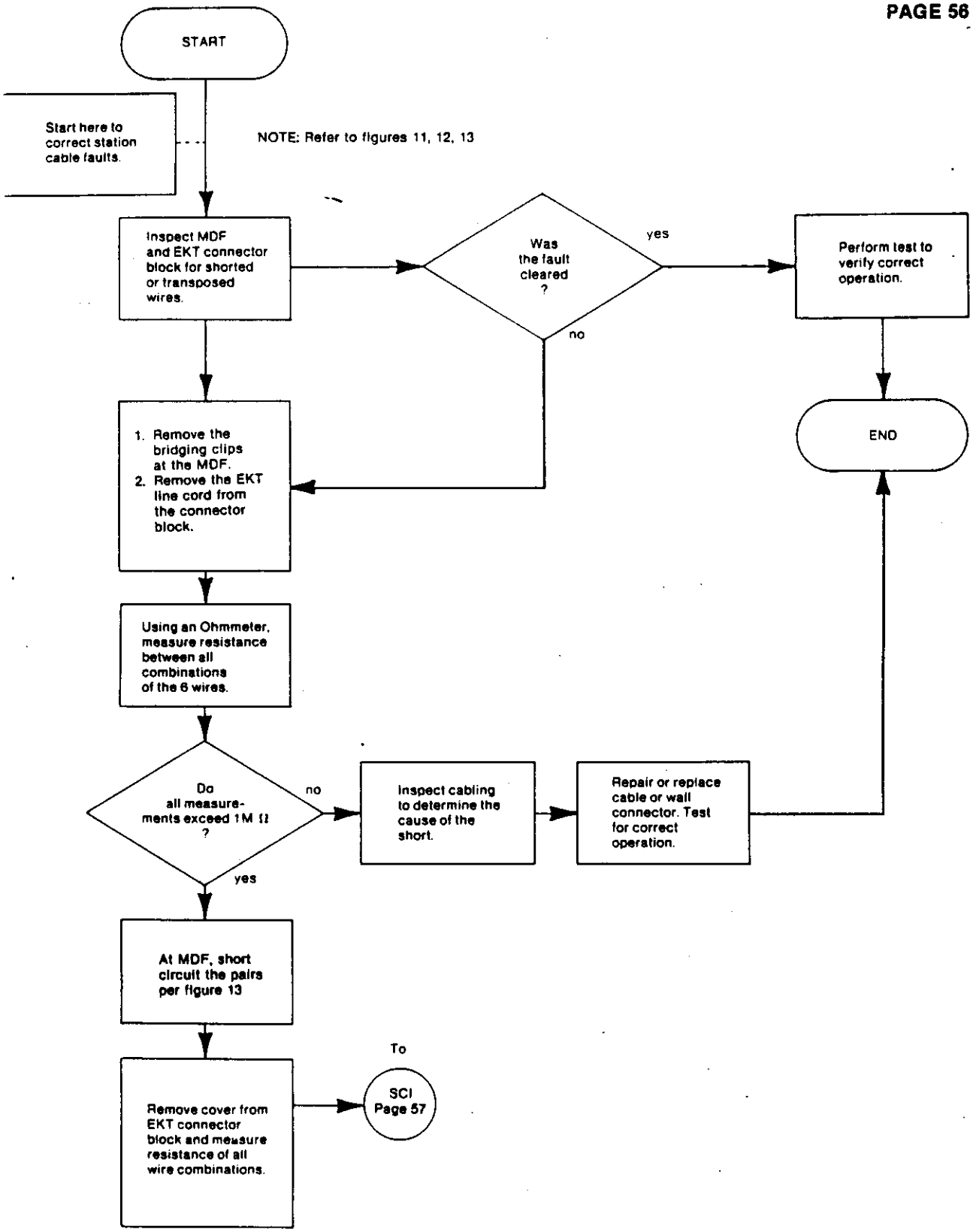
FLOW CHART 6.5.2—BLF FAULTS (Cont)



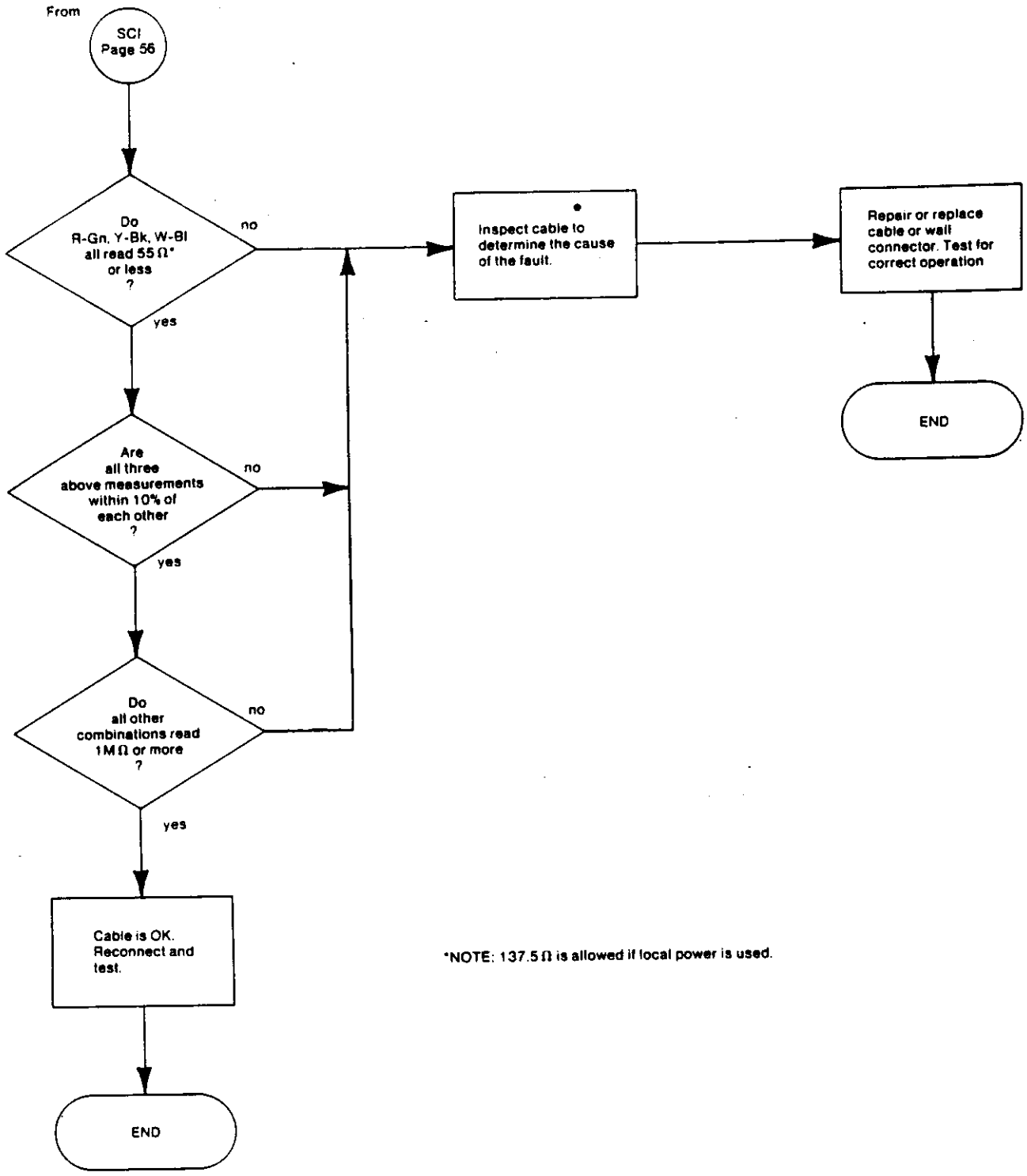
FLOW CHART 6.6—SINGLE STATION FAULTS



FLOW CHART 6.6.1 – SINGLE STATION FAULTS (CONT)

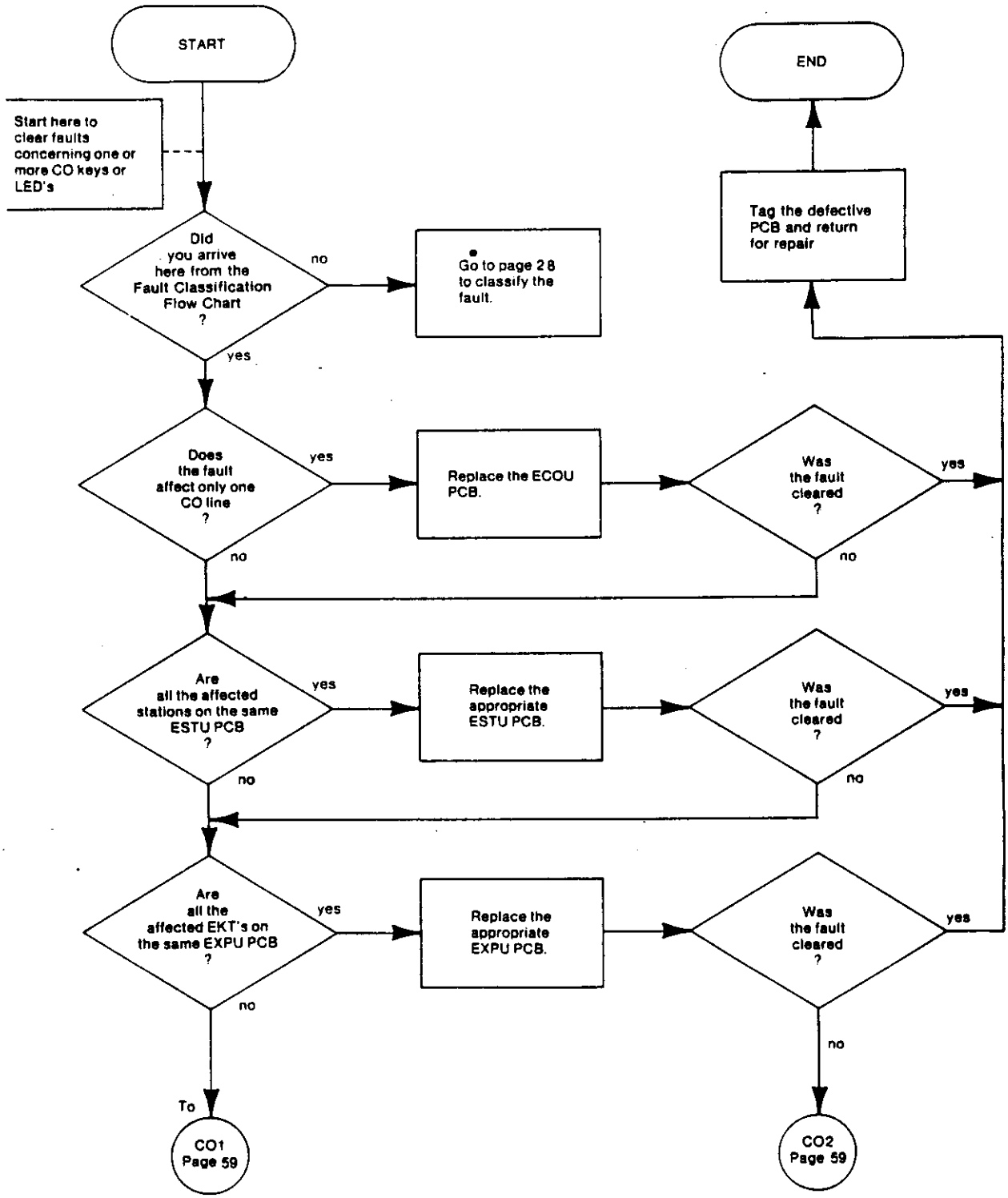


FLOW CHART 6.7—CABLE FAULTS

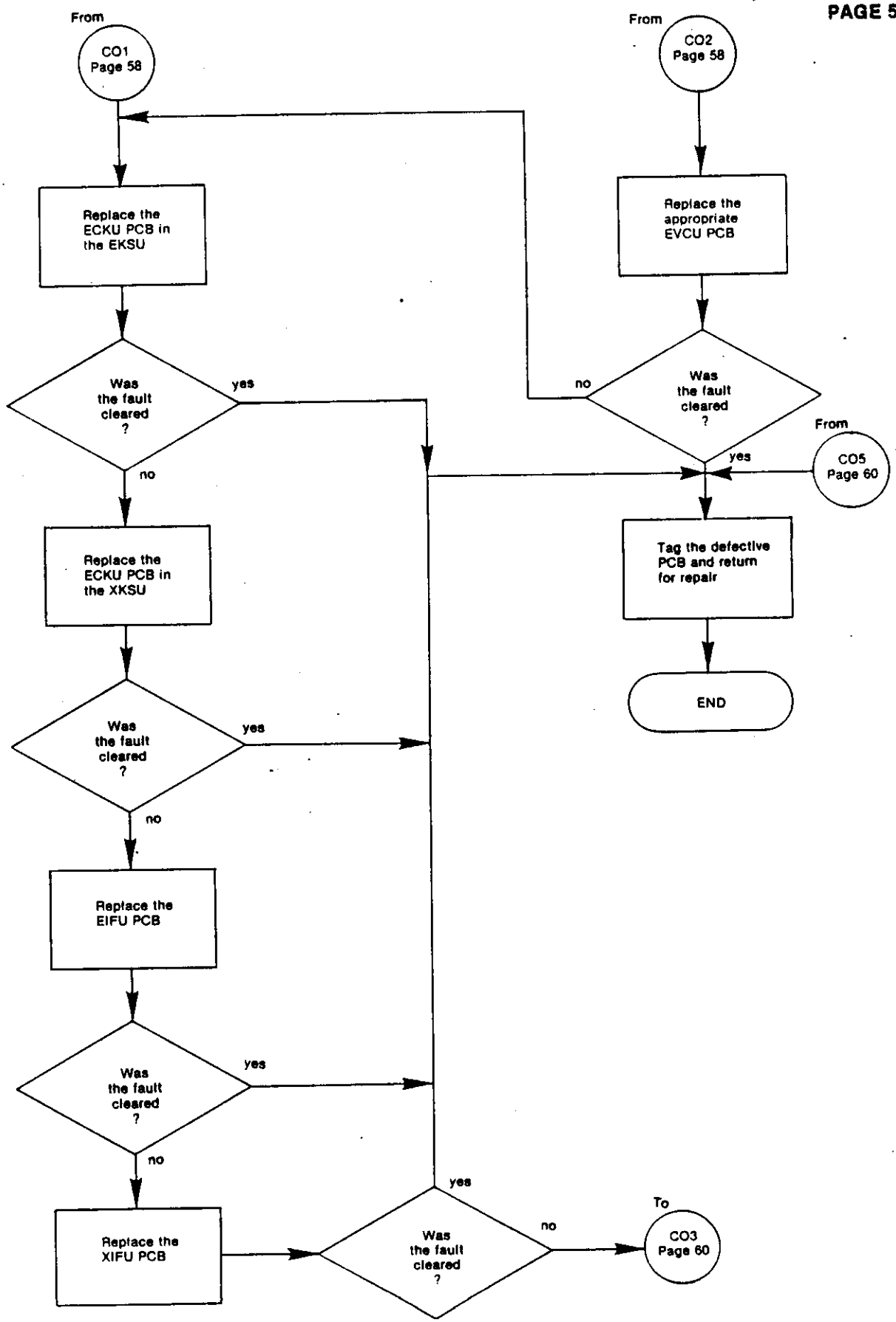


*NOTE: 137.5 Ω is allowed if local power is used.

FLOW CHART 6.7.1 – CABLE FAULTS (Cont)



FLOW CHART 6.8 – C.O. KEY/LED FAULTS



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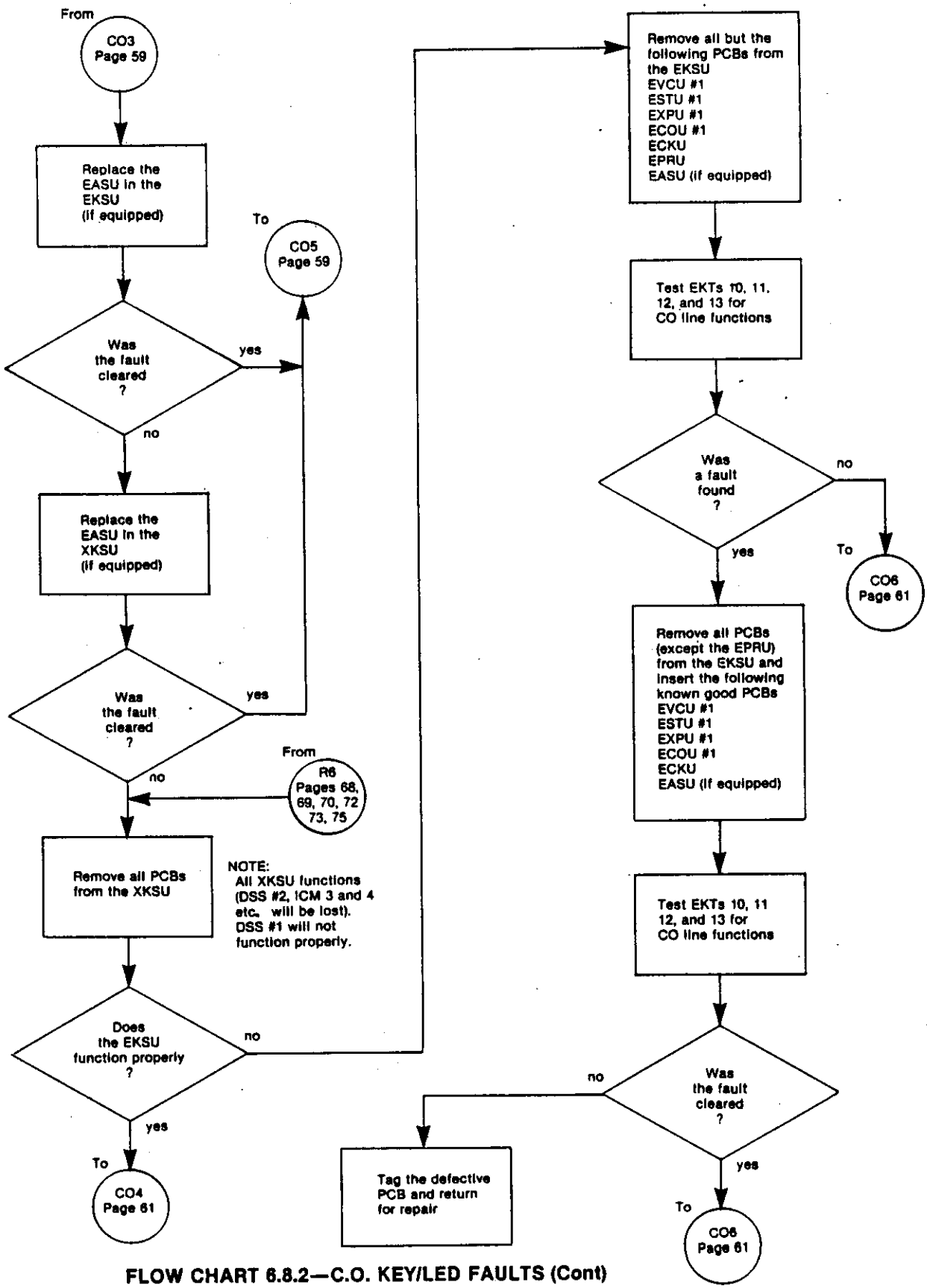

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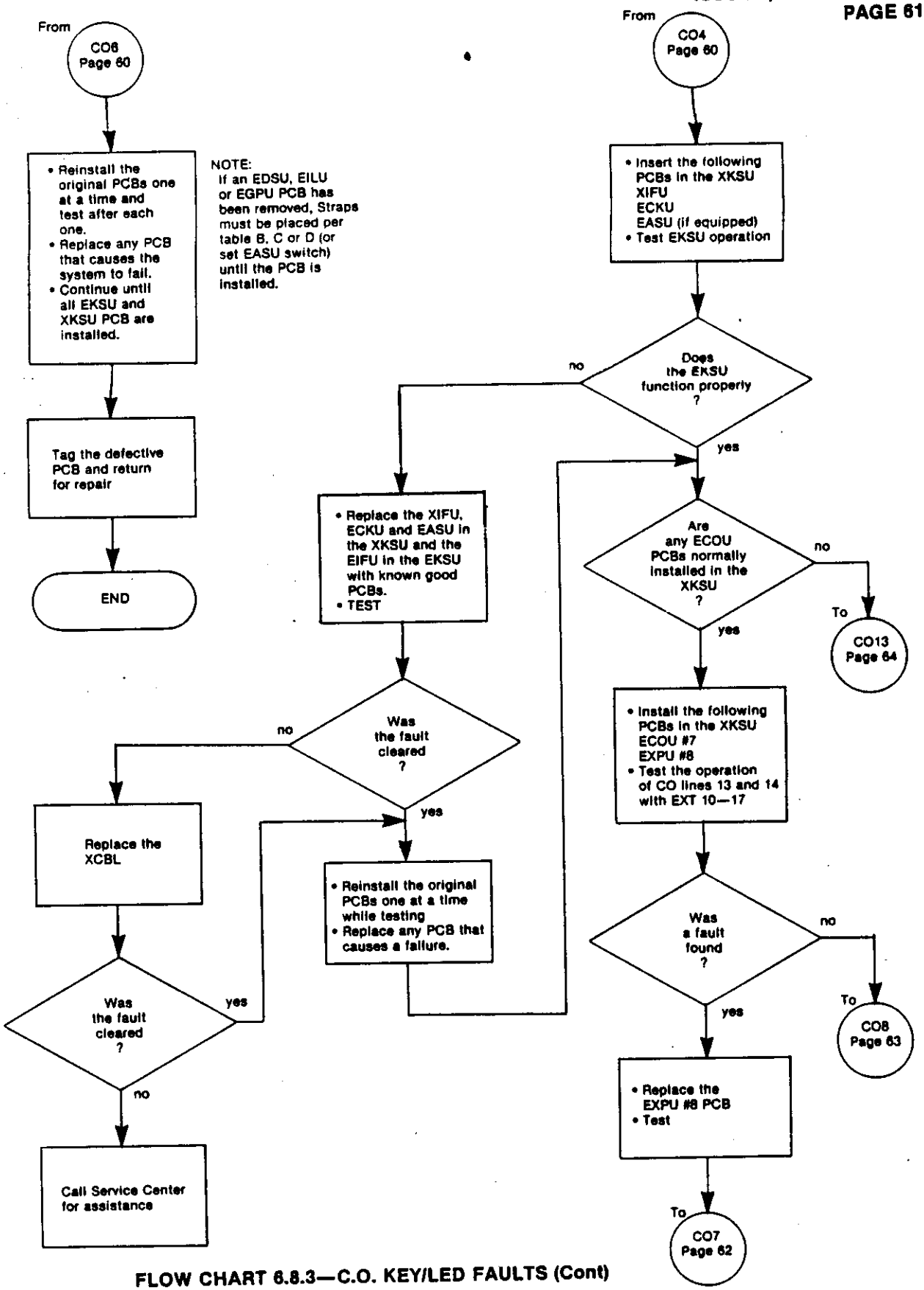

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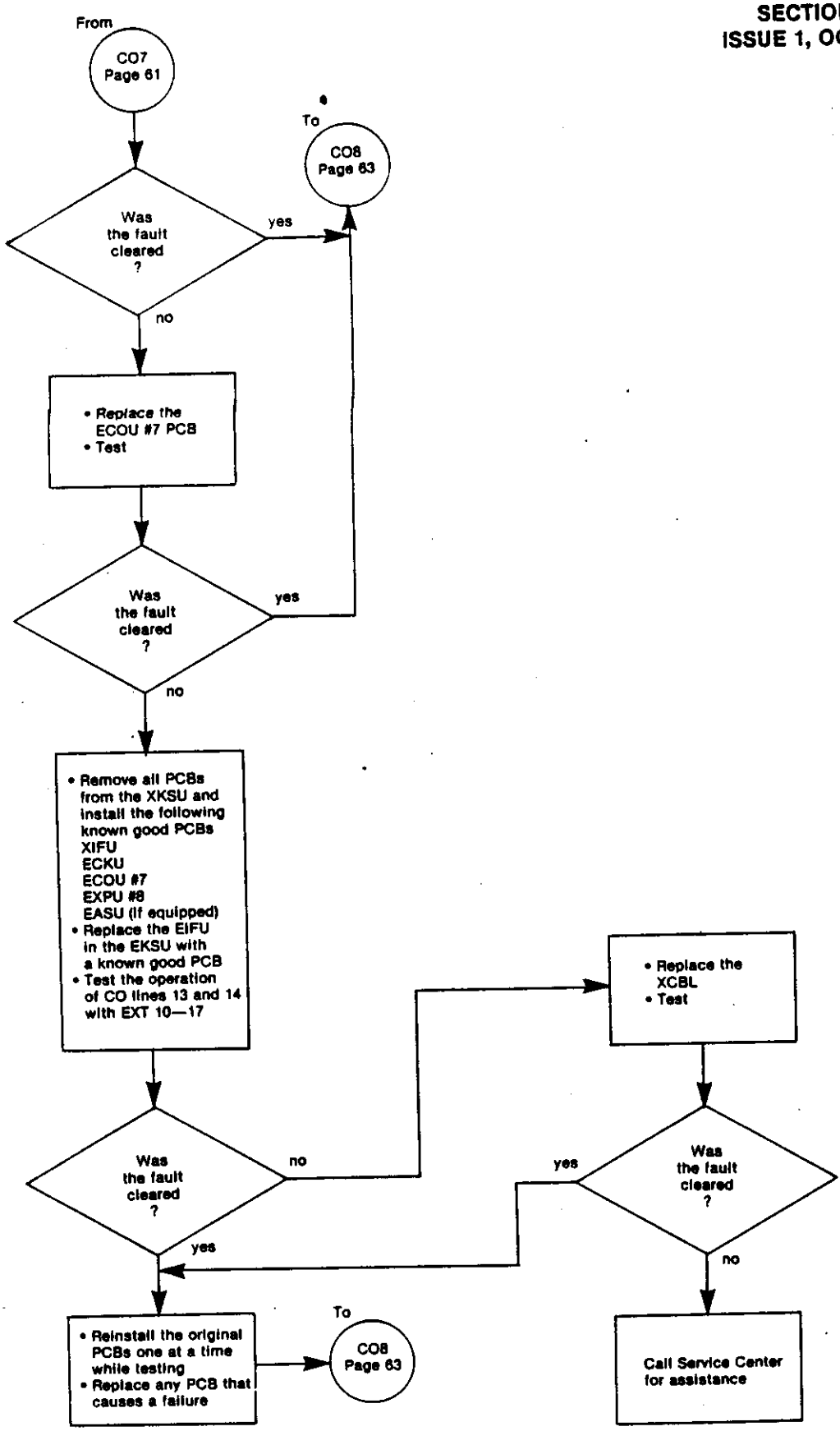

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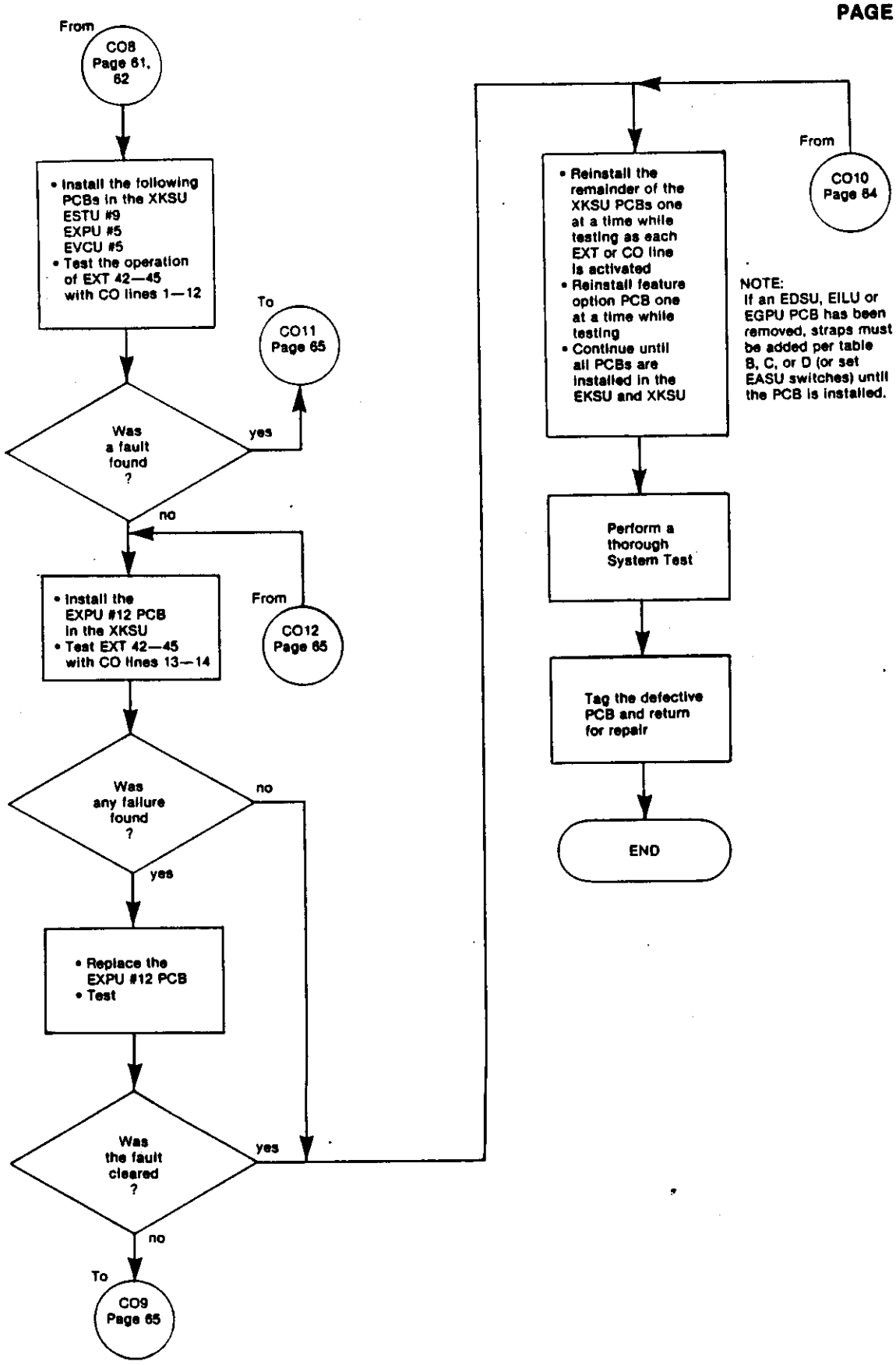
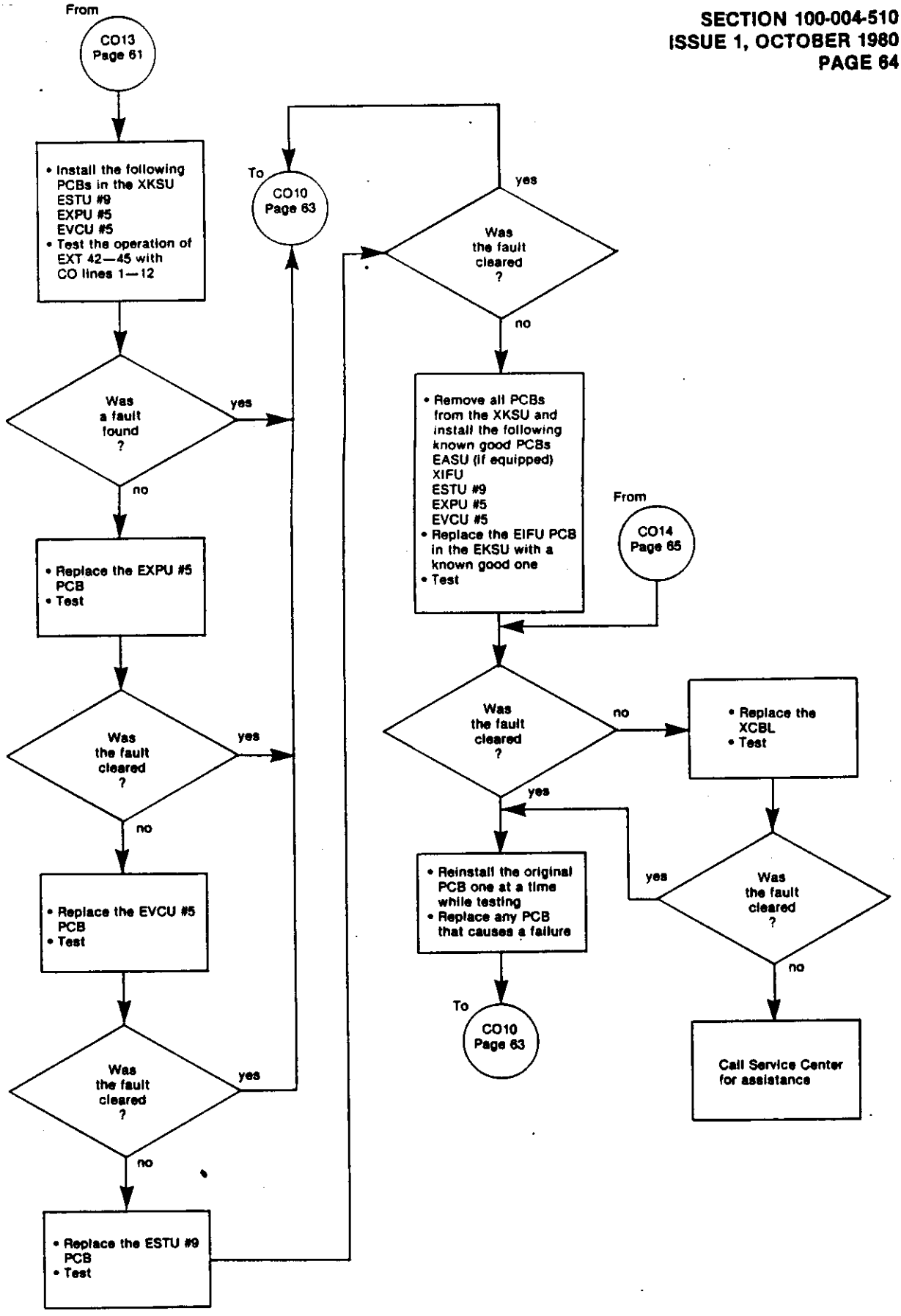
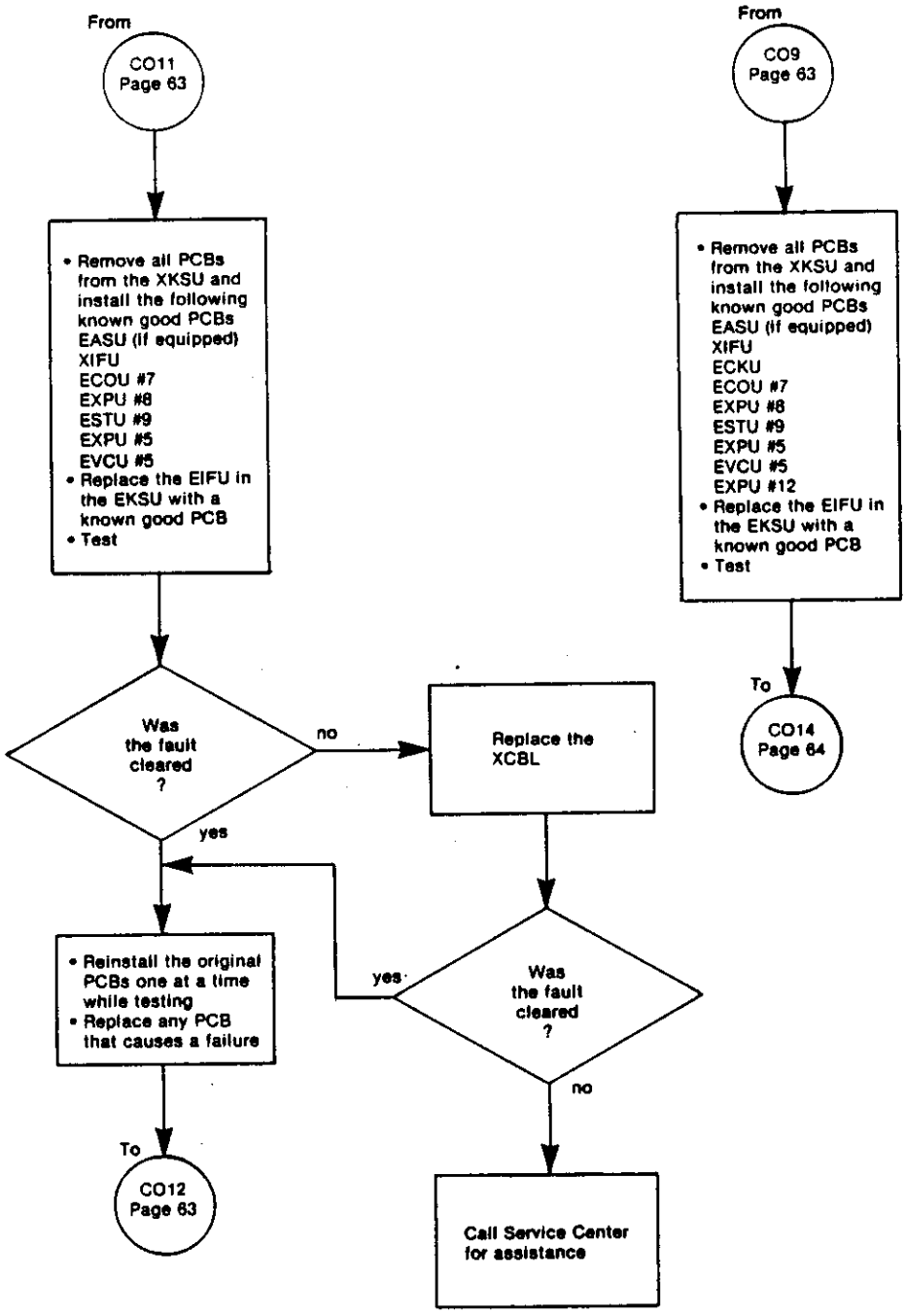


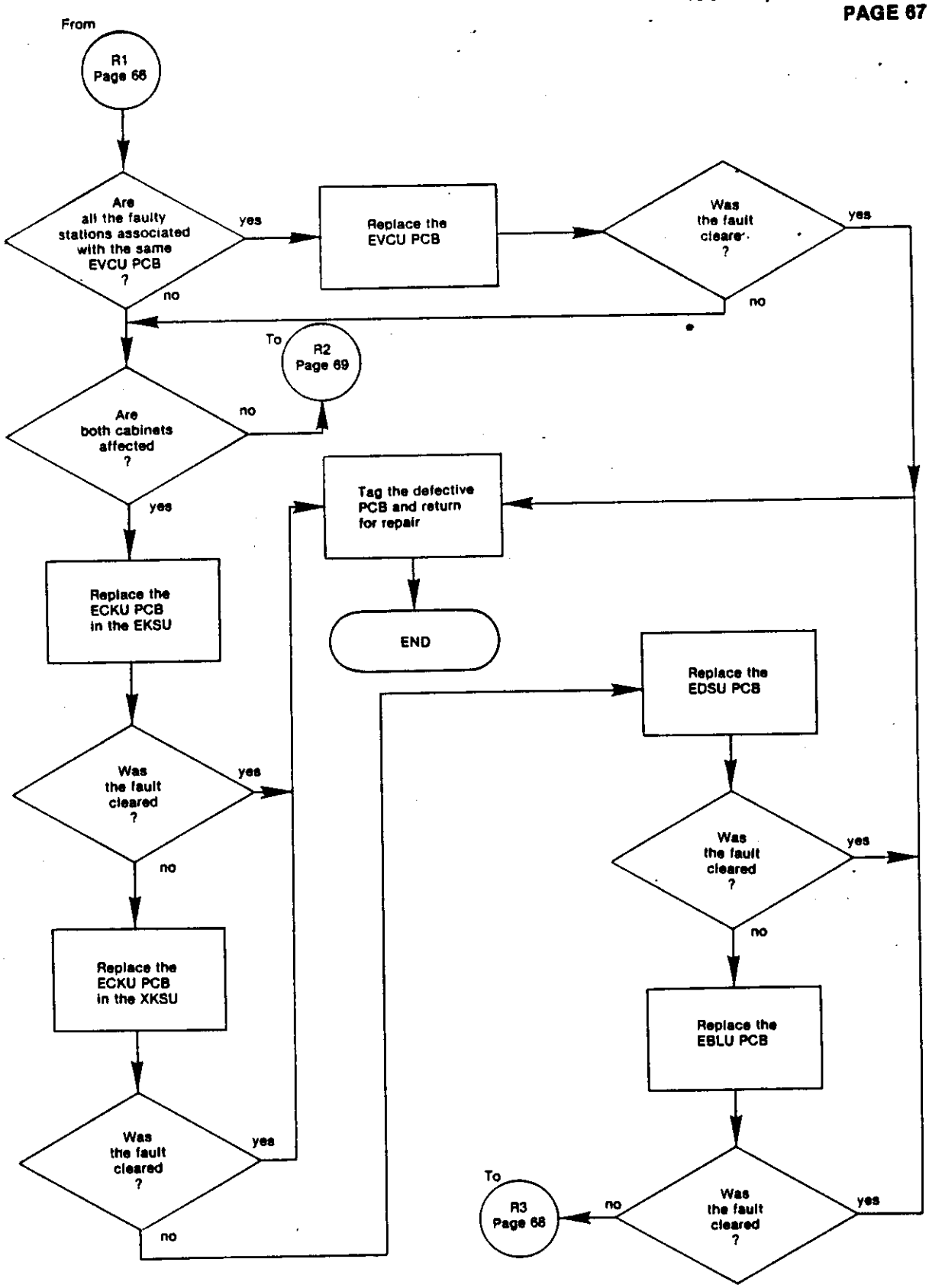
FLOW CHART 6.8.5—C.O. KEY/LED FAULTS (Cont)



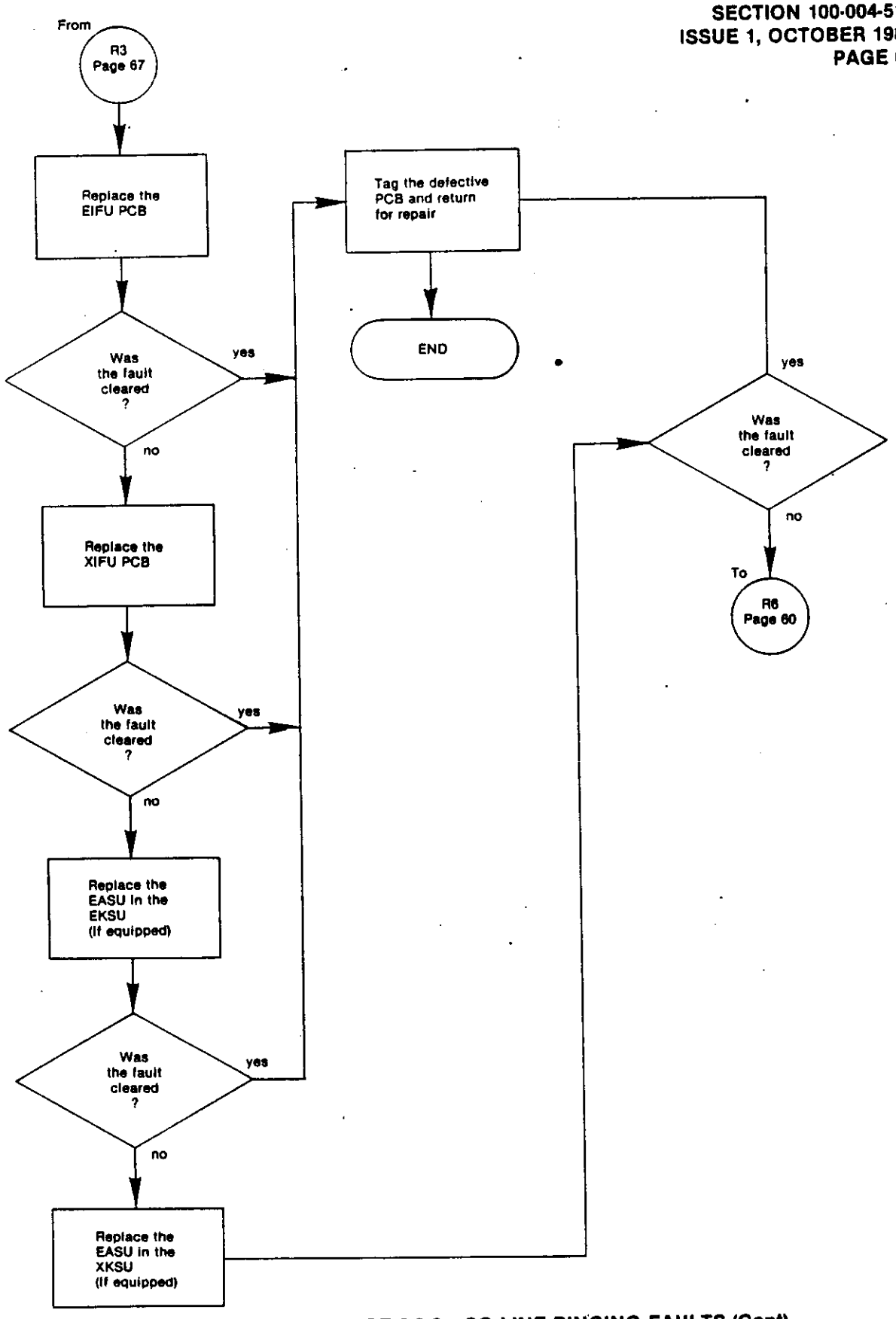
FLOW CHART 6.8.6—C.O. KEY/LED FAULTS (Cont)



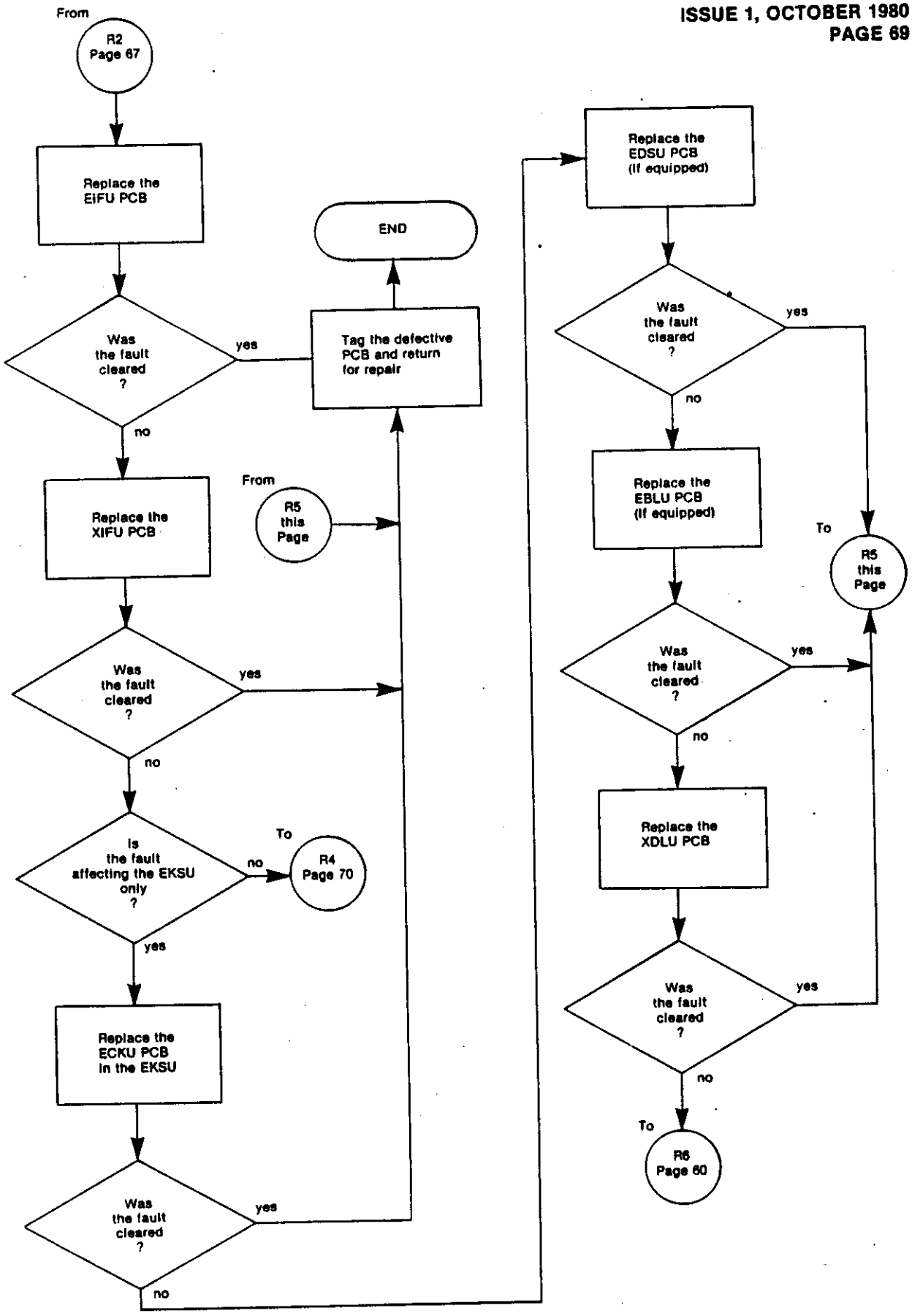
FLOW CHART 6.8.7—C.O. KEY/LED FAULTS (Cont)



FLOW CHART 6.9.1—C.O. LINE RINGING FAULTS (Cont)



FLOW CHART 6.9.2—CO LINE RINGING FAULTS (Cont)



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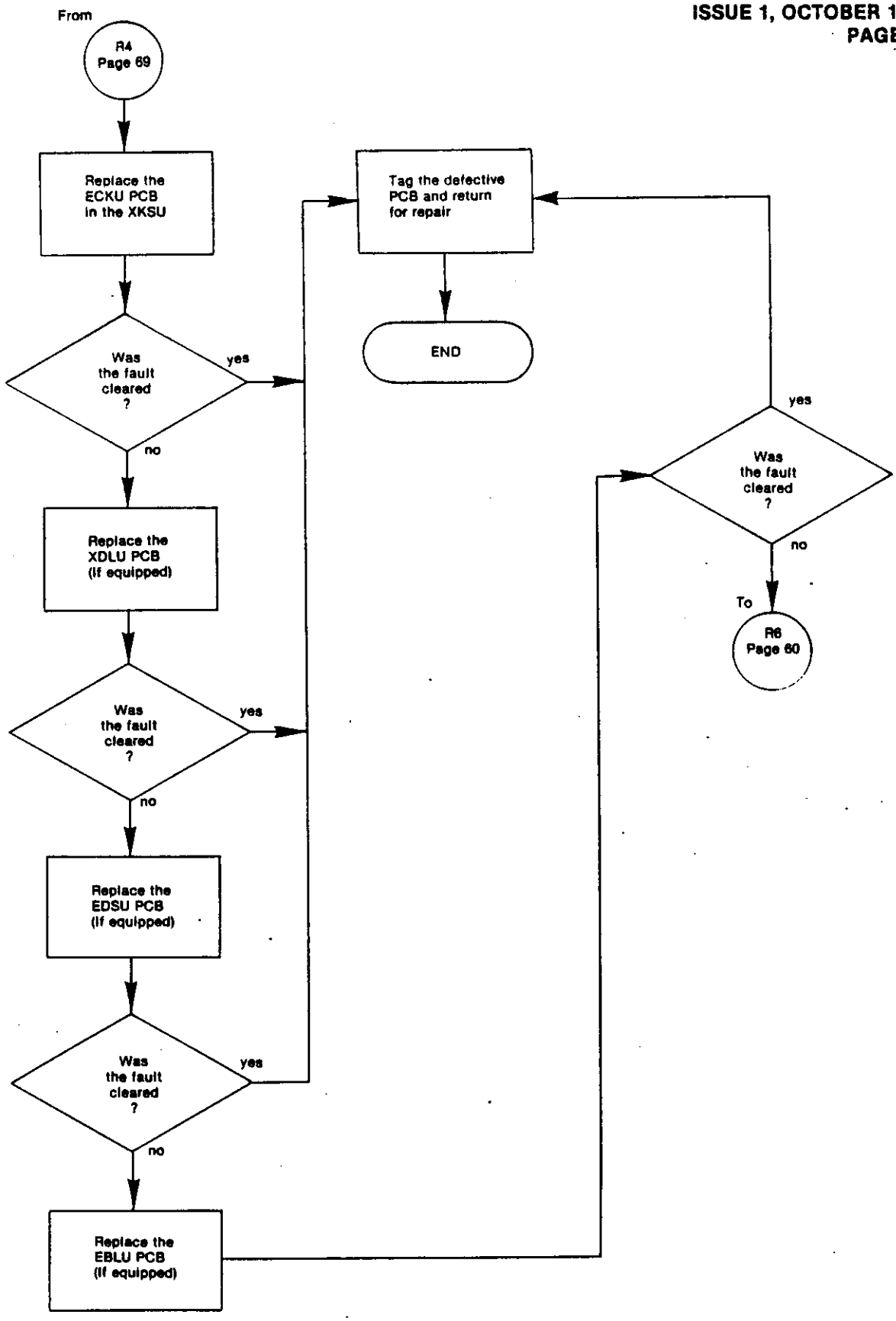

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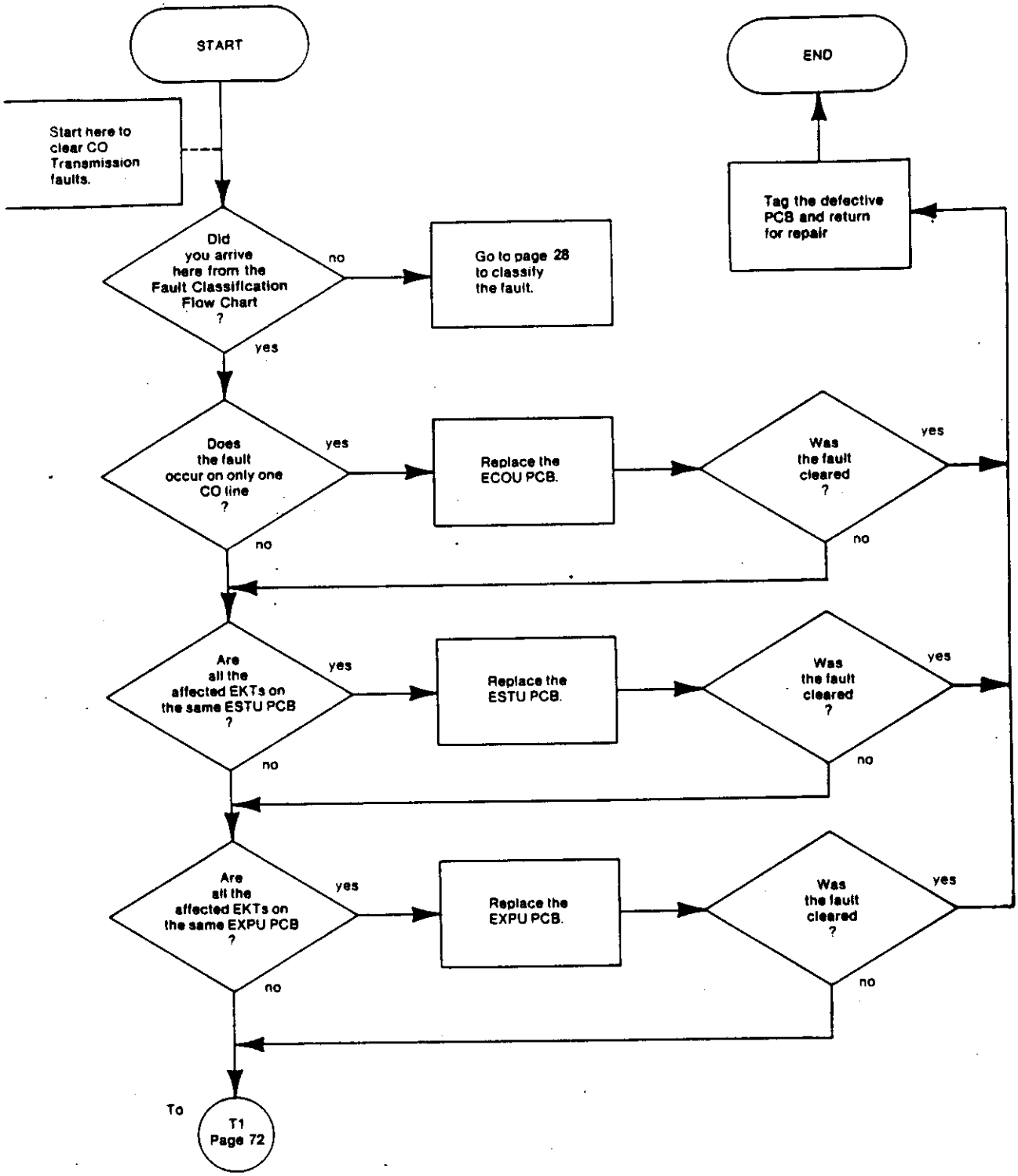
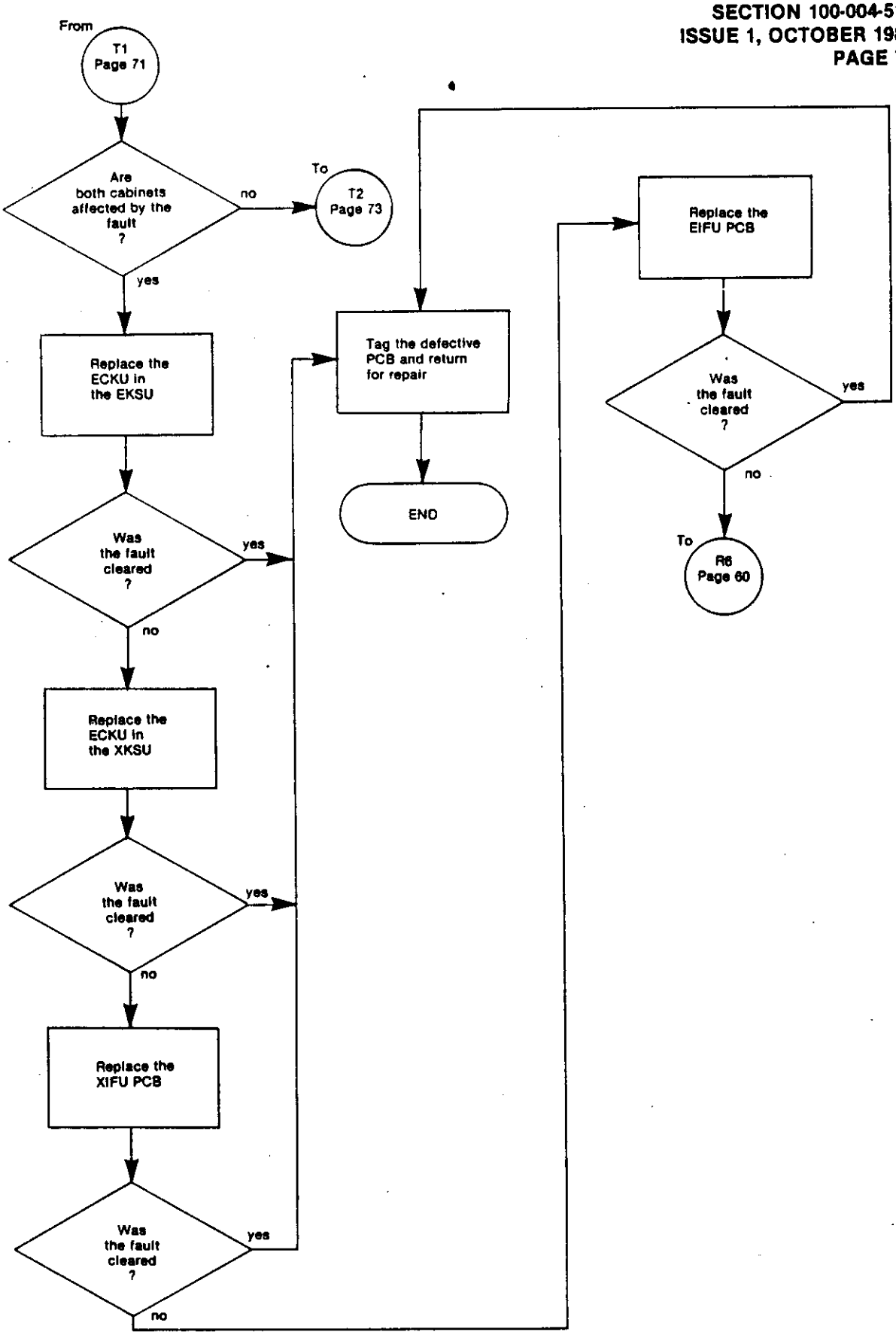
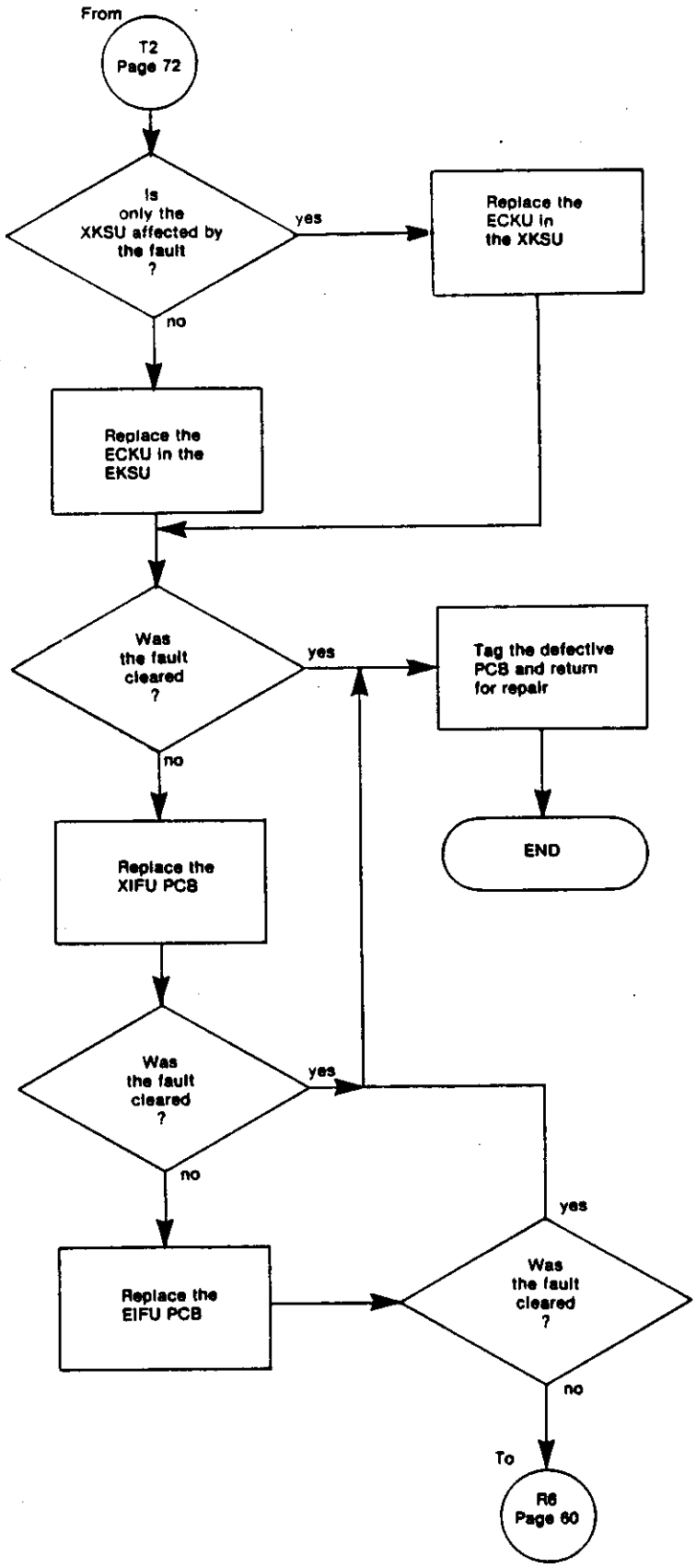


FLOW CHART 6.10—CO LINE TRANSMISSION FAULTS



FLOW CHART 6.10.1—CO LINE TRANSMISSION FAULTS (Cont)



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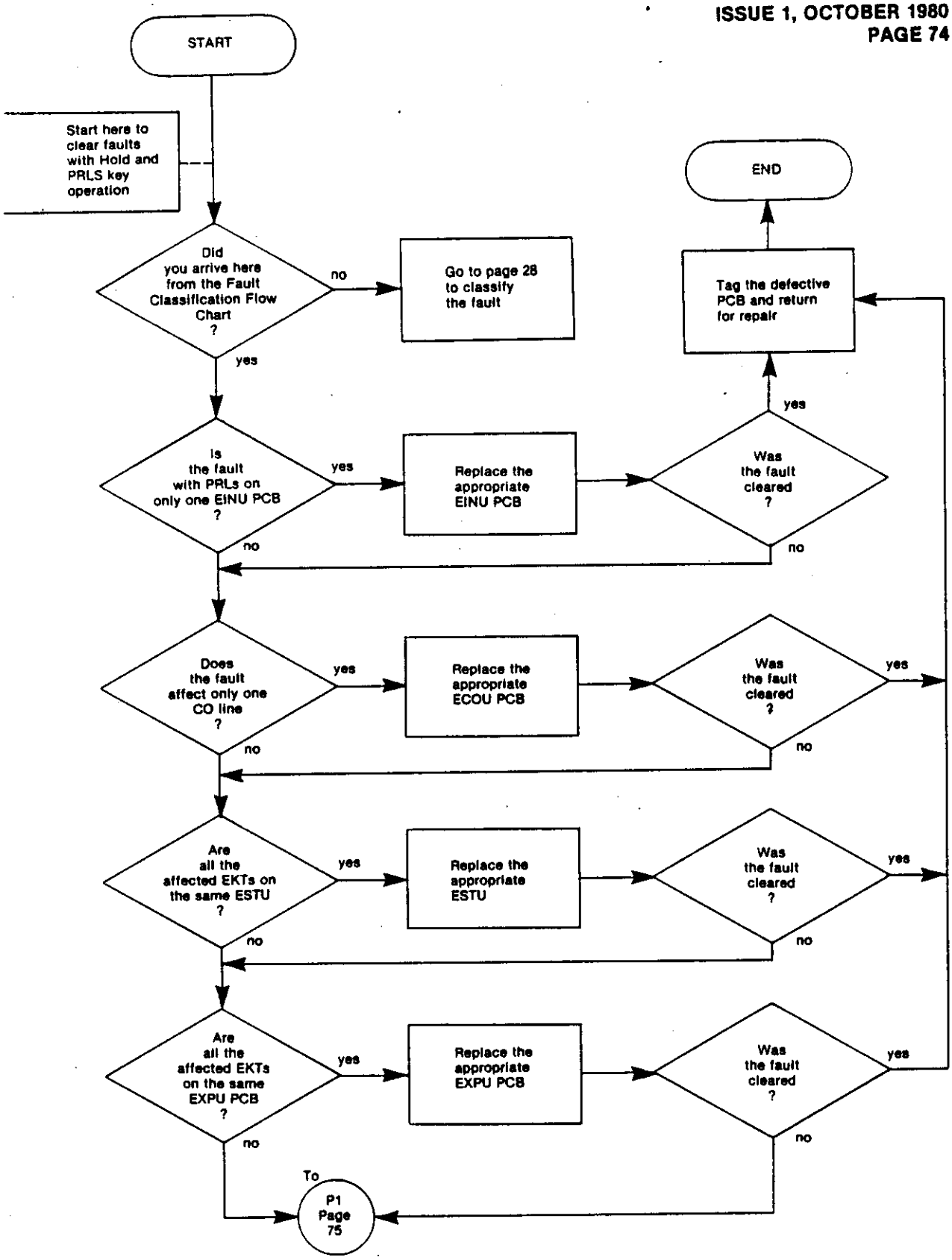
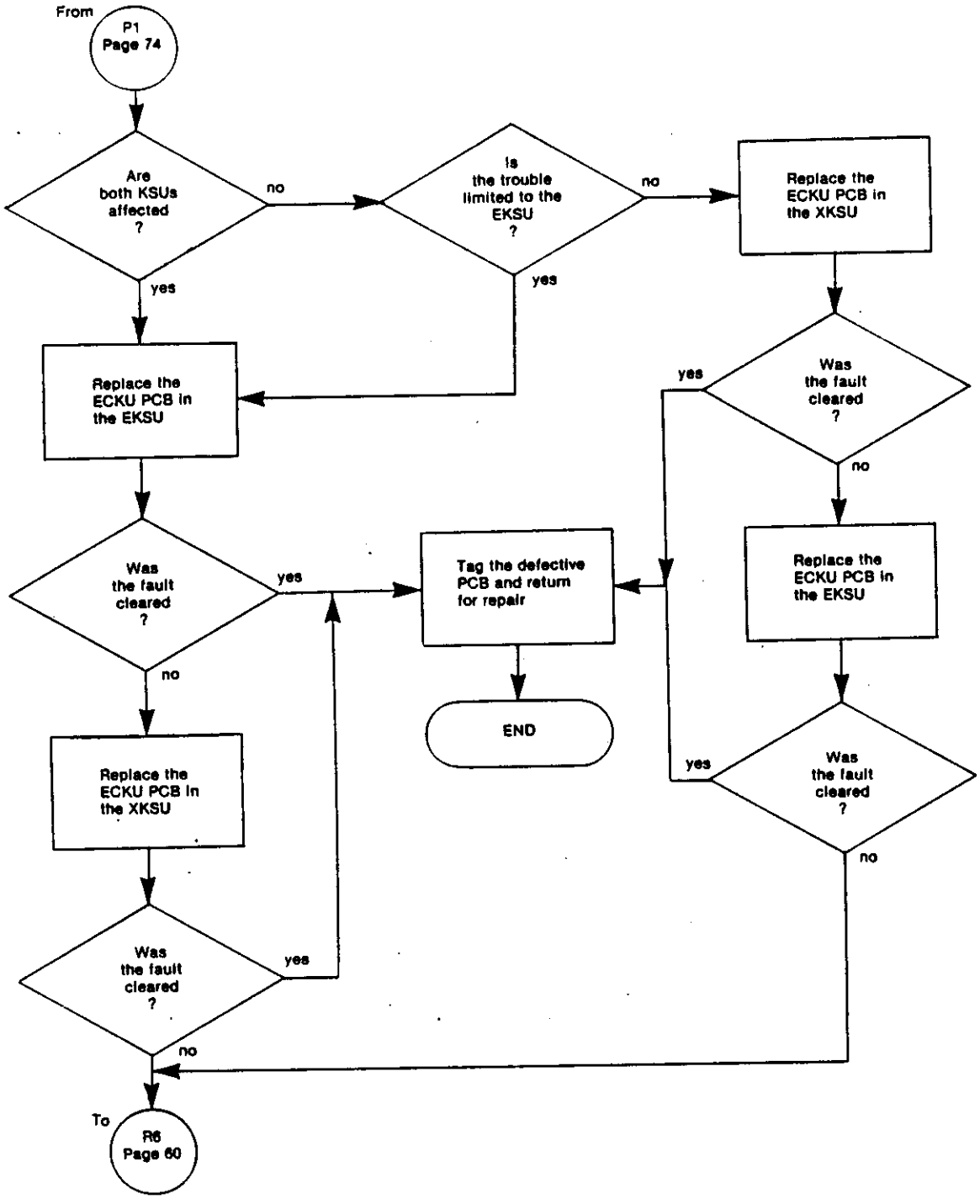


FLOW CHART 6.11—HOLD/PRLS KEY FAULTS



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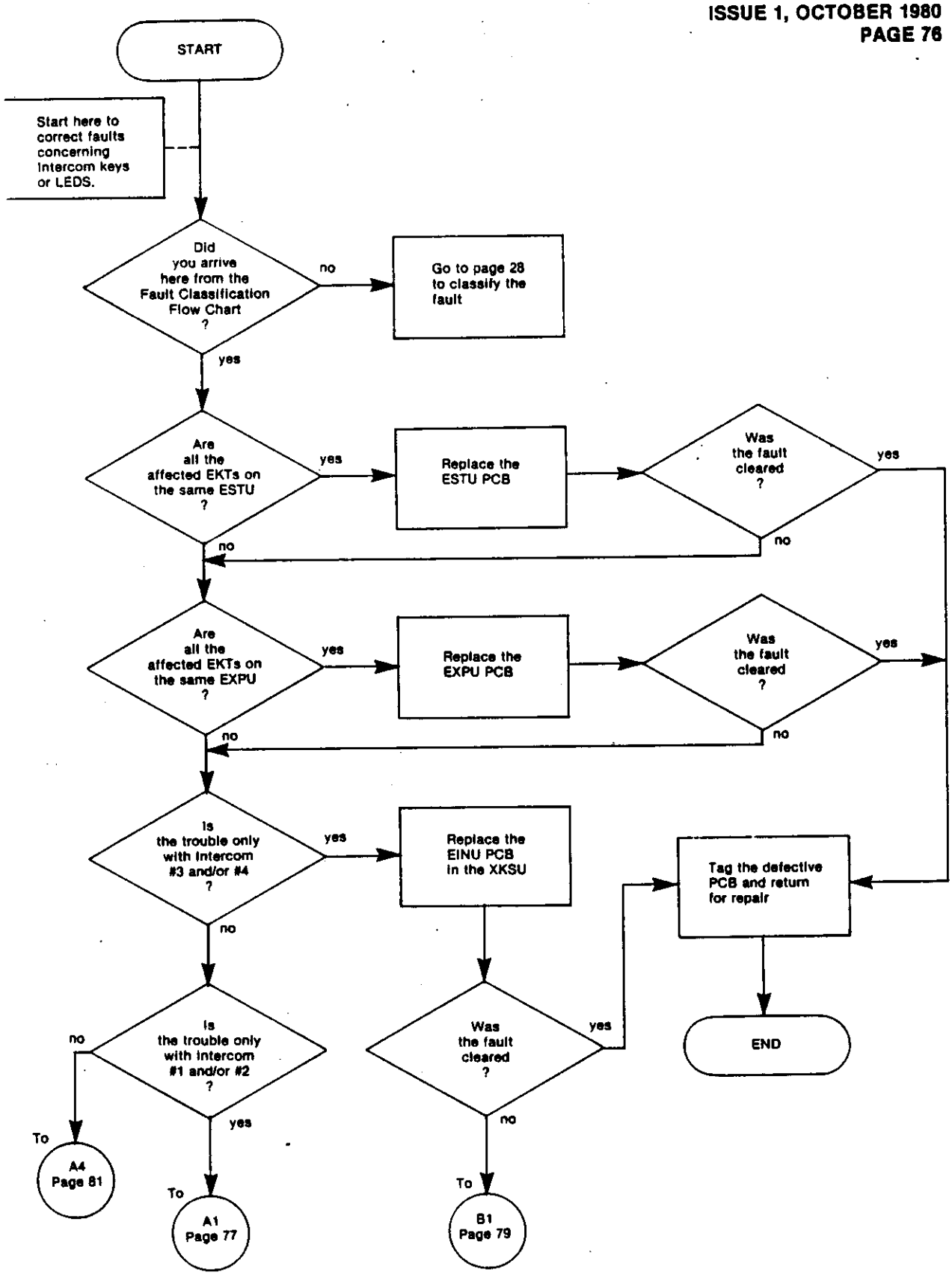
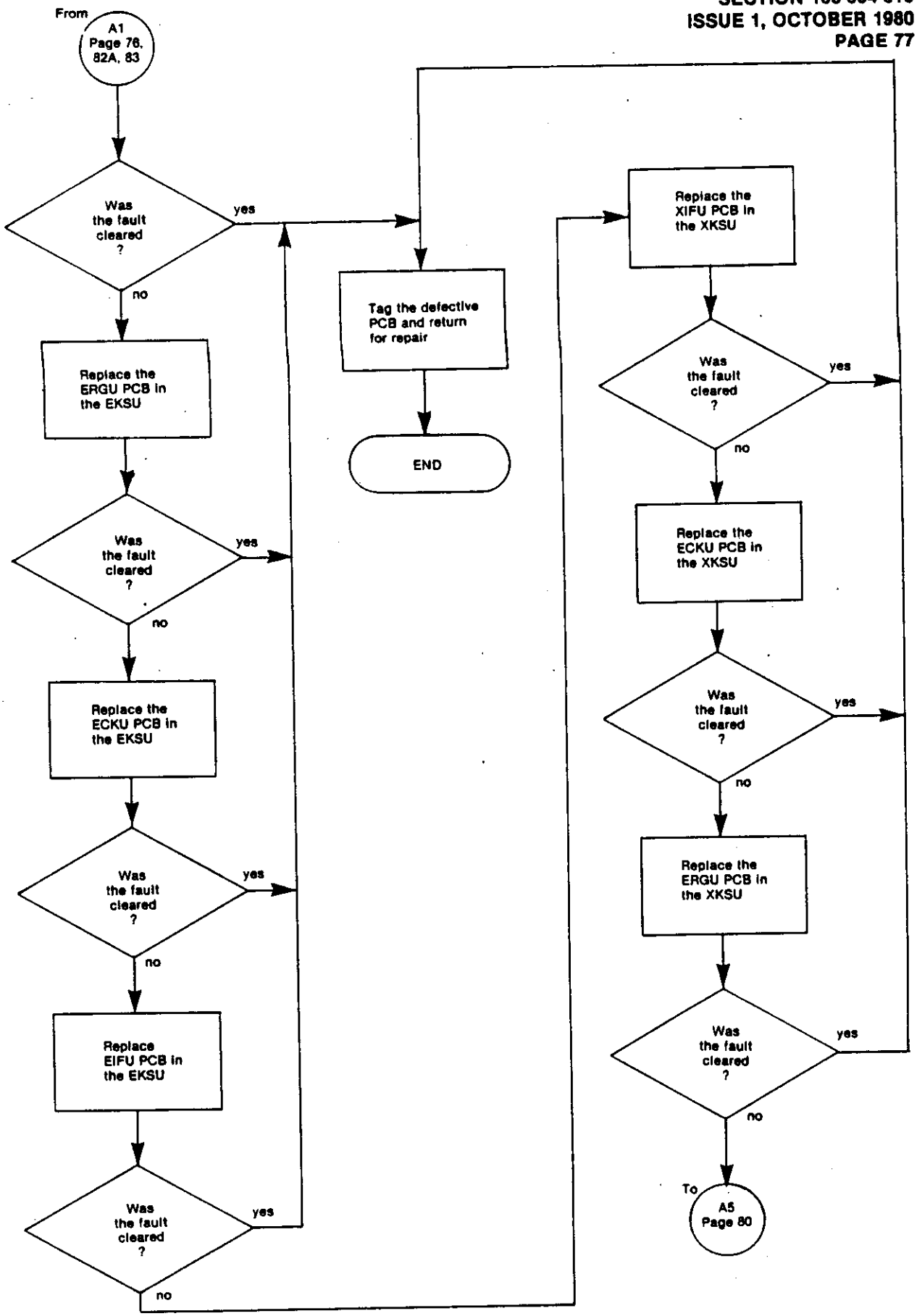


FLOW CHART 6.12—INTERCOM KEY/LED FAULTS



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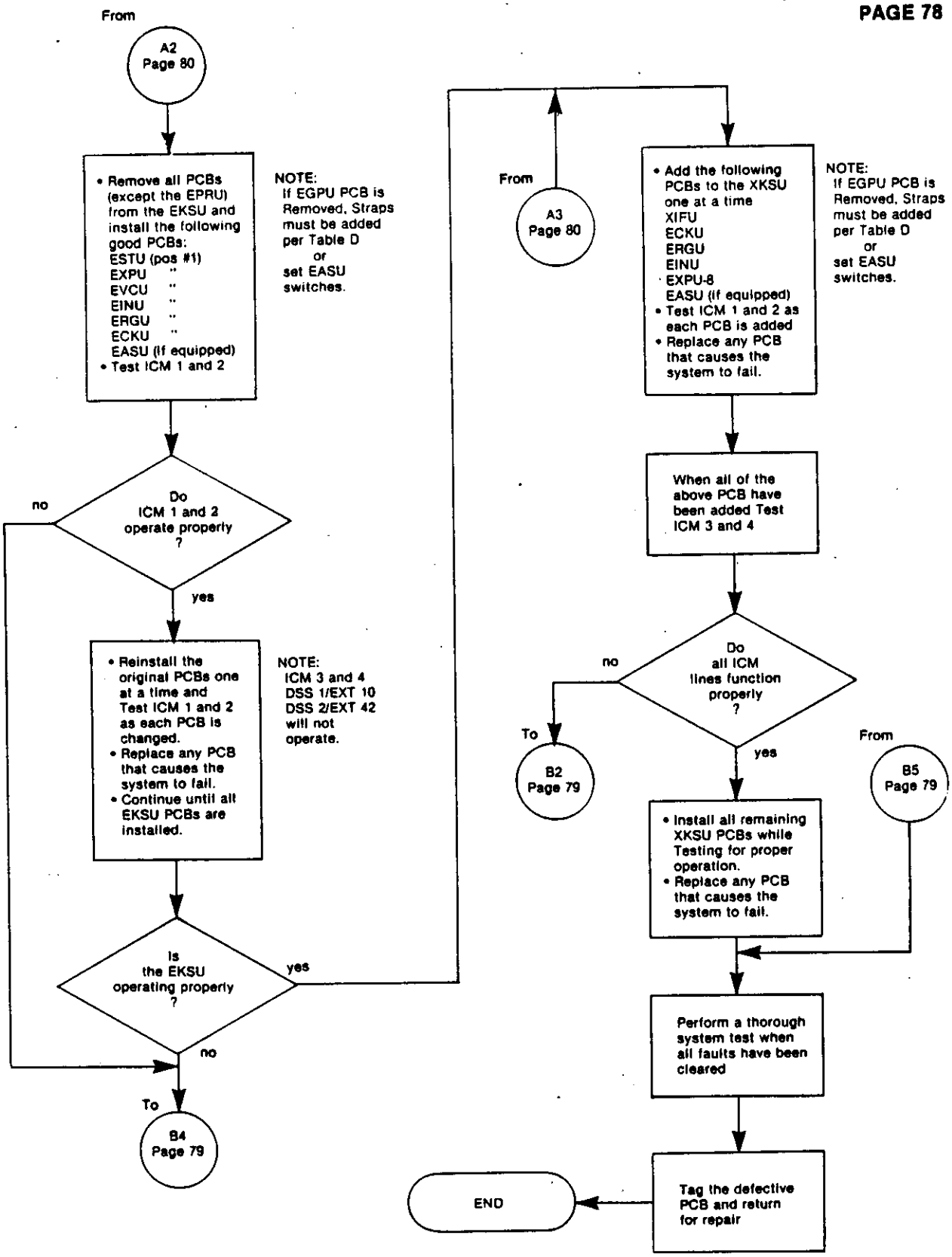

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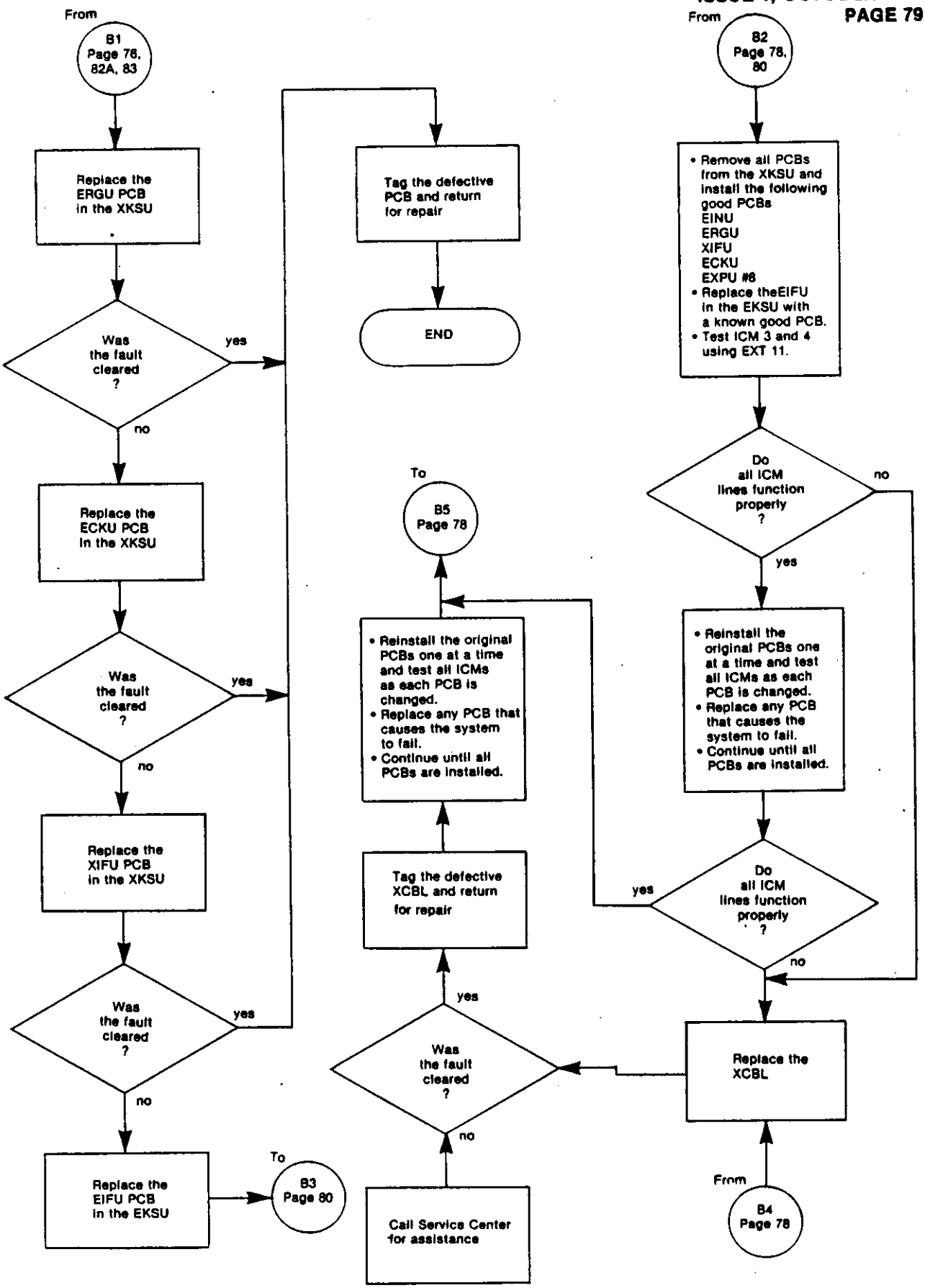

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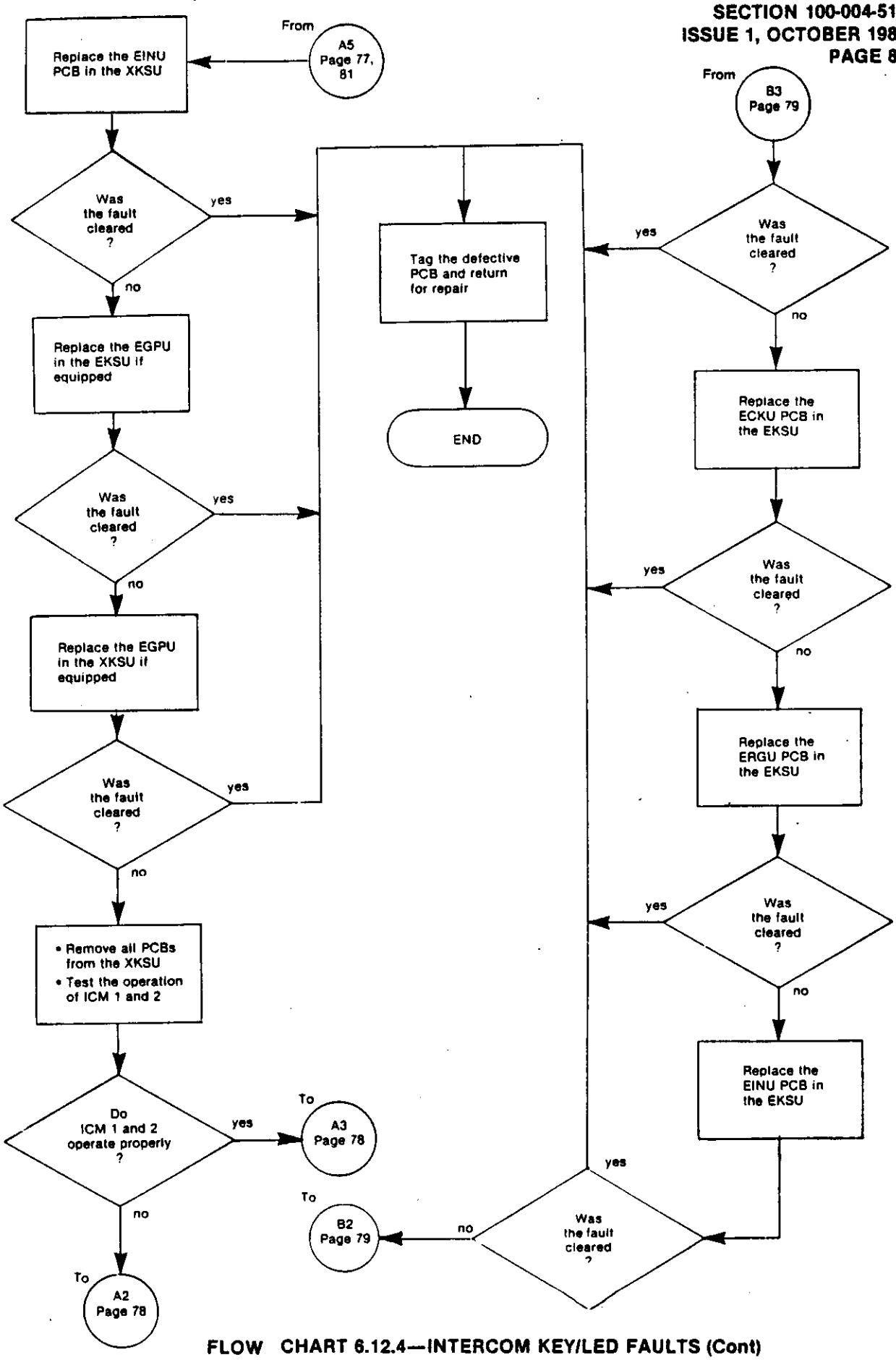

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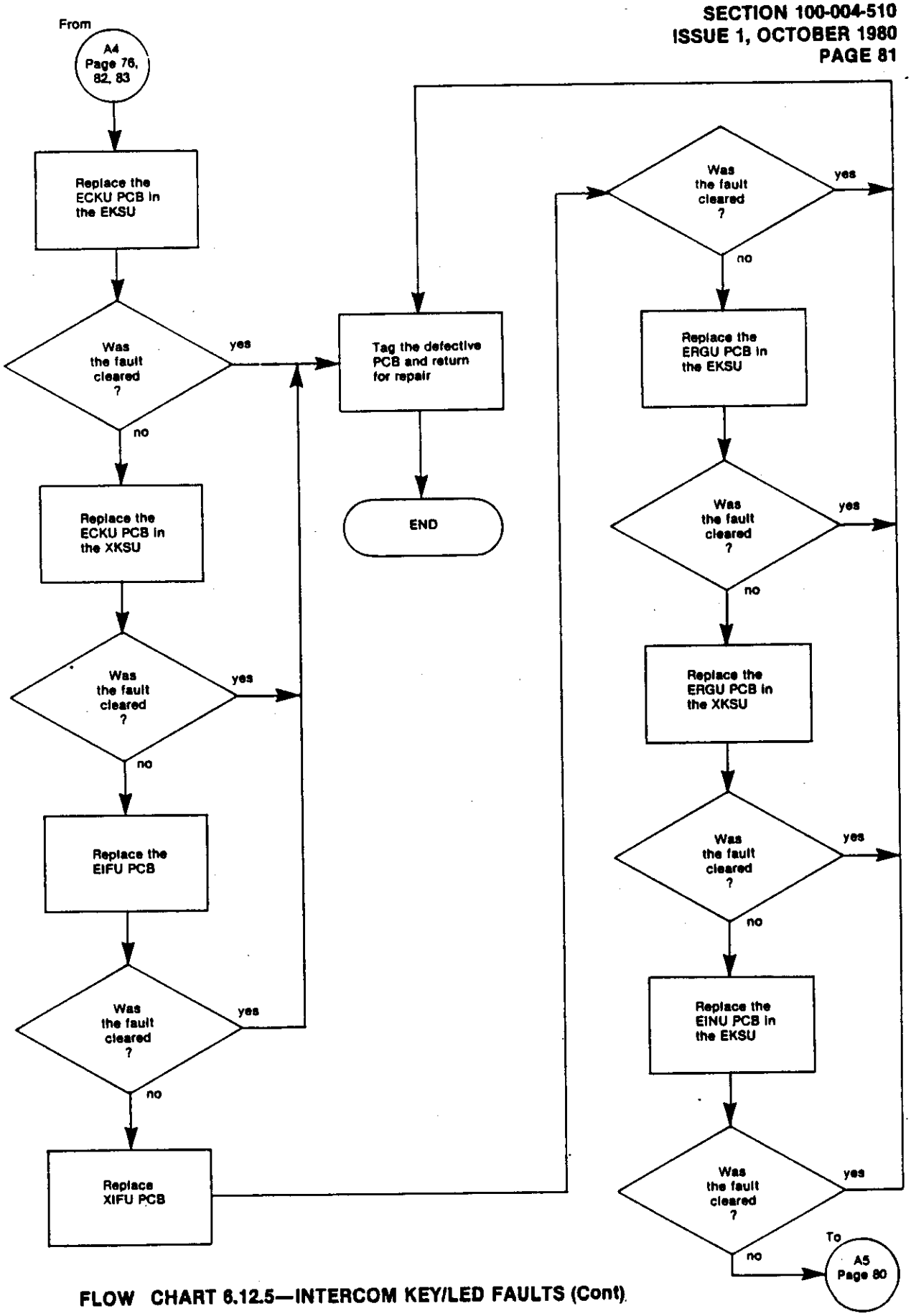

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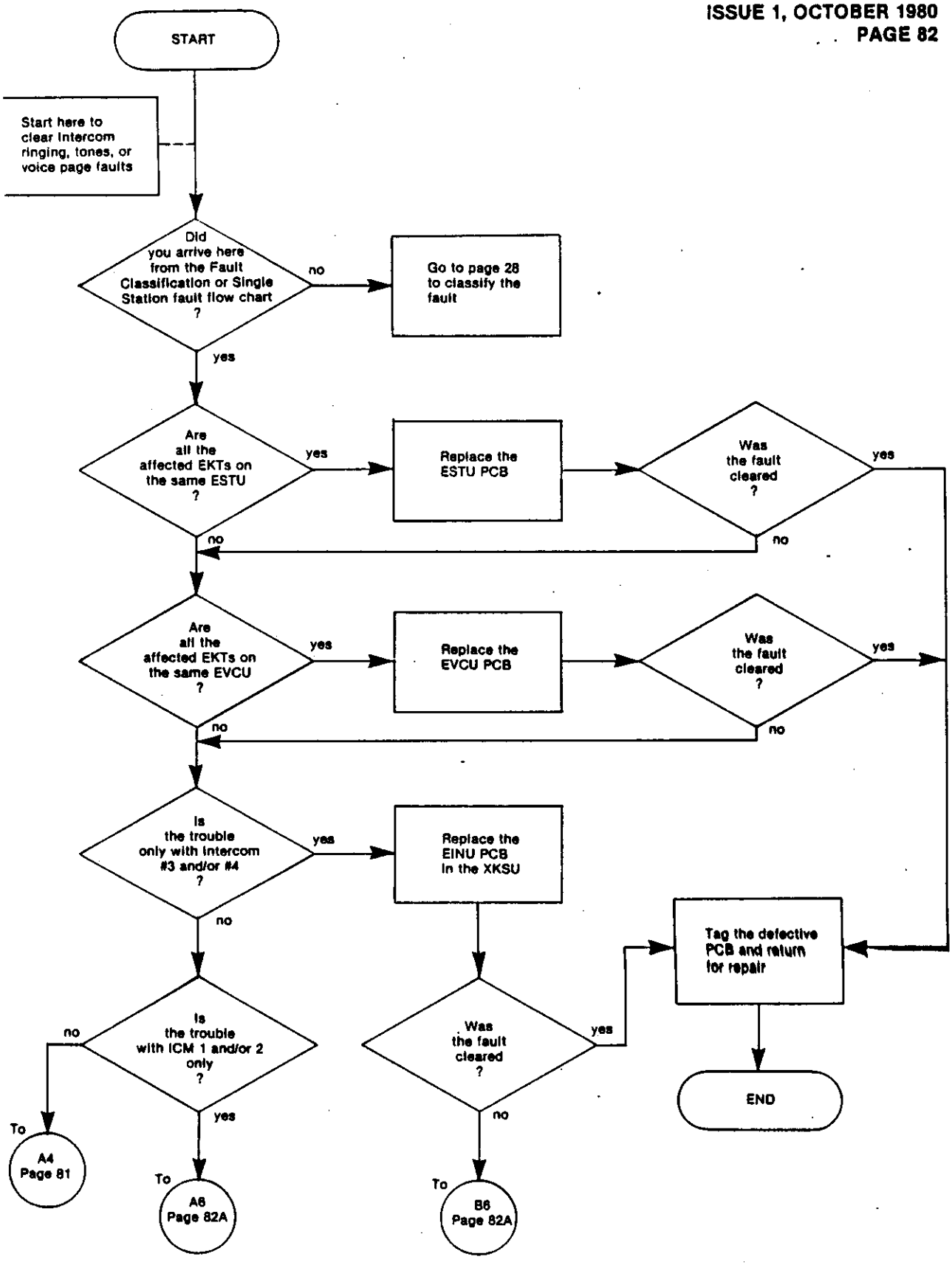
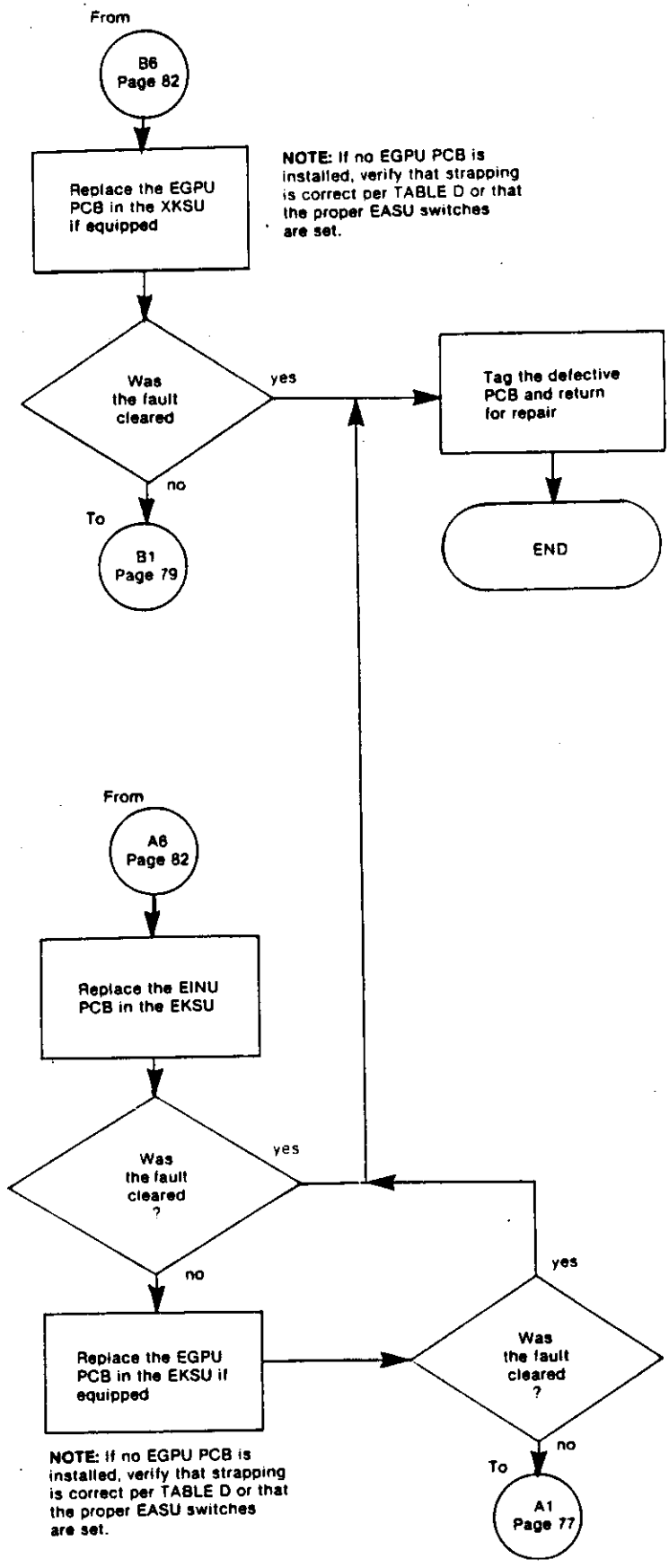
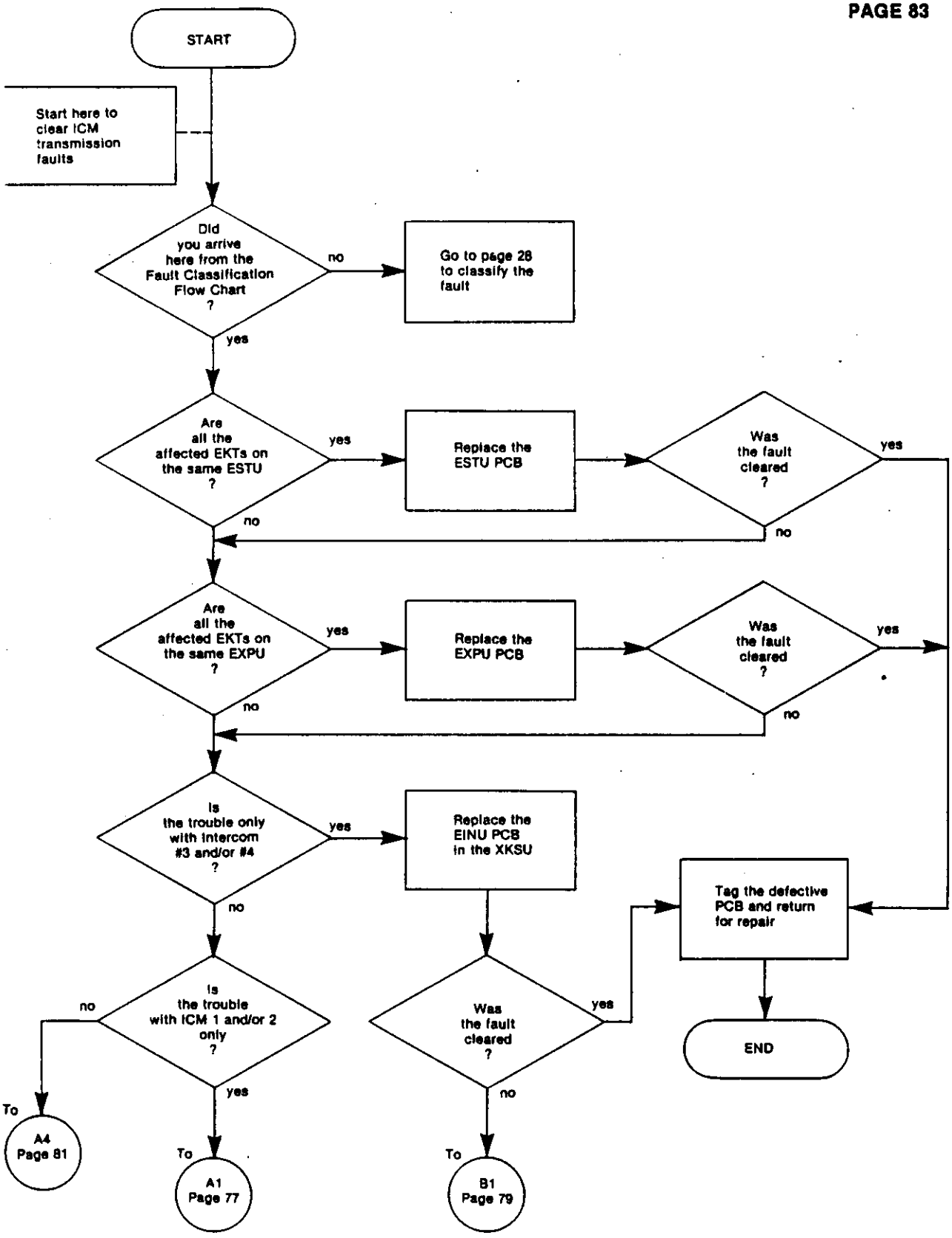


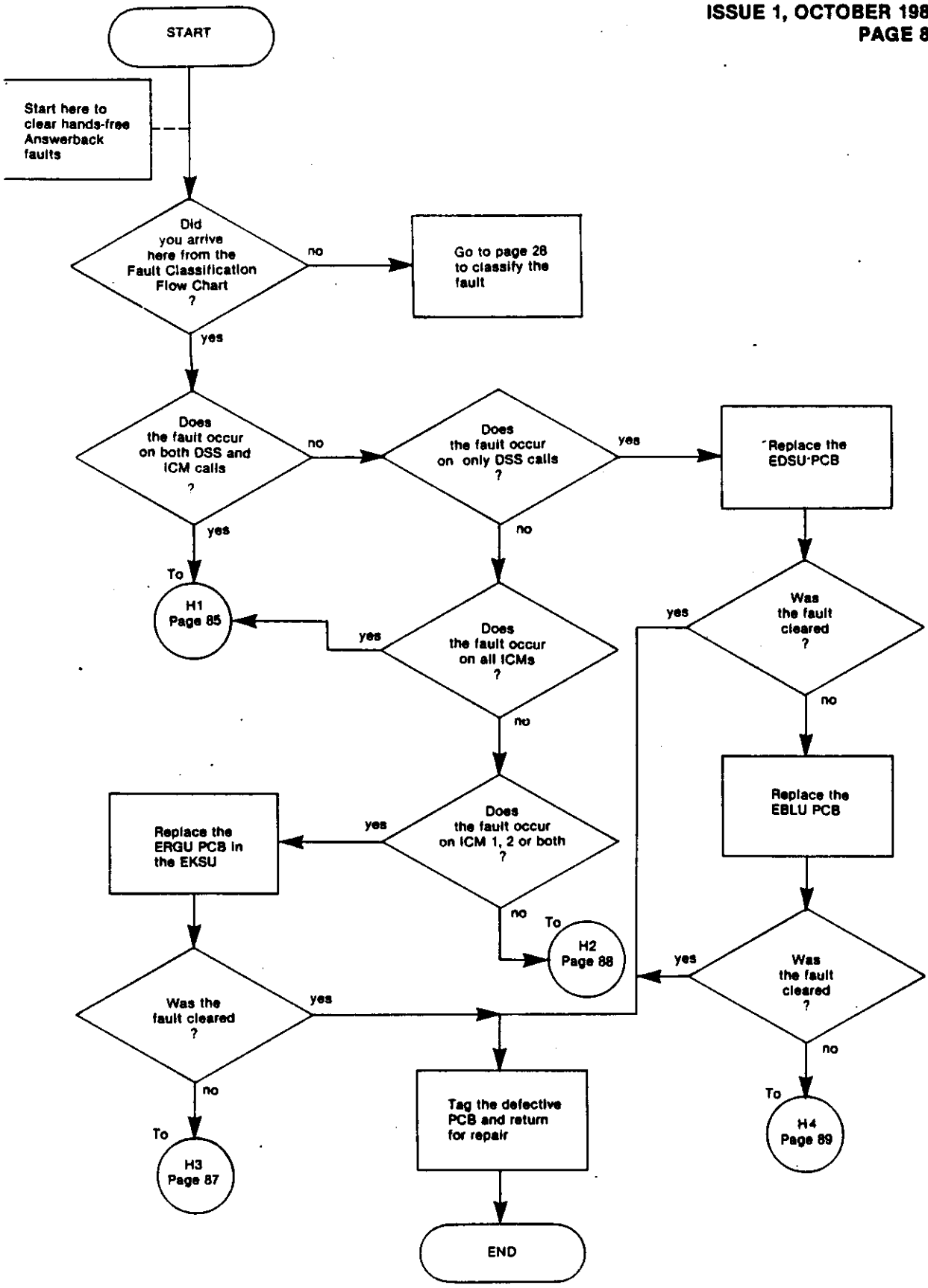
FLOW CHART 6.13—INTERCOM RINGING/TONE FAULTS



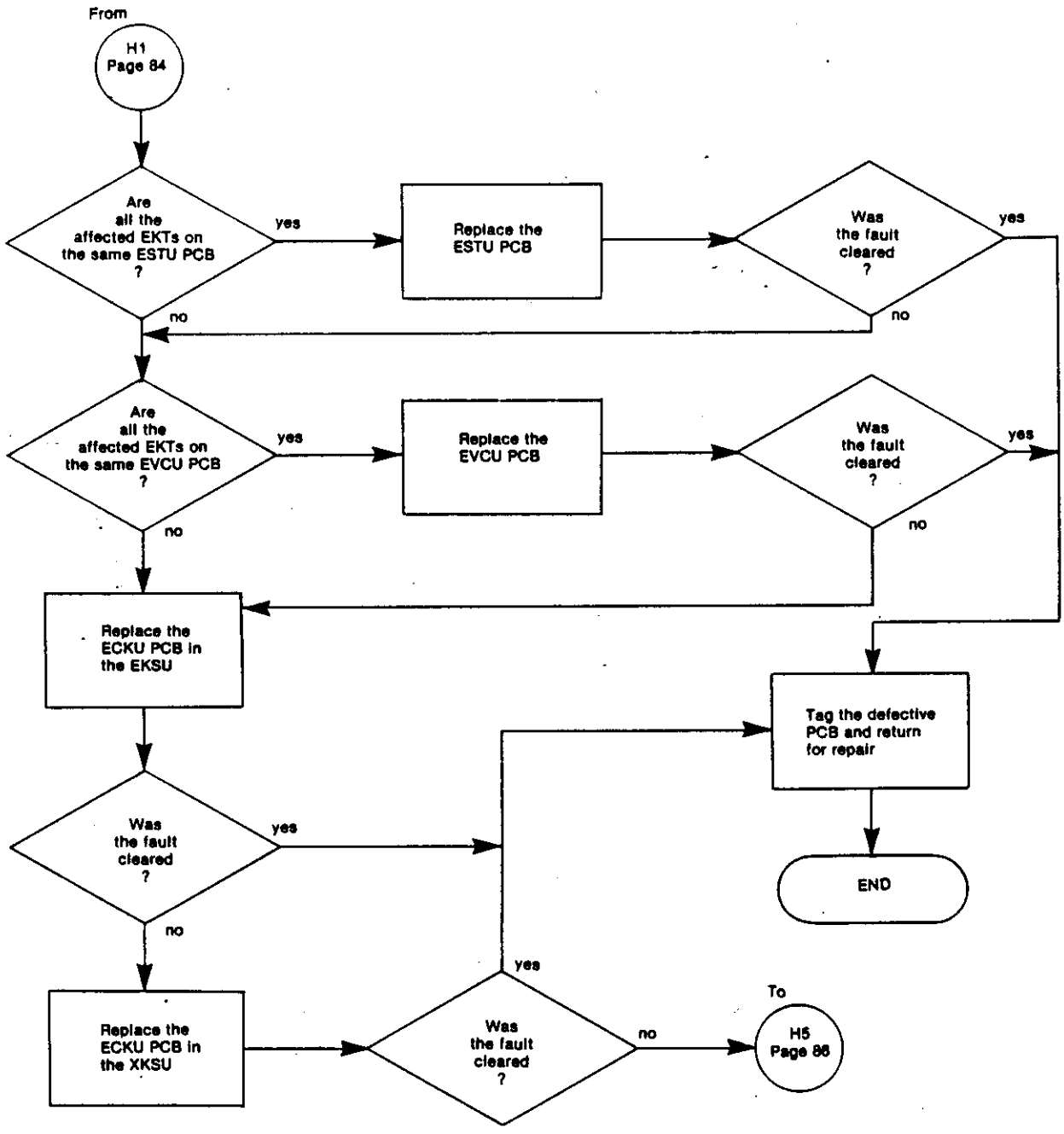
FLOW CHART 6.13.1 — INTERCOM RINGING/TONE FAULTS (Cont)



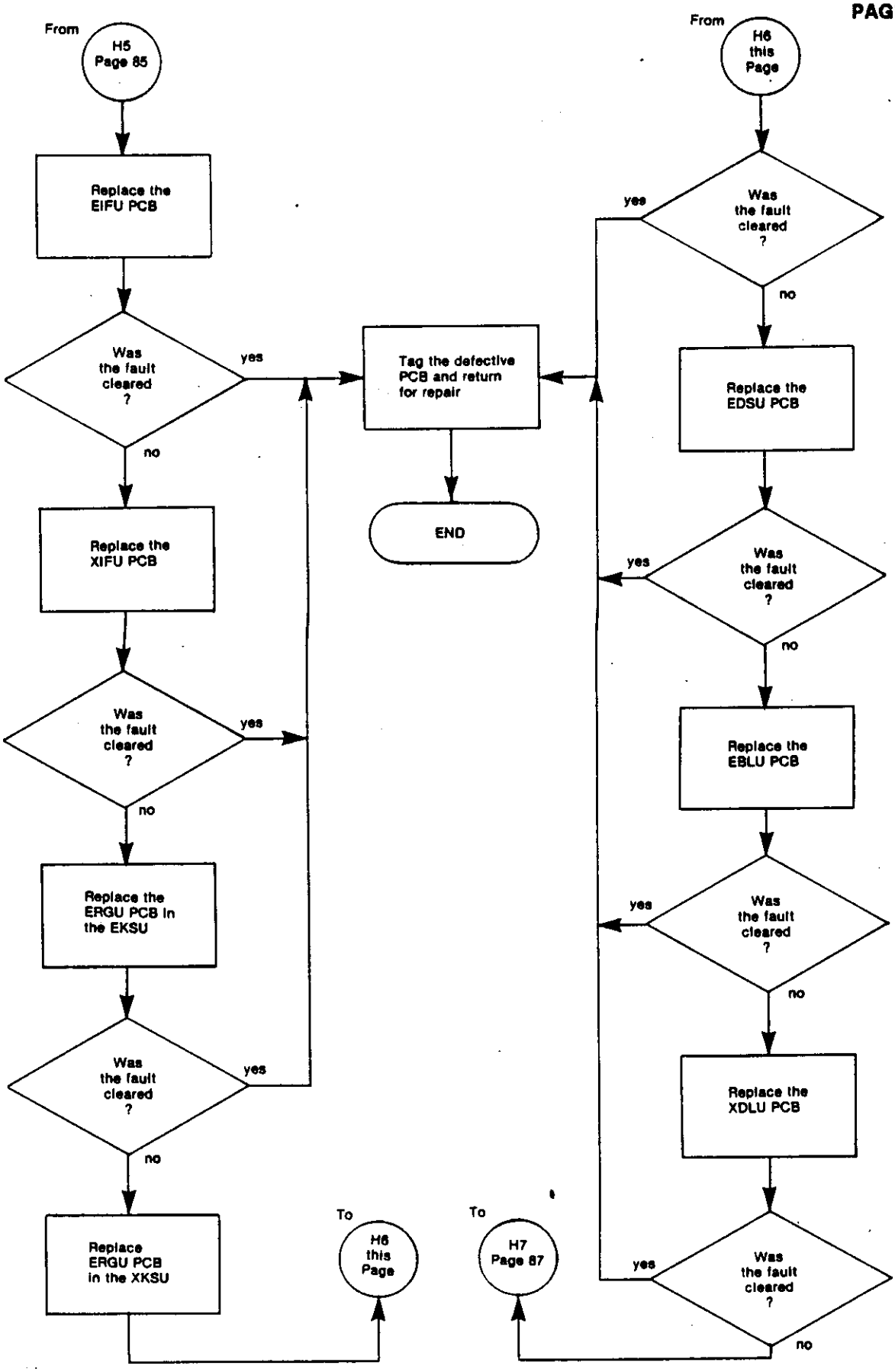
FLOW CHART 6.14—INTERCOM TRANSMISSION FAULTS



FLOW CHART 6.15—HANDS-FREE ANSWERBACK FAULTS



FLOW CHART 6.15.1—HANDS-FREE ANSWERBACK FAULTS (Cont)



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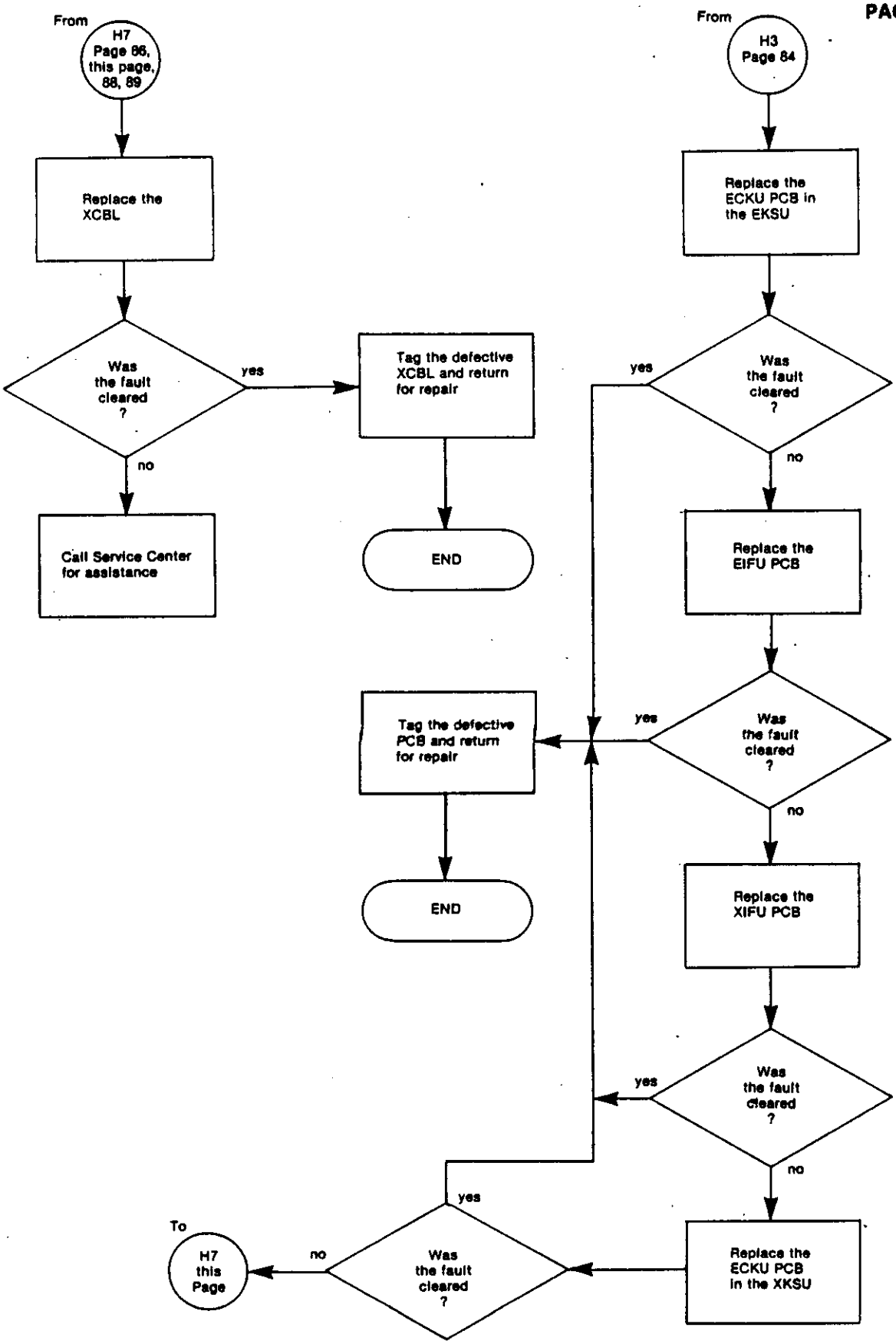

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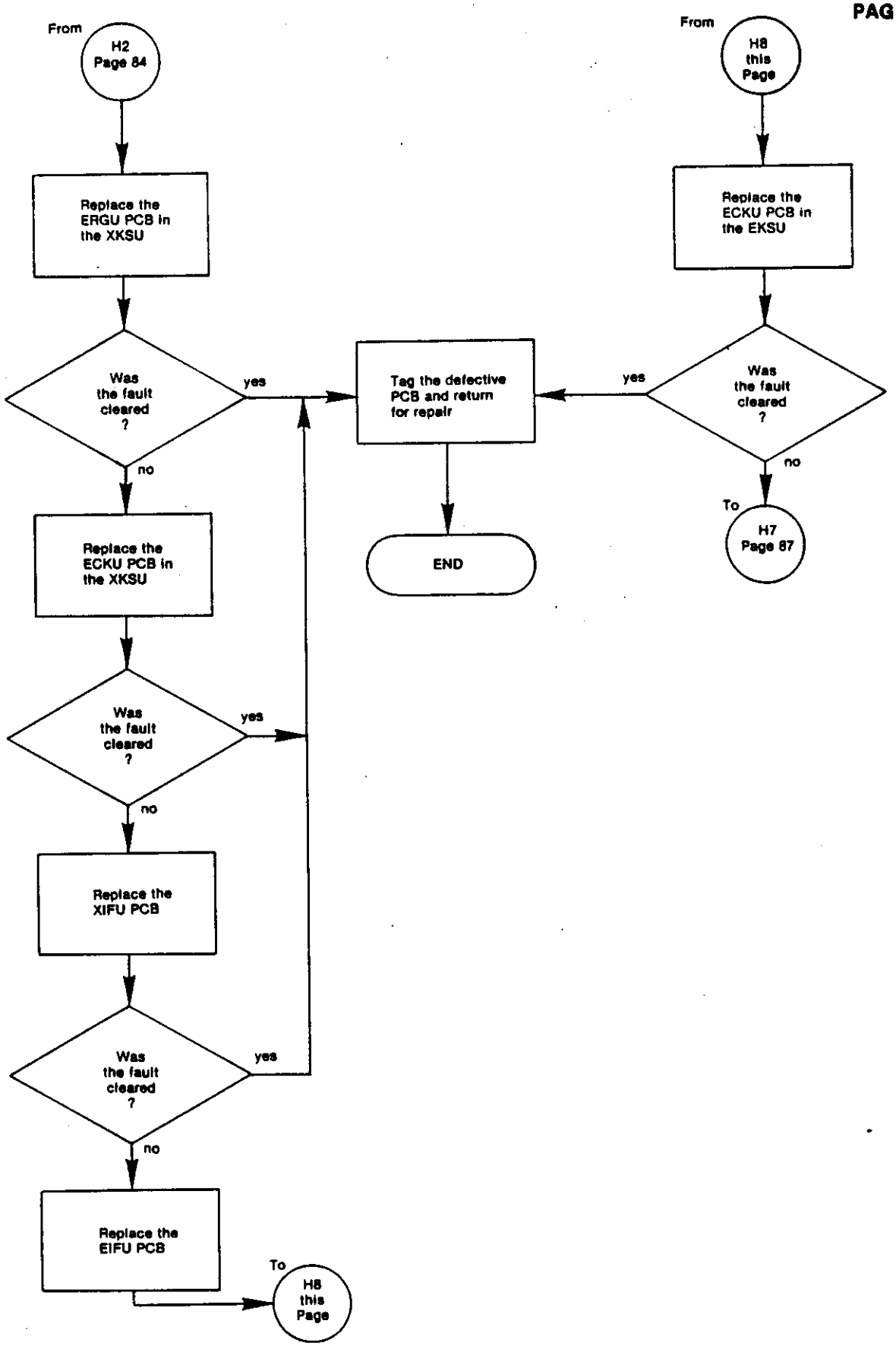

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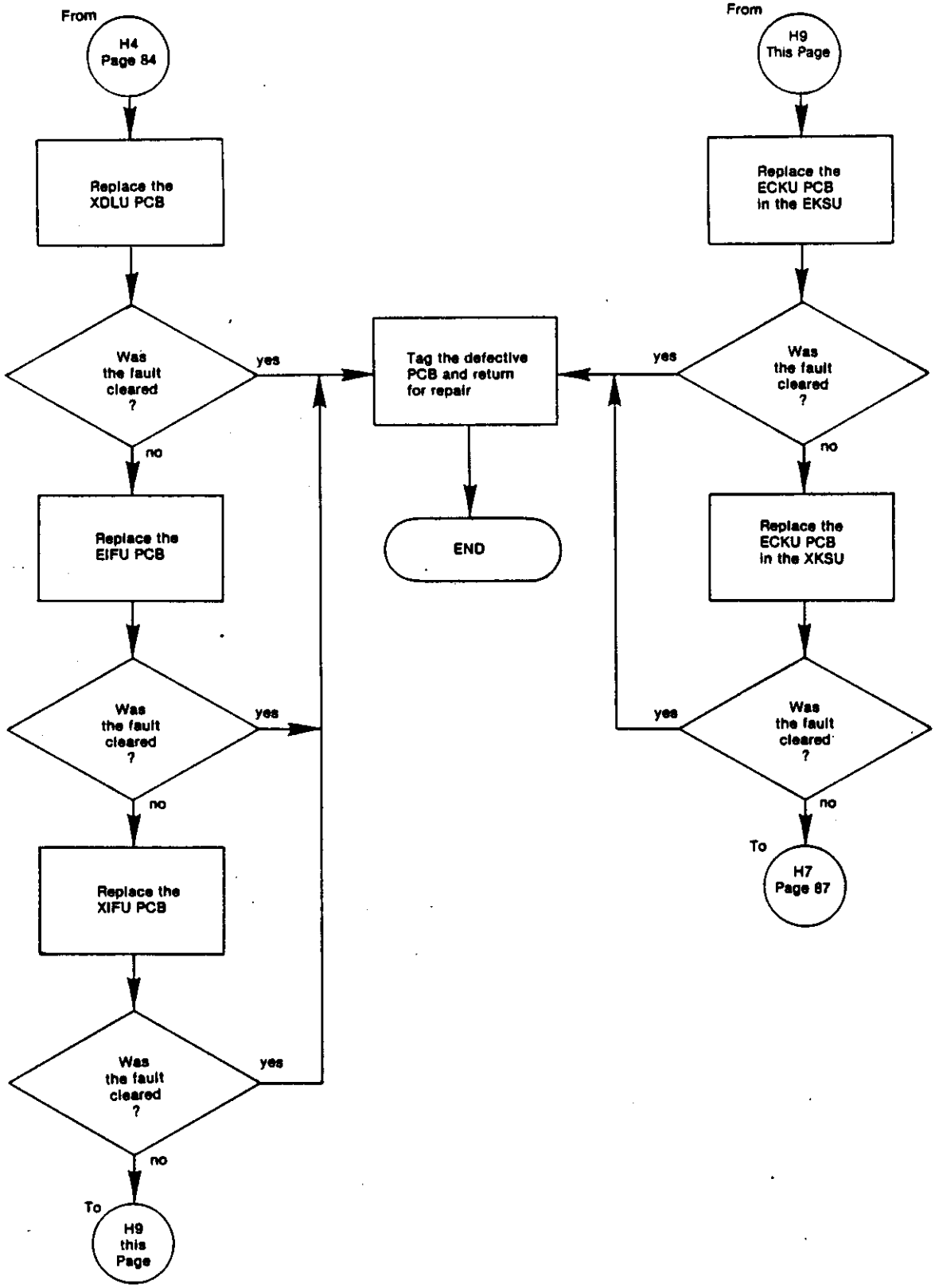

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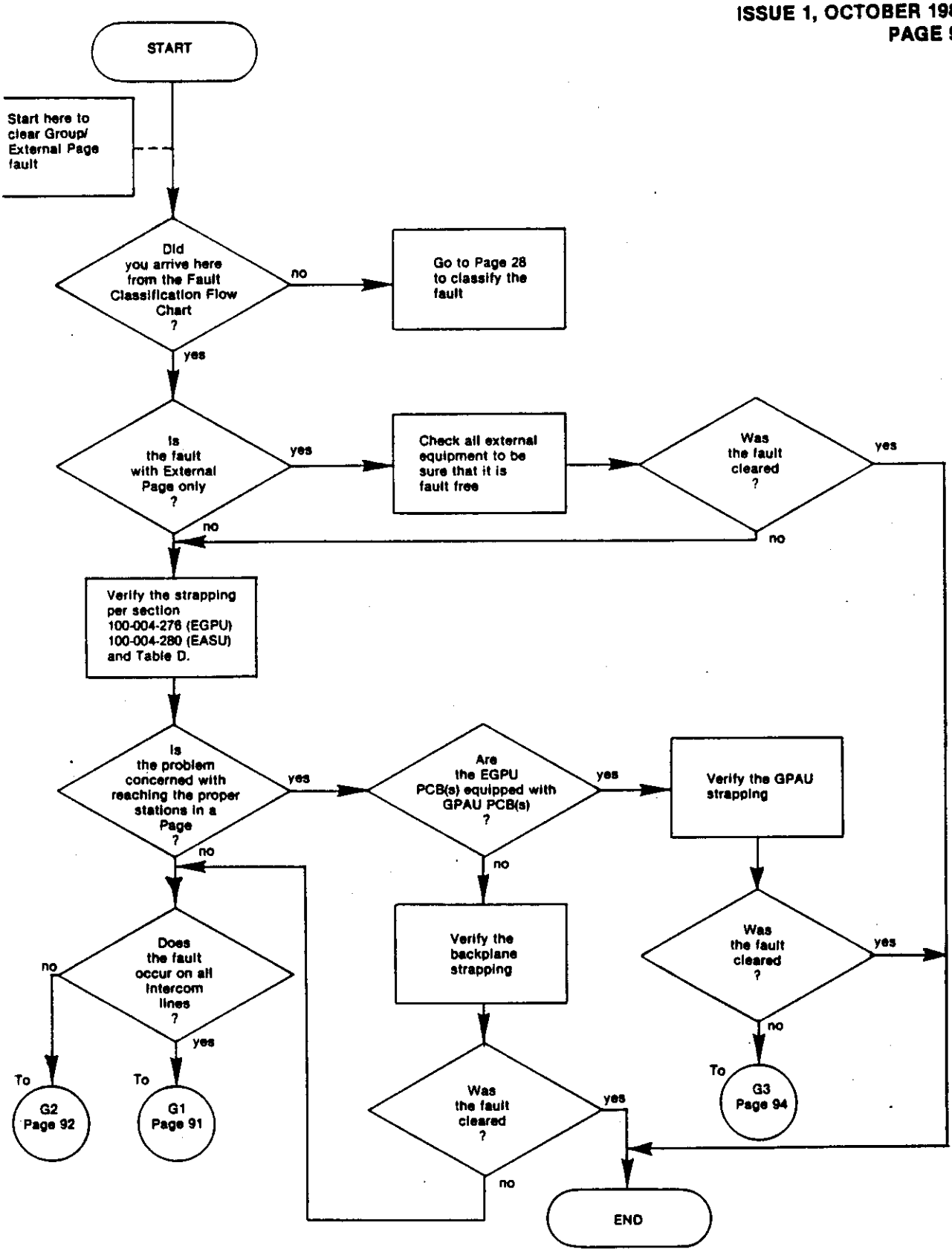
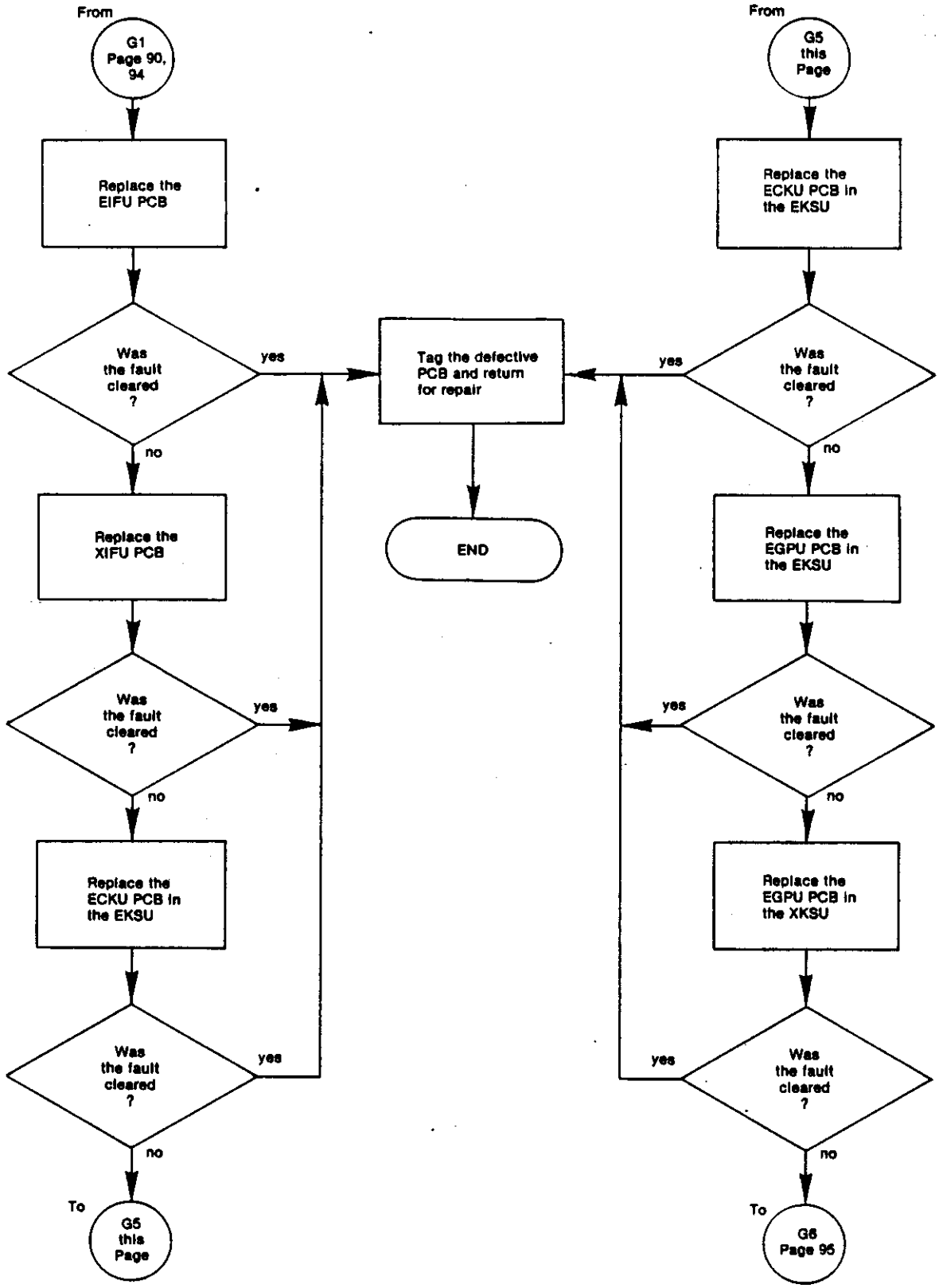
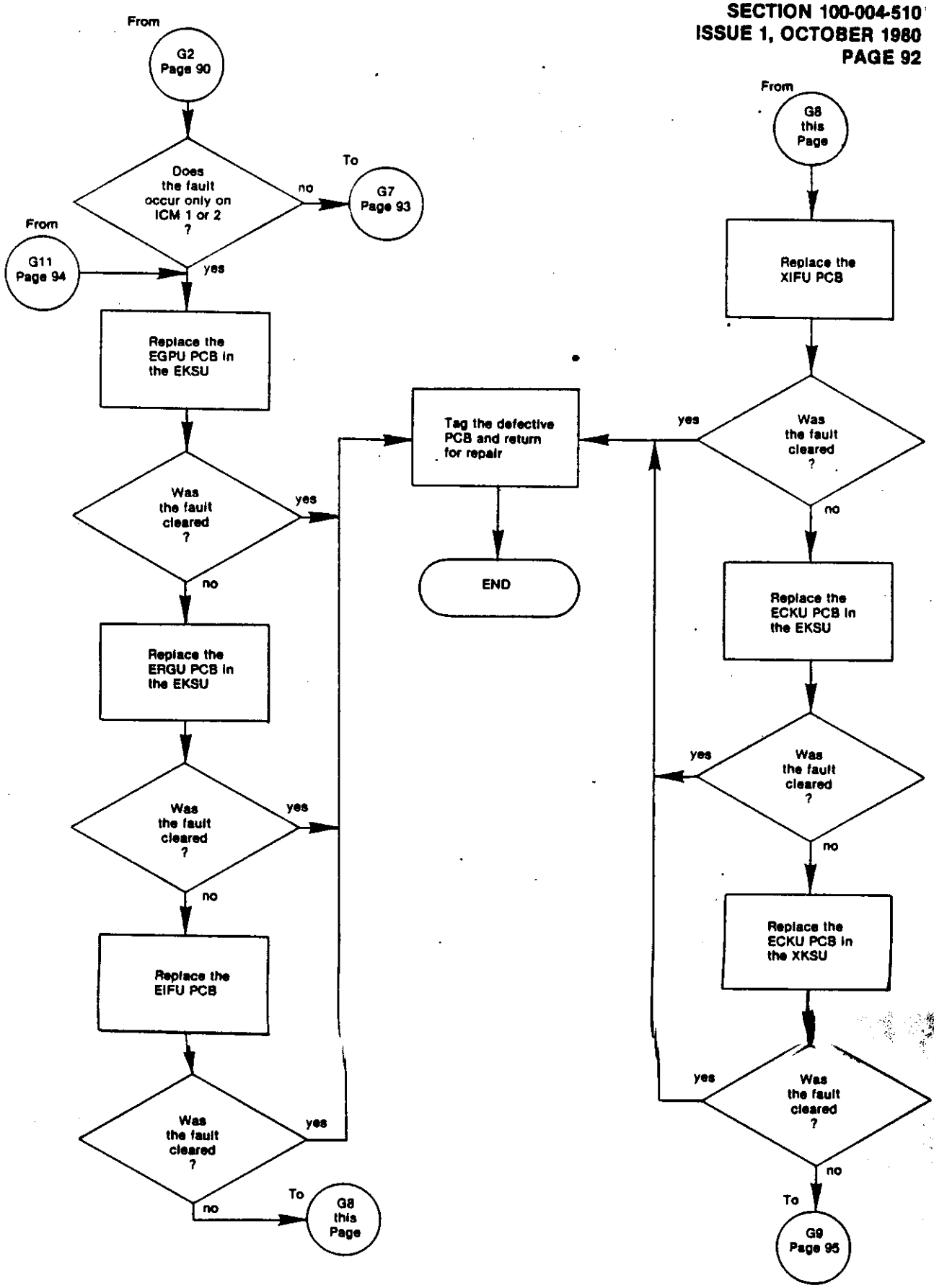


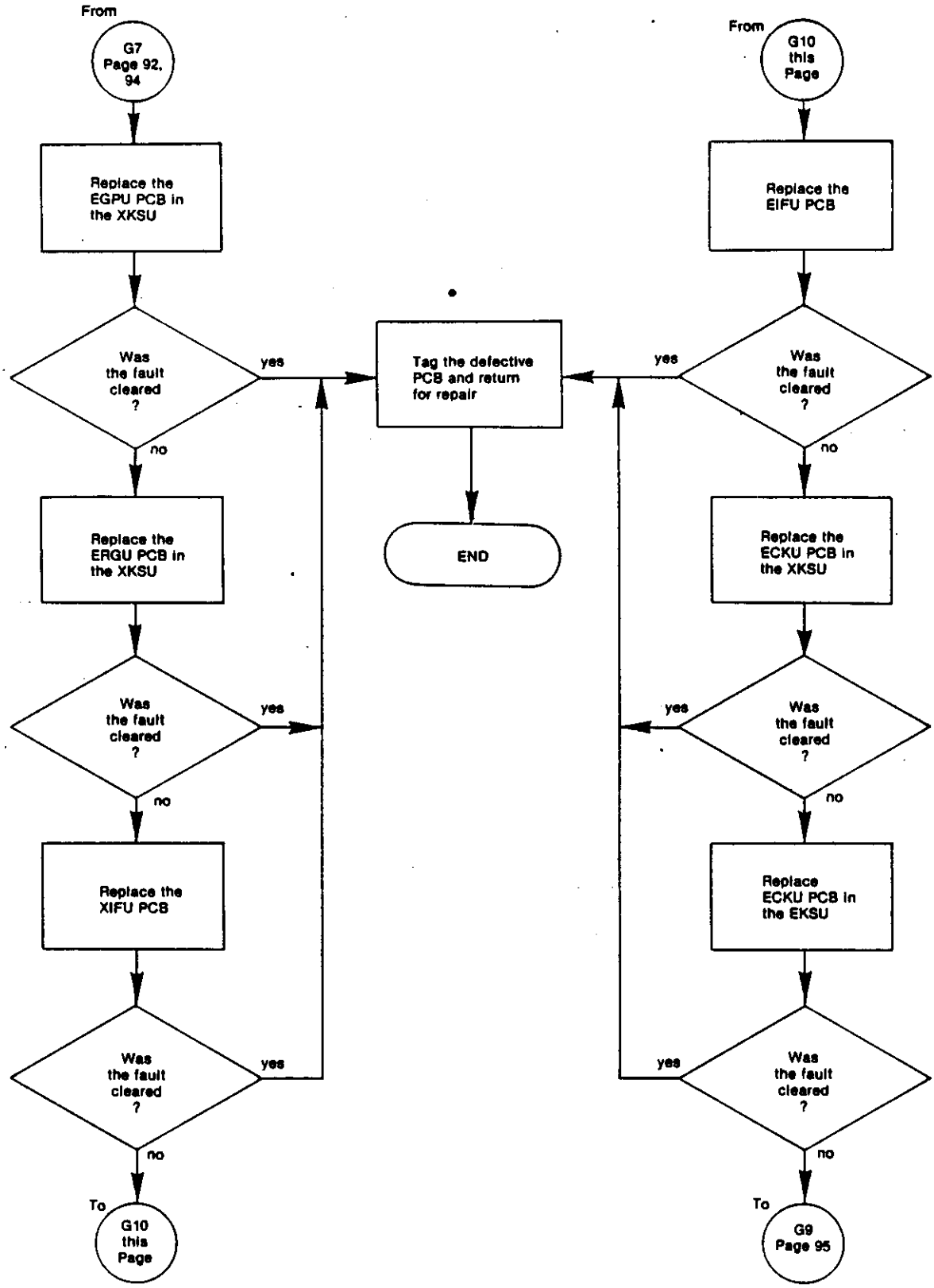
FLOW CHART 6.16—GROUP/EXTERNAL PAGE FAULTS



FLOW CHART 6.16.1—GROUP/EXTERNAL PAGE FAULTS (Cont)



FLOW CHART 6.16.2—GROUP/EXTERNAL PAGE FAULTS (Cont)



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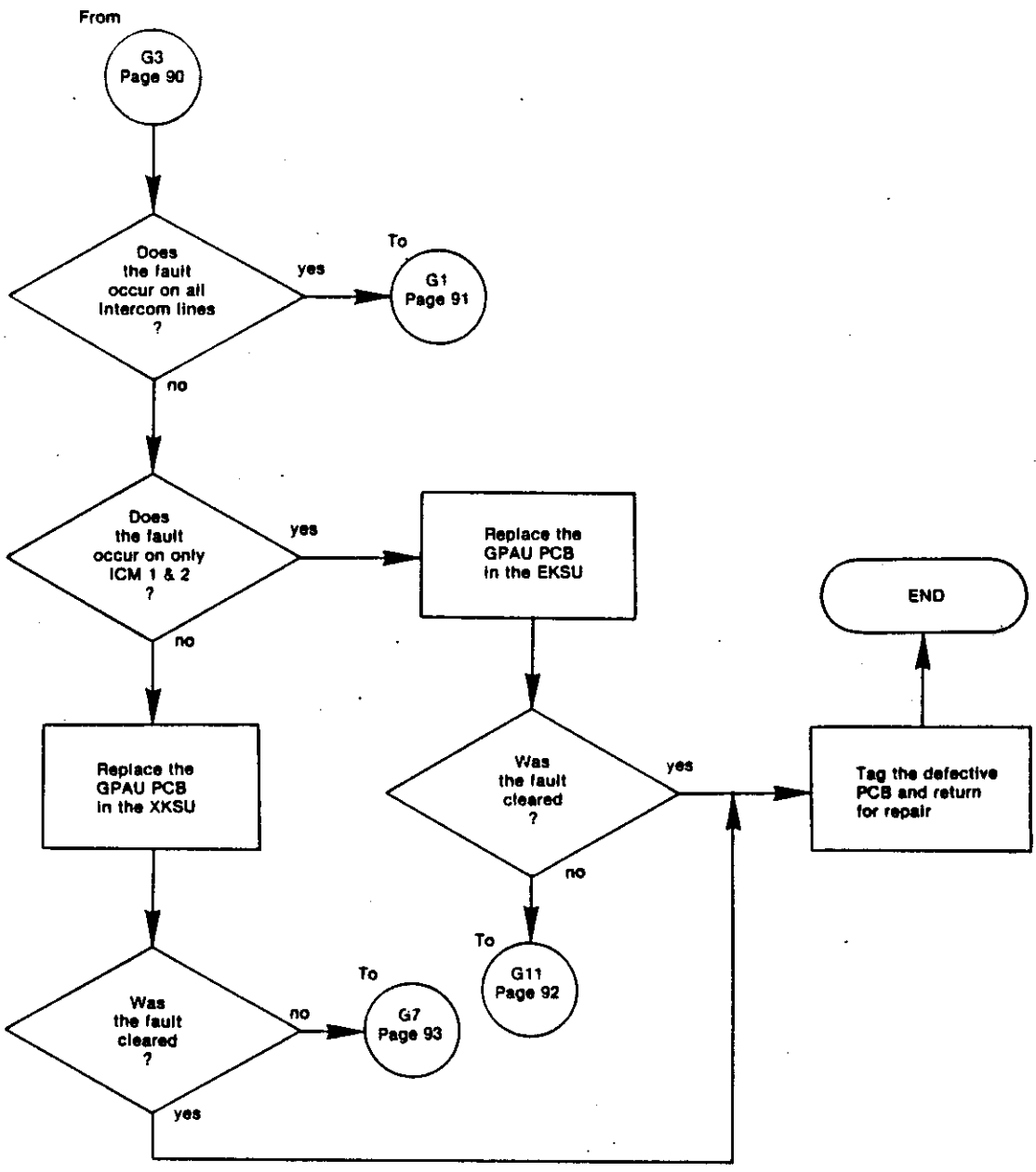

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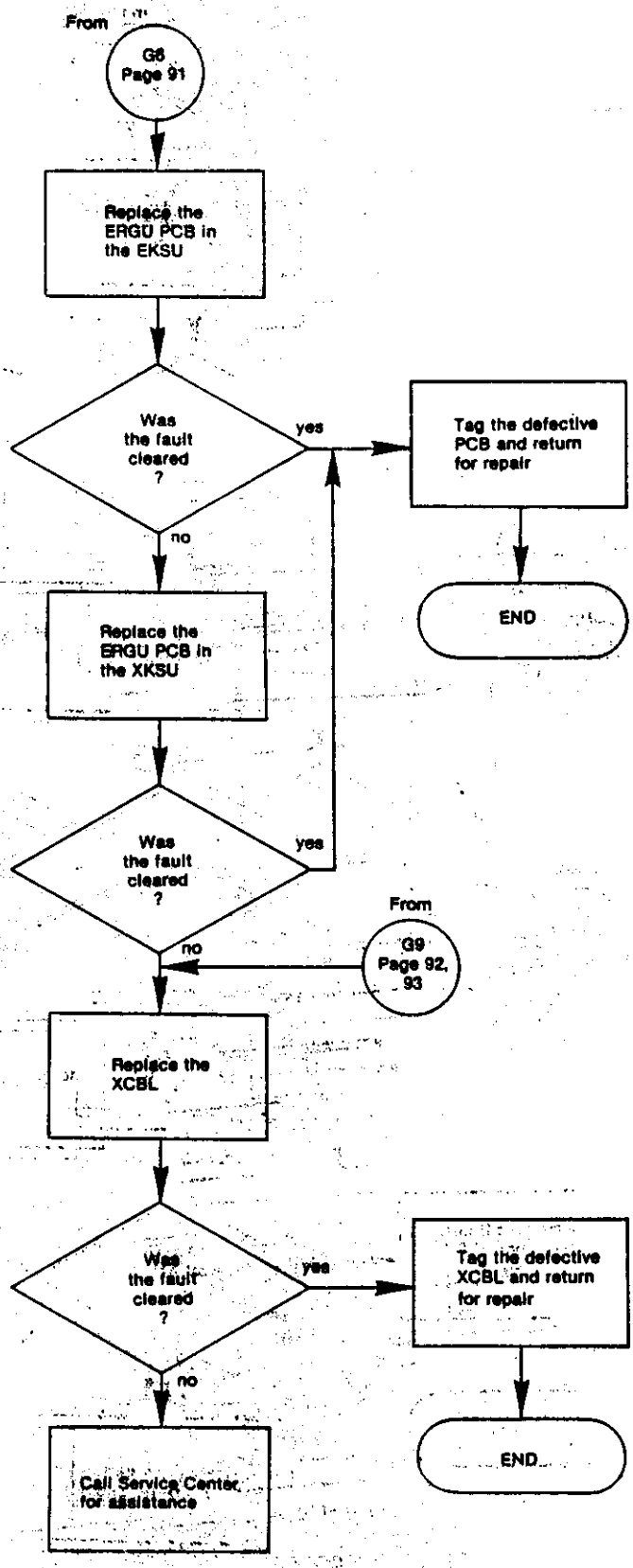

FLOW CHART 6.16.5—GROUP/EXTERNAL PAGE FAULTS (Cont)

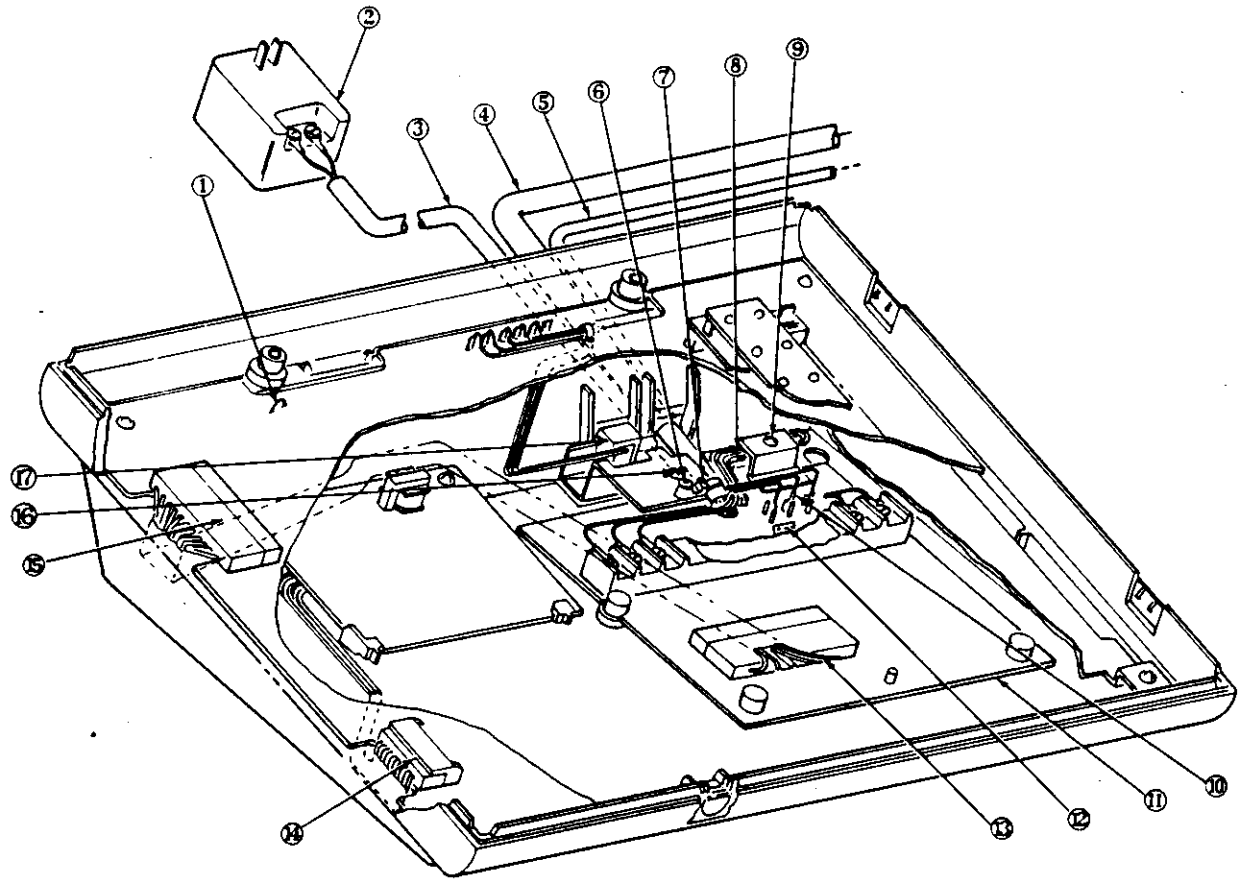

FIGURE 4 — CUT AWAY VIEW OF EKT WITH ESIU PCB INSTALLED

(1) Strap S1
(2) External speakerphone transformer
(3) The external speakerphone transformer cable
(4) The external speakerphone connecting cable
(5) The automatic dialer connecting cable
(6) Machine screw securing the bound cables to the metal retaining bracket for the modular plug.
(7) Nylon cable tie binding two external speakerphone cables and the automatic dialer cable together
(8) The external speakerphone cable wires folded under the ESIU PCB retaining bracket
(9) Metal bracket securing ESIU PCB to EKT base
(10) The automatic dialer spade tip terminals
(11) ESIU PCB
(12) The location of the "No A.D." pins
(13) ESIU cable connection
(14) The EHFU cable connection on the EKT PCB
(15) The ESIU cable connection on the EKT PCB
(16) Self-tapping screw securing the metal retaining bracket to support post ≠2
(17) Modular jack.

with the bottom of the EKT case. Use the 3 x 10 self-tapping screw supplied with the ESIU kit to secure the ESIU to support post No. 3.

2.3 Identify the ESIU cable connector SPF/P3 on the upper left-hand corner of the EKT PCB (see **Figures 3 and 4**):

2.3.1 Count the pins on the SPF/P3 connector.

2.3.2 If there are fifteen pins, proceed to Paragraph 2.5, as special modification of the ESIU connector cable will not be necessary.

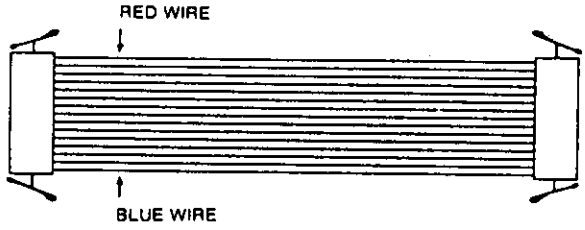

FIGURE 5A — ESIU CONNECTOR CABLE

2.4 If the male SPF/P3 connector has only twelve pins the connectors *must* be modified as follows (see **Figures 5A and 5B**):

2.4.1 Cut the *red* wire and *two* adjacent gray wires from *one* female cable connector. See **Figure 5B.**

2.4.2 Note the two small finger projections at each end of the SPF/P3 male connector. In order for the fifteen pin female connector to be connected, it is necessary that the upper finger (see **Figure 5B**) be cut and removed. Using a pair of diagonal cutters, cut the upper finger as close to the SPF/P3 connector as possible without damaging the connector or its pins.

2.4.3 Strip ¼ inch of insulation from the ends of the cut red and two gray wires. Twist the ends of each wire to form a point. With the EKT PCB face down on a protected surface, apply the heated tip of a soldering iron to the L2 soldering position. See **Figure 5C.** When the solder is liquified, insert the end of the cut red wire into the drilled hole in the L2 position. Repeat this procedure with the 1st gray wire for

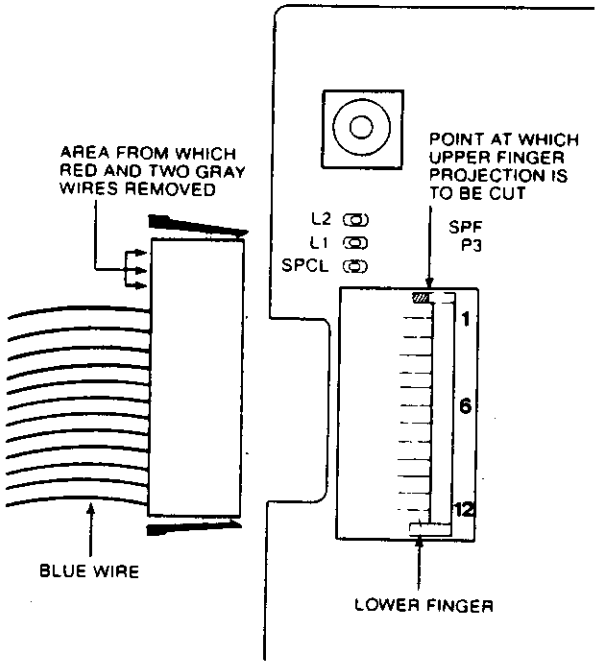

FIGURE 5B — VIEW OF UPPER LEFT CORNER OF EKT PCB (FROM ABOVE) — LINE UP OF ESIU CONNECTOR WITH SPF/P3 CONNECTOR

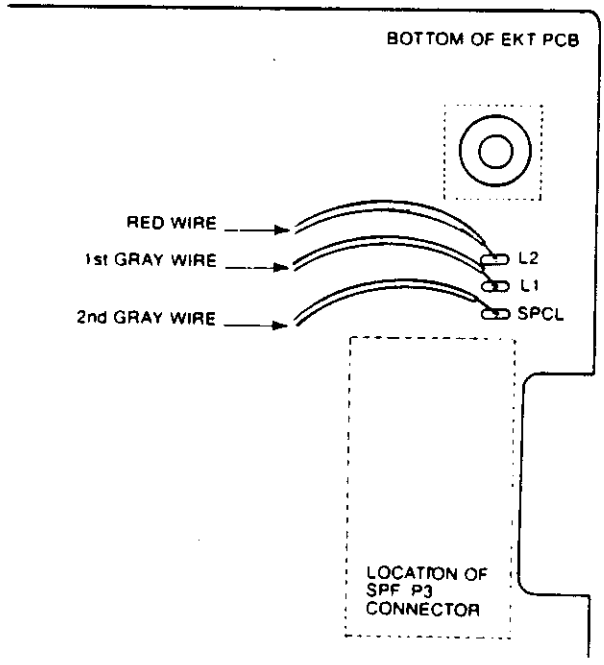

FIGURE 5C — VIEW OF UPPER LEFT CORNER OF EKT PCB (FROM BELOW) — WIRE SOLDERING POINTS

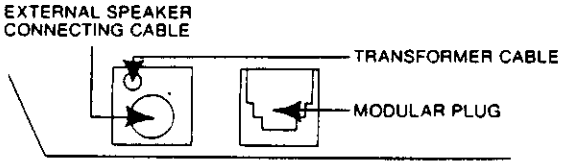

FIGURE 6 — REAR VIEW EKT EXIT PORTS WITH EXTERNAL SPEAKERPHONE CABLES

solder position L1 and with the 2nd gray wire for position SPCL.

2.4.4 Turn the EKT PCB face up and trim those portions of the soldered wires protruding above the surface of the EKT PCB.

2.4.5 Line up the fifteen pin female plug, with the red and two adjacent gray wires cut off, with the twelve pin male SPF/P3 connector as shown in **Figure 5B.** The outside blue wire should be opposite the twelfth pin and the portion of the female plug from which the three wires were cut should extend beyond the twelve pins of the SPF/P3 connector. Connect the twelve remaining plug positions to the twelve pin SPF/P3 connector.

2.5 Remove the two piece plastic insert and the modular jack from the metal retaining bracket.

2.6 Reinstall the metal retaining bracket for the modular jack. See **Figure 4.**

2.7 If only an automatic dialer is to be installed, go to Paragraph 4.

3. EXTERNAL SPEAKER PHONE CONNECTIONS

3.1 The external speakerphone should have a sixteen wire, round connecting cable equipped with spade-tip connectors.

3.1.1 Feed the sixteen wire cable into the EKT through the exit port in the rear wall of the EKT case. See **Figure 6.**

3.1.2 The spade-tip connectors are to be connected to the terminal strip connectors on the ESIU PCB as shown in **Figure 7.**

NOTE: The color-codes for the speakerphone cable connections to the ESIU terminal strip are also

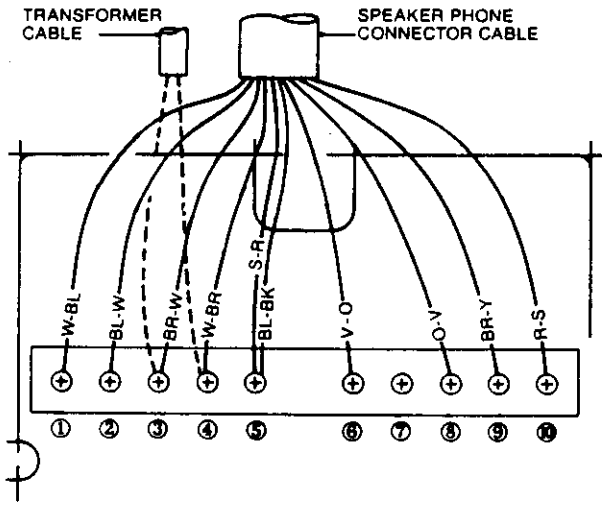

FIGURE 7 — EXTERNAL SPEAKERPHONE CONNECTIONS TO ESIU

shown in the box printed on the right front corner of ESIU PCB.

3.1.3 The black-blue, red-orange, yellow-slate, orange-red, yellow-violet, and slate-yellow wires will not be connected. Insulate these spade-tips. Tie the wires one inch from the spade-tips. (Use the nylon insulator caps, if provided with the speakerphone unit, to insulate the unused spade-tips).

3.2 Feed the transformer cable into the EKT through the exit port. See **Figure 6.**

3.2.1 Connect one wire to terminal number 3, on top of the brown-white wire.

3.2.2 Connect the other transformer wire to terminal number 4 on top of the white-brown wire.

3.3 To secure the excess speakerphone cable wire:

3.3.1 Loosely, tie the ten wires connected to the terminal strip with a nylon tie-wrap. Slide the tie-wrap to within one inch of the terminal strip, just in front of the metal retaining bracket. Remove any slack from the individual wires that exists between the tie-wrap and their connections on the terminal strip. Tighten the tie-wrap.

3.3.2 With the end of the jacketed portion of the speakerphone cable beside the tie-wrap, place another tie-wrap around all sixteen wires at the

furthest point, the loop formed by the ten connected wires permits.

3.3.3 Unscrew the metal bracket holding the ESIU PCB in place. Place the loop formed by the tied wires over the anchoring post for the ESIU PCB. Replace the bracket retaining screw and secure the ESIU metal bracket over the looped wires. See **Figure 4.**

3.3.4 Press the wires against the walls of the EKT case, with the unused wires running along the right edge of the ESIU PCB.

3.3.5 If an automatic dialer is also to be installed, proceed to Paragraph 4.

3.4 Using the nylon tie-wrap, with the securing eyelet, tie the speakerphone cable and the transformer cable together and secure the tie-wrap to the modular jack metal retaining bracket with the 3/8 inch machine screw, provided with the ESIU. Proceed to paragraph 5.

4. AUTOMATIC DIALER (AD) CONNECTIONS

4.1 The automatic dialer should be equipped with a connected transformer and a cable to connect it to the ESIU PCB. If the connecting cable terminates in three spade-tip connectors go to paragraph 4.3.

4.2 If the automatic dialer cable terminates in a modular plug, it is not compatible with the ESIU and the cable must be replaced with the four wire cable supplied with the ESIU kit.

4.2.1 Take the automatic dialer and place it face down. Remove the raised protective cover from the bottom of the AD.

4.2.2 Remove the second cover protecting the terminal strips.

4.2.3 Unscrew and remove the clamp anchoring the connector cable to the AD. Disconnect the connector cable spade-tips and remove the original connector cable.

4.2.4 Take the four wire replacement cable supplied with the ESIU, equipped with four spade-tip connectors on each end. From inside the EKT case feed the end of the cable, not equipped with the nylon eyelet, out of the exit port. See **Figure 8**.

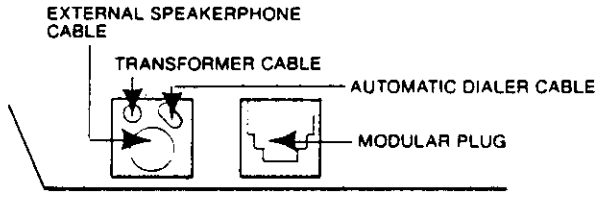

FIGURE 8 — REAR VIEW OF EKT EXIT PORTS BOTH EXTERNAL SPEAKERPHONE AND AUTOMATIC DIALER CONNECTED

4.2.5 Connect the end of the AD connector cable, without the nylon eyelet, to the AD terminals as follows (see **Figure 9**):

- Green wire to terminal (1)
- Red wire to terminal (2)
- Black wire to terminal (3)
- Yellow wire to terminal (4).

4.2.6 Place clamp used to anchor original cable to AD on the replacement cable and anchor the four wire cable to the AD and replace the protective covers.

4.2.7 Connect the AD spade-tip connectors to the terminals located on the rear right-hand corner of the ESIU PCB as follows (see **Figure 9**):

- Green wire to terminal (1)
- Yellow wire to terminal (4)
- Black wire to terminal (3)
- Red wire to terminal (2).

NOTE: Numeral wiring codes are printed on the ESIU PCB.

4.2.8 Proceed to paragraph 4.4.

4.3 From the outside of the EKT, feed the three spade-tips of the original AD connector cable into the EKT through the exit port. Connect the spade-tips to the terminals located on the rear right corner of the ESIU PCB as follows:

- Green wire to terminal (1)
- Yellow wire to terminal (3)
- Red wire to terminal (2).

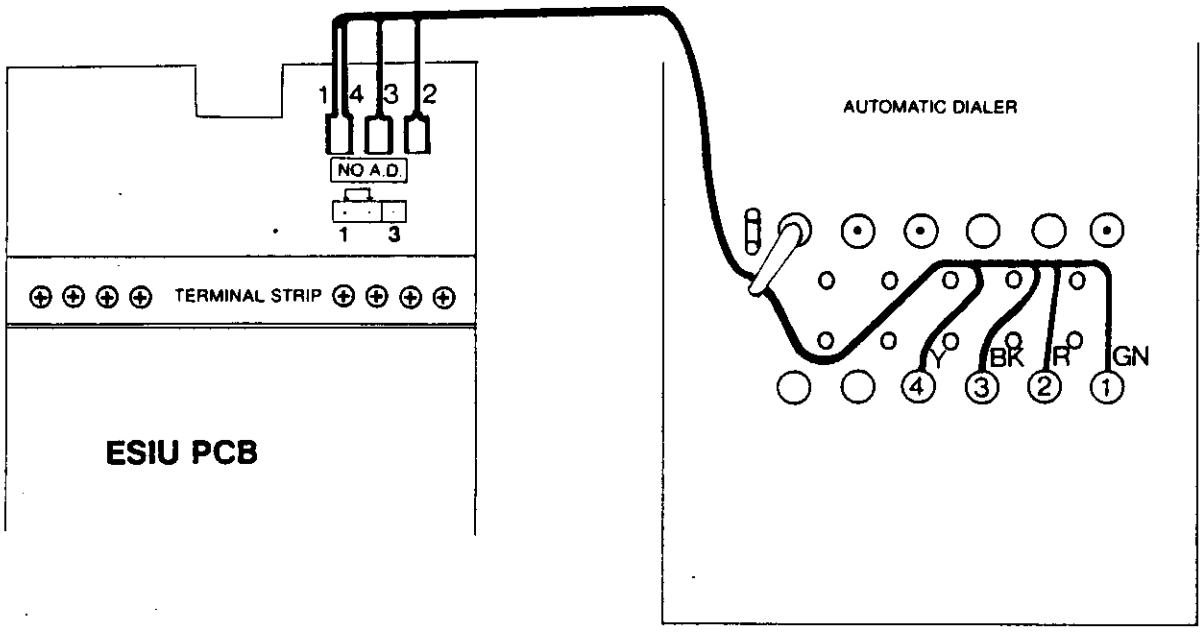

FIGURE 9 — AUTOMATIC DIALER CONNECTIONS FOR FOUR WIRE REPLACEMENT CABLE

4.4 If no external speakerphone is connected, loosen the modular jack metal retaining bracket and insert the plastic cable spacer (without the plug), underneath the AD connector cable. Insert the $^{3}/_{8}$ x $^{7}/_{16}$ inch plastic insert, provided with the ESIU, over the AD connecting cable. Tighten the metal retaining bracket screw. See **Figure 10.**

4.5 Using the $^{3}/_{8}$ inch machine screw provided with the ESIU, secure the replacement AD cable's nylon eyelet to the metal retaining bracket.

4.6 If an external speakerphone is also connected, use a nylon tie-wrap to tie the two speakerphone cables to the AD cable.

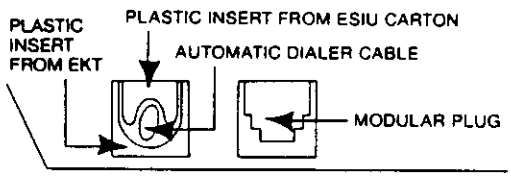

FIGURE 10 — REAR VIEW EKT EXIT PORTS — AUTOMATIC DIALER CONNECTED

4.7 If the AD cable was not replaced, use the tie-wrap with eyelet to secure the cables.

5. CONNECTION OF ESIU TO EKT

5.1 On the ESIU PCB, directly below the AD terminals, are three pins labeled "NO A.D." These pins are to be strapped as follows (see **Figure 9**):

- If no automatic dialer is connected, the strapping plug should be positioned on pins 1 and 2.
- If an automatic dialer is connected the plug should be positioned on pins 2 and 3.

5.2 Connect the fifteen wire ESIU connector cable to the fifteen pin terminal on the ESIU PCB, as shown in **Figure 4.**

5.3 Insert the modular jack (attached to the EKT PCB) back into the metal retaining bracket at the rear of the EKT base. See **Figure 4.**

5.4 Drape the ESIU and the EHFU (if present) connector cables over the left edge of the EKT case.

5.5 Replace the metal shielding plate.

5.6 Place the EKT PCB in position on top of the shielding plate.

5.7 Locate strap S1 on the EKT PCB and cut it. See **Figure 4.**

5.8 Connect the ESIU cable to the SPF/P3 connector, located towards the rear on the left edge of the EKT PCB (if this connection was not previously made). If an EHFU is present, reconnect its cable to the P1 connector located on the left edge near the front. See **Figure 4.**

5.9 Secure the EKT PCB and the metal shielding plate with the four self-tapping screws originally removed.

5.10 Re-connect the handset spade-tips (connector color codes are printed beside the terminals). See **Figure 3.**

5.11 Re-connect the built-in speaker to the P2 connector, located above the P1 CONNECTOR. See **Figure 3.**

5.12 Replace the main top cover and the handset well.

5.13 Secure the covers with the four captive screws located underneath the front and rear lips of the EKT case.

5.14 Plug the modular plug into its socket in the back of the EKT.

6. TEST PROCEDURE

6.1 Before connecting either the external speakerphone or automatic dialer transformers, test the EKT's normal operations.

6.2 Carefully, read the operating instructions provided with the external speakerphone. Plug in its transformer and test its features. Disconnect external speakerphone transformer.

6.3 Carefully read the operating instructions provided with the automatic dialer. Plug in its transformer and test its features.

6.4 Plug the speakerphone transformer back in and test both together.

SECTION 100-004-239
ISSUE 3, OCTOBER 1980

Strata III

EHIU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

1. GENERAL

1.1 The Electronic Headset Interface Unit (EHIU) is an optional printed circuit board (PCB) which provides interfacing between the STRATA III Electronic Key Telephone (EKT) and a headset unit's jackset when installed in the EKT. It also provides the required interfacing for an automatic dialer unit.

1.2 The EHIU can be used to connect either a headset unit's jackset or an automatic dialer or both to an EKT.

1.3 Early "J1" to "J7" lot number EKT's are equipped with a twelve pin EHIU connector. This will require modification of the cable connector and soldering of wires to the EKT PCB. EKT's which have lot numbers beginning with "A" or "J8" and later EKT's are equipped with a fifteen pin EHIU connector and do not require this modification. The EKT lot number appears on the label attached to the bottom of the EKT.

1.4 EQUIPMENT SUPPLIED WITH THE EHIU KIT

- EHIU PCB
- EHIU Connector cable (15 pin female connectors at each end)
- 3 x 10 self-tapping screw
- $\frac{3}{8}$ inch machine screw with lockwasher
- $\frac{3}{8}$ x $\frac{7}{16}$ inch plastic insert
- Tie-wrap with securing eyelet
- Tie-wrap (no eyelet)
- Four wire cable with spade-tips.

1.5 SUPPLEMENTARY EQUIPMENT TO BE SUPPLIED BY INSTALLER

1.5.1 For installation of a headset:

- Plantronics StarSet®, or compatible headset
- Plantronics JackSet® Model JS 180, or compatible jackset
- Two nylon tie-wraps.

1.5.2 For installation of an automatic dialer:

- ATC TeleDialer® 32T or other compatible automatic dialer.

1.6 Suggested tools for installation:

- Medium size phillips screwdriver
- Small diagonal cutters
- Small flat-blade screwdriver.

1.7 Additional tools suggested for installation in J1 to J7 EKT's:

- Soldering iron (40 watts or less)
- Needle-nose pliers.

1.8 To determine if an EHIU has already been installed in an EKT, without opening the case, turn it face down and check the left upper "keyhole." If an EHIU has been installed an **"H"** will be visible in the keyhole. **See Figure 1.**

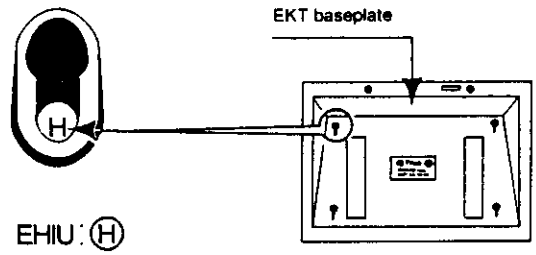

FIGURE 1 — INDICATION OF EHIU IN EKT

CAUTION: To prevent any possible damage to component circuitry, installers should first discharge any static buildup on their persons by touching a grounded metallic object before opening an EKT or handling a PCB. Also, the 110 VAC transformer for the automatic dialer, if installed must not be plugged in until all work is complete.

2. EHIU INSTALLATION INSTRUCTIONS

2.1 To install an EHIU PCB, the EKT handset well and the main top cover, the EKT PCB and the metal shielding plate must be removed as follows **(see Figures 2 and 3):**

2.1.1 Disconnect the modular line cord plug from the rear of the EKT. **See Figure 2.**

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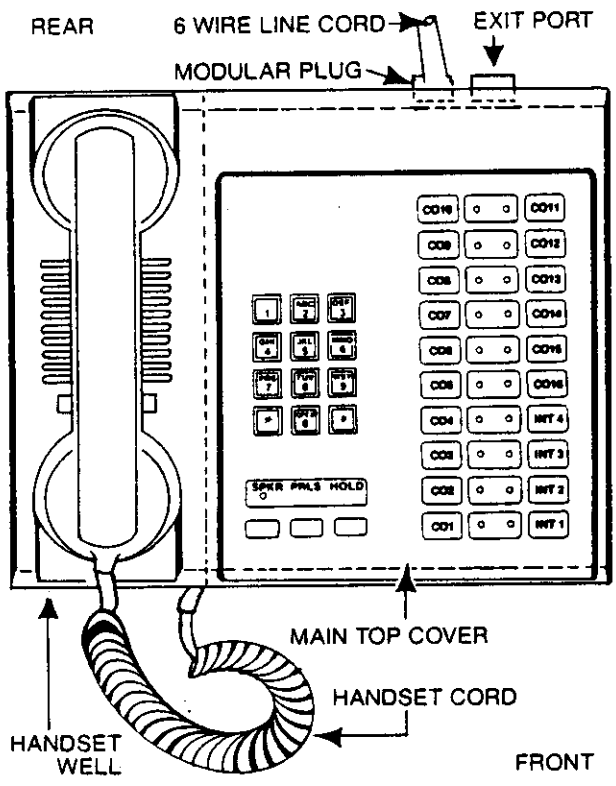

FIGURE 2 — EKT PHYSICAL LAYOUT

2.1.2 Loosen the four captive screws on the bottom of the EKT.

2.1.3 Remove the handset well by lifting the well up and swinging it to the left.

2.1.4 Remove the main top cover by lifting it up and to the right.

2.1.5 Disconnect the speaker cable from the P2 connector on the EKT PCB. **See Figure 3.**

2.1.6 Disconnect the handset cord spade-tips from the EKT PCB **(see Figure 3)** and remove the handset cord from the EKT case.

NOTE: If an EHFU PCB has been installed in the EKT, its connecting cable must be disconnected from the P1 connector. **See Figure 3.**

2.1.7 Unscrew the four retaining screws located in each corner of the EKT PCB.

2.1.8 Refer to **Figure 3.** Lift the rear edge of the EKT PCB and the metal shielding plate about 3 inches. Locate the modular jack for the line cord plug and its metal retaining bracket in the rear wall of the EKT base and unscrew the metal retaining bracket anchoring screw.

2.1.9 Remove the modular jack metal retaining bracket, plastic cable spacer and its insert plug.

2.1.10 Remove the EKT PCB and the modular jack and its attachments from the EKT case. Remove the modular jack from the metal retaining bracket.

2.2 Place the EHIU PCB in the EKT base as shown in **Figure 3**, aligning the hole in the EHIU metal retaining bracket with the screw hole in post #3 located in the right rear corner of the EKT base. The front edge of the EHIU PCB should rest flush with the bottom of the EKT case. Use the 3 x 10 self-tapping screw supplied with the EHIU kit to secure the EHIU to support post #3.

2.3 Identify the male EHIU cable connector SPF/P3 on the upper left-hand corner of the EKT PCB. **See Figure 3.**

2.3.1 Count the pins on the SPF/P3 connector.

2.3.2 If there are fifteen pins, proceed to Paragraph 2.5 as special modification of the EHIU connector cable will not be necessary.

2.4 If the male SPF/P3 connector has only twelve pins the connectors *must* be modified as follows (see **Figures 4A and 4B**):

2.4.1 Cut the *red* wire and *two* adjacent gray wires from *one* female cable connector. See **Figure 4B.**

2.4.2 Note the two small finger projections at each end of the SPF/P3 male connector. In order for the fifteen pin female connector to be connected, it is necessary that the upper finger (see **Figure 4B**) be cut and removed. Using a pair of diagonal cutters, cut the upper finger as close to the SPF/P3 connector as possible without damaging the connector or its pins.

2.4.3 Strip ¼ inch of insulation from the ends of the cut red and two gray wires. Twist the ends of each wire to form a point. With the EKT PCB face down on a protected surface, apply the heated tip of a

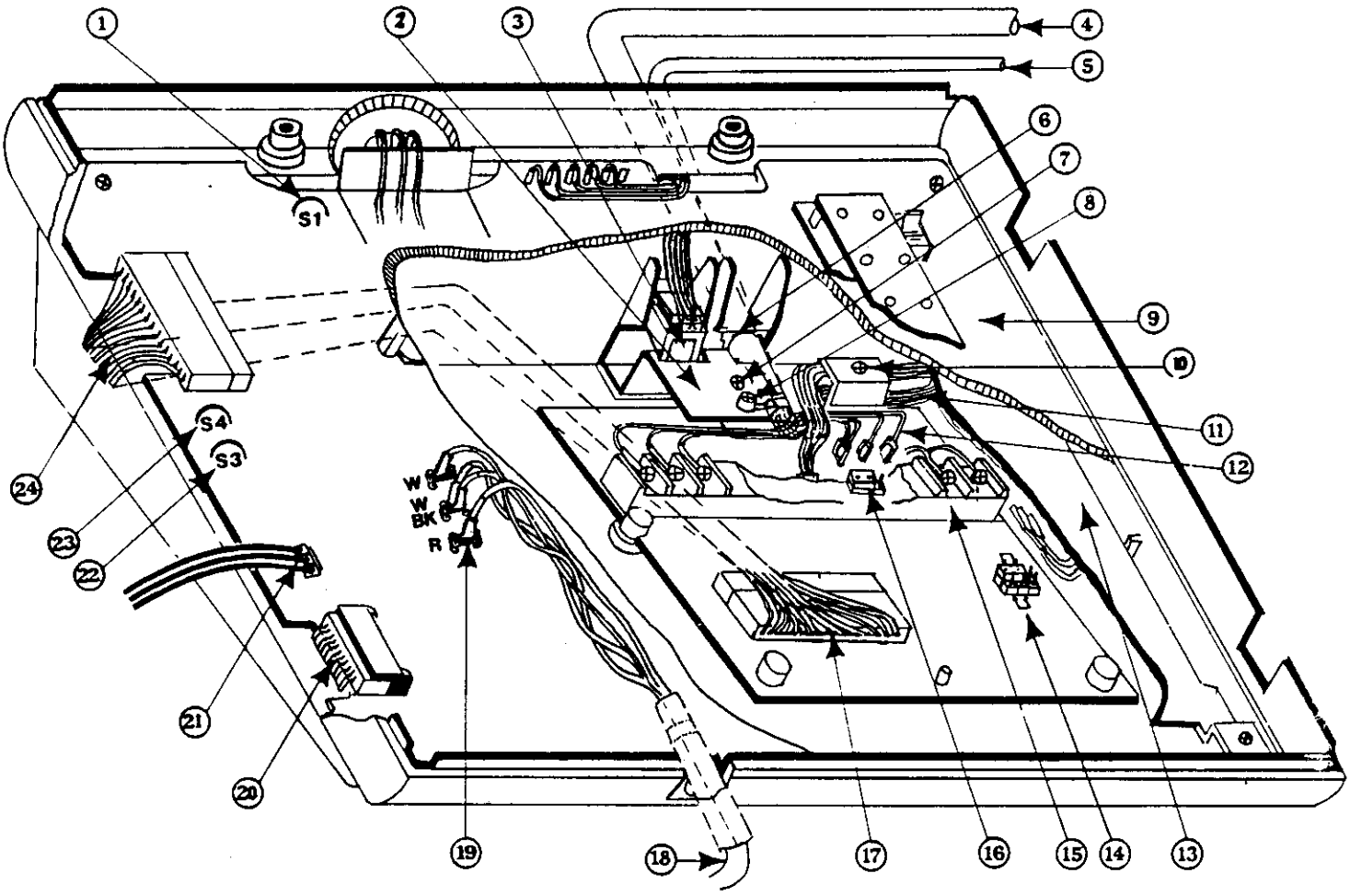

FIGURE 3 — CUT AWAY VIEW OF EKT WITH EHIU PCB INSTALLED

(1) Strap S1
(2) Metal retaining bracket for the modular jack
(3) Modular jack
(4) Jackset connecting cable
(5) Automatic dialer cable
(6) Exit port
(7) Self-tapping screw used to secure metal retaining bracket to support post # 2
(8) Machine screw used to secure bound jackset and automatic dialer cables to the metal retaining bracket
(9) EKT PCB
(10) Self-tapping screw used to secure the EHIU metal bracket to support post # 3
(11) Excess jackset wires
(12) Automatic dialer spade-tip connectors
(13) Metal shielding plate
(14) "NO H.S." strapping pins (P4 and P5)
(15) Terminal strip on EHIU PCB
(16) "NO A.D." strapping pins
(17) EHIU cable connection on EHIU PCB
(18) Handset cord
(19) Handset cord spade-tip connectors
(20) EHFU cable P1 connection on EKT PCB.
(21) Built-in speaker P2 connection on EKT PCB
(22) Strap S3
(23) Strap S4
(24) EHIU cable SPF/P3 connection on EKT PCB.

soldering iron to the L2 soldering position. See **Figure 4C.** When the solder is liquified, insert the end of the cut red wire into the drilled hole in the L2 position. Repeat this procedure with the 1st gray wire for solder position L1 and with the 2nd gray wire for position SPCL.

2.4.4 Turn the EKT PCB face up and trim those portions of the soldered wires protruding above the surface of the EKT PCB.

2.4.5 Line up the fifteen pin female plug, with the red and two adjacent gray wires cut off, with the twelve pin male SPF/P3 connector as shown in **Figure 4B.** The outside blue wire should be opposite the twelfth pin and the portion of the female plug from which the three wires were cut should extend beyond the twelve pins of the SPF/P3 connector.

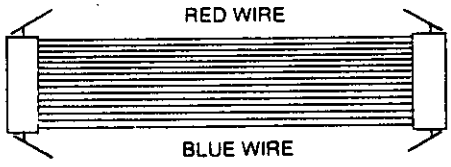

FIGURE 4A — EHIU CONNECTOR CABLE

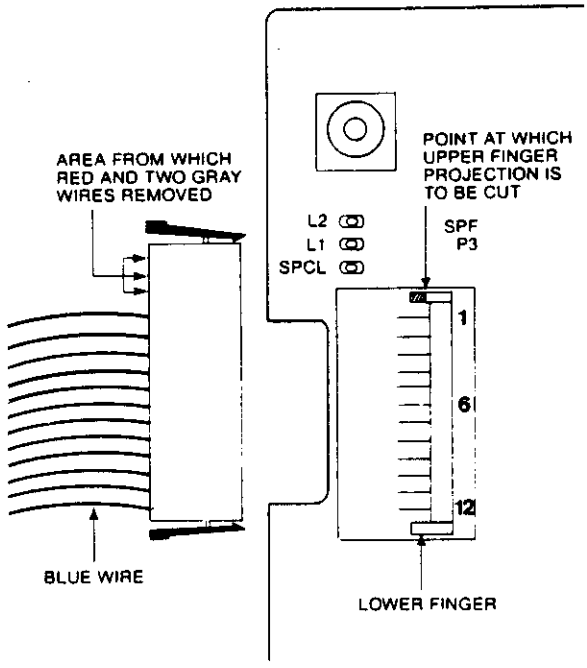

FIGURE 4B — VIEW OF UPPER LEFT CORNER OF EKT PCB (FROM ABOVE) — LINE UP OF EHIU CONNECTOR WITH SPF/P3 CONNECTOR

Connect the twelve remaining plug positions to the twelve pin SPF/P3 connector.

2.5 Remove the plastic cable spacer and its insert plug from the modular jack metal retaining bracket.

2.6 Reinstall the metal retaining bracket for the modular jack. Do not put the modular jack back in place.

2.7 If only an automatic dialer is to be installed, GO TO Paragraph 4.

3. HEADSET UNIT'S JACKSET CONNECTIONS

3.1 The jackset should have a sixteen wire, round connecting cable equipped with spade-tip connectors.

3.1.1 Feed the sixteen wire cable into the EKT through the exit port in the rear wall of the EKT case. **See Figure 3.**

NOTE: The metal eyelet attached to the jackset cable is positioned improperly for securing the cable to the EKT. Remove the metal eyelet from the jackset cable.

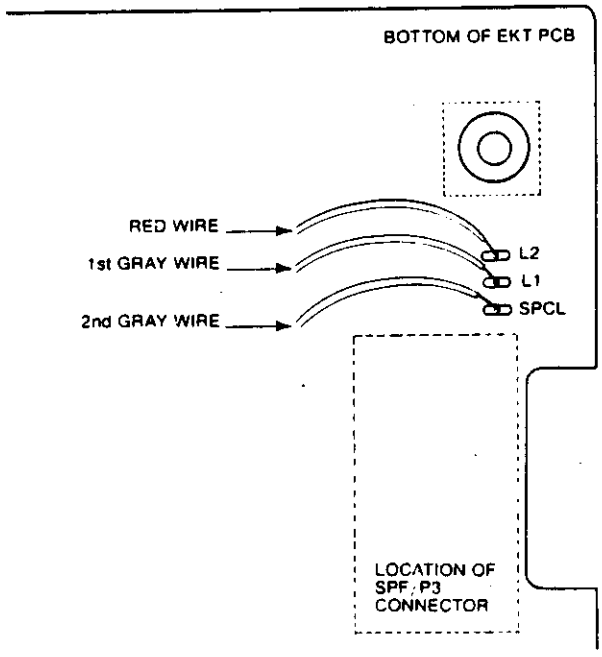

FIGURE 4C — VIEW OF UPPER LEFT CORNER OF EKT PCB (FROM BELOW) — WIRE SOLDERING POINTS

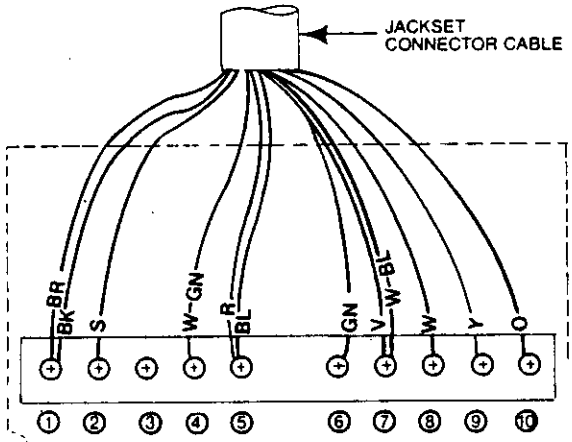

FIGURE 5 — JACKSET CONNECTIONS TO EHIU

3.1.2 The spade-tip connectors are to be connected to the terminal strip connectors on the EHIU PCB as shown in **Figure 5.**

3.1.3 The white-brown, white-red, white-yellow, and white-orange wires will not be connected. Insulate these spade-tips. Use the nylon insulator caps, if provided with the jackset unit, to insulate the unused spade-tips.

3.2 To secure the excess jackset cable wires:

3.2.1 Install a tie-wrap(1) loosely around the twelve wires connected to the terminal strip. Slide the tie-wrap to within one inch of the terminal strip, just in front of the metal retaining bracket. Remove any slack from the individual wires that exists between the tie-wrap and their connections on the terminal strip. Tighten the tie-wrap. **See Figure 6.**

3.2.2 With the end of the jacketed portion of the jackset cable beside tie-wrap(1), place another tie-wrap(2) around all sixteen wires at the furthest point the loop formed by the twelve connected wires permits.

3.2.3 Unscrew the metal bracket holding the EHIU PCB in place. Place the loop formed by the tied wires over the anchoring post and secure the EHIU metal bracket over the looped wires. **See Figure 6.**

3.2.4 Press the wires against the walls of the EKT case, with the unused wires folded back along the right edge of the EHIU PCB. Tie these wires together one inch from the spade-tips with a tie-wrap(3).

3.2.5 If an automatic dialer is also to be installed, proceed to Paragraph 4.

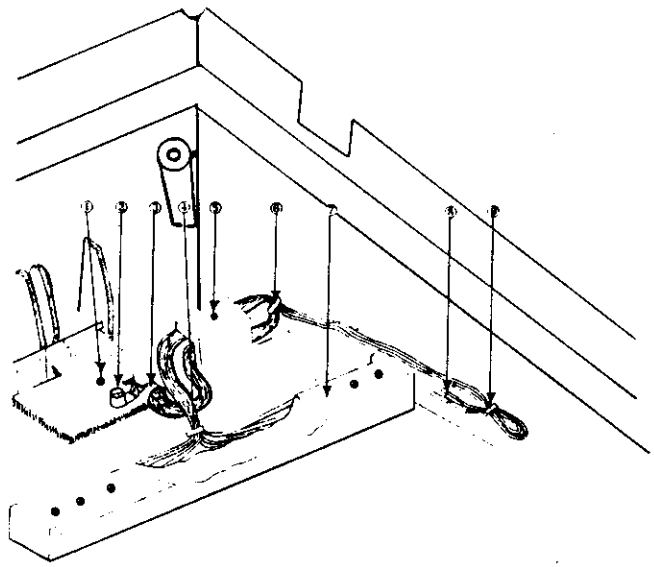

FIGURE 6 — JACKSET CABLE SECURED TO EKT AND EXCESS WIRES SECURED

(1) Self-tapping screw used to secure the modular jack metal retaining bracket to support post ≠ 2
(2) Machine screw used to secure the tie-wrap with eyelet to metal retaining bracket
(3) Jackset cable
(4) Tie-wrap (1)
(5) Self-tapping screw used to secure the EHIU PCB metal bracket to support post = 3
(6) Tie-wrap (2)
(7) Terminal strip
(8) Insulated unconnect spade-tips
(9) Tie-wrap (3).

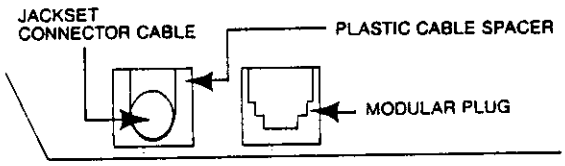

FIGURE 7 — REARVIEW EKT EXIT PORTS — JACKSET CABLE

3.3 Loosen the metal retaining bracket for the modular jack and insert the plastic cable spacer, removed in paragraph 2.5, underneath the jackset connector cable in the exit port. **See Figure 7.**

3.4 Using the nylon tie-wrap with securing eyelet, tie the jackset cable and secure the tie-wrap to the modular jack's metal retaining bracket with the 3/8 inch machine screw provided with the EHIU. **See Figure 6.** Proceed to Paragraph 5.

4. AUTOMATIC DIALER (AD) CONNECTIONS

4.1 The automatic dialer should be equipped with a connected transformer and a cable to connect it to the EHIU PCB. If the connecting cable terminates in three spade-tip connectors GO TO Paragraph 4.3.

4.2 If the automatic dialer terminates in a modular plug, it is not compatible with the EHIU and the cable must be replaced with the four wire cable supplied with the EHIU kit.

4.2.1 Remove the raised protective cover from the bottom of the AD.

4.2.2 Remove the second cover protecting the terminal strips.

4.2.3 Unscrew and remove the clamp anchoring the connector cable to the AD. Disconnect the connector cable spade-tips and remove the original connector cable.

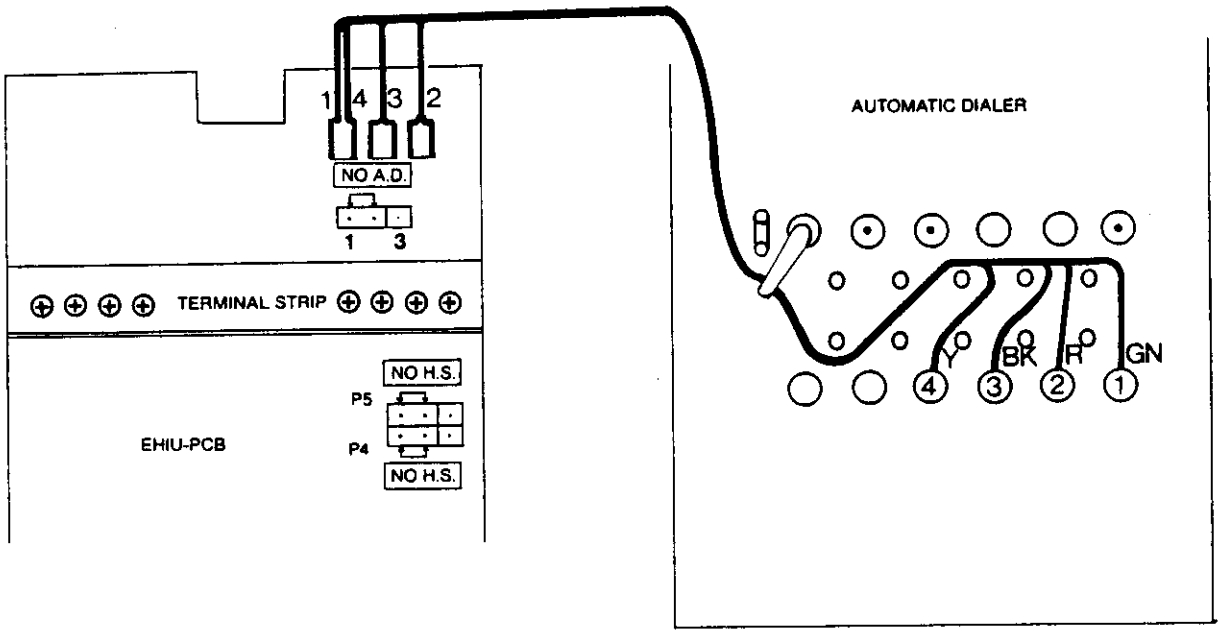

FIGURE 8 — AUTOMATIC DIALER CONNECTIONS FOR REPLACEMENT CABLE AND "NO A.D." AND "NO H.S." PIN LOCATIONS

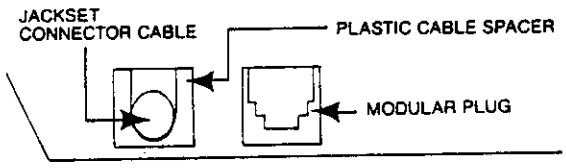

FIGURE 7 — REARVIEW EKT EXIT PORTS — JACKSET CABLE

3.3 Loosen the metal retaining bracket for the modular jack and insert the plastic cable spacer, removed in paragraph 2.5, underneath the jackset connector cable in the exit port. **See Figure 7.**

3.4 Using the nylon tie-wrap with securing eyelet, tie the jackset cable and secure the tie-wrap to the modular jack's metal retaining bracket with the 3/8 inch machine screw provided with the EHIU. **See Figure 6.** Proceed to Paragraph 5.

4. AUTOMATIC DIALER (AD) CONNECTIONS

4.1 The automatic dialer should be equipped with a connected transformer and a cable to connect it to the EHIU PCB. If the connecting cable terminates in three spade-tip connectors GO TO Paragraph 4.3.

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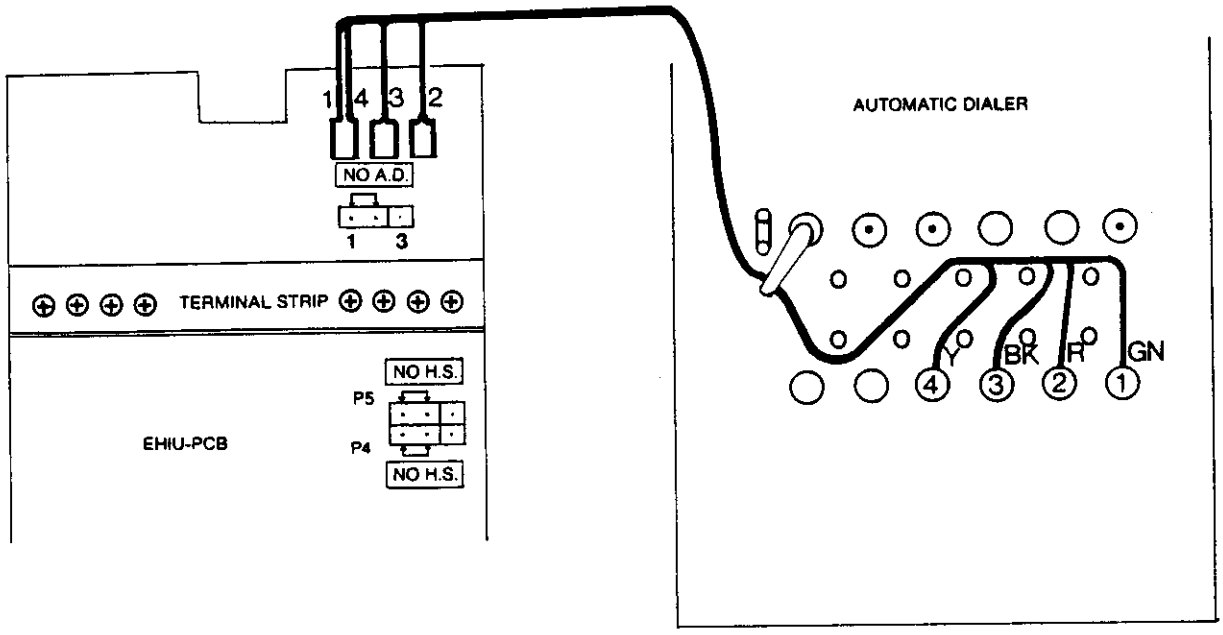

FIGURE 8 — AUTOMATIC DIALER CONNECTIONS FOR REPLACEMENT CABLE AND "NO A.D." AND "NO H.S." PIN LOCATIONS

5. CONNECTION OF EHIU TO EKT

5.1 On the EHIU PCB, directly below the AD terminals, are three pins labeled "NO A.D." These pins are to be strapped as follows **(see Figure 8):**

- If no automatic dialer is connected, the strapping plug should be positioned on pins 1 and 2
- If an automatic dialer is connected the plug should be positioned on pins 2 and 3.

5.2 Identify the P4 and P5 pins. Both are labeled "NO H.S." (HeadSet) and are directly in front of terminals (9) and (10) on the EHIU PCB. The straps for both the P4 and the P5 should be set as follows **(see Figure 8):**

- If no jackset is connected, the strapping plugs **must** be positioned on pins 1 and 2 for both P4 and P5.
- If a jackset is connected the straps must be positioned on pins 2 and 3.

5.3 Connect the fifteen wire EHIU connector cable to the fifteen pin terminal on the EHIU PCB as shown in figure 3.

5.4 Insert the modular jack (attached to the EKT PCB) back into the metal retaining bracket at the rear of the EKT case.

5.5 Drape the EHIU and the EHFU (if present) connector cable(s) over the left edge of the EKT case. Replace the metal shielding plate.

5.6 Place the EKT PCB in position on top of the shielding plate.

5.7 If a jackset is installed, locate straps S1, S3, and S4 on the EKT PCB. **See Figure 3.** These straps **must** be cut.

5.8 If an Automatic Dialer without a jackset is connected, cut strap S1 only. See **Figure 3.**

5.9 Connect the EHIU cable to the SPF/P3 connector, located towards the rear on the left edge of the EKT PCB, if this connection was not previously made in paragraph **2.4.5.** If an EHFU is present, reconnect its cable to the P1 connector located on the left edge near the front of the EKT PCB. **See Figure 3.**

5.10 Secure the EKT PCB and the metal shielding plate with the four self-tapping screws originally removed.

5.11 Re-connect the handset spade-tips. The connector color codes are printed beside the terminals on the EKT PCB. **See Figure 3.**

5.12 Re-connect the speaker cable to the P2 connector on the EKT PCB. **See Figure 3.**

5.13 Replace the main top cover and the handset well.

5.14 Secure the covers with the four captive screws located underneath the front and rear lips of the EKT case.

5.15 Plug the modular plug into its socket in the back of the EKT.

6. TEST PROCEDURES

6.1 Before connecting the automatic dialer's transformer, test the EKT's normal operations.

6.2 Carefully, read the operating instructions provided with the headset and its jackset. Test its features. NOTE: The jackset "Re-Call" button, which is designed to flash the operator, will not function with the STRATA III System.

6.3 Carefully read the operating instructions provided with the automatic dialer. Plug in its transformer and test its features.

SECTION 100-004-242
ISSUE 1, MAY 1980

Strata III

OFF PREMISE LINE

INSTALLATION INSTRUCTIONS

TABLE OF CONTENTS

LIST OF FIGURES

1. GENERAL

1.1 The Off-Premise Line (OPL) Feature allows the bridging of a Central Office (C.O.) line appearing in a STRATA III Electronic Key Telephone System to a 2500 type (DTMF dial) telephone. "OPL" telephones thus connected will then automatically cause a busy indication within the STRATA III system and establish system privacy when initiating or answering a call on the dedicated C.O. line.

1.2 Only odd-numbered C.O. line appearances (1, 3, 5, 7, 9, 11, 13, 15, 17, 19) within the STRATA III system may be dedicated to an OPL circuit.

1.3 Each OPL kit (OPXT2) provides the necessary in-cabinet wiring for connecting 2 C.O. lines to separate OPL circuits.

1.4 Physical mounting considerations limit each cabinet (EKSU, XKSU) to the mounting of one kit.

1.5 An ECOU-3 PCB must be obtained separately and substituted for the standard ECOU PCB serving the C.O. line to be dedicated for OPL services.

1.6 In addition, the COPU PCB must be obtained and plugged into each ECOU-3.

1.7 The presence of the STRATA III system on the circuit is not a limiting factor in determining loop length parameters since OPL supervision current used will always be less than that required by the central office itself.

1.7.1 The actual "loop length" of the OPL circuit will be the COMBINED total of the C.O. line loop from the Central Office to the STRATA III system location, plus the leased circuit loop from the system location to the OPL telephone location.

1.7.2 The combined ringer equivalence of the ECOU-3 PCB (which is .6B) and OPL telephones bridged on the same line, and wired to ring, should not exceed 5.0.

1.8 OFF-PREMISE TELEPHONE OPERATIONS

1.8.1 Incoming Calls

1.8.1.1 Incoming calls on a C.O. line appearing in a STRATA III system and also connected to an OPL telephone will cause ringing at both locations. Ringing at the OPL location may be controlled by the installation of an (off-on) switch.

1.8.1.2 Incoming calls may be answered by either a STRATA III EKT or by the off-premise telephone.

1.8.1.3 If the off-premise telephone answers, the appropriate C.O. line LED on each STRATA III telephone (EKT) will light, and privacy will be established. However, privacy release by the off-premise telephone is not possible.

1.8.1.4 If the incoming call is answered by a STRATA III EKT, the corresponding C.O. line LED will light and privacy will be engaged within the system. The OPL telephone, however, will be able to override privacy by simply going off-hook.

1.8.2 Outgoing Calls

1.8.2.1 Either the off-premise telephone or a STRATA III system EKT having access to the line can place an outgoing call via the C.O. line.

1.8.2.2 If the off-premise telephone originates the call, the LED will light and system privacy will engage. Privacy release by the OPL telephone is not possible.

1.8.2.3 If a system EKT originates the call, the LED will light and privacy will be in effect for all other EKTs in the system, with the OPL telephone able to bridge onto the line anytime it goes off-hook. The PRLS buttons will operate normally within the STRATA III system.

1.8.3 Calls between the off-premise telephone and the STRATA III system can only be made via the telephone company central office.

1.9 OPL COMPONENTS

- OPXT terminal strip with two cables terminating in jacks for connection to two selected C.O. lines
- Mounting bracket
- Terminal strip cover
- Three 3 x 8 mm machine screws with lockwashers
- Two PB 4 x 8 mm machine screws
- Nylon tie-wrap with securing eyelet
- Three adhesive-backed cable clamps

1.10 The 2500 type instruments and the leased lines are to be provided by the installer.

CAUTION: To prevent any possible damage to component circuitry, installers should first dis-

charge any static build-up on their persons by touching a grounded metallic object before opening an EKSU, XKSU, or handling a printed circuit board.

2. MOUNTING THE OPXT TERMINAL STRIP

2.1 The OPXT terminal strip is to be mounted on the back of the EKSU or XKSU having the C.O. lines selected for connection to the off-premise telephones. Observe the following steps for installation in either an EKSU or XKSU.

2.1.1 Remove the front and back covers of the KSU. Using the switch on the EPRU PCB, shut the system power down.

2.1.2 Remove the small cover plate located on the back left edge of the KSU housing just above the rear shelf. See **Figure 1**.

2.1.3 Install the mounting bracket supplied with the OPL in place of the small cover plate. Use the two PB 4 x 8 machine screws, originally securing the cover plate, to anchor the mounting bracket to the KSU.

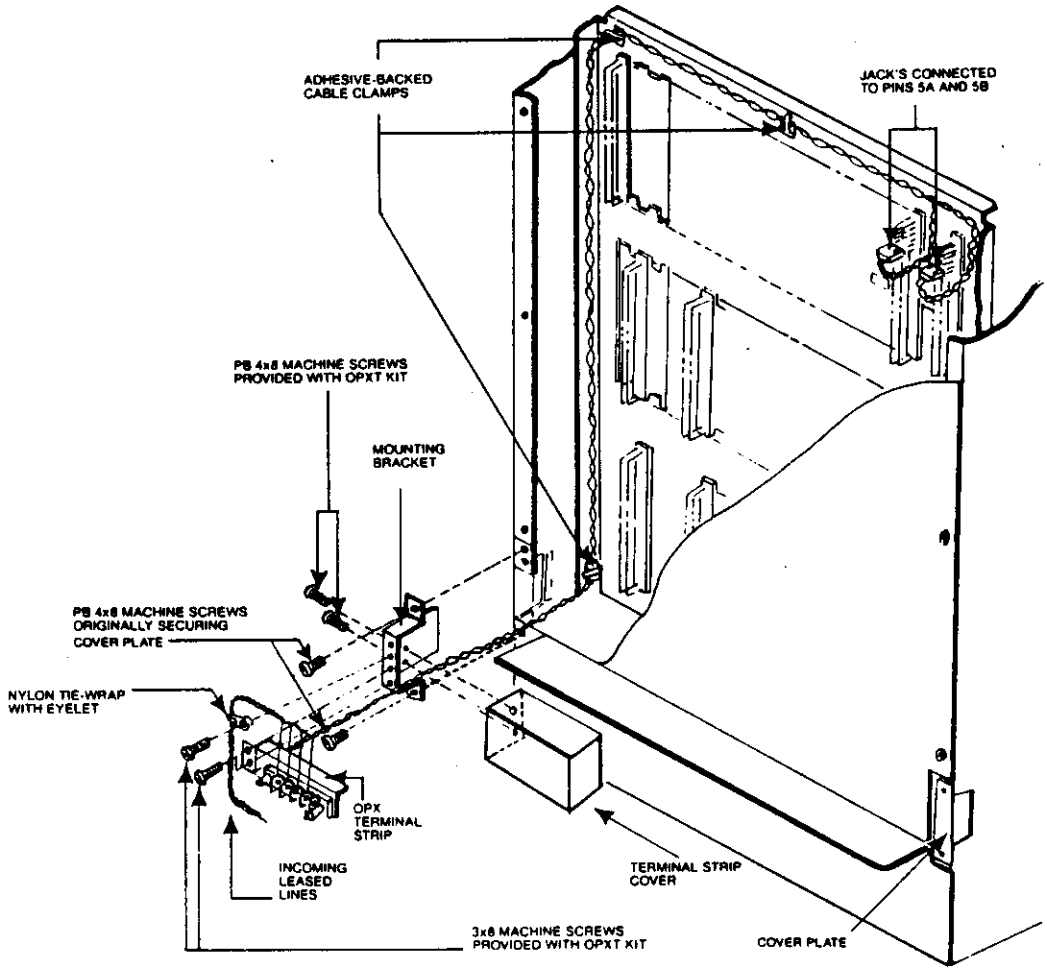

FIGURE 1—MOUNTING THE TERMINAL STRIP AND CONNECTIONS TO ECOU WIRING PINS

2.1.4 Secure the terminal strip to the bottom two holes in the mounting bracket with two of the 3 x 8 machine screws with lockwashers provided with the OPL kit.

2.2 Each ECOU PCB installed in an EKSU or XKSU provides the required interfacing for two C.O. lines. However, only the first (odd numbered) C.O. line in each pair, serviced by a ECOU-3, can be connected to an off-premise telephone. The second C.O. line will function normally within the STRATA III system, but it cannot be assigned to an off-premise telephone.

2.2.1 From the C.O. lines connected to the EKSU, one or two of the following C.O. lines: (1), (3), (5), (7), (9), or (11) may be selected for connection to off-premise telephones. See **Figure 2A**.

2.2.2 Of the C.O. lines connected to an XKSU, up to two of the following C.O. lines (13), (15), (17), or (19) may be selected for connection to off-premise telephones. See **Figure 2B**.

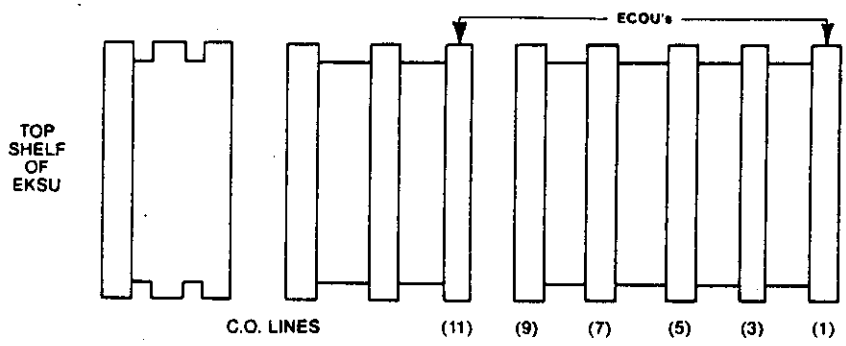

FIGURE 2A—LOCATION OF ECOU BACKPLANE CONNECTOR PINS—EKSU

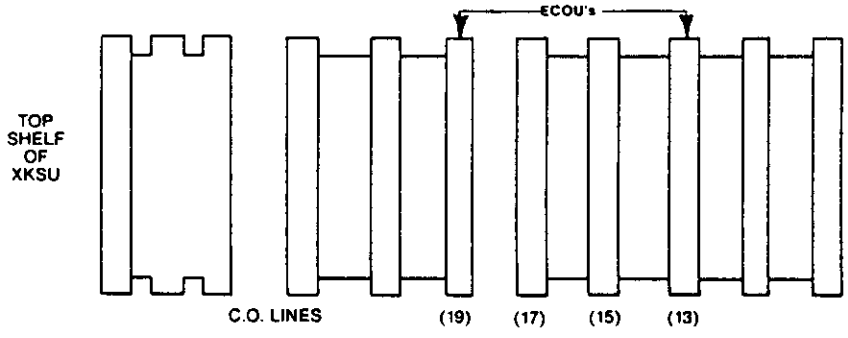

FIGURE 2B—LOCATION OF ECOU BACKPLANE CONNECTOR PINS—XKSU

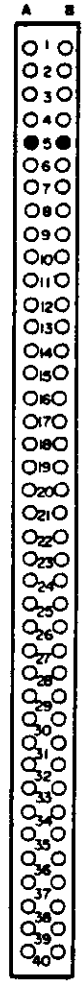

FIGURE 2C—ECOU CONNECTOR PIN NUMBERING

NOTE: The selected C.O. lines must be connected to the KSU's via RJ21X C.O. line connector (A) as outlined in Sections 100-004-210 and 100-004-215.

2.3 Locate the ECOU backplane connector pins for the C.O. lines selected for connection to the off-premise telephones. See **Figures 2A and 2B**.

2.3.1 Connect the OPL jack, whose tag reads "1C 5AB," to pins (5A) and (5B) of the backplane location for the first C.O. line selected. See **Figures 1 and 2C**. To prevent a reversed connection, one side of the jack is labeled "UP."

2.3.2 If a second C.O. line from the KSU has been selected for connection to an off-premise telephone, connect the jack whose tag reads "2C 5AB" to pins (5A) and (5B) of the backplane wiring location for the second C.O. line.

2.3.3 Using the three adhesive-backed cable clamps provided with the OPL, secure the OPXT cables inside the KSU housing. See **Figure 1**.

2.3.4 If only one C.O. line from the KSU is to be connected to an off-premise telephone, use a tie-wrap to tie the cable for the second jack to the first OPXT cable, behind the adhesive-backed cable clamp at the top of the KSU.

3. INSTALLATION OF COPU PCB

3.1 An ECOU-3 PCB, with a COPU PCB mounted on it, must be installed in the KSU for each of its C.O. lines to be connected to off-premise telephones. As ECOU-2 PCB's are not equipped with mountings for the COPU PCB, only ECOU-3 or later PCB's can be used to interface STRATA III system C.O. lines selected for connection to off-premise telephones.

3.2 Mount a COPU PCB on each ECOU-3 as shown in **Figure 3**.

NOTE: COPU and ECOU-3 connectors are keyed so they can be inserted in only one way.

3.3 Install an ECOU-3 PCB with a COPU PCB mounted on it, in each KSU ECOU slot serving a C.O. line to appear on an OPL telephone.

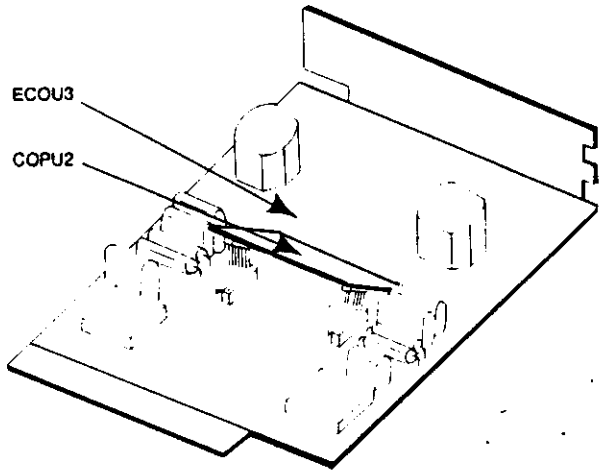

FIGURE 3—MOUNTING THE COPU PCB ON THE ECOU PCB

4. CONNECTING THE OFF-PREMISE TELEPHONE CIRCUIT

4.1 Connect the tip wire for the first off-premise telephone to position "1T" and the ring wire to position "1R" on the OPXT terminal strip mounted on the back of the KSU.

NOTE: If the "tip" and "ring" wires cannot be identified, no problem in the STRATA III KSU will be encountered as the OPL unit is not polarity sensitive.

4.2 If a second off-premise telephone is to be connected, connect its tip wire to position "2T" and its ring wire to "2R."

4.3 Power up the system and test the operation of the off-premise telephones.

4.4 Secure the incoming leased lines with the nylon tie-wrap provided with the OPXT kit. Secure the tie-wrap to the mounting bracket with the third 3 x 8 machine screw. See **Figure 1**.

4.5 Mount the terminal strip cover (see **Figure 1**) using the two PB 4 x 8 machine screws provided.

4.6 Replace the front and back KSU covers.

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ISSUE 1, MARCH 1979

Strata III

ELECTRONIC DIRECT STATION SELECTION CONSOLE (EDSS) MODEL 102

INSTALLATION INSTRUCTIONS

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LIST OF FIGURES

3.6 Install the modular line cord in the EDSS console and in the station connector block.

4. PCB REQUIREMENTS

4.1 EBLU—Install an EBLU in the proper slot in the EKSU. (Refer to Figure 4 for proper PCB locations.)

4.1.1 The presence of the EBLU in the system (along with an EDSS or EBLF) allows the programming of C.O. Signaling (NIGHT) transfer. Refer to section 100-004-210, paragraph 7.4 for feature wiring instructions.

4.1.2 Cut EBLU strap 5A to 8B if system was installed previously without EBLU and strap is still present.

4.2 EDSU—Install an EDSU in the proper slot in the EKSU. (Refer to Figure 4 for proper PCB location.)

4.2.1 Examine the rear of the EDSU connectors in the EKSU. If the following straps are present remove them:

- PIN 5A to PIN 5B
- PIN 6A to PIN 6B
- PIN 8A to PIN 8B
- PIN 9A to PIN 9B

5. EDSS OPTIONS

5.1 TONE FIRST STATION SIGNALING—The EDSS console may be programmed for tone paging upon pressing a station selection key. Move option strap S1 on the EDSU board from Pin P1 to P2 (see Figure 5). Remove the button top of the TONE key and replace with a VOICE label. (See Figure 1).

5.2 SPECIAL ILLUMINATIONS

5.2.1 "I HOLD", "I USE", or "OPERATOR RECALL" are desired at the EDSS console, an EILU PCB must be installed in the proper slot in the EKSU. Refer to section 100-004-100, paragraph 4.3.3 for feature descriptions.

5.2.2 When installing the EILU, examine the rear of the EILU connector. If the following straps are present remove them:

- PIN 21A to PIN 21B
- PIN 22A to PIN 22B

IMPORTANT: IF AN EILU PCB IS NOT TO BE INSTALLED IN THE EKSU, THE ABOVE STRAPS MUST BE PRESENT TO ALLOW PROPER SYSTEM FUNCTIONING. IF PLACEMENT OF THE ABOVE STRAPS PROVE NECESSARY, USE 30 AWG INSULATED WIRE AND A 30 GAUGE WRAPPING TOOL.

6. FINAL STEPS

6.1 Place the bridging clips between the EKSU feature pin for the EDSS and the termination pins for the EDSS running cable on MDF blocks B and C (see Figure 2).

6.2 Referring to the EDSS Consoles Operator's Guide, test the EDSS console for proper feature operation. If a malfunction occurs, refer to section 100-004-500.

1. GENERAL

1.1 The STRATA III Electronic Direct Station Selection Console (EDSS) is an optional item or unit of equipment which may be installed with the operator's keyset (always #10) to assist in the forwarding of calls and to speed up internal communication.

2. PHYSICAL DESCRIPTION

2.1 The STRATA III Electronic Direct Station Selection Console is equipped with 60 keys, 50 of which are utilized for direct station selection. The remaining 10 keys are utilized or spares for feature operation. Each EDSS is equipped with a six conductor modular tail cord, 2 conductors of which are spare (see Figure 1).

2.2 The physical dimensions of the EDSS console are as follows:

Width	10.7 inches	(272 mm)
Depth	9.1 inches	(230 mm)
Height	2.9 inches	(73mm)

3. CABLING PROCEDURE

3.1 A 6-conductor (3 twisted pairs, indoor, jacketed) cable must be run from the location of MDF blocks B and C to the proposed EDSS console location.

3.2 Terminate the W-BL and W-GN pairs as shown in Figure 2. The W-O and O-W running cable conductors are spare.

NOTE: It is recommended that 3 pairs rather than "quad" be run in order to have a uniform color-coded installation.

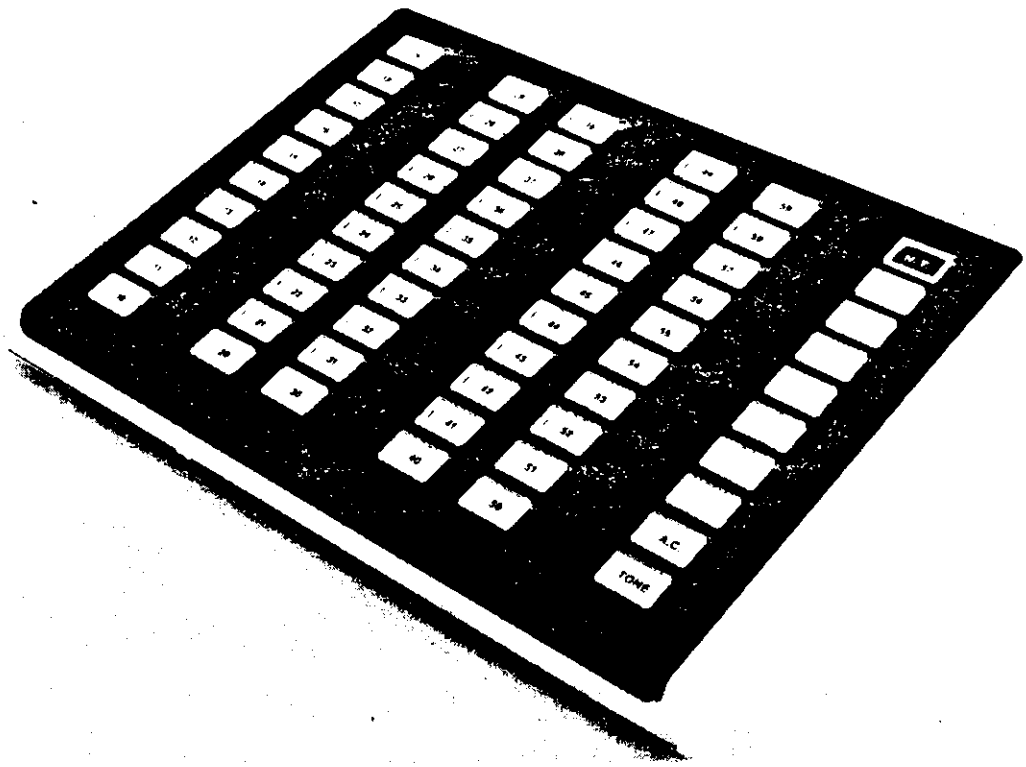
3.3 The overall length of the conductor run between the EKSU and EDSS cannot be greater than 1000 feet.

3.4 Mount a six-conductor, modular station connector block in in the immediate vicinity of the proposed EDSS location, keeping in mind that the console standard line cord is 7' in length. (Maximum allowable length is 25'.)

3.5 Connect the running cable to the station connector block wires as shown in Figure 2.

3.5.1 Different makes of modular connector blocks have the white and blue wires reversed. The following chart shows the proper connection of the three most popular models. Other manufacturer's models should be checked with an ohmmeter as shown in Figure 3 to verify which lead represents pin #1 and which lead represents pin #6, and connected accordingly.

INTERNAL PIN#	GTE	SUTTLE	NORTHERN TELECOM	3 PAIR RUNNING CABLE CONNECTION
1	Blue	Blue	Blue	White-Blue
2	Yellow	Yellow	Yellow	Blue-White
3	Green	Green	Green	White-Orange
4	Red	Red	Red	Orange-White
5	Black	Black	Black	White-Green
6	White	White	White	Green-White



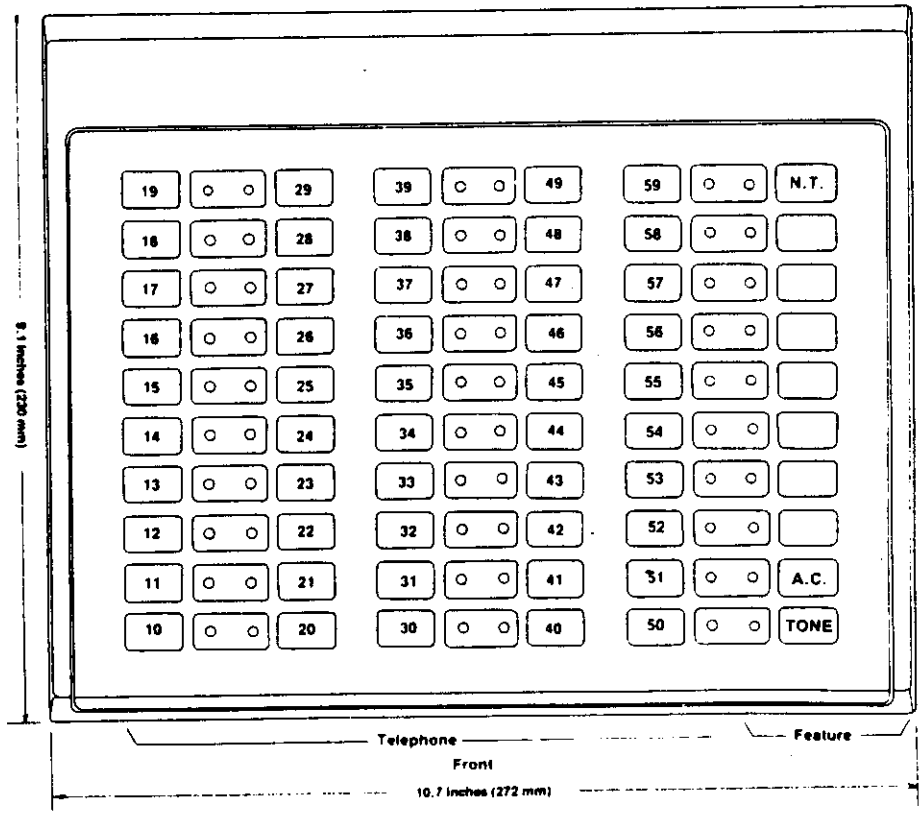
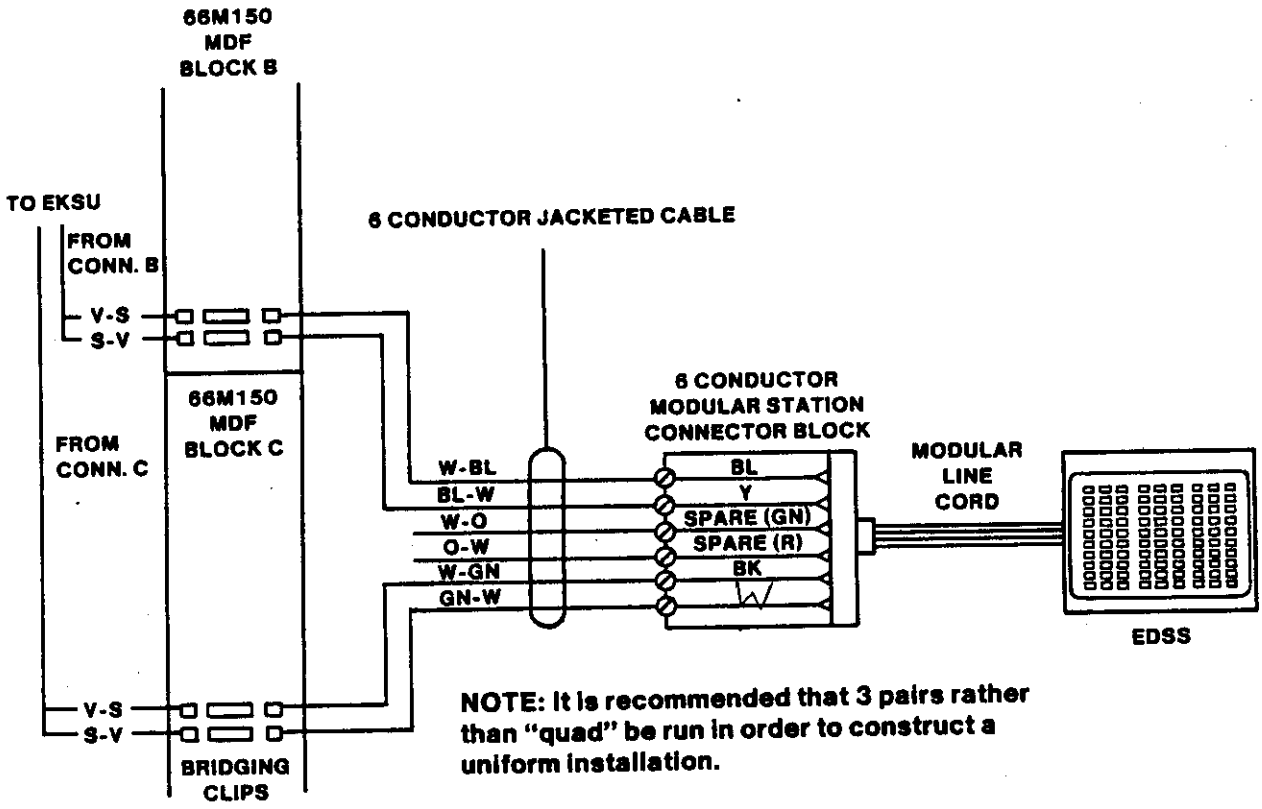


FIGURE 1—EDSS LAYOUT



NOTE: It is recommended that 3 pairs rather than "quad" be run in order to construct a uniform installation.

***See section 3.5.1.**

FIGURE 2—EDSS RUNNING CABLE CONNECTIONS

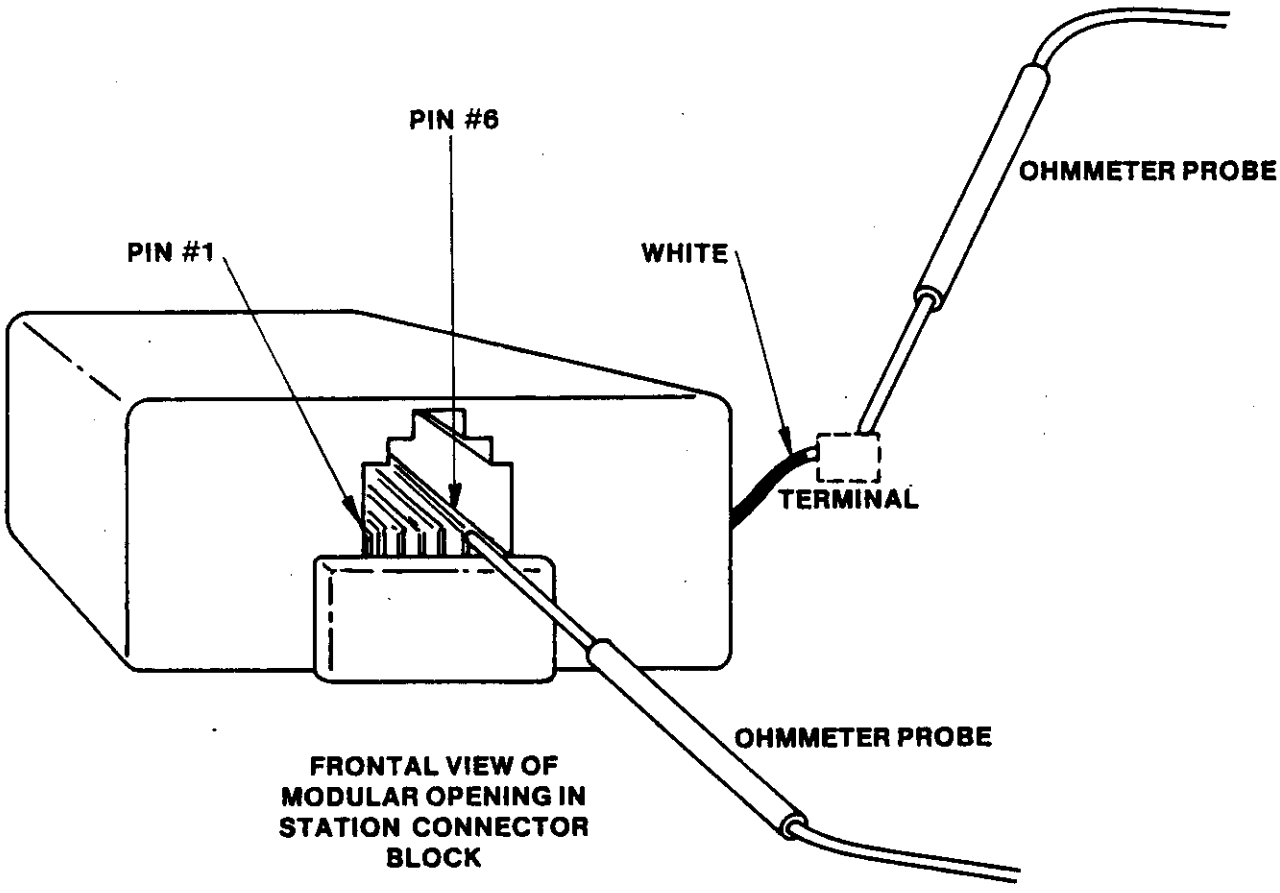


FIGURE 3—VERIFICATION OF CONNECTOR BLOCK WIRING

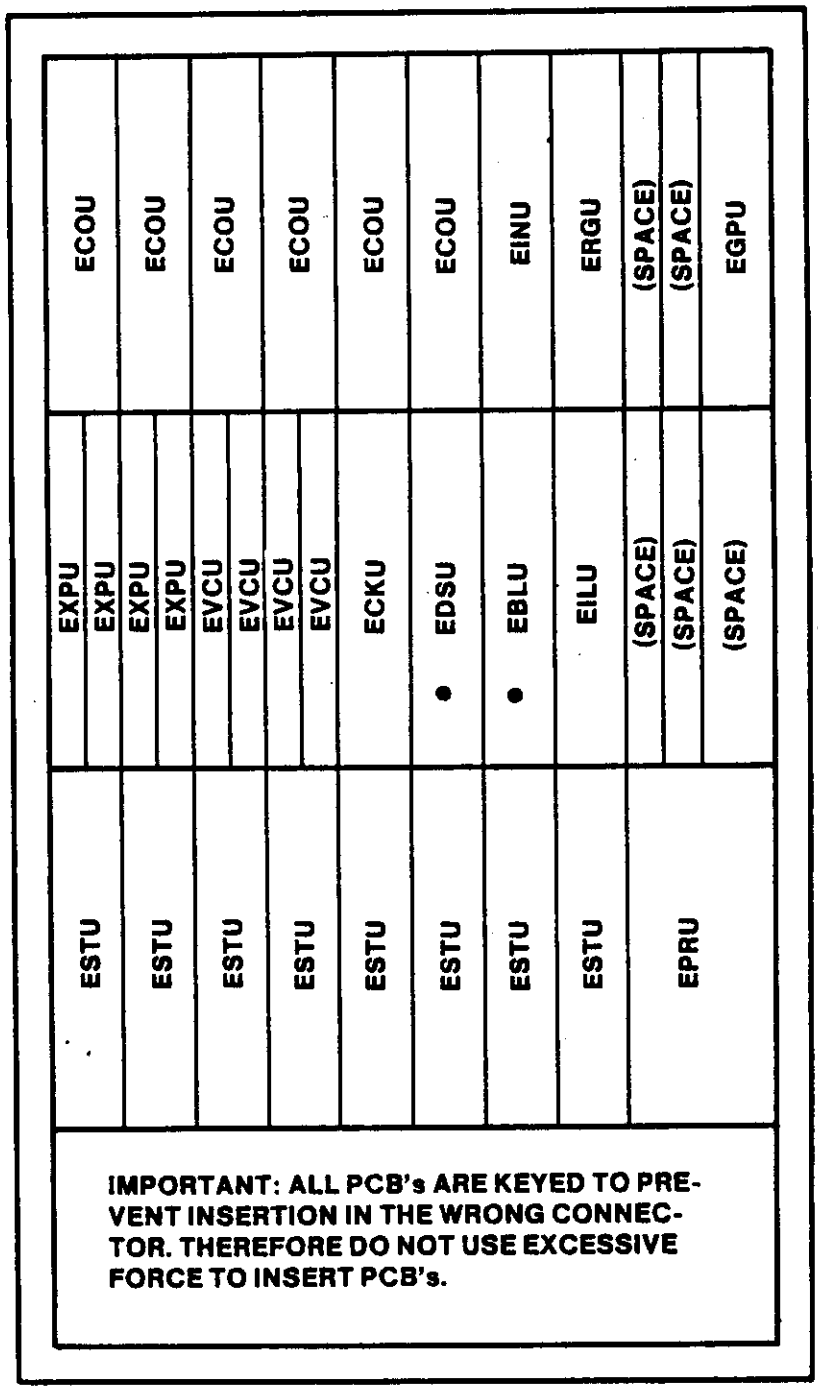


FIGURE 4—LOCATION OF PCB's IN EKSU

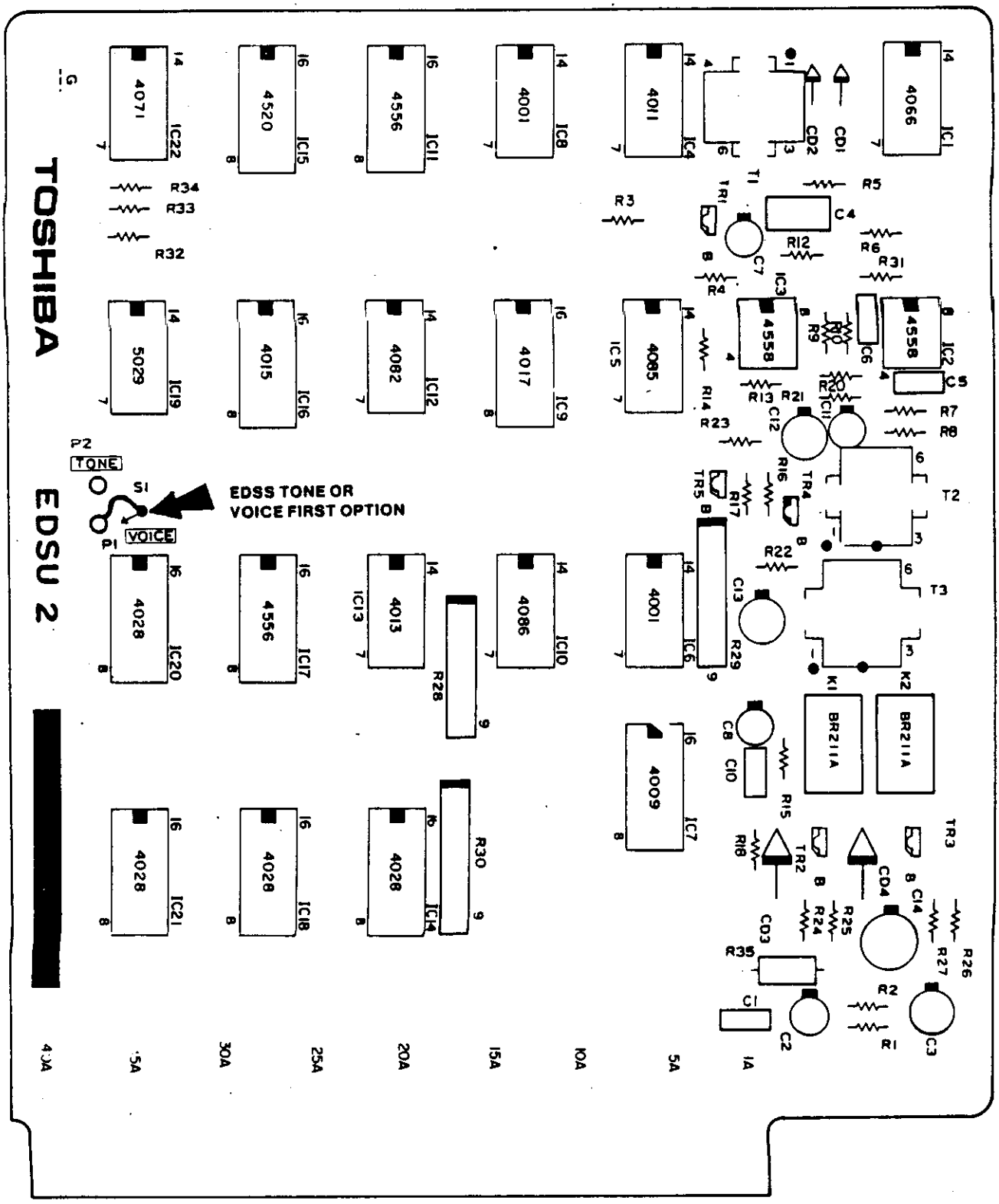


FIGURE 5—EDSU PCB LAYOUT

SECTION 100-004-265
ISSUE 1, FEBRUARY 1981

Strata III

SECOND REGISTER OPTION

INSTALLATION INSTRUCTIONS

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1. GENERAL

1.1 The STRATA III Electronic Key Service Unit (EKSU) has provision for the installation of **one** Electronic Register Unit (ERGU) printed circuit board (PCB). The EKSU is factory programmed to permit either intercom path #1 or #2 to utilize the ERGU as a register for intercom dialing and voice paging. However, when one intercom path is using the register, the second is disabled until the first intercom path users go "handset-to-handset" or hang-up.

1.2 A STRATA III system with two paths of intercom can be up-graded to include a second register by the installation of the Second Register Option. The Second Register Option permits intercom path #2 to function independently of path #1. Also, the need to time-out Handsfree Answerback conversations is eliminated. (See paragraph 5.1.1.1 of this section for instructions on the elimination of the time-out feature.)

1.3 To install the Second Register Option in the EKSU the following items will be required:

1.3.1 A Second ERGU PCB will be required to provide the register for intercom path #2.

1.3.2 An Electronic Register Harness (ERHS-3) kit must also be obtained. The kit contains the following items:

- **ERHS-3 HARNESS** (provides the various connections required to connect the additional ERGU to the EKSU)
- **2 CABLE KEEPS** (To secure the loose ERHS-3 harness wires to the EKSU back panel)
- **RPCC-3 CONNECTOR** (Provides a connection in the EKSU for the second ERGU PCB)
- **MACHINE SCREW** (To secure the RPCC-3 Connector to the EKSU back panel)
- **"R2" DECAL** (To mark the second ERGU PCB location on the EKSU backplane)
- **"ERGU-2" DECAL** (To mark the placement of the ERGU PCB on the shelf of the EKSU)

1.4 When the Second Register Option is to function in a STRATA III system, the following PCB's, if they are to be installed, must be model 3 s.

- **Electronic Intercom Unit (EINU-3)** This PCB provides interfacing between the station lines during intercom conversations. It also interfaces with the two ERGU PCB's for intercom dialing and voice paging.
- **Electronic Group Paging Unit (EGPU-3)** This PCB provides the interfacing required for 3-Zone Group Paging, All Call, and External Paging for both intercom paths.

  NOTE: If the EGPU-3 PCB is not to be present in the system, straps must be added to the backplane EGPU connector. See paragraph 3.3.3.

- **Electronic InterFace Unit (EIFU)** This PCB must be installed in the EKSU when an Expansion Key Service Unit (XKSU) is added to the system. It provides interfacing and component protection between the two units.

1.5 The Second Register Option will not function in an expanded system with **four** paths of intercom. However, a Second Register Option installation can be easily removed to permit upgrading to four paths of intercom. See paragraph 7.

NOTE: An expanded system with four paths of intercom utilizes two registers. The register housed in the EKSU is shared by intercom paths 1 and 2. Intercom paths 3 and 4 share the register housed in the XKSU.

2. INSTALLATION OF THE RPCC-3 CONNECTOR

2.1 PREPARATION OF THE EKSU FOR THE INSTALLATION OF THE RPCC-3 CONNECTOR

2.1.1 Remove the front cover of the EKSU by pulling out the six plastic snap fasteners securing the front cover of the EKSU. Power the system down by putting the off/on switch located on the EPRU PCB in the "OFF" position.

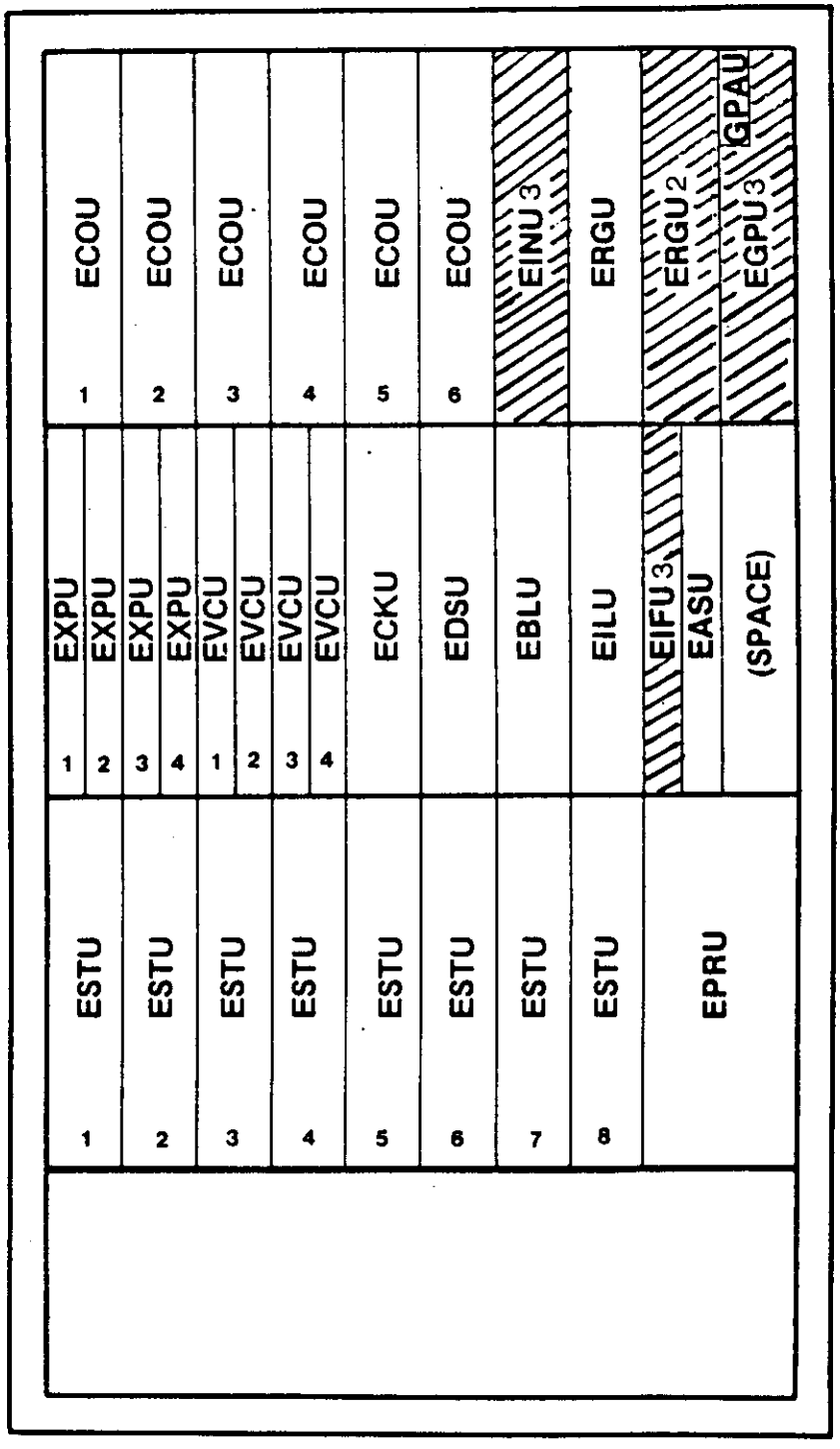


FIGURE 1 - PLACEMENT OF THE SECOND REGISTER OPTION PCB'S IN THE EKSU

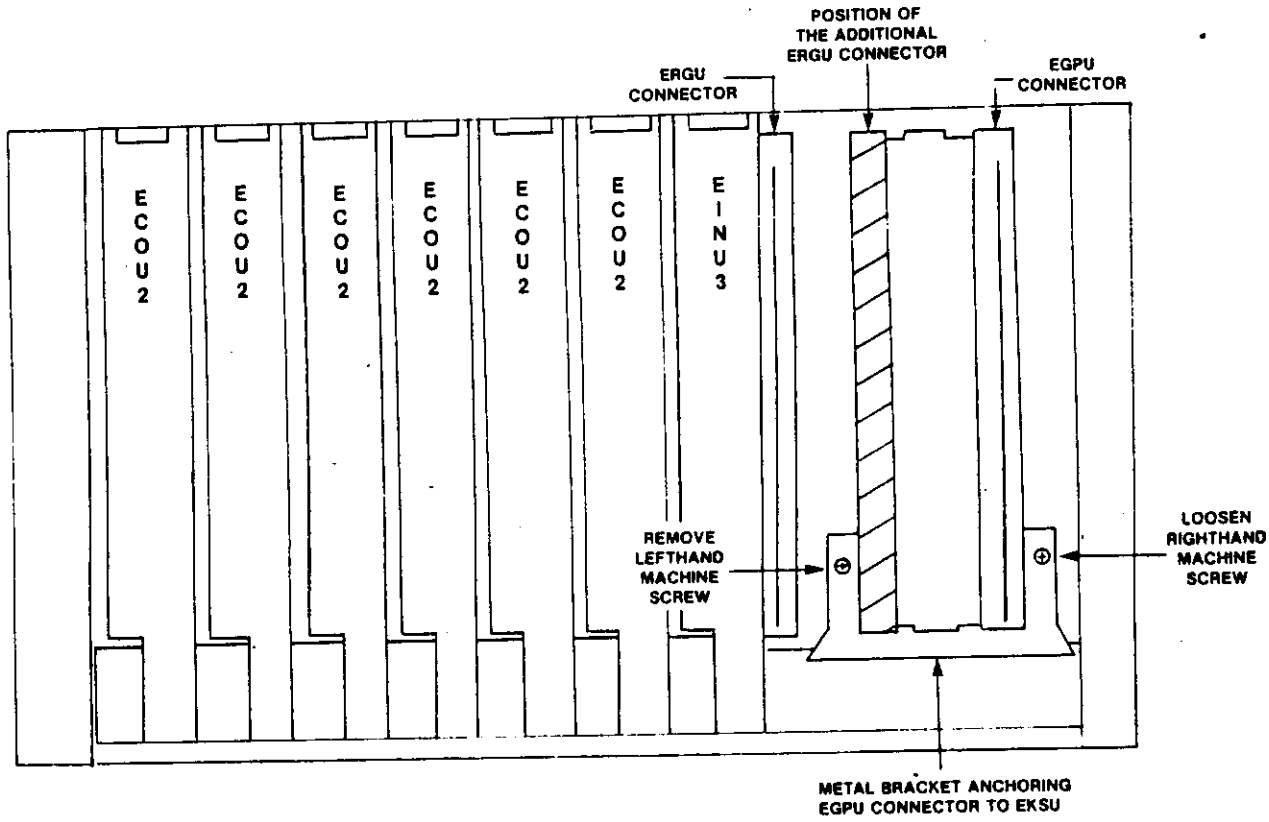


FIGURE 2 - FRONT VIEW OF TOP SHELF OF EKSU

2.1.2 Remove the rear cover of the EKSU by unscrewing the six machine screws securing it. (Save these machine screws to re-attach the back cover).

2.1.3 The additional ERGU-2 PCB is to be installed on the top shelf of the EKSU between the original ERGU PCB and the EGPU PCB after the following steps are completed. See **Figure 1.**

2.1.3.1 Locate the metal bracket anchoring the EGPU connector to the rear panel of the EKSU. See **Figure 2.**

2.1.3.2 From the front of the EKSU, loosen, but do not remove the right-hand (nearest to the sidewall) machine screw securing the EGPU connector bracket to the EKSU rear panel. **See Figure 2.**

2.1.3.3 Remove and save the machine screw securing the left side of the bracket.

2.2 PLACEMENT OF THE RPCC-3 CONNECTOR

2.2.1 From the front of the EKSU, insert the RPCC-3 connector (for the additional ERGU-2 PCB) straight into the position it is to occupy on the rear panel of the EKSU. Make certain the TOP of the connector is UP and the connector pins point toward the rear of the EKSU. See **Figure 2.**

CAUTION: If the connector pins are moved up or down, or if the top or the bottom of the RPCC-3 is pushed through the rear of the EKSU, the wires on the backplane may be damaged. (Inspect these wires after the RPCC-3 is secured.)

2.2.2 With the RPCC-3 held in place, align the bracket with the threaded screw hole in the rear panel of EKSU. (It is suggested that the EASU PCB, if present, be removed temporarily from the cabinet and the bracket be aligned with one hand reaching up from underneath the shelf.) Replace the previously removed machine screw, but do not tighten fully.

2.2.3 Insert the machine screw provided with the RPCC-3 in the top of the RPCC-3 connector and secure it to the rear panel of the EKSU.

2.2.4 Tighten both bracket screws.

2.2.5 Tag the front shelf where the ERGU PCB is to be inserted with the "ERGU-2" decal. See **Figure 1.**

2.2.6 Place the "R2" decal on the outside of the rear panel above the position of the RPCC-3 as shown in **Figure 3.**

3. CHANGES IN EKSU BACKPLANE STRAPPING

3.1 IDENTIFICATION OF BACKPLANE CONNECTORS AND CONNECTOR PINS

3.1.1 **Figure 3** provides the location of the backplane connector pins for each PCB that may be installed in the EKSU.

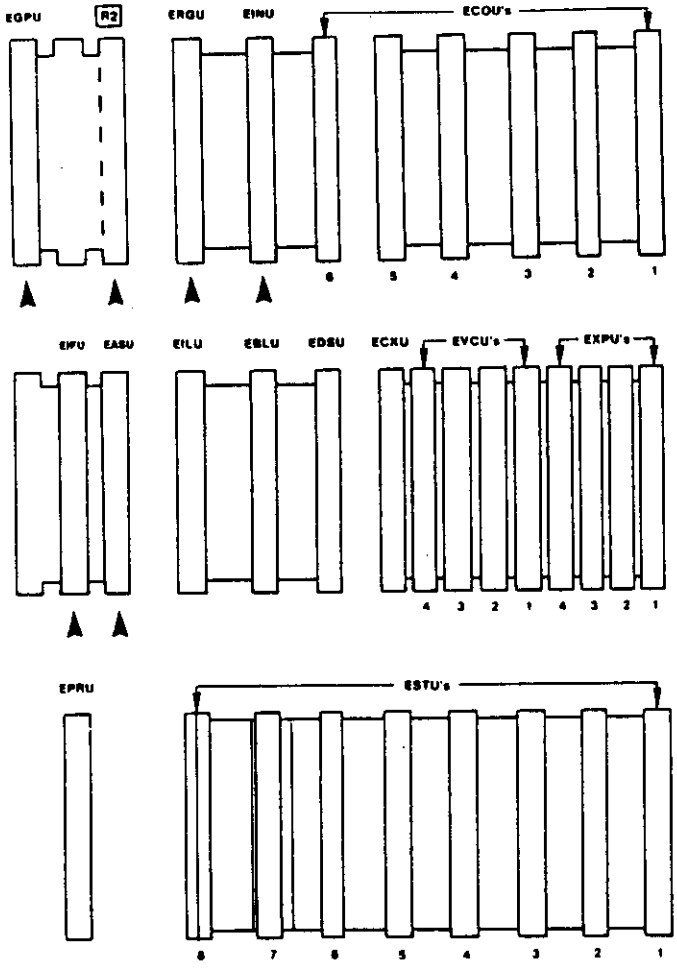


FIGURE 3 - EKSU REAR VIEW - LOCATION OF PCB CONNECTORS ON BACKPLANE

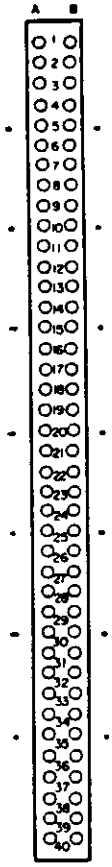


FIGURE 4 - PCB CONNECTOR PIN NUMBERING

3.1.2 Each connector has an "A" and "B" column of forty pins each. See **Figure 4.** The connector numbers shown in **Figure 4** are not imprinted on the actual connectors, but are shown here to help orient the installer.

3.1.3 The columns of connector pins are marked in increments of five pins as shown in **Figure 4** to reduce errors in pin counting.

3.2 ERGU/EINU CONNECTOR BACKPLANE STRAPS TO BE REMOVED

3.2.1 Referring to **Figure 5**, locate the five ERGU/EINU connector straps to be removed.

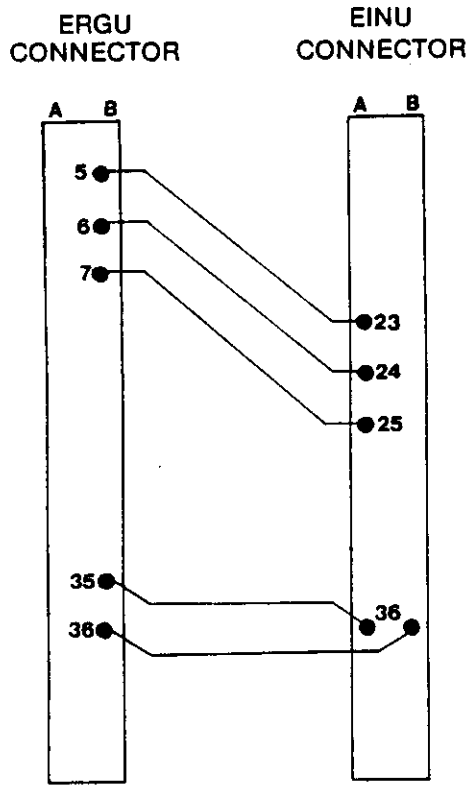


FIGURE 5 - ERGU/EINU BACKPLANE STRAPS TO BE REMOVED

3.2.2 Unwrap the five wires from their termination on the EINU connectors or cut the wires if a hand AWG 30 unwrap tool is not available.

3.2.3 As each wire is unwrapped from the EINU connector pins, trim the bare portion of each wire and leave the connected wire in the cabinet.

3.3 SPECIAL PROGRAMMING NECESSITATED BY THE GROUP PAGING OPTION

3.3.1 Verify the absence of the following straps on the EGPU connector pins of the EKSU backplane. Those straps which are present must be manually unwrapped and removed from those EGPU connector pins listed below:

5A to 5B
6A to 6B
7A to 7B
20A to 20B

See **Figures 3 and 4.** If these straps are present on the EKSU backplane, they will be the 3rd wire wrapped on these pins. The ERHS-3 harness (see paragraph 4.) will not be able to make a good connection on backplane pins having three or more wires wrapped on them.

3.3.2 If an EGPU-3 PCB is to be installed in the system, verify that the following connector pins are not strapped together. If any of these straps are present cut or remove them. Proceed to **paragraph 4.**

4A to 4B
29A to 29B
30A to 30B
36A to 36B

3.3.3 If an EGPU-3 PCB is **not** to be installed, verify the presence of the following straps between these EGPU connector pins:

4A to 4B
29A to 29B
30A to 30B
36A to 36B

If any of these straps are absent, use a 30 guage wire wrap tool and 30 AWG wire to replace the missing straps.

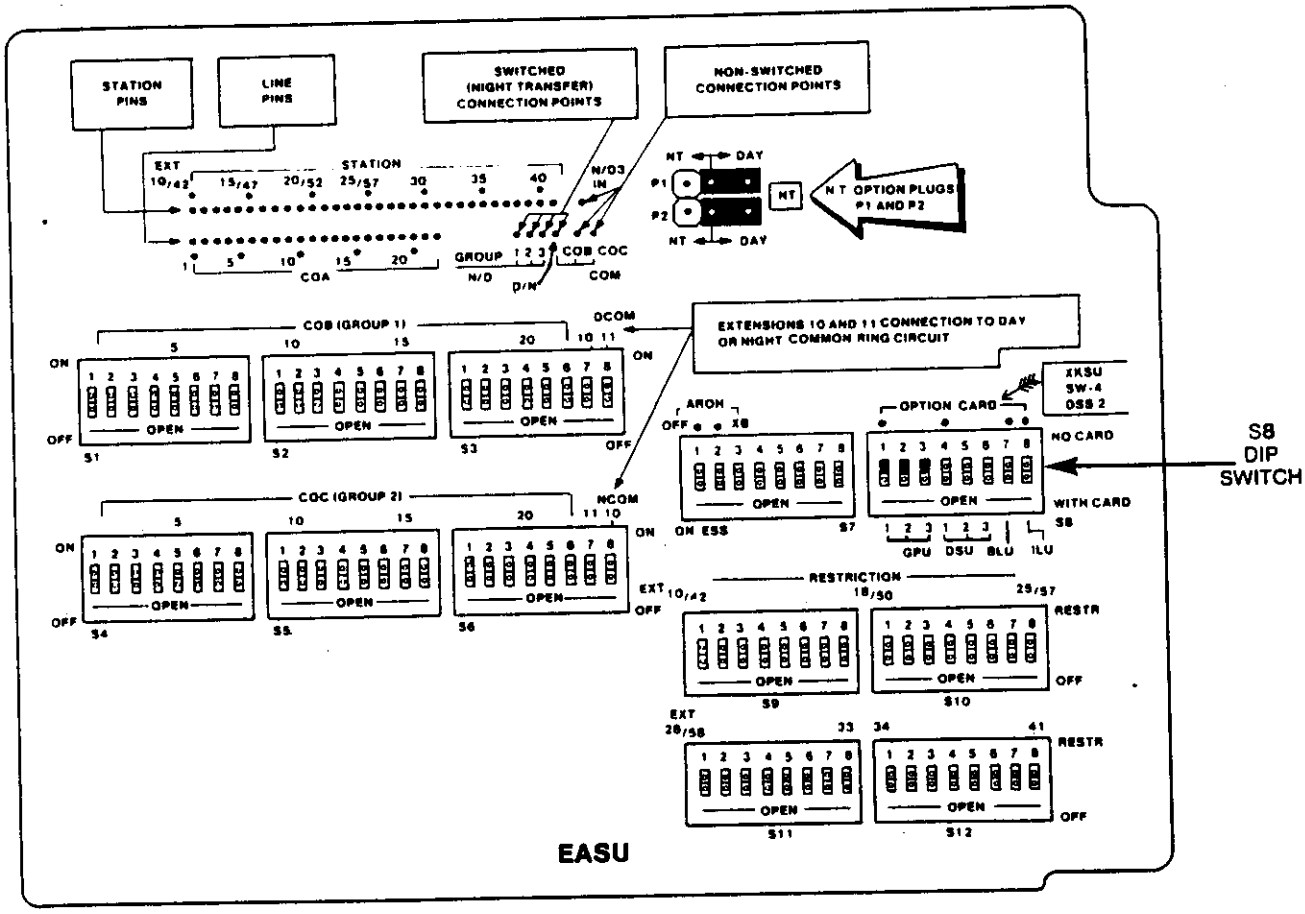


FIGURE 6 - EASU PCB PROGRAMMING DIP SWITCH LOCATIONS

3.3.4 If an EASU PCB is to be installed without an EGPU PCB in the system, set rockers (1), (2) and (3) of dip switch (S8) in the "NO CARD" position as shown in **Figure 6.** Proceed to **paragraph 4.**

3.3.5 If neither an EASU PCB nor an EGPU PCB is to be installed in the EKSU, the following backplane connector pins must be strapped together. Using 30 AWG wire and a 30 gauge wire wrap tool strap the following EASU connectors together:

6A to 6B
7A to 7B
8A to 8B
9A to 9B

4. INSTALLATION OF EHRS-3 HARNESS

4.1 To provide the additional connections required in the EKSU to permit the second ERGU PCB to function, an ERHS-3 harness must be connected to the EKSU backplane connectors.

4.2 As shown in **Figure 7,** place the female ERHS-3 connectors on top of the appropriate EKSU male connectors. Press gently but firmly into place.

4.2.1 Where the letters "TOP" appear at one end of an ERHS-3 connector, that end of the ERSH-3 connector must be at the top of the EKSU connector.

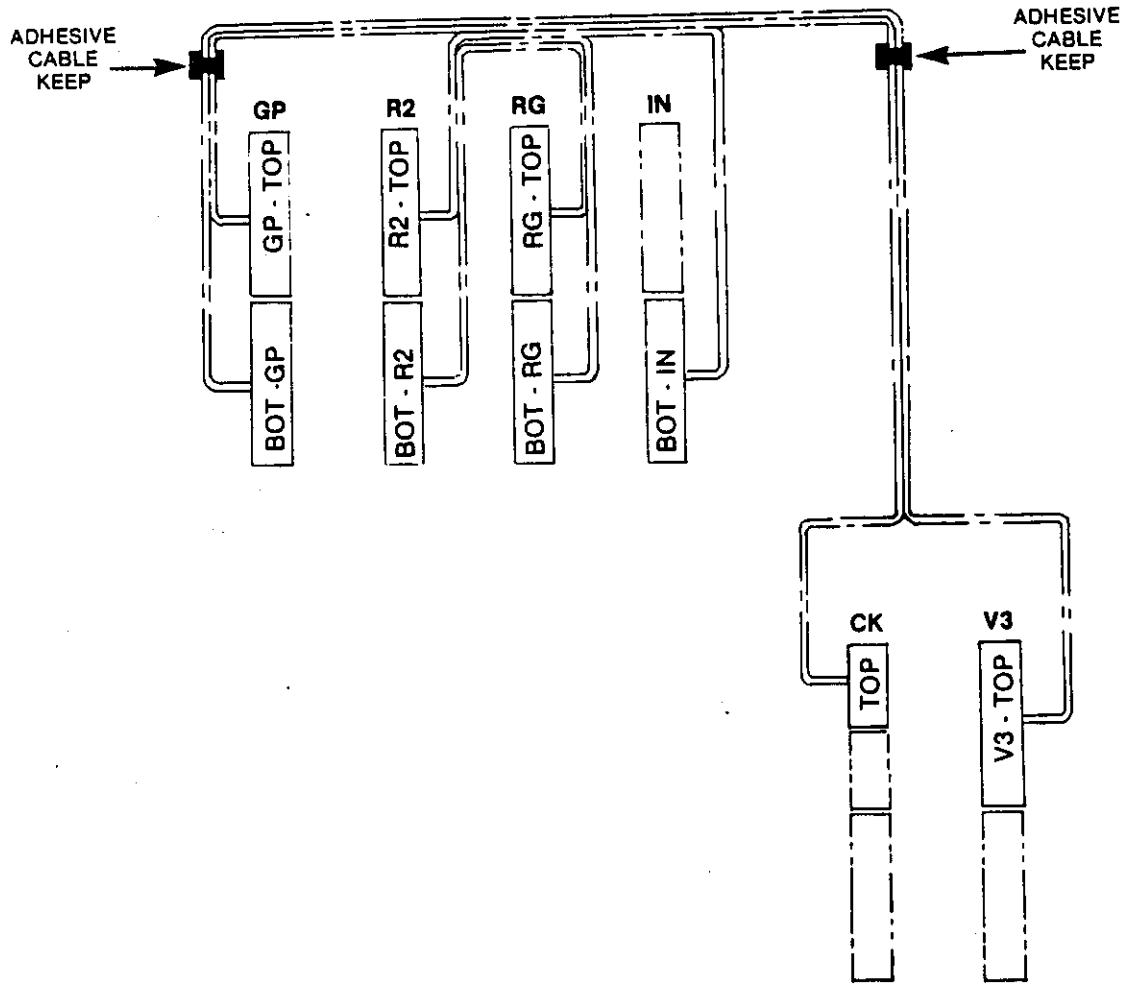


FIGURE 7 - PLACEMENT OF THE ERHS-3 HARNESS CONNECTORS ON THE EKSU BACKPLANE

4.2.2 Where the letters "BOT" appear at one end of an ERHS-3 connector, that end goes at the bottom of the EKSU connector.

4.3 Secure the loose wires of the ERHS-3 harness running to the ECKU and EVCU connectors, at the top of the EKSU rear panel as shown in **Figure 7.** Use one of the adhesive cable keeps provided.

4.4 Secure the balance of the loose harness wires to the upper lefthand corner of the EKSU rear panel with the remaining cable keep.

CAUTION: If an ERHS-3 connector is incorrectly placed, printed circuit boards may be damaged when the system is powered up. Verify that all connections are correct before powering up the system.

5. INSTALLATION OF THE SECOND REGISTER OPTION PCB'S

5.1 PCB'S REQUIRED IN THE EKSU

5.1.1 An additional ERGU-2 must be inserted in the EKSU as indicated in **TABLE A** to serve as a register for intercom path #2.

5.1.1.1 If the Handsfree Answerback time-out feature is to be eliminated, locate the (S1) strap on the ERGU PCB, before it is placed in the EKSU. See **Figure 8.**

5.1.1.2 Cut Strap (S1) to elminated the Handsfree Answerback time-out feature for intercom path #2.

5.1.1.3 To eliminate the Handsfree Answerback time-out feature for intercom path #1, remove the original ERGU PCB from the EKSU. Cut the (S1) strap and replace the PCB in the EKSU.

5.1.2 An EINU PCB, model 3, must be installed as shown in **TABLE A.**

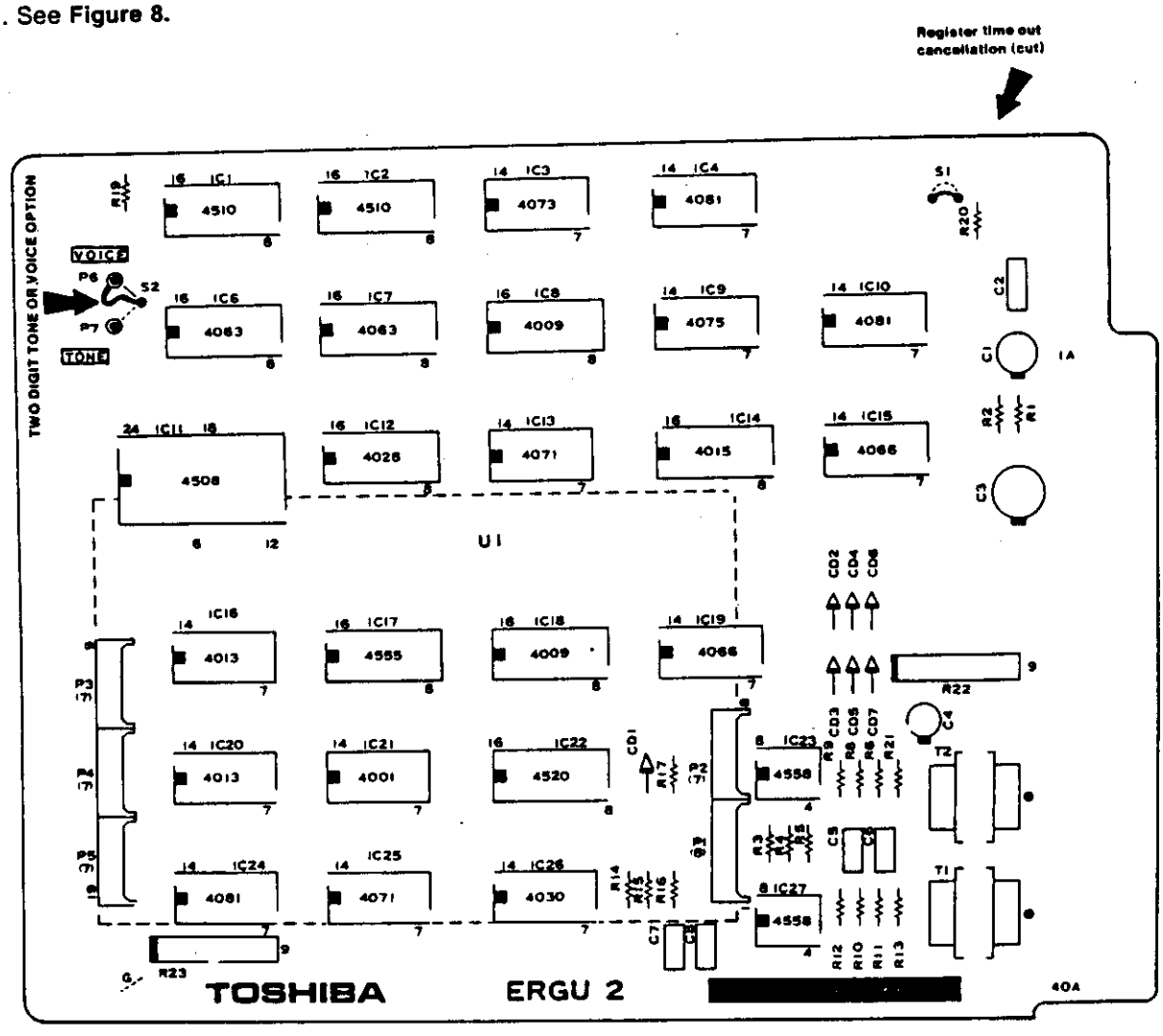


FIGURE 8 - ERGU-2 PCB - PHYSICAL LAYOUT

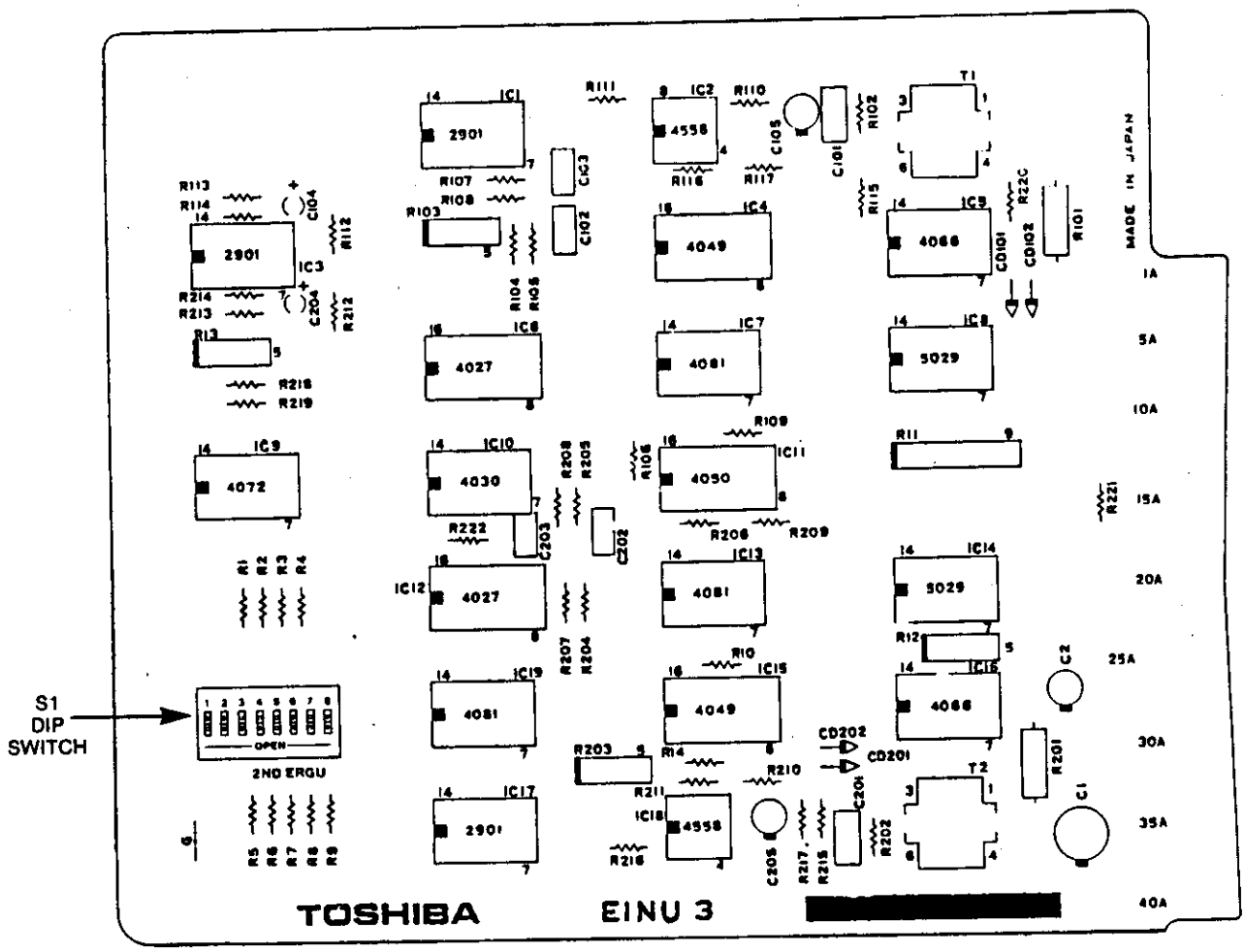


FIGURE 9 - EINU-3 PCB - PHYSICAL LAYOUT

5.1.2.1 Locate dip switch (S1) shown in **Figure 9** on the EINU-3 PCB.

5.1.2.2 If the Second Register Option is installed, the eight (S1) rockers must be set in the OPEN position (depressed on the open side of the switch).

5.2 OPTIONAL PCB'S INSTALLED IN THE EKSU

5.2.1 If the 3-Zone Group Page, All Call, and External Page options are to be provided with the system, an EGPU PCB model 3 must be installed in the EKSU as indicated in **TABLE A.** (Before attempting to install an EGPU PCB, review Section 100-004-276, EGPU Printed Circuit Board Installation Instructions). See **Figure 10.**

TABLE A - SECOND REGISTER PCB'S

REQUIRED PCB'S	OPTIONAL PCB'S
ERGU-2	EGPU-3 (Required if the Group Page/All Call option is to be provided.
EINU-3	EIFU-3 (Required if an XKSU is to be present in the system).
	EASU-2 (Can be used to eliminate most backplane strapping requirements).

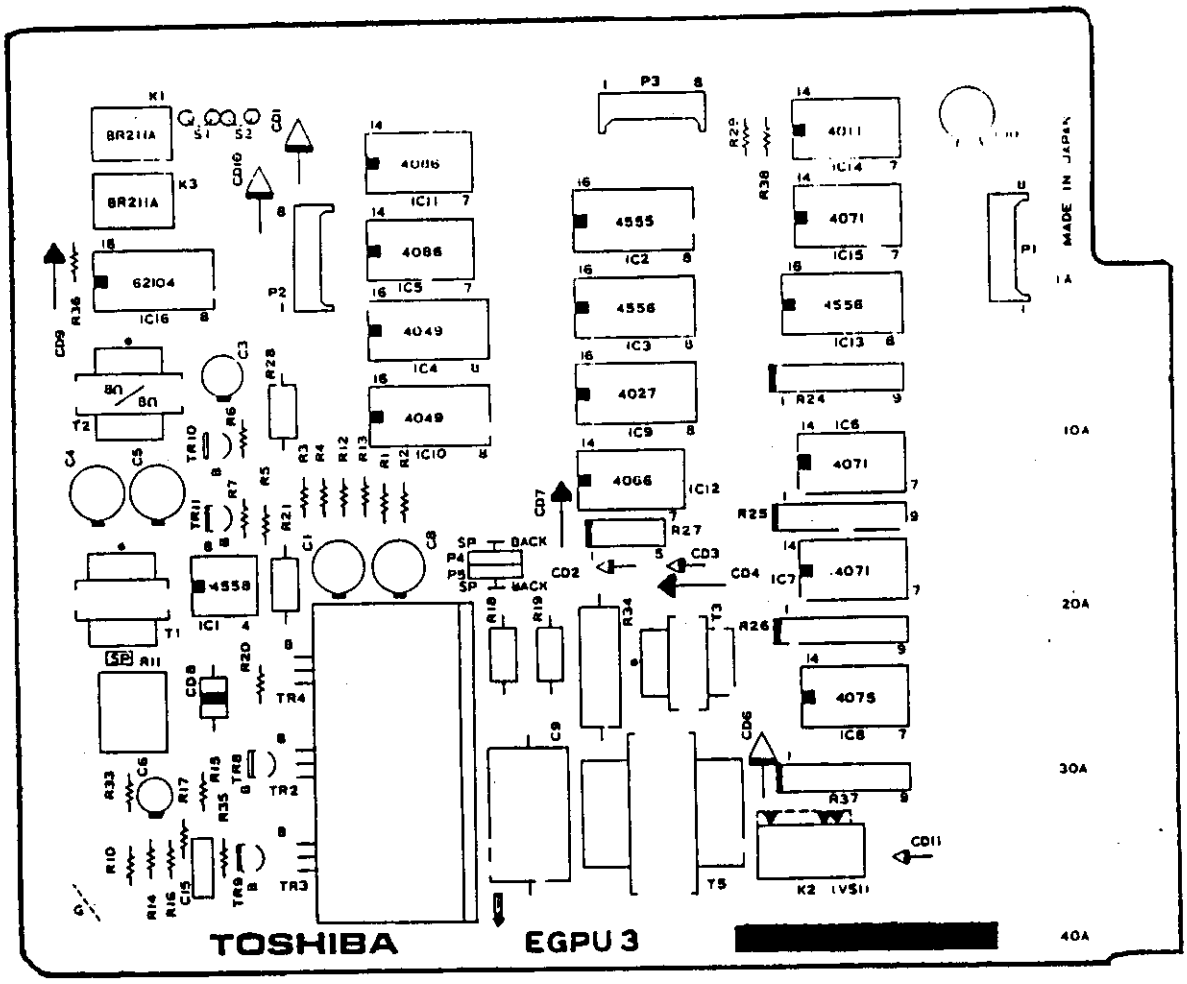


FIGURE 10 - EGPU-3 PCB - PHYSICAL LAYOUT

5.2.2 An EIFU PCB is required in the EKSU when an XKSU is added to the system. However, if the Second Register Option is to be present in the system and the system is not to be up-graded to provide four paths of intercom, a model 3 EIFU PCB must be installed. The model 3 EIFU PCB is required to interface the Second Register Option functions between the primary and expanded system stations. See **Figure 11.** If an XDLU PCB is installed in the XKSU, the (S1) dip switches must be set in the open (off) position. See **Figure 11.** If no XDLU is present the (S1) dip switches must be set in the closed (on) position.

NOTE: Up-grading an expanded system to four paths of intercom may be preferable, to operating it with only two paths of intercom. See paragraph 7. For instruction on the removal of a Second Register Option.

5.3 **TABLE B** provides a detailed listing of the programming requirements and options with a Second Register Option.

6. FINALIZATION OF THE SECOND REGISTER OPTION INSTALLATION

6.1 After carefully inspecting the installation, power up the system and test the second register features for intercom path #2.

6.2 If a malfunction occurs, verify that the installation procedures outlined in this manual section were correctly followed.

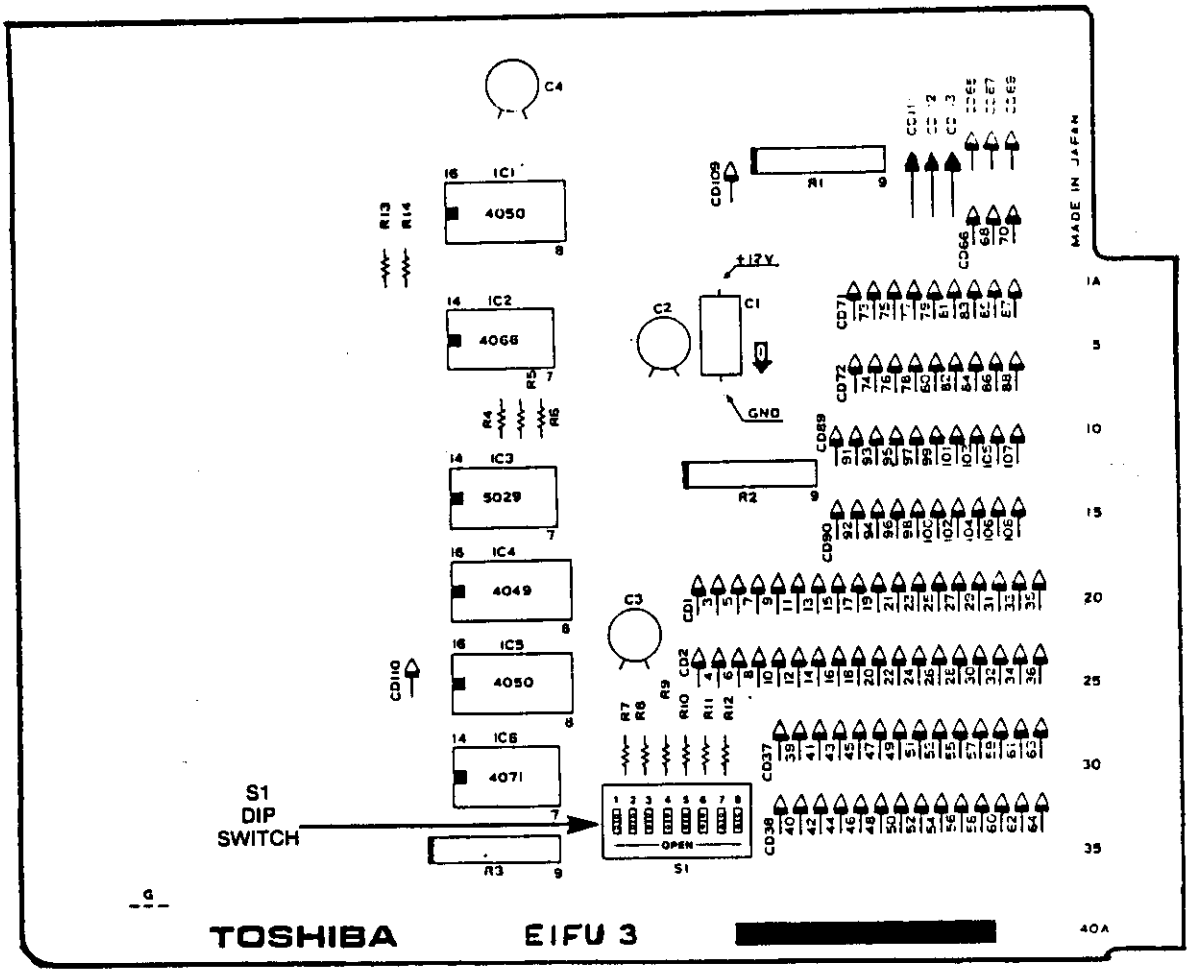


FIGURE 11 - EIFU-3 PCB - PHYSICAL LAYOUT

SECTION 100-004-270
ISSUE 1, MARCH 1979

Strata III

EDSU, EBLU, AND EILU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

TABLE OF CONTENTS

LIST OF FIGURES

1. GENERAL

1.1 The following printed circuit boards (PCB's) are optional to the STRATA III Electronic Telephone System in that they assist in the functioning of non-standard features:

- **EDSU**-EDSS Console Key Data Control
- **EBLU**-EDSS and/or EBLF LED Data Control
- **EILU**-Special Operator LED Illuminations and Operator Recall

1.2 Refer to Section 100-004-100, paragraph 4.3 for feature descriptions.

1.3 Refer to Section 100-004-500, paragraph 5., for circuit descriptions.

1.4 Installation of the optional EGPU PCB is covered in detail in Section 100-004-276.

1.5 The ECKU, EPRU, ERGU, and EINU PCB's represent "common" equipment and are shipped, one each, with every primary EKSU. Refer to Section 100-004-210, paragraph 6.

1.6 The EXPU, EVCU, ESTU, and ECOU PCB's represent standard function PCB's, and are installed as dictated by the number of stations or outside lines to appear in the system (refer to Section 100-004-210, paragraph 6).

2. INSTALLATION INSTRUCTIONS

IMPORTANT: BEFORE INSTALLING ANY PCB IN A STRATA III EKSU, THE EKSU MUST BE PROPERLY GROUNDED. REFER TO SECTION 100-004-210, PARAGRAPH 11. DO NOT WORK ON OR HANDLE PCB's IN A CARPETED AREA. DO NOT WALK THROUGH A CARPETED AREA WHILE DIRECTLY HOLDING A PCB. TAKE CARE TO DISCHARGE ALL STATIC ELECTRICITY FROM YOUR PERSON BY TOUCHING THE GROUNDED EKSU CABINET BEFORE HANDLING A PCB OR WORKING ON THE BACK PLANE OF THE EKSU.

ALSO, ALL PCB's ARE KEYED TO PREVENT INSERTION IN THE WRONG CONNECTOR. THEREFORE DO NOT USE EXCESSIVE FORCE TO INSERT PCB's.

2.1 EDSU PCB

2.1.1 If the EDSU is being installed in a previously operative system, remove the rear cover of the EKSU and cut the following straps if present on the rear of the EDSU connector (refer to Figure 2):

- PIN 5A to PIN 5B
- PIN 6A to PIN 6B
- PIN 8A to PIN 8B
- PIN 9A to PIN 9B

2.1.2 If the EDSS console is to tone signal rather than voice page upon direct station selection, move option strap "S1" on the EDSU PCB from pin "P1" to pin "P2" (refer to Figure 3).

2.1.3 Insert the PCB in the proper slot in EKSU (refer to Figure 1).

2.2 EBLU PCB

2.2.1 If the EBLU is to be installed in a previously operative system, remove the rear cover of the EKSU and cut the following strap if present on the rear of the EBLU connector (refer to Figure 2):

- PIN 5A to PIN 8B

2.2.2 If grouped "ringing" stations are desired during the day rather than when the N.T. feature is activated, move plugs N.T. to the left-most position designated "N.T." on the EBLU PCB. If grouped "ringing" is desired when the N.T. feature is activated, leave the plugs in the "DAY" positions (refer to Section 100-004-210, paragraph 7.4).

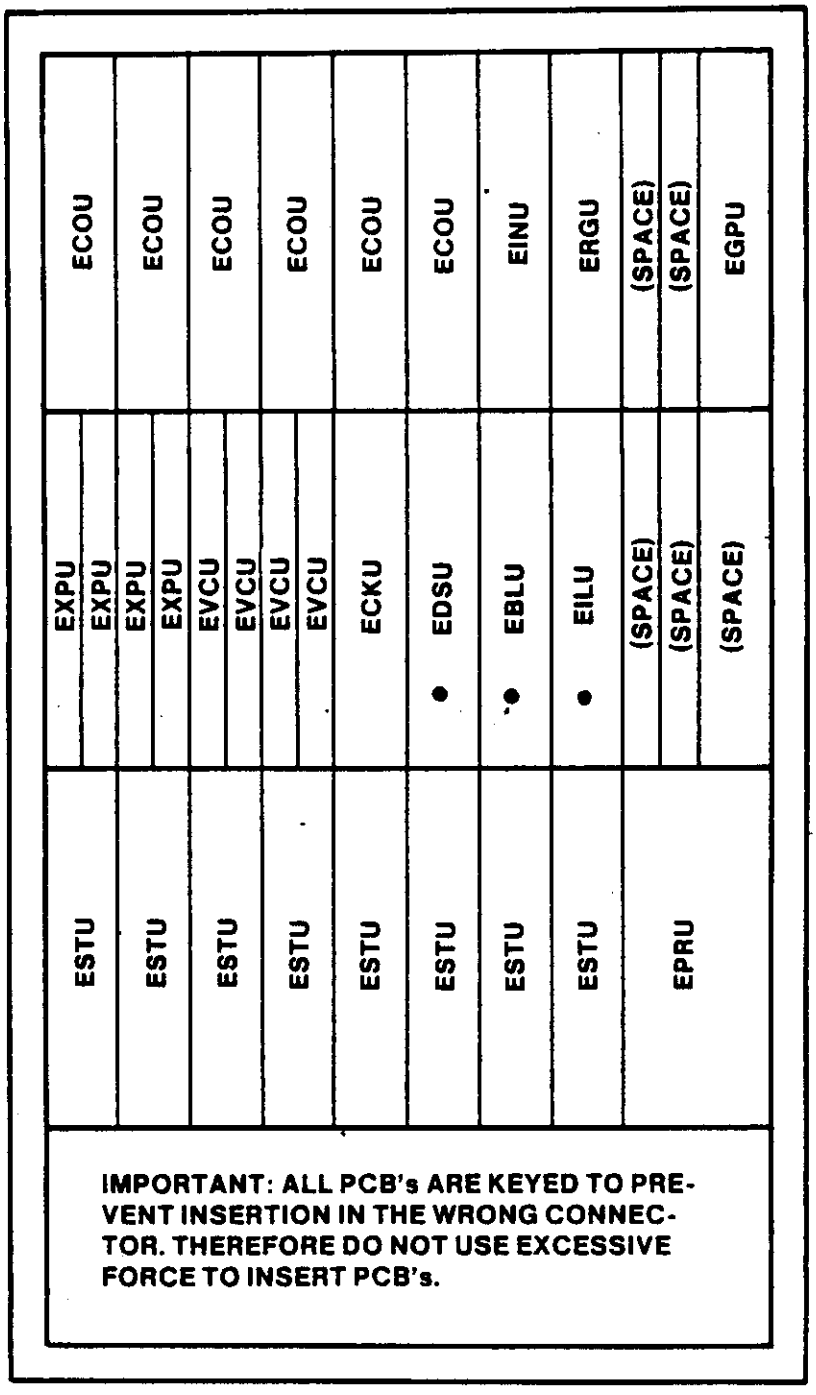
2.2.3 Insert the PCB in the proper slot in the EKSU (refer to Figure 1).

2.3 EILU PCB

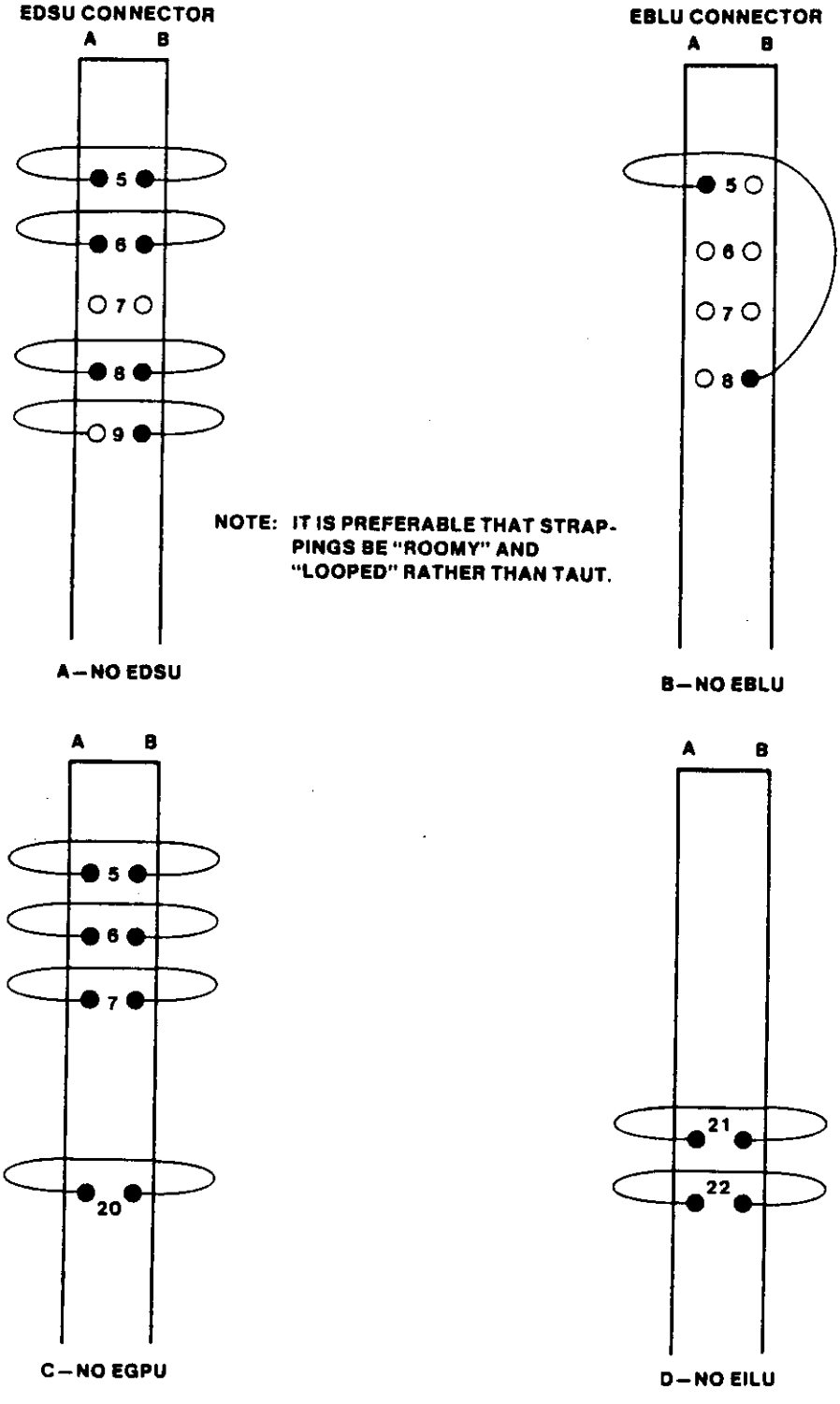
2.3.1 If the EILU is being installed in a previously operative system, remove the rear cover of the EKSU and cut the following straps if present on the rear of the EILU connector (refer to Figure 2):

- PIN 21A to PIN 21B
- PIN 22A to PIN 22B

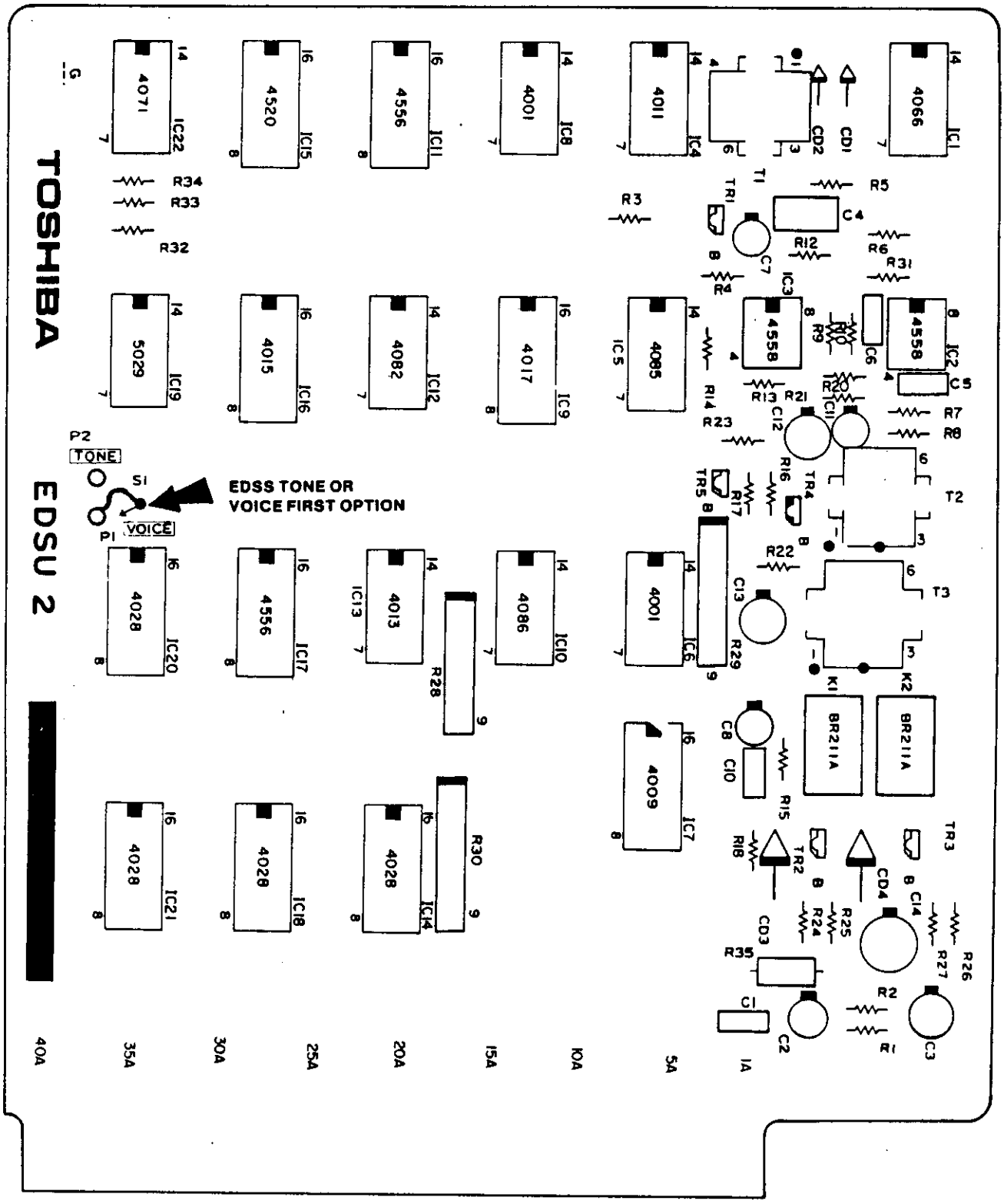
2.3.2 Insert the EILU PCB in the proper slot in the EKSU (refer to Figure 1).



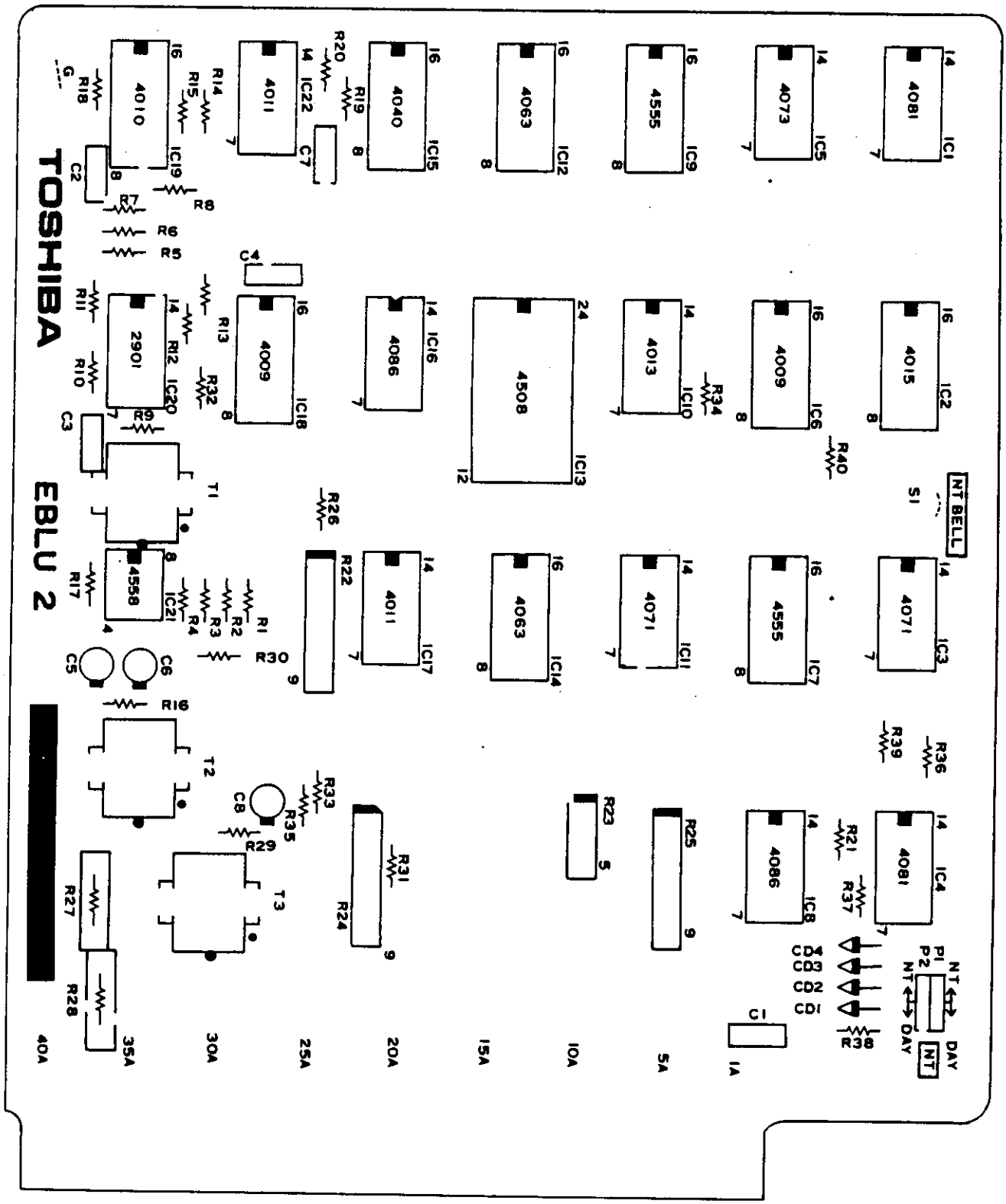
1—LOCATION OF PCB's IN EKSU



2—REAR VIEW—PCB CONNECTORS IN EKSU



3—EDSU—PHYSICAL LAYOUT



4—EBLU—PHYSICAL LAYOUT

SECTION 100-004-276
ISSUE 2, NOVEMBER 1979

Strata III

EGPU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

TABLE OF CONTENTS

LIST OF FIGURES

1. GENERAL

1.1 The EGPU Printed Circuit Board (PCB) is an optional unit providing Group Page, All Page, and External Page functions in the Strata III Electronic Key Telephone System.

1.2 Assignment of extensions to Group Page zones may be accomplished by programming and connecting a GPAU PCB onto each EGPU, or by back-plane wiring in the key service unit(s). (EKSU and XKSU). For GPAU installation instructions see section 100-004-278. For back-plane wiring instructions refer to paragraph 2. of this section.

1.3 Installed in the EKSU, the primary EGPU provides the above mentioned features for extensions 10 thru 41, as functions of intercom paths 1 and 2.

In an expanded system, a second EGPU PCB must be installed in the XKSU if any of extensions 42 thru 61 are to be included in a Group Page zone and/or intercom paths 3 and 4 are to provide Group Page, All Call, or External Paging functions.

1.4 Up to 3 Group Page zones may be established in a Strata III system.

1.5 GROUP PAGING

1.5.1 Special two-digit codes, dialed while having accessed an intercom path equipped for paging, allow the station-user to voice page through the station speakers of all stations assigned to the zone dialed. The Group Page codes are:

CODE	ZONE (GROUP)
81	1
82	2
83	3

1.5.2 A Group Page may be answered by any extension having access to the intercom path being used to page.

1.6 ALL CALL

1.6.1 By accessing an idle intercom path equipped for paging and dialing the access code 80, a station-user may access all three zones at once.

1.6.2 A station not assigned to a Group Page zone will not be included in an All Call page.

1.6.3 An All Call page may be answered by any station having access to the intercom path being used to page.

1.7 EXTERNAL PAGING—A special two-digit code (89) permits intercom access to external paging speakers thru a 3 Watt amplifier located on the EGPU PCB when installed in the EKSU. (When installed in the XKSU the 3 Watt amplifier on the secondary EGPU is not used.) A 600 ohm two-way voice path is also provided for connection to a talk-back amplifier/speaker arrangement.

NOTE: Stations not assigned to a Group Page zone may still originate a Group Page, All Call page, or External Page, providing the station has access to an intercom path equipped for such.

1.8 BACKGROUND EXTERNAL MUSIC—A dry relay closure is optionally provided to disable an external customer-provided music system driving external speakers when external paging is activated. The music system must have provision for a relay input.

IMPORTANT: BEFORE INSTALLING ANY PCB IN AN EKSU OR XKSU, THE KEY SERVICE UNIT(S) MUST BE PROPERLY GROUNDED. REFER TO SECTIONS 100-004-210 (EKSU) and 100-004-215 (XKSU): POWER AND GROUNDING CONNECTIONS.

POWER SHOULD BE SHUT OFF ON THE FRONT PANEL OF THE EPRU PCB, LOCATED IN THE EKSU, BEFORE BEGINNING BACK-PLANE WIRING. DO NOT REMOVE THE POWER SUPPLY PLUG FROM THE A.C. OUTLET AS THAT WOULD ALSO REMOVE THE PROTECTIVE GROUND FROM THE SERVICE CABINET(S).

DO NOT HANDLE PCB'S IN A CARPETED AREA. TAKE CARE TO DISCHARGE STATIC ELECTRICITY FROM YOUR PERSON BY TOUCHING A PROPERLY GROUNDED SERVICE UNIT CABINET BEFORE HANDLING PCB'S OR WIRING THE BACK-PLANE OF A KEY SERVICE UNIT.

PCB'S SHOULD BE INSERTED IN THE KEY SERVICE UNIT(S) LAST, AFTER ALL OTHER SYSTEM PREPARATIONS HAVE BEEN COMPLETED.

ALL PCB'S ARE KEYED TO PREVENT INSERTION IN THE WRONG CONNECTOR. THEREFORE DO NOT USE EXCESSIVE FORCE TO INSERT THEM.

2. STATION-TO-ZONE BACK-PLANE WIRING ASSIGNMENT

IMPORTANT: 30 AWG INSULATED WIRE AND A SUITABLE WIRE WRAP TOOL MUST BE USED FOR BACK-PLANE WIRING.

2.1 If the GPAU PCB is to be used for station-to-Group Page zone assignment, proceed to section 100-004-278. Upon completion of the instructions given there return to paragraph 3 of this section.

2.2 If the GPAU PCB is not to be installed on the EGPU PCB, back-plane wiring will be necessary in order to assign stations to Group Page zones. Extensions 10 thru 41 will require wiring in the EKSU while extensions 42 thru 61 will require wiring in the XKSU.

2.3 If back-plane wiring is to be performed, remove the rear key service unit cover(s). Refer to figure 1 for EKSU PCB connector locations and figure 2 for XKSU connector locations.

2.4 Each extension in a Strata III system is assigned an extension page pin, which is located on the rear of the EVCU connector servicing it. Extensions 10 thru 41 are represented in the EKSU, while extensions 42 thru 61 are represented in the XKSU. Refer to figures 3 and 4 to ascertain extension page pin locations.

2.5 On the rear of the EGPU connectors in both the EKSU and XKSU are 3 pins representing the 3 possible group page zones (refer to figures 3 and 4):

- Pin 15A = Group Page Zone #1 (code 81)
- Pin 16A = Group Page Zone #2 (code 82)
- Pin 17A = Group Page Zone #3 (code 83)

2.6 Extension to zone assignment is accomplished by first wiring all the extension page pins that are to be assigned to the same zone together, one to the other, in a chain-like manner. Next, wire the first or last extension page pin in the chain to the proper Group Page Zone Pin on the rear of the EGPU connector in the same service unit (EKSU or XKSU). Figure 5 gives an example of extension-to-zone wiring assignment.

3. EXTERNAL PAGING CONNECTIONS

NOTE: ALL PAGE VOLUME ADJUSTMENTS ARE MADE UPON INSERTION OF THE EGPU PCB IN THE EKSU AND ARE COVERED IN PARAGRAPH 5.

3.1 DIRECT EXTERNAL SPEAKER CONNECTION

3.1.1 The exact number of external speakers which may be connected to the 8-ohm/3-watt output from the EGPU will be dependent on the ohmage of the speakers, the conductor resistances, and the desired volume of the speakers.

3.1.2 Speaker connections (without external amplifier) will be to the 2 terminals labelled "8" on the rear of the EKSU. (See Figure 6). Examples of speaker connections are given in figure 7.

3.2 EXTERNAL AMPLIFIER CONNECTION

3.2.1 ONE WAY AMPLIFIER—If more volume is needed than can be delivered by the EGPU, an external amplifier may be connected to the two terminals on the rear of the EKSU marked "8" and the external speakers connected to the amplifier in the manner described in the manufacturer's amplifier connection instructions. (See Figure 6).

3.2.2 TALK-BACK AMPLIFIER—Connect the input terminals of the talk-back amplifier/speaker arrangement to the "6T" and "6R" terminals (refer to Figure 6).

3.3 BACKGROUND MUSIC INTERRUPTION UPON EXTERNAL PAGE—The optional "BR" relay must be installed on the EGPU being installed in the EKSU to obtain a dry closure on terminals "BR" (see Figure 6) when an external page is made. This closure may then be used to control a background music source while a page is in progress. Installation of the "BR" relay is covered in paragraph 4.6.

4. GPAU PCB INSTALLATION

NOTE: If the GPAU PCB is being used to assign stations to Group Page zones it should be programmed and installed on the EGPU before inserting the EGPU in its slot in the EKSU or XKSU (see Section 100-004-278).

4.1 Remove the front cover of the service unit to receive the EGPU and shut down system power on the EPRU PCB located in the EKSU.

4.2 If the EGPU is being installed in a previously working system, remove the rear cover of the service unit to receive it and cut the following straps on the rear of the EGPU connector:

- Pin 5A to Pin 5B
- Pin 6A to Pin 6B
- Pin 7A to Pin 7B
- Pin 20A to Pin 20B

4.3 Unbox and unwrap the EGPU, handling the PCB by its front panel.

4.4 If one-way external paging speakers or a one-way amplifer/speaker arrangement is to be connected for external paging purposes, make sure that plugs P4 and P5 are in the "SP" positions on the EGPU being installed in the EKSU. This will transfer the output of the PCB to the 600 ohm terminals marked "8" at the bottom rear of the EKSU (see Figure 6).

4.5 If a talk-back amplifier arrangement is to be utilized, be sure that option plugs P4 and P5 have been moved to the "back" positions on the EGPU PCB (see Figure 8). This will transfer the output of the PCB to the 600-ohm terminals marked "6T" and "6R" at the bottom rear of the EKSU (see Figure 6).

4.6 If background music is to be customer-provided for an external paging speaker arrangement and interrupted upon paging, the optional "BR" plug-in relay must be obtained and inserted in position K2 on the EGPU being installed in the EKSU (refer to Figure 8).

4.7 Installation of the EGPU PCB in the XKSU does not require the positioning of plugs P4 and P5 nor the installation of the optional "BR" relay. The representative functions are obtained only from the EGPU installed in the EKSU.

4.8 Cut strap "S1" on the EGPU(s) being installed if External Paging will be operative and NOT to be automatically included in a Group Page or All Call Page (see Figure 8).

4.9 Insert the EGPU(s) in the proper slot in the key service unit(s).

4.10 Return power to the system by moving the switch on the front panel of the EPRU (located in the EKSU) to "ON".

5. EXTERNAL PAGING VOLUME ADJUSTMENTS

5.1 If External Paging speakers are connected directly to terminals "8" on the rear of the EKSU (no external amplifier), volume is controlled by the "SP" variable resistor on the front panel of the EGPU PCB installed in the EKSU. Using a suitable flat-blade screwdriver, turn the "POT" fully counter-clockwise and then clockwise until the desired volume is obtained.

5.2 If an external amplifier is used (one-way or talk-back) turn the "SP" volume control on the front panel of the EGPU installed in the EKSU fully counterclockwise, and then clockwise just enough to deliver sufficient sound output to the amplifier. Use the volume control of the amplifier to control the volume of the speakers.

6. INSTALLATION FINALIZATION

6.1 Test all paging and system functions. If paging assignment is incorrect, "power-down" and check GPAU programming or back-plane wiring. If a system malfunction occurs, power-down and carefully check back-plane wiring installed, if any. If no mis-wirings are found, refer to section 100-004-500 for basic system (no XKSU), or section 100-004-510 for expanded system (with XKSU) maintenance procedures.

6.2 Replace front and rear covers of key service unit(s).

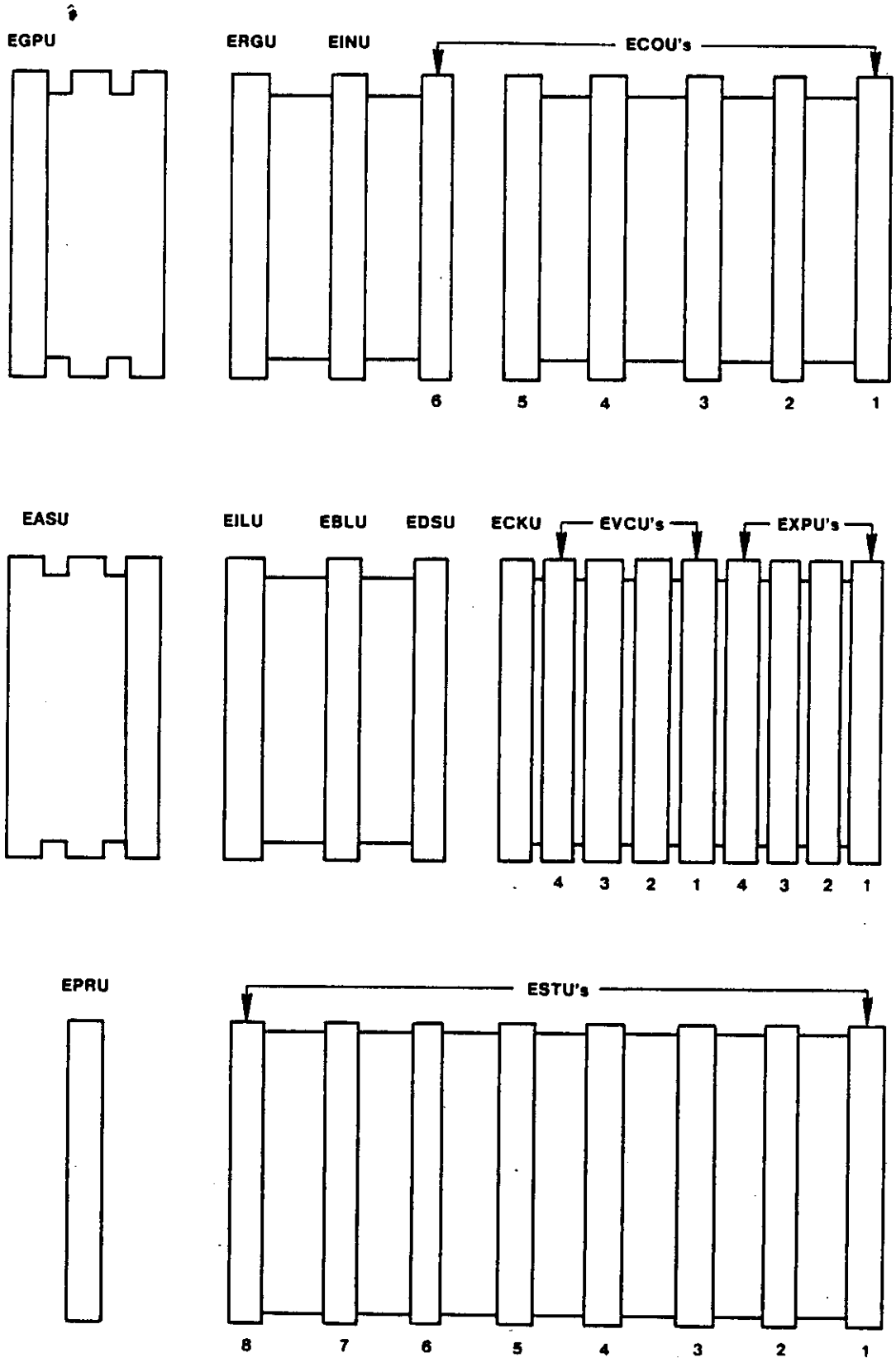


FIGURE 1—REAR VIEW—PCB CONNECTORS IN EKSU

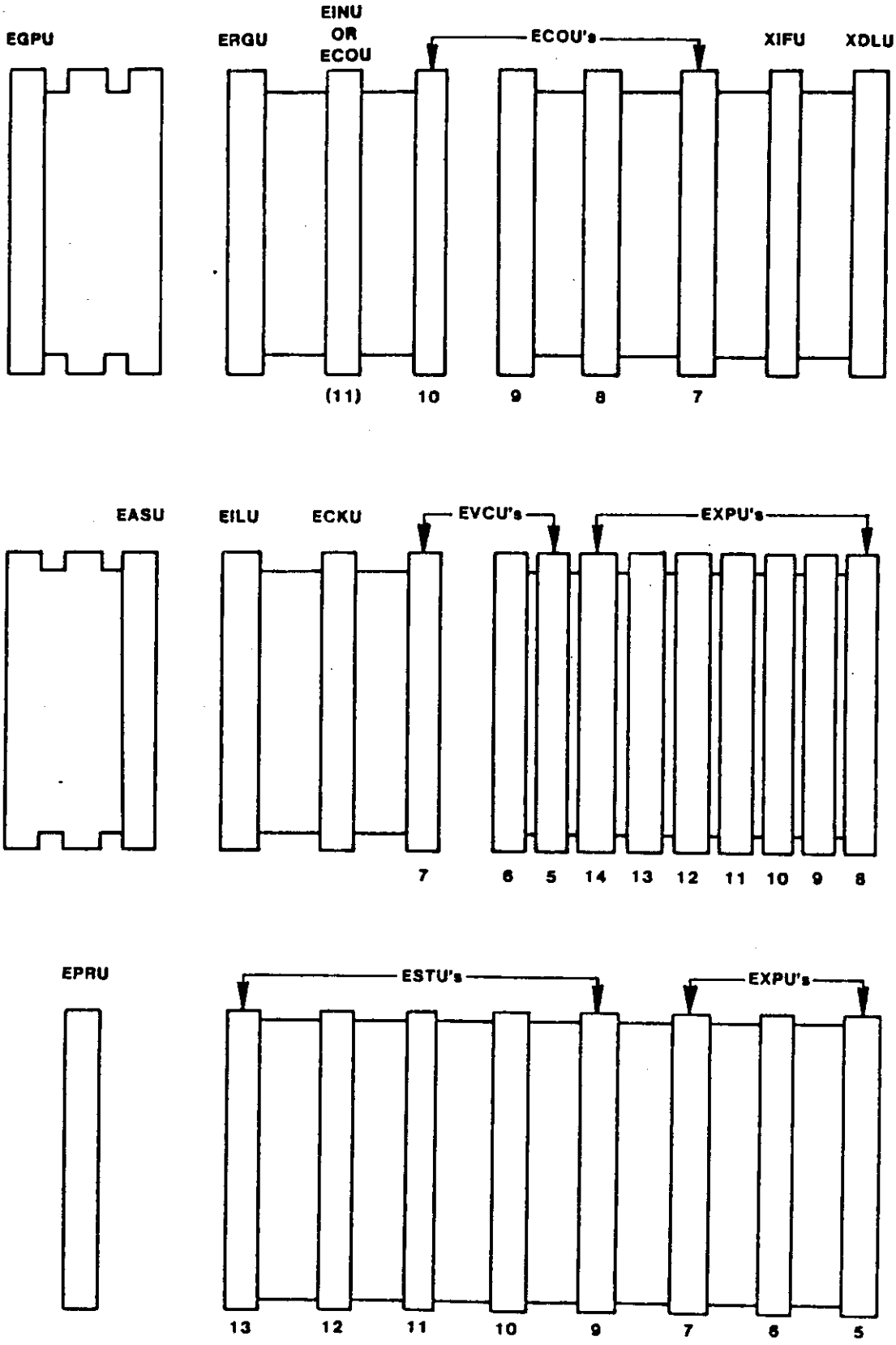


FIGURE 2—REAR VIEW—PCB CONNECTORS IN XKSU

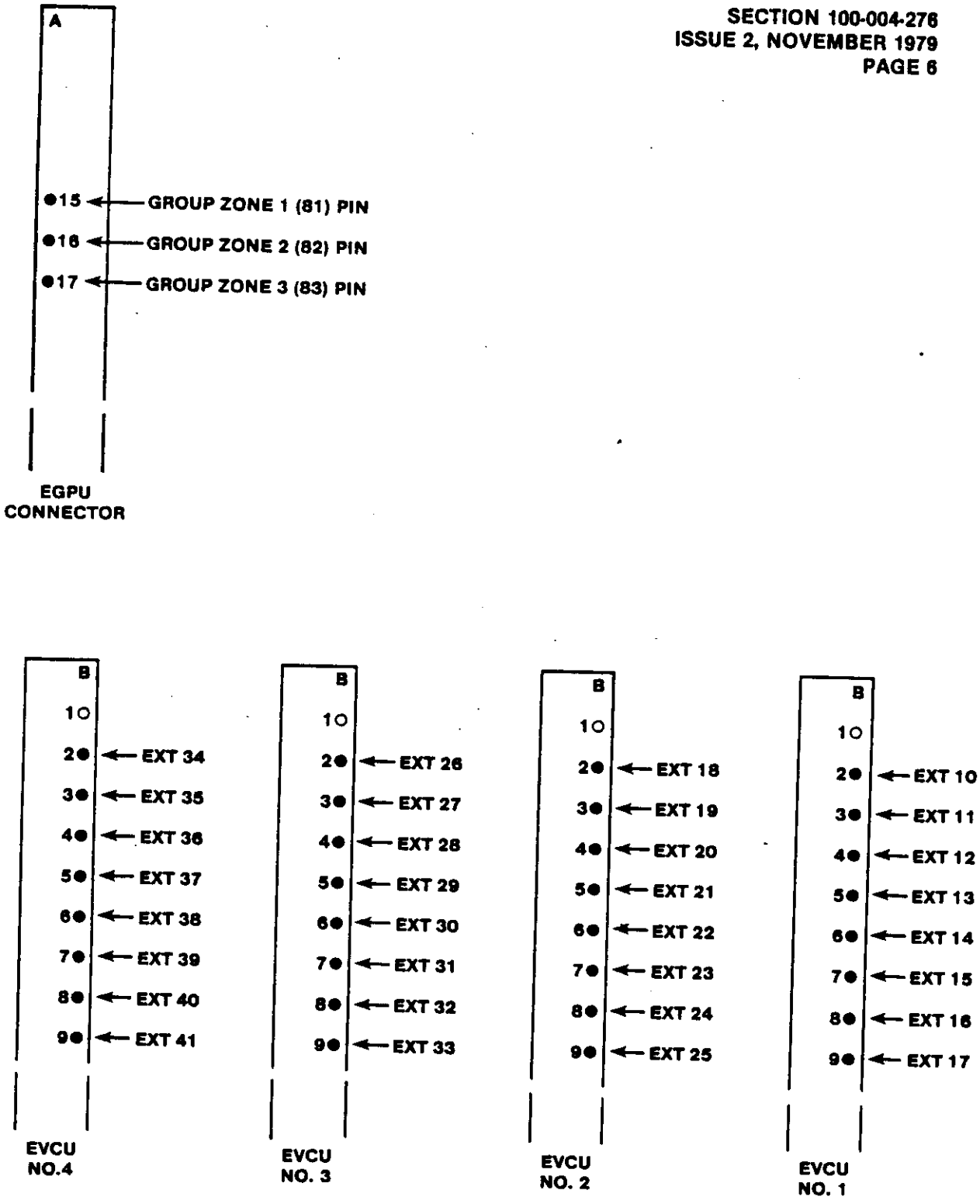


FIGURE 3 — EXTENSION PAGE AND GROUP PAGE ASSIGNMENT PIN LOCATIONS IN EKSU.

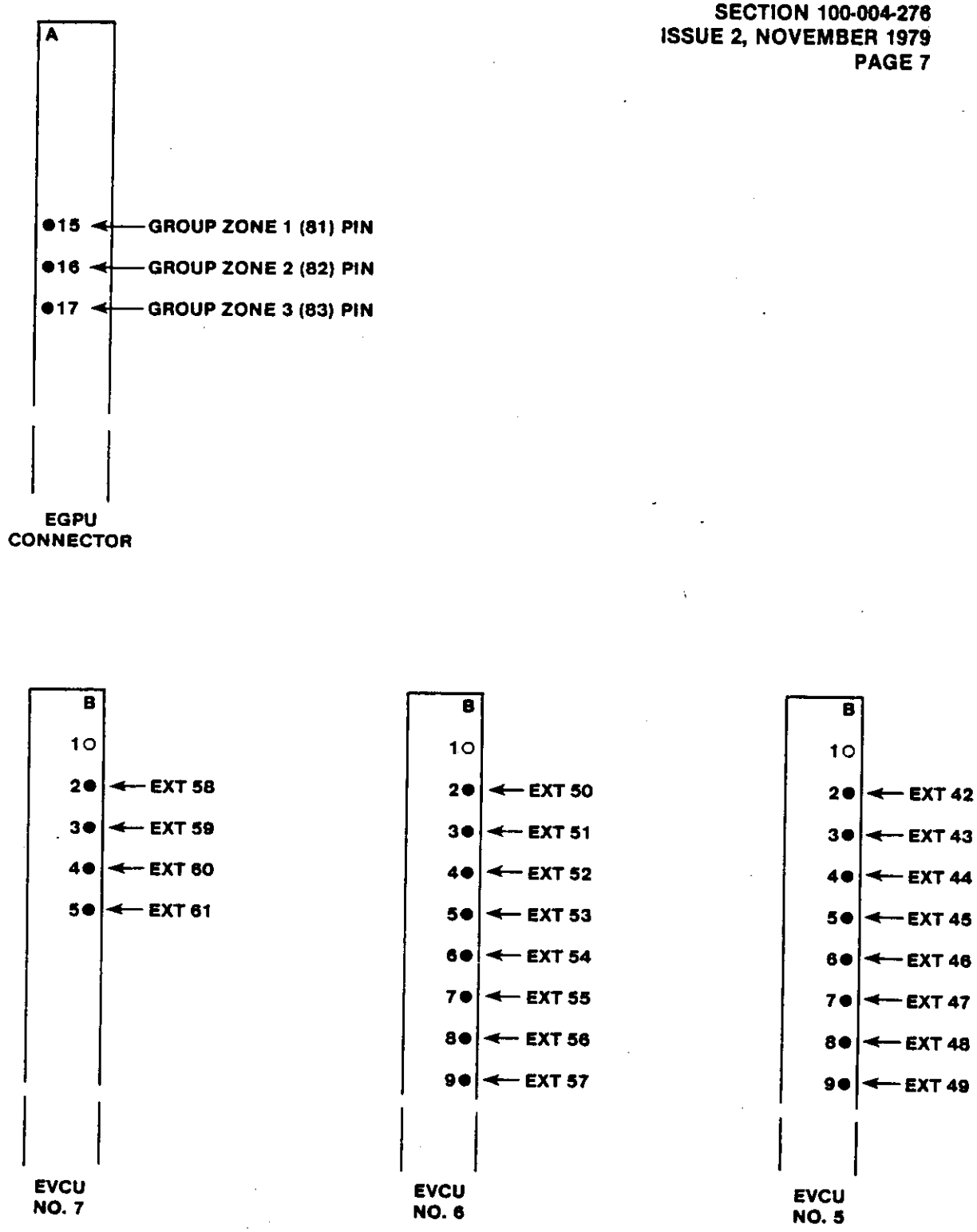
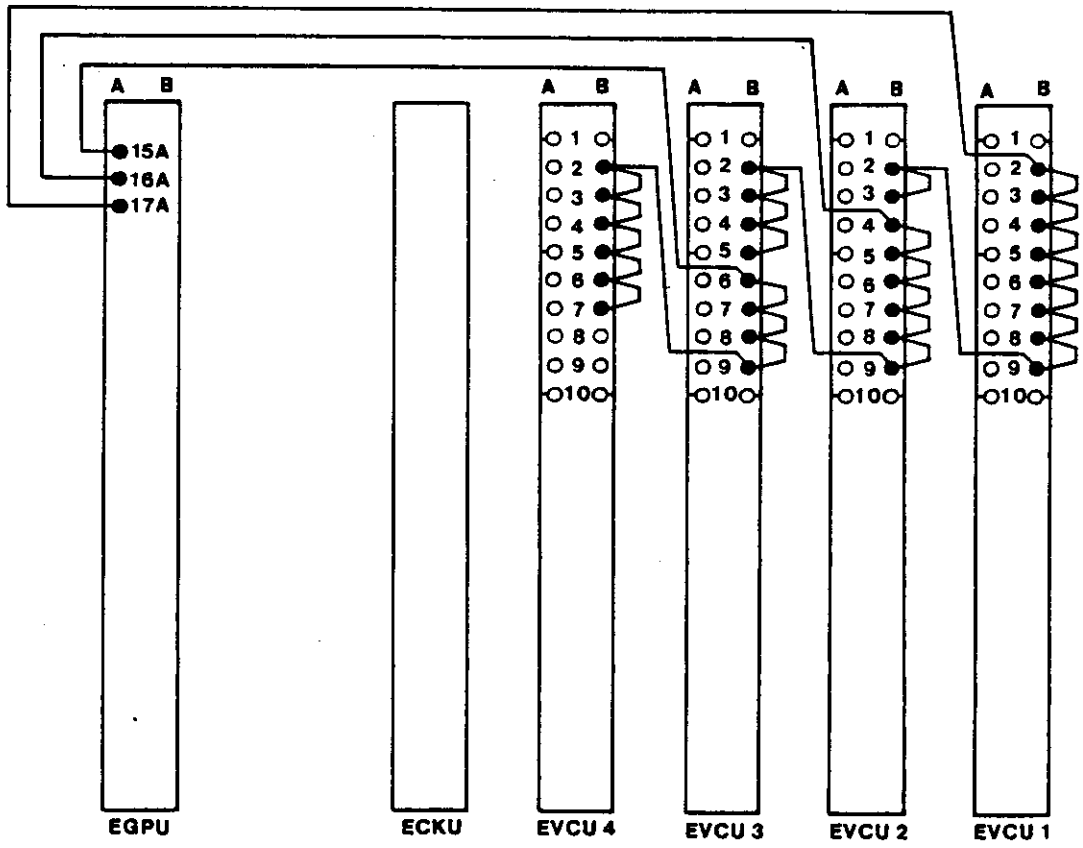


FIGURE 4 — EXTENSION PAGE AND GROUP PAGE ASSIGNMENT PIN LOCATIONS IN XKSU.

EKSU



EXPLANATION:

Extensions 10 (EVCU 1, pin 2B) through 17 (EVCU 1, pin 9B) are connected to EGPU pin 17A and thus are assigned to Group Page zone 3.

Extensions 18 (EVCU 2, pin 2B) and 19 (EVCU 2, pin 3B) are connected to EVCU 1 pin 9B and hence are also assigned to Group Page zone 3.

The Extension Page pins for intercom code extensions 20 through 29 are similarly wired to EGPU pin 16A, assigning these stations to Group Page zone 2.

Extensions 30 through 39 are similarly assigned to Group Page zone 1 (EGPU pin 15A).

FIGURE 5—EXAMPLE OF GROUP PAGE STATION ASSIGNMENT BY USING BACK-PLANE WIRING IN EKSU

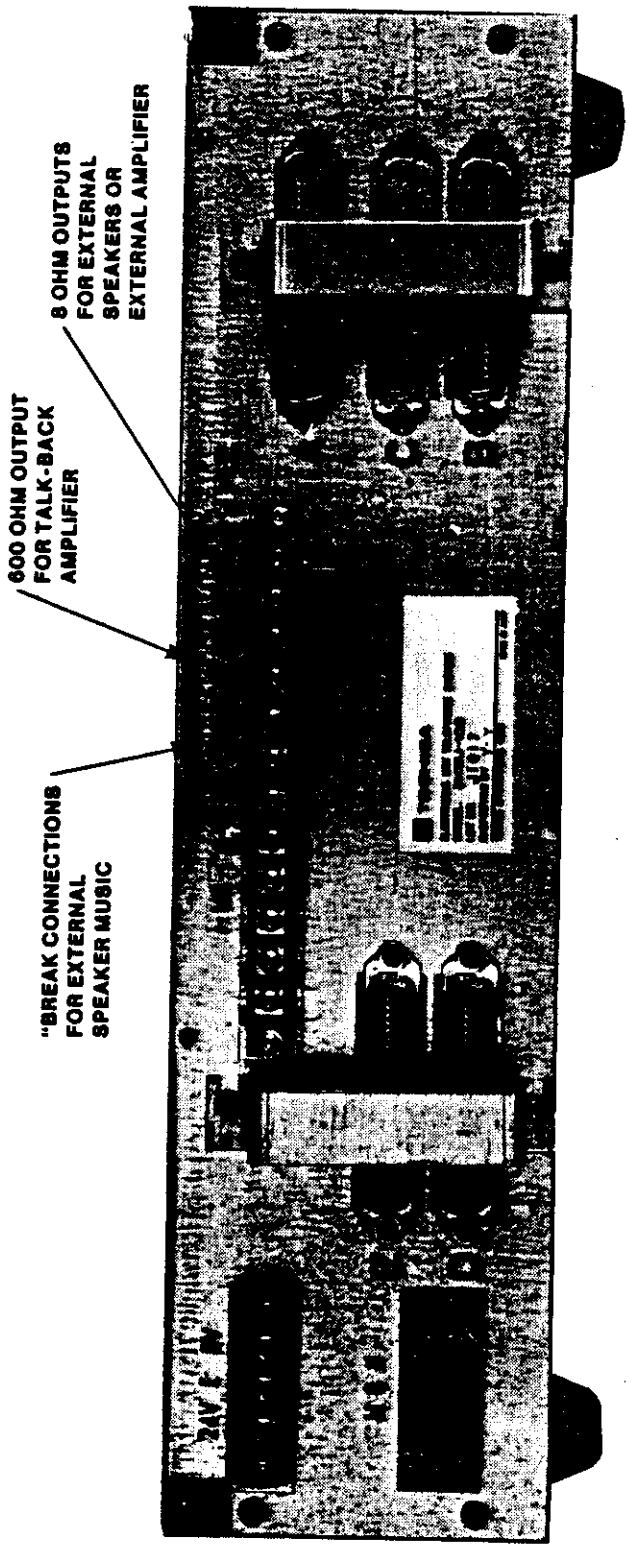


FIGURE 6—EXTERNAL SPEAKER OR AMPLIFIER CONNECTION TERMINAL LOCATIONS

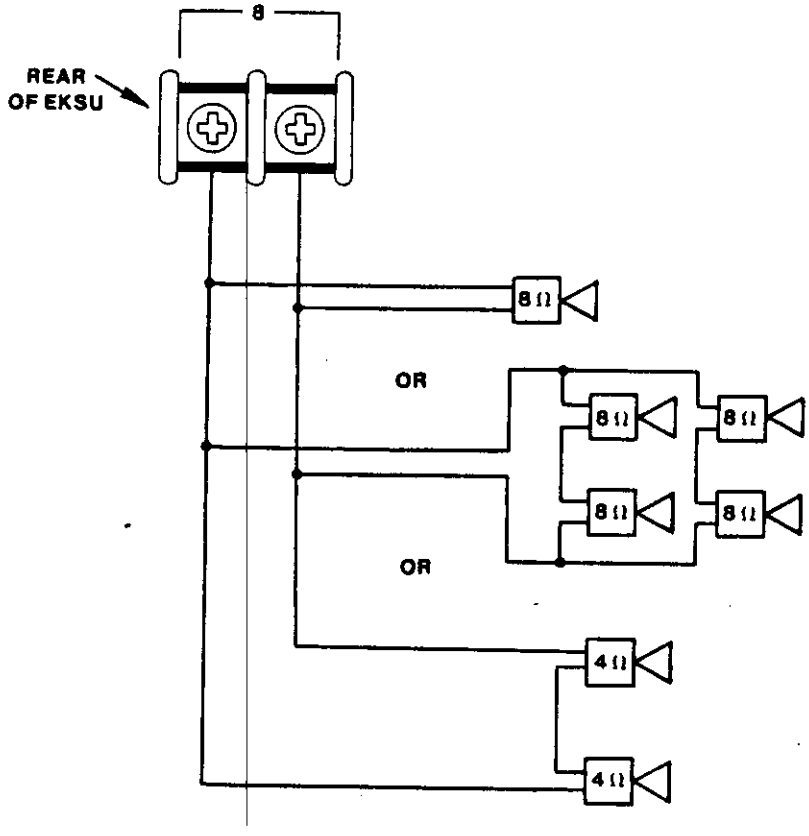


FIGURE 7—EXAMPLES OF DIRECT SPEAKER CONNECTION

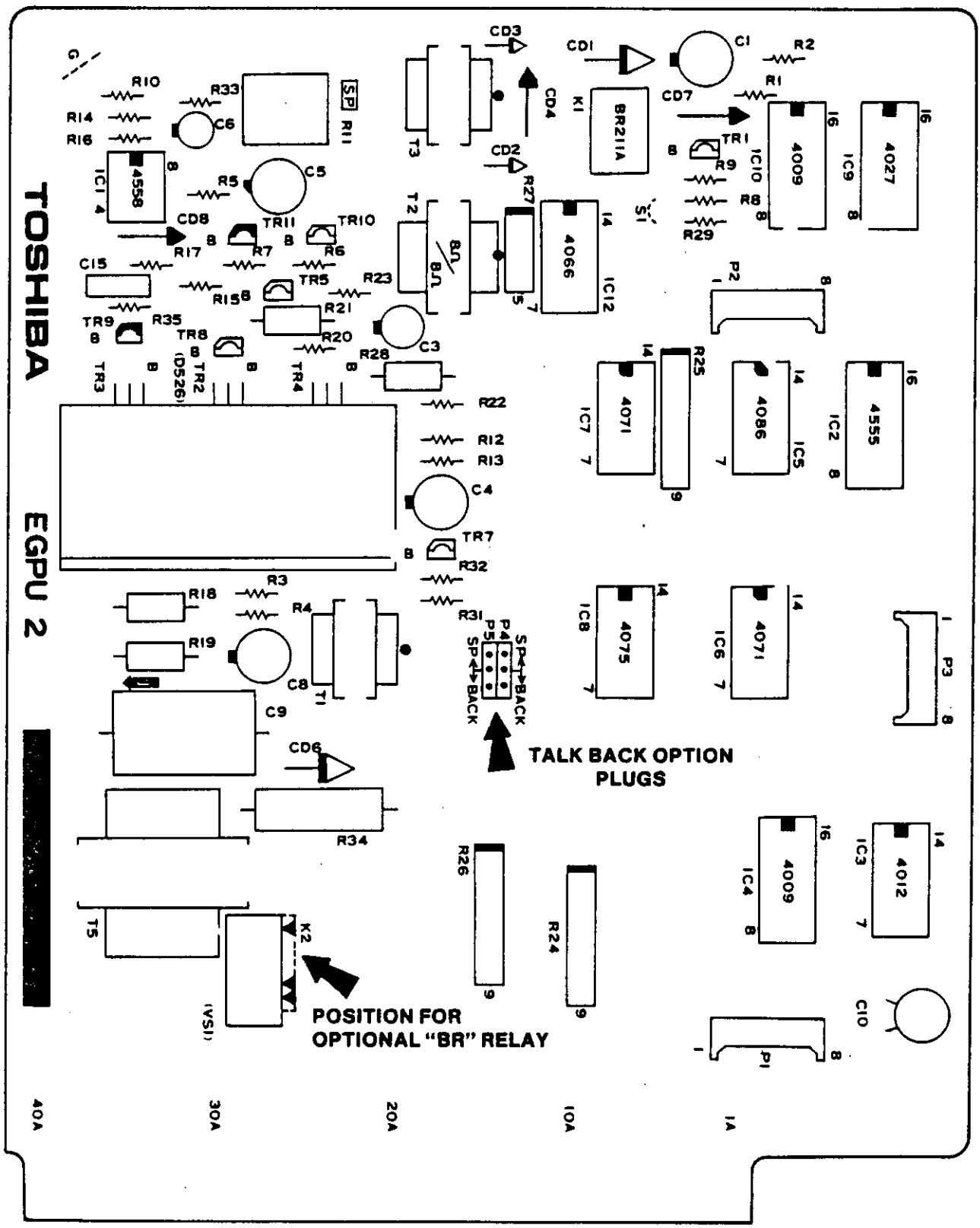


FIGURE 8— EGPU PCB PHYSICAL LAYOUT

SECTION 100-004-278
ISSUE 1, OCTOBER 1979

Strata III

GPAU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

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LIST OF FIGURES

1. GENERAL

1.1 The GPAU Printed Circuit Board (PCB) is an optional unit which allows "dip switch" assignment of extensions in a Strata III Electronic Key Telephone System (EKTS) to a Group Page zone. Use of GPAU eliminates the need for back plane wiring assignment in the service unit (EKSU or XKSU) in which it is present. The GPAU is used in conjunction with the optional EGPU PCB.

1.2 To allow dip switch assignment of extensions 10 thru 41 to a Group Page zone, a GPAU must be connected to the EGPU PCB installed in the EKSU.

1.3 To allow dip switch assignment of extensions 42 thru 61 to a Group Page zone, a GPAU must be connected to the EGPU PCB installed in the XKSU.

1.4 Before installing a new Strata III System in which GPAU's are to be employed, it is recommended that the programming procedure of the PCB be reviewed before assigning extension numbers to the stations in the system. Proper extension assignment will allow maximum use of the switches to assign extensions to Group Page zones, and minimize (if not eliminate) the need for wire-wrapping on the GPAU.

1.5 30 AWG insulated wire and a suitable wire wrap tool may be necessary to complete the programming of the GPAU, depending upon the complexity of the Group Paging assignments.

2. PROGRAMMING INSTRUCTIONS

IMPORTANT: PERSONNEL SHOULD BE CAREFUL TO DISCHARGE STATIC ELECTRICITY FROM THEIR PERSONS BEFORE HANDLING PCBS. THIS MAY BE ACCOMCOMPLISHED BY TOUCHING A PROPERLY GROUNDED EKSU OR XKSU CABINET. SEE SECTIONS 100-004-210 (EKSU) AND 100-004-215 (XKSU): POWER AND GROUNDING CONNECTIONS. DO NOT HANDLE PCB'S IN A CARPETED AREA.

2.1 Remove the GPAU PCB from its box and protective wrappings and place it, component side up, on a clean surface.

2.2 Packed with the GPAU will also be a small plastic bag containing 3 connector bars. Take the bars out of the bag and lay them aside for later use.

2.3 Referring to figure 1, locate the 4 rows of extension pins. When the GPAU is installed in the EKSU these pins represent extensions 10 thru 41, in consecutive order. When installed in the XKSU the same pins represent extensions 42 thru 61 (the last 4 pins in this case are functionless). The pin rows are labeled A, B, C, and D.

2.4 GROUP ASSIGNMENT OF "SWITCHED" PINS 17/49, 25/57, 33 AND 41

2.4.1 In the upper right-hand corner of the GPAU PCB is located Dip Switch Assembly (DSA) S1, equipped with 8 micro-switches, the functions of which are as follows:

- SWITCH NO. 1—may be used to assign pin 17/49 of row A to Group Page zone 1 by setting it in the ON position.
- SWITCH NO. 2—may be used to assign pin 17/49 of row A to Group Page zone 2 by setting it in the ON position.
- SWITCH NO. 3—may be used to assign pin 25/57 of row B to Group Page zone 1 by setting it in the ON position.
- SWITCH NO. 4—may be used to assign pin 25/57 of row B to Group Page zone 2 by setting it in the ON position.
- SWITCH NO. 5—may be used to assign pin 33 of row C to Group Page zone 2 by seting it in the ON position.
- SWITCH NO. 6—may be used to assign pin 33 of row C to Group Page zone 3 by setting it in the ON position.
- SWITCH NO. 7—may be used to assign pin 41 of row D to Group Page zone 2 by setting it to the ON position.
- SWITCH NO. 8—may be used to assign pin 41 or row D to Group Page zone 3 by setting it to the ON position.

2.5 By connecting additional extension pins to the "switched" pins cited in paragraph 2.4, the extensions represented will be assigned to

the same group page zone as the switched pin. Additional extension pins are connected to the switched pins by using the connector bars included with the GPAU or by using 30 AWG insulated wire and a suitable wire wrap tool.

2.7 HOW TO USE THE CONNECTOR BARS

2.7.2 By placing a connector bar on the first 11 extension pins, the installer may assign extensions 10 thru 20 (when the GPAU is to be used in EKSU) or extensions 42 thru 52 (when GPAU is to be used in the XKSU) to either Group Page zone 1 or 2 by setting switch 1 OR switch 2 on Dip Switch Assembly S1 to the ON position. (See figure 2). A lesser number of extensions may be assigned by cutting the connector bar to the appropriate length (diagonal cutters, etc.). However, pin 17/49 must be included in the group if dip-switch zone assignment is to be utilized.

NOTE: When placing a connector bar on extension pins, push the edge with the holes in it on first; this will allow easier connection.

2.7.3 If more than 11 stations are to be assigned to the first Group Page zone, a second connector bar should be cut to the appropriate length and placed on the appropriate pins, PLUS the last pin protruding thru connector bar #1 (see figure 3). In this manner up to 21 extensions may be assigned to the first zone.

NOTE: When 2 connector bars are placed as described in paragraph 2.7.3, switched pin 17/49 and switched pin 25/57 are both included in the first zone. Therefore only one need be assigned to a Group Page zone via Dip Switch Assembly S1. If each pin is inadvertently assigned to a different zone, continuity will be established between all extension pins in both zones. In this case dialing either zone would result in both zones being paged simultaneously.

2.7.4 Additional extensions may be assigned to the first zone by adding a third connector bar (of appropriate length) to the "chain" in the same manner as described above.

2.7.5 A second and third Group Page Zone may also be constructed using the above described procedure, being careful to alternate the connector bar "height" on the extention pins so that they do not touch each other (see figure 4).

NOTE: Observance of the following "rules" will allow the easiest GPAU programming:

- Whenever possible, assign consecutive extension numbers to stations to be included in the same Group Page zone.
- Note the "switched pin" extension numbers and include at least one of them in each Group Page zone.

2.8 AUXILIARY WIRE-WRAP PROGRAMMING

2.8.1 In installations where more complex Group Page zone assignments are required, 30 AWG insulated wire may be used to augment or replace the use of the connector bars.

NOTE: Each extension pin will accept only two wrap-on connections. Hence, if entire zones are to be formed by wire-wrapping, they must be wired one to the other in a chain-like manner. A switched pin should be included in the chain, allowing dip-switch assignment to the desired zone.

2.8.2 Above each row of extension pins (row A, row B, row C, and row D) appear 3 pins labelled G1, G2, and G3. These pins represent the three possible Group Page zones. (See figure 1).

2.8.3 In instances where extension pins are to be assigned to a group different from that of neighboring extension pins (preventing inclusion in a connector bar arrangement), the pin(s) may be assigned to the desired zone by wire-wrapping to the appropriate group pin (G1, G2, or G3). Figure 5 gives an example of a connector bar and wire wrap programming arrangement.

3.0 INSTALLATION INSTRUCTIONS

IMPORTANT: BEFORE INSTALLING ANY PCB IN AN EKSU OR XKSU THE SERVICE UNIT(s) MUST BE PROPERLY GROUNDED. SEE SECTION 100-004-210 (EKSU) and 100-004-215 (XKSU): POWER AND GROUNDING INSTRUCTIONS.

POWER SHOULD BE TURNED OFF ON THE FRONT PANEL OF THE EPRU PCB BEFORE INSERTING OR REMOVING PCB'S IN A WORKING SYSTEM. ALSO, ALL PCB'S ARE KEYED TO PREVENT INSERTION IN THE WRONG SLOT. THEREFORE, DO NOT USE EXCESSIVE FORCE TO INSERT PCB'S.

3.1 When the GPAU is fully programmed, it is ready to be installed on the EGPU PCB. Remove the EGPU from it's packing, observing the same static electricity precautions stated for the GPAU. If the EGPU is already in a working system, turn the system power off before removing it.

3.2 Align the pins of plugs P1, P2, and P3 of the GPAU with the corresponding sockets on the EGPU and slowly press the units together, observing that all pins slip properly into the correct holes.

3.3 Insert the EGPU with the connected GPAU into the proper slot in the service cabinet (EKSU or XKSU). In expanded systems receiving two EGPU/GPAU units, be sure to insert the unit programmed for extensions 10 thru 41 in the EKSU and the unit programmed for extensions 42 thru 61 in the XKSU.

3.4 After inserting the EGPU/GPAU unit(s), turn the power on at the EPRU PCB front panel. Check Group Page zone assignments for correctness. If corrections are necessary, be sure to turn system power off before removing units for reprogramming.

3.5 Should a system malfunction occur in a basic system (no XKSU) consult section 100-004-500.

3.6 Should a system malfunction occur in an expanded system (EKSU and XKSU) consult section 100-004-510.

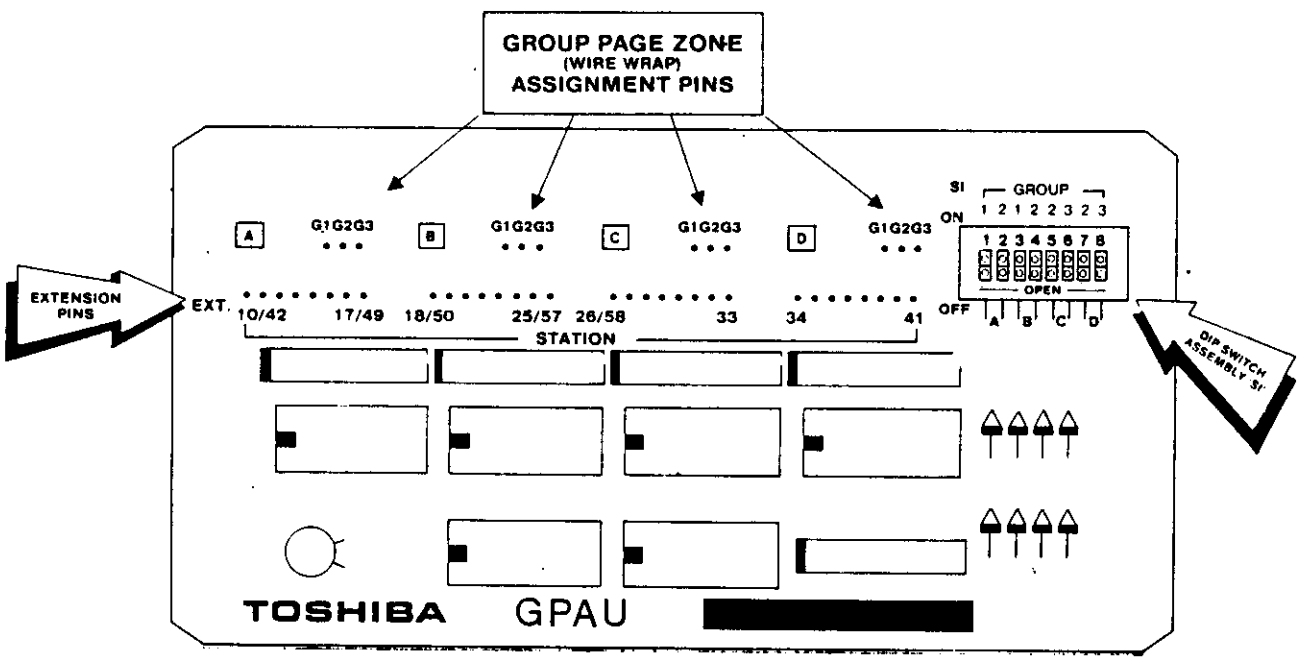


FIGURE 1-PHYSICAL LAYOUT OF GPAU PCB SHOWING PROGRAMMING POINTS

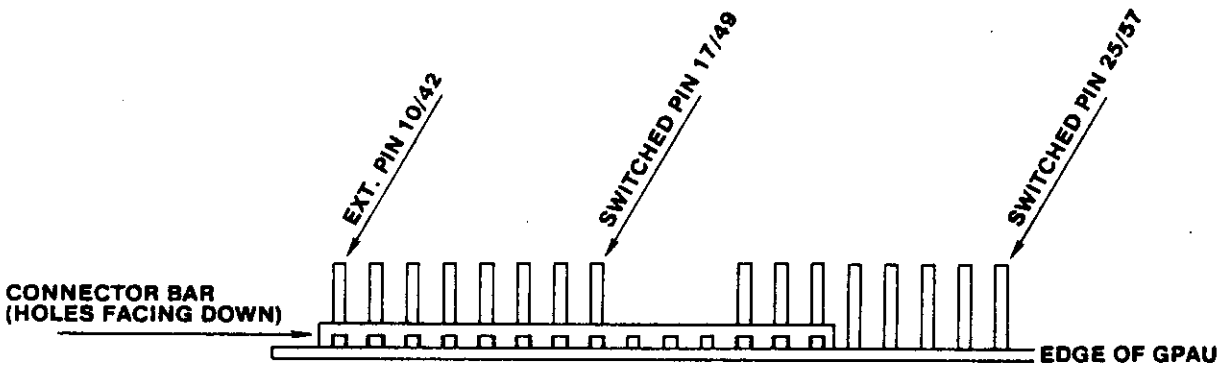


FIGURE 2-EXAMPLE OF CONNECTOR BAR PLACEMENT

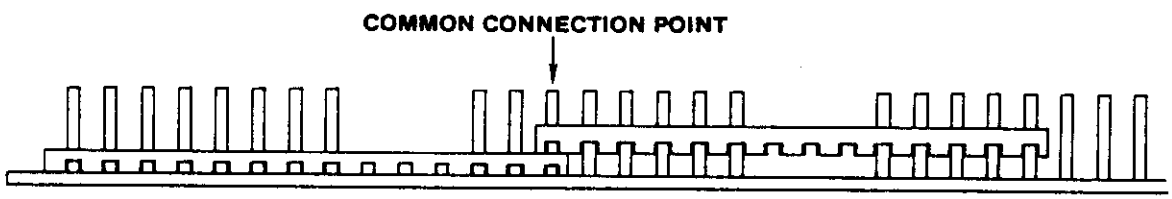


**FIGURE 3-EXAMPLE OF ZONE FORMATION
UTILIZING MORE THAN ONE CONNECTOR BAR**

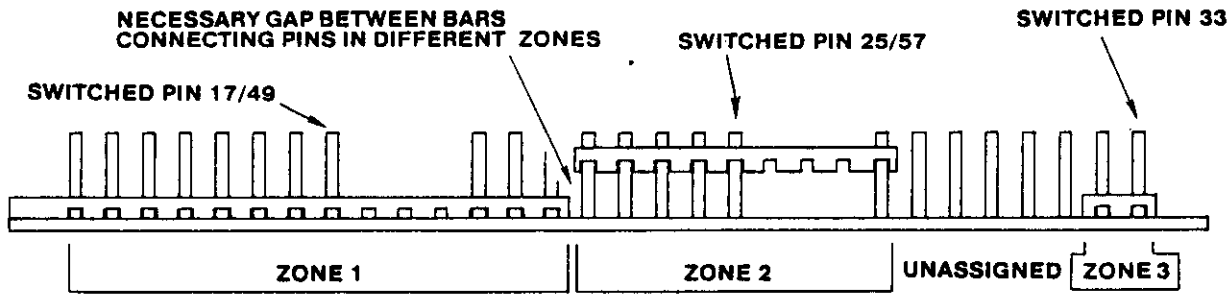
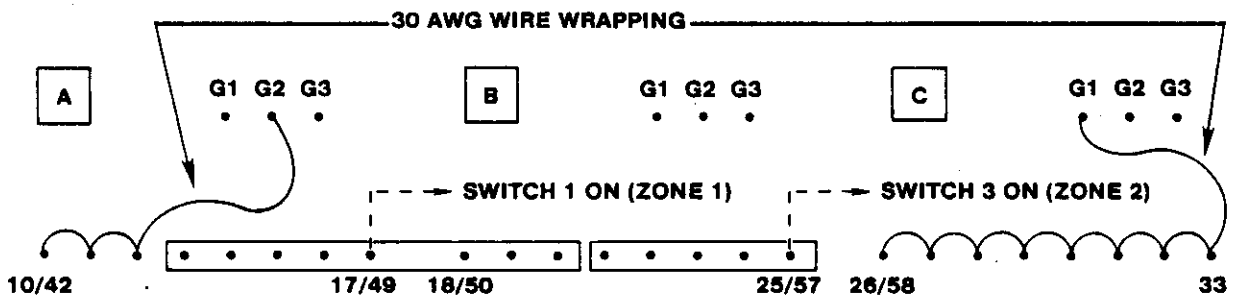


FIGURE 4-EXAMPLE OF 3 ZONE FORMATIONS UTILIZING CONNECTOR BARS



WITH GPAU/EGPU INSTALLED IN EKSU:

- EXTENSIONS 10, 11, AND 12 ARE WIRE-WRAP ASSIGNED TO ZONE 2 VIA PIN G2
- EXTENSIONS 13 THRU 20 ARE ASSIGNED TO ZONE 1 VIA SWITCH 1 AND "SWITCHED" PIN 17/49
- EXTENSIONS 21 THRU 25 ARE ASSIGNED TO ZONE 2 VIA SWITCH 3 AND "SWITCHED" PIN 25/57
- EXTENSIONS 26 THRU 33 ARE ASSIGNED TO ZONE 1 VIA PIN G1

FIGURE 5-EXAMPLE OF AUXILIARY WIRE WRAP CONNECTIONS

SECTION 100-004-280
ISSUE 1, SEPTEMBER 1979

Strata III

EASU PRINTED CIRCUIT BOARD

INSTALLATION INSTRUCTIONS

TABLE OF CONTENTS

LIST OF FIGURES

1. GENERAL

1.1 The proper programming and installation of the EASU Printed Circuit Board (PCB) in an EKSU or XKSU eliminates the need for backplane wiring in that particular service unit for the following system features:

- Optional PCB Replacement Strapping (EGPU, EDSU, EBLU, EILU)
- CO/PBX Line Ringing Assignment
- Auto-Release of Hold (on abandoned outside C.O. Line connections)
- Station Restriction of Outward Dialing

1.2 If Group Paging and/or External Paging are desired system features and a GPAU PCB is programmed and installed on the EGPU PCB(s), backplane wiring of any kind will be unnecessary. (See sections 100-004-276 and 100-004-278.)

1.3 In an expanded system containing an XKSU as well as an EKSU, one EASU PCB per cabinet is needed if the functions represented by the PCB are to be system-wide.

2. PROGRAMMING INSTRUCTIONS

IMPORTANT: AVOID HANDLING PCB'S IN A CARPETED AREA. DO NOT WALK THRU A CARPETED AREA WHILE HOLDING AN UNPACKED PCB. TAKE CARE TO DISCHARGE ANY STATIC ELECTRICITY FROM YOUR PERSON BY TOUCHING A PROPERLY GROUNDED SERVICE UNIT CABINET BEFORE WORKING ON OR INSTALLING A PCB.

2.1 Carefully remove the EASU PCB from its packing and lay it component side up on a clean surface.

2.2 EBLU, EILU, EDSU, EGPU CIRCUIT PROGRAMMING

2.2.1 When installing the EASU PCB in a previously existing system in which some or all of the following PCB's were NOT installed, the rear of the PCB connectors must be inspected and the designated strap(s) cut:

- NO EBLU—cut the strap from pin 5A to pin 8B o the rear of the EBLU connector.
- NO EGPU—cut the following straps on the rear of the EGPU connector in the EKSU (and XKSU if an expanded system):

  Pin 5A to Pin 5B
  Pin 6A to Pin 6B
  Pin 7A to Pin 7B
  Pin 20A to Pin 20B

- NO EILU—cut the following straps on the rear of the EILU connector in the EKSU (and XKSU if an expanded system):

  Pin 21A to Pin 21B
  Pin 22A to Pin 22B

2.2.2 **EGPU**—If an EGPU PCB will not be present in the EKSU or XKSU receiving the EASU PCB, set switches 1, 2, and 3 on Dip Switch Assembly "S8" to the "NO CARD" position (see Figure 1). If an EGPU PCB will be present in the same cabinet, be sure switches 1, 2, and 3 are in the "WITH CARD" position (see Figure 1).

2.2.3 **EDSU**—If an EDSU PCB will not be present in the EKSU (No EDSS console(s) in system), set switches 4, 5, and 6 of Dip Switch Assembly "S8" to the "NO CARD" position. If extension #10 will be equipped with an EDSS

(EDSU in EKSU) be sure that switches 4, 5, and 6 are in the "WITH CARD" position (see Figure 1).

IMPORTANT: IF EXTENSION #42 IN AN EXPANDED SYSTEM IS TO BE EQUIPPED WITH A SECONDARY EDSS, SWITCH #4 OF DIP SWITCH ASSEMBLY S8 ON THE EASU PCB BEING INSTALLED IN THE XKSU MUST BE SET IN THE "NO CARD" POSITION.

2.2.4 EBLU—If an EBLU PCB WILL NOT be present in the EKSU (no EDSS or EBLF in system) set switch 7 of Dip Switch Assembly "S8" in the "NO CARD" position. If an EBLU will be present in the system be sure that switch 7 is in the "WITH CARD" position. EBLU programming is nonfunctional on an EASU being installed in an XKSU.

2.2.5 EILU

2.2.5.1 If an EILU PCB will not be present in the EKSU (no "Special Illuminations" for the primary EDSS position—extension#10), switch #8 of Dip Switch Assembly "S8" on the EASU being installed in the EKSU must be set in the "NO CARD" position (see Figure 1). If an EILU will be present in the EKSU be sure the switch is set in the "WITH CARD" position.

2.2.5.2 If an EILU PCB will not be present in the XKSU (no "Special Illuminations" for the secondary EDSS position—extension #42) switch #8 of Dip Switch Assembly "S8" on the EASU being installed in the XKSU must be set in the "NO CARD" position (see Figure 1). If an EILU will be present in the XKSU be sure the switch is set in the "WITH CARD" position.

2.3 AUTOMATIC RELEASE OF HOLD

2.3.1 Proper programming of the Automatic Release of Hold (AROH) feature insures that a call placed on hold within the system will release from the hold condition should the distant party disconnect. In expanded systems be sure to program both EASU PCB's. Refer to Figure 1 when performing the following steps.

2.3.1.1 If AROH is not desired as a system feature, set switch #1 of Dip Switch Assembly S7 to the "OFF" position.

2.3.1.2 If AROH is desired as a system feature set switch #1 to the "ON" position, and set switch #2 as follows:

- If the C.O. lines originate from an "ESS-type" Central Office set swtich #2 on Dip Switch Assembly "S7" to the "ESS" position.
- If the C.O. lines originate from a "cross-bar" or "step by step" type Central Office set switch #2 to the "XB" position.

NOTE: Model 102 EKSU's have backplane straps in place on the EASU connector to provide ESS Central Office compatability without the need for modification or the presence of an EASU PCB. Should the C.O. serving the STRATA III system be other than an ESS-type, these straps must be cut before installing the EASU PCB:

Pin 3A to Pin 3B

Pin 4A to Pin 4B

2.3.2 AROH LED INDICATOR—An LED is located on the front panel of the EASU PCB which will lite if the AROH switch settings of Dip Switch Assembly S7 do not agree with existing AROH wiring on the rear of the EASU connector. The AROH strappings should be cut and the EASU programmed instead. Refer to section 100-004-210; "AUTO RELEASE FROM HOLD" for proper strap identification (the strapping options are the same in the EKSU and XKSU).

2.4 STATION RESTRICTION FROM OUTWARD DIALING

2.4.1 By properly programming the EASU PCB, individual stations in the STRATA III system may be prevented from accessing and dialing out on an idle outside line.

NOTE: Restricted stations may still answer incoming calls and access and dial out on idle outside lines placed on hold by an unrestricted station, allowing key stations (ie: an operator) to control access to outside lines without having to dial for restricted stations.

2.4.2 When installing an EASU PCB in an existing system, previously existing backplane restriction strapping must be cut before programming for restriction on an EASU PCB (see

section 100-004-210). Strapping options are the same in an EKSU and XKSU.

2.4.3 Station Restriction is accomplished via Dip Switch Assemblies "S9" thru "S12" on the EASU PCB (see Figure 1).

2.4.4 When installed in the EKSU the switches of assemblies "S9" thru "S12" represent, in consecutive order, extensions 1 thru 41.

2.4.5 When installed in the XKSU the same switches represent extensions 42 thru 61.

2.4.6 Restriction is accomplished by setting the representative switch of the station to be restricted to the "RESTR" position.

2.4.7 Be sure switches are in the "OFF" position for all stations not to be restricted.

NOTE: Though represented, extensions 10 and 42 cannot be restricted because of special backplane wiring considerations (both extensions are potential EDSS attendant stations). Therefore switch #1 of Dip Switch Assembly S7 is functionless in either position.

2.5 OUTSIDE LINE RINGING ASSIGNMENT

2.5.1 If the factory-wired "common-ring" circuit on the backplane of the EKSU (and XKSU if present) has not been altered extension #10 will ring for lines 1 thru 16 without EKSU Ringing Assignment programming, providing the following is also true:

- Switch #7 of Dip Switch Assembly S8 on the EASU being installed in the EKSU is positioned properly (see paragraph 2.2.3 of this section).
- If an EBLU PCB will be present in the EKSU, the "NT" option plugs P1 and P2 on the card must be in the "DAY" positions.

2.5.2 If this arrangement is satisfactory EASU Ringing Assignment will not be necessary.

NOTE: If an EBLU is present and the N.T. plugs are in the "NT" positions, extension #11 will ring instead of extension #10 with the N.T. feature idle (for Night Transfer considerations see paragraph 2.5.8).

2.5.3 If the backplane common ring circuit has been altered in either the EKSU or XKSU and the resulting ring pattern is no longer desirable, the circuit should be isolated and "abandoned" by performing the following appropriate step and the EASU progammed for ring assignment:

- No EBLU—Set switch #7 of Dip Switch Assembly S8 on the EASU PCB in the EKSU to the "WITH CARD" position.
- With EBLU—Set "NT" plugs P1 and P2 on the EBLU so that the plugs are seated on only one pin each (see Figure 2).

IMPORTANT: IF THE EASU IS TO BE PROGRAMMED FOR RINGING ASSIGNMENT AND DIRECT ECOU TO EVCU RINGING ASSIGNMENT WIRING HAS BEEN PREVIOUSLY INSTALLED ON THE EKSU AND/OR XKSU BACKPLANE, THESE STRAPPINGS MUST BE CUT (REFER TO SECTION 100-004-210 AND SECTION 100-004-215): INCOMING CALL SIGNALING.

IF THE EASU PCB IS BEING PROGRAMMED FOR RINGING ASSIGNMENT AND EXTENSIONS OTHER THAN 10, 11, 42, OR 43 ARE TO RING ON OUTSIDE LINES, 30 AWG INSULATED WIRE AND AN APPROPRIATE WIRE WRAP TOOL WILL BE REQUIRED.

2.5.4 Outside lines appearing in the STRATA III system may be programmed via the EASU PCB as one group to ring at one or more stations; assigned individually or in groups to ring at multiple stations; or arranged in 3 "DAY" or "NIGHT" ringing groups and one "combined ring" group controlled by the optional Night Transfer feature.

2.5.5 If any of the extensions 10 thru 41 are to be programmed to ring for incoming calls, an EASU PCB should be installed in the EKSU. If any of extensions 42 thru 61 are to ring an EASU should be installed in the XKSU.

2.5.6 SIMPLE "COMMON RING" CIRCUIT PROGRAMMING FOR EXTENSIONS 10, 11, 42 AND 43

2.5.6.1 The EASU PCB is equipped with 6 Dip Switch Assemblies which may be used to

assign the outside lines appearing in the system to two ringing groups. The first 22 switches on assemblies "S1" thru "S3" represent the 22 possible outside lines in consecutive order, and are used to assign a line to Ring Group #1 (see Figure 1).

2.5.6.2 Lines assigned to Ring Group #1 by having their representative switches set in the "ON" position will "ring thru" to pin "COB" on the EASU PCB (see Figure 1).

2.5.6.3 With option plugs P1 and P2 in the standard "DAY" positions (see Figure 1) lines ringing thru to pin COB will also ring thru on pin D/N, providing the N.T. feature is not active (for ring programming in systems with Night Transfer see paragraph 2.5.8).

2.5.6.4 When the EASU PCB being programmed is to be installed in an EKSU switch 7 on Dip Switch Assembly S3 represents extension 10, as marked (see Figure 1). When this switch is set in the "ON" position, extension 10 is connected to pin D/N and will ring for any line assigned to Ring Group #1.

2.5.6.5 By assigning all lines in the system to Group #1, programming extension #10 to ring and having N.T. option plugs P1 and P2 in the "DAY" positions, a "common ring" circuit is established for extension #10 (see Figure 3).

2.5.6.6 Similarly, switch #7 on Dip Switch Assembly S6 represents extension #11. When in the "ON" position extension #11 is connected to pin D/N and will also ring for any lines assigned to Group #1.

2.5.6.7 When the EASU PCB is installed in the XKSU switch #7 on Dip Switch Assembly S3 represents extension #42 while #7 on "S6" represents extension #43, allowing both of these extensions to be connected to Ring Group #1 as previously described for extensions 10 and 11.

2.5.7 ADDITIONAL RING GROUP FORMATION AND RINGING EXTENSION ASSIGNMENTS

2.5.7.1 Switches 1 thru 22 on Dip Switch Assemblies S4 thru S6 are used to assign any active outside line to Ring Group #2. Ring Group #2 will ring thru to pin "COC" (see Figure 1).

2.5.7.2 The EASU PCB is also equipped with 32 station pins (see Figure 1). When installed in the EKSU these pins represent extensions 10 thru 41. When installed in the XKSU the same pins represent extensions 42 thru 61 (the remaining pins in the latter case become functionless).

2.5.7.3 By strapping selected station pins directly to pin COB (ring Group #1) or pin COC (ring Group #2) other stations may be assigned to ring for either group.

NOTE: No station pin may be wired to more than one ring group.

2.5.7.4 A second row of 22 pins, located directly below the station pins, represent, in consecutive order, the 22 possible lines in the system and are referred to collectively as "COA" (see Figure 1). By wiring selected line pins together, one to the other, and wiring the last pin in the "chain" to a station pin, the respective station will ring on those lines.

NOTE: Dip Switch Assemblies S1 thru S3 are diode-isolated from assemblies S4 thru S6. The line pins are similarly isolated from the Dip Switch Assemblies, allowing the same lines to appear in multiple groupings. However an extension may "ring" for only one group.

2.5.7.5 Direct station pin wiring to pins COB, COC, or to any of the pins comprising COA will cause the respective extension(s) to ring for that group at all times. For Night Transfer ringing options see paragraph 2.5.8.

2.5.8 NIGHT TRANSFER RINGING OPTIONS

2.5.8.1 In addition to or in place of the ring circuits described in the preceding paragraphs outside lines appearing in the STRATA III system may be arranged in up to 3 "switched" ringing groups and one combined "switched" ringing group which will operate in an "either-or" manner under the control of the N.T. button appearing on an EDSS console.

2.5.8.2 With N.T. option plugs P1 and P2 on the EASU PCB(s) in the "DAY" positions, and upon operation of the N.T. key on an EDSS console the following occurs (refer to Figure 4):

- GROUP PIN 1 is connected to pin "COB" (Ring Group #1)
- GROUP PIN 2 is connected to "COC" (Ring Group #2)
- GROUP PIN 3 is connected to "N/D3" (Ring Group #3)
- ALL GROUPS PIN D/N becomes inactive.

2.5.8.3 Release of the N.T. key (lamp off) results in the following (refer to Figure 5):

- GROUP PIN 1 becomes inactive
- GROUP PIN 2 becomes inactive
- GROUP PIN 3 becomes inactive
- ALL GROUPS PIN D/N is connected to pins COB, COC, and N/D3.

NOTE: In an expanded system containing a second EDSS console, either console may activate the Night Transfer Feature, providing the console has signaling transfer (TRNS) control (LED ON). For feature description see section 100-004-245.

2.5.8.4 Switch #7 on Dip Switch Assembly "S3" may be used to "quick connect" station pin #10/42 to Combined Group pin D/N by setting it to the "ON" position, causing the represented extension to ring for lines assigned to any group when the N.T. feature is idle (lamp off) and cease to ring when the feature is activated (lamp on).

2.5.8.5 Switch #7 on Dip Switch Assembly "S6" may be used in a similar manner to connect station pin 11/43 to pin D/N and have extension 11 or 43 ring in an identical fashion.

2.5.8.6 Switch #8on Dip Switch Assembly "S3" may be used to connect station pin 11/43 to Group pin 1, while Switch #8 on Dip Switch Assembly "S6" may be used to connect extension pin 10/42 to Group pin 1, causing the represented extension to ring for any lines assigned to Group 1 when the nite feature is activated.

NOTE: The actual extension that will ring with regard to above Dip Switch assignment (10 or 42, 11 or 43) depends on which cabinet (EKSU or XKSU) the EASU PCB is installed in.

2.5.8.7 Additional station pins may be wired to pins 10/41 or 11/42, causing the respective additional extensions to ring for the same lines assigned to 10/42 or 11/43.

2.5.8.8 By wiring selected station pins on the EASU PCB to either Group Pin 1, 2, or 3, the respective stations will ring for that group of lines when the N.T. feature is activated (lamp on) and cease to ring when the feature is released (lamp off).

2.5.8.9 By wiring selected station pins to the ALL GROUPS PIN D/N the respective stations will ring for lines assigned to any group when the N.T. feature is idle (lamp off) and not ring when the N.T. feature is on.

2.5.8.10 By moving the N.T. option plugs to the "NT" positions the operation of the N.T. feature as described above is reversed. GROUP PINS 1, 2 and 3 will be active when the N.T. feature is idle (lamp off) while ALL GROUPS pin D/N will be active when the N.T. feature is on (lamp on). Refer to Figures 6 and 7.

2.5.8.11 In an expanded system, Ring Group assignment on the EASU installed in the EKSU is independent of the ring group assignment performed on the EASU installed in the XKSU. This allows lines assigned to ring groups on one EASU to be assigned to different ring groups on the second EASU.

2.5.8.12 In addition to the above consideration, the N.T. option plugs (P1 and P2) on one EASU may be in the "DAY" position, while the N.T. plugs on the second EASU are in the N.T. position. This allows the Night Transfer arrangements of one EASU to be opposite the arrangement of the second EASU.

EXAMPLE: EKSU (EXTENSIONS 10 THRU 41)—N.T. plugs in "DAY" position, causing extensions assigned to one of the three individual "switched" groups to ring when the N.T. feature is on and extensions assigned to the "combined group" signal to ring when the N.T. feature is off.

XKSU (EXTENSIONS 42 THRU 61)—N.T. plugs in the N.T. position, causing extensions assigned to one of the three "switched" groups to ring when the N.T. feature is off and extensions assigned to the combined group signal to ring when the N.T. feature is on.

2.5.9 SUMMARY OF RINGING OPTIONS

2.5.9.1 To have additional or different stations ring, other than extensions 10, 11, 42, or 43, the station and line wiring pins will have to be utilized (refer to paragraphs 2.5.7.2 thru 2.5.7.5).

2.5.9.2 To assign additional stations to any of the 3 "switched" (N.T. feature controlled) groups wire wrap the representative station pin(s) to the desired GROUP PIN.

2.5.9.3 To assign additional stations to the switched "combined signal" ring group, wire wrap the representative station pin(s) to pin D/N.

2.5.9.4 To assign stations to Group 1 on a permanent, non-switched basis (not affected by N.T. feature) wire wrap the representative station pin(s) to pin COB.

2.5.9.5 To assign stations to Group 2 on permanent non-switched basis wire wrap the representative station pins to pin COC.

2.5.9.6 To assign stations to Group 3 on a permanent non-switched basis wire wrap the representative station pins to pin N/D3 IN.

2.5.9.7 To assign stations to ring on individual lines or groups of lines other than the 3 main ring groups, wire wrap the representative station pins directly to the "COA" line pin(s).

2.5.9.8 Figure 8 illustrates the EASU PCB's potential for multiple ring arrangements:

- Outside lines 1 thru 5 have been assigned to Group #1 via Dip Switch Assembly S1.
- Outside lines 6 thru 10 have been assigned to Group #2 via Dip Switch Assemblies S4 and S5.
- Outside lines 11 thru 15 have been directly wired to station pin 12.
- Outside lines 16 thru 20 have been assigned to Ring Group #3 via wiring from the respective line pins to pin N/D3 IN.

2.5.9.9 With the N.T. option plugs in the "NT" position, station pin straps installed as shown, and the PCB depicted installed in an EKSU, the following ring patterns would occur:

- LINES ONE THRU FIVE—will ring on extension #31 when the N.T. feature is idle (Group pin #1 wired to station pin #31), ring at extension #39 at all times (pin COB wired to station pin #39) and ring at extension #37 when the N.T. feature is activated (pin D/N to station pin #37)

  Lines 1 thru 5 would also ring at extension #10 when the N.T. feature is idle (Dip Switch Assembly S6 switch #8 on—connection to Group #1 pin) and at extensions 10 and 11 when the N.T. feature is on (switch #7 of Dip Switch Assembly S3 on, switch #8 of S6 on —connecting extension 10 to Group 1 pin and 11 to pin D/N).
- LINES SIX THRU TEN—will ring at extension #33 when the N.T. feature is idle via Group 1 pin; will ring at extension #41 at all times via COC pin and will ring at extensions #10 and 11 as part of the combined signal from pin D/N when the N.T. feature is ON (Dip Switch Assembly S3—switch #7 On, Dip Switch Assembly S6—switch #7 On).
- LINES 11 THRU 15—will ring ONLY at extension #12 and at all times via direct wiring from the respective line pins to extension pin #12.
- LINES 16 THRU 20—are assigned via line pin wiring. The respective line pins are wired to pin N/D3 IN, forming ring group 3. Pin N/D3 IN is also wired to extension pin #29, causing lines 16 thru 20 to ring at this extension at all times. Lines 16 thru 20 will also be included in the combined signal when it appears at pin D/N; thus ringing at extensions 10, 11 and 37 when the N.T. feature is on.

3. INSTALLATION INSTRUCTIONS

IMPORTANT: BEFORE INSTALLING ANY PCB IN AN EKSU OR XKSU THE SERVICE UNIT(S) MUST BE PROPERLY GROUNDED. SEE SECTIONS 100-004-210 AND 100-004-215: POWER AND GROUNDING CONNECTIONS.

3.1 Remove the front cover(s) from the EKSU (and XKSU, if present).

NOTE: If the cabinet to receive the EASU PCB is an EKSU model 102 and the Central Office supplying the outside lines is a non-ESS type, the rear cover will also have to be removed and the following straps on the rear of the EASU connector cut:

PIN 3A to PIN 3B

PIN 4A to PIN 4B

The rear cover may now be replaced.

3.2 Locate the EPRU PCB in the EKSU and set the power supply switch to the OFF position.

3.3 Insert the EASU PCB in the proper slot in the cabinet(s).

3.4 Turn the power back on.

3.5 Test all system functions and EASU feature operations. If an EASU feature operation malfunctions, turn the power off at the EPRU, remove the EASU and check the programming. Insert the PCB, turn the power on, and re-test.

3.6 If a system malfunction occurs, consult section 100-004-500 or 100-004-510.

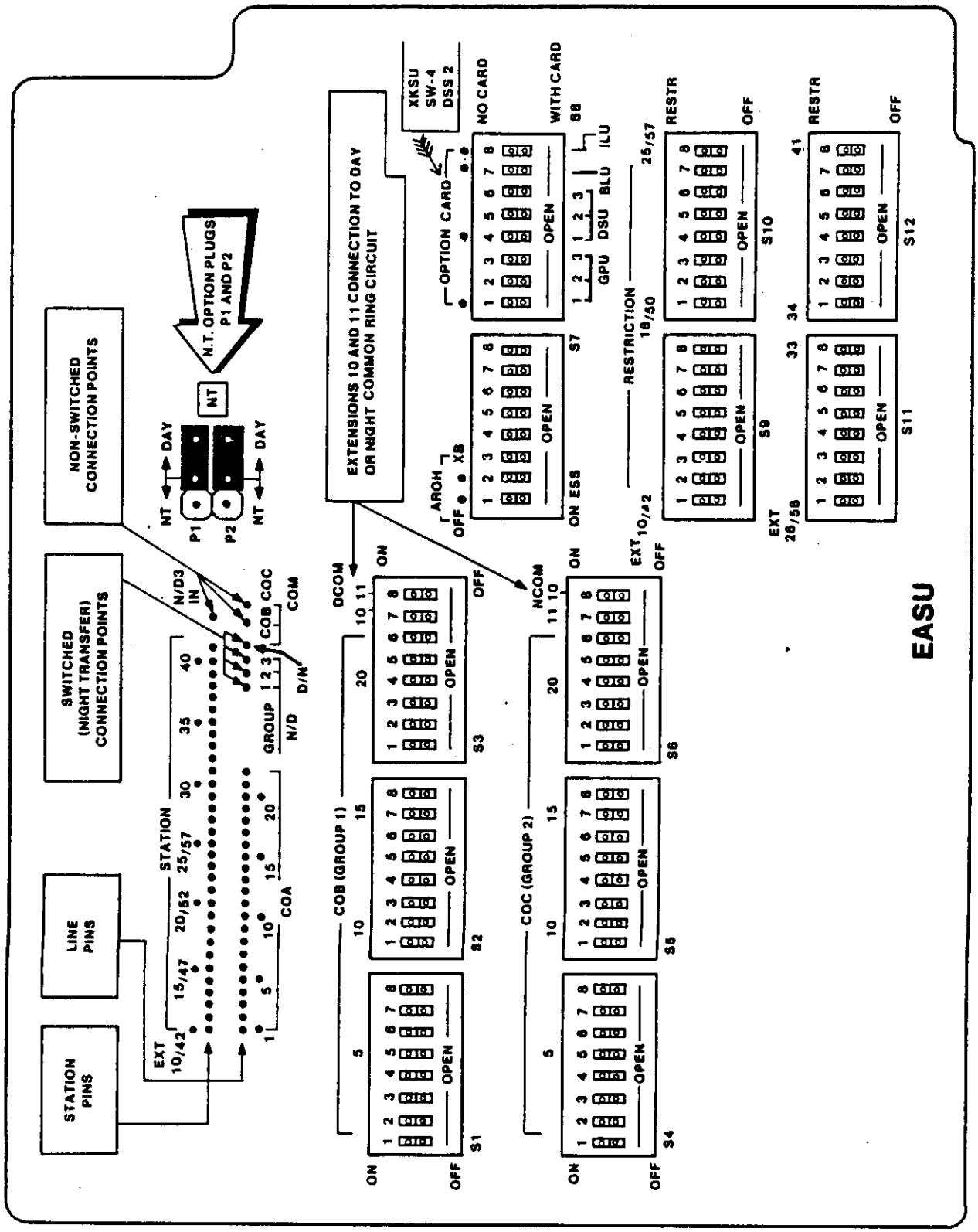


FIGURE 1 – EASU PCB PROGRAMMING POINT LOCATIONS

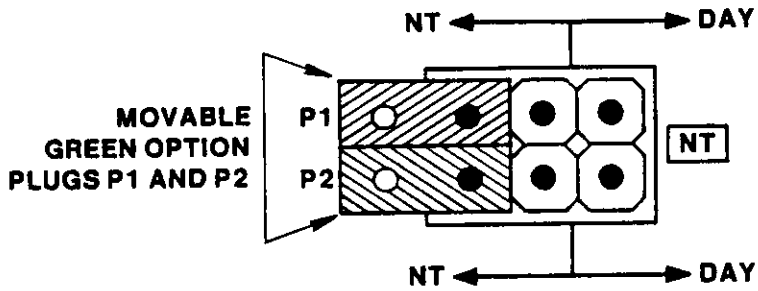


FIGURE 2—ISOLATION OF BACKPLANE COMMON RING CIRCUIT(S) ON EBLU PCB

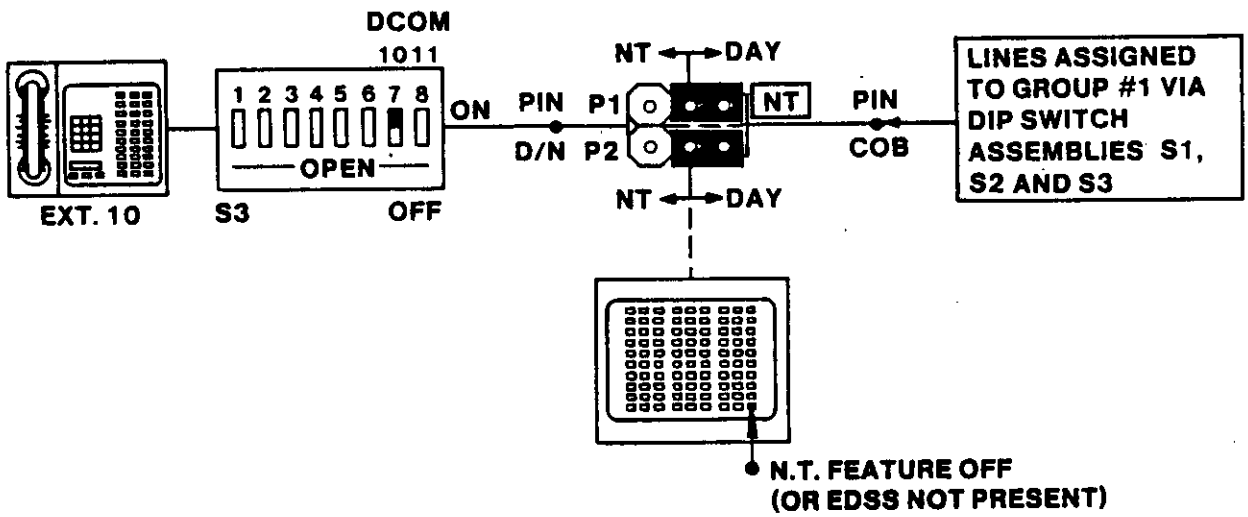


FIGURE 3—EXTENSION #10 CONNECTION
TO COMMON RING CIRCUIT

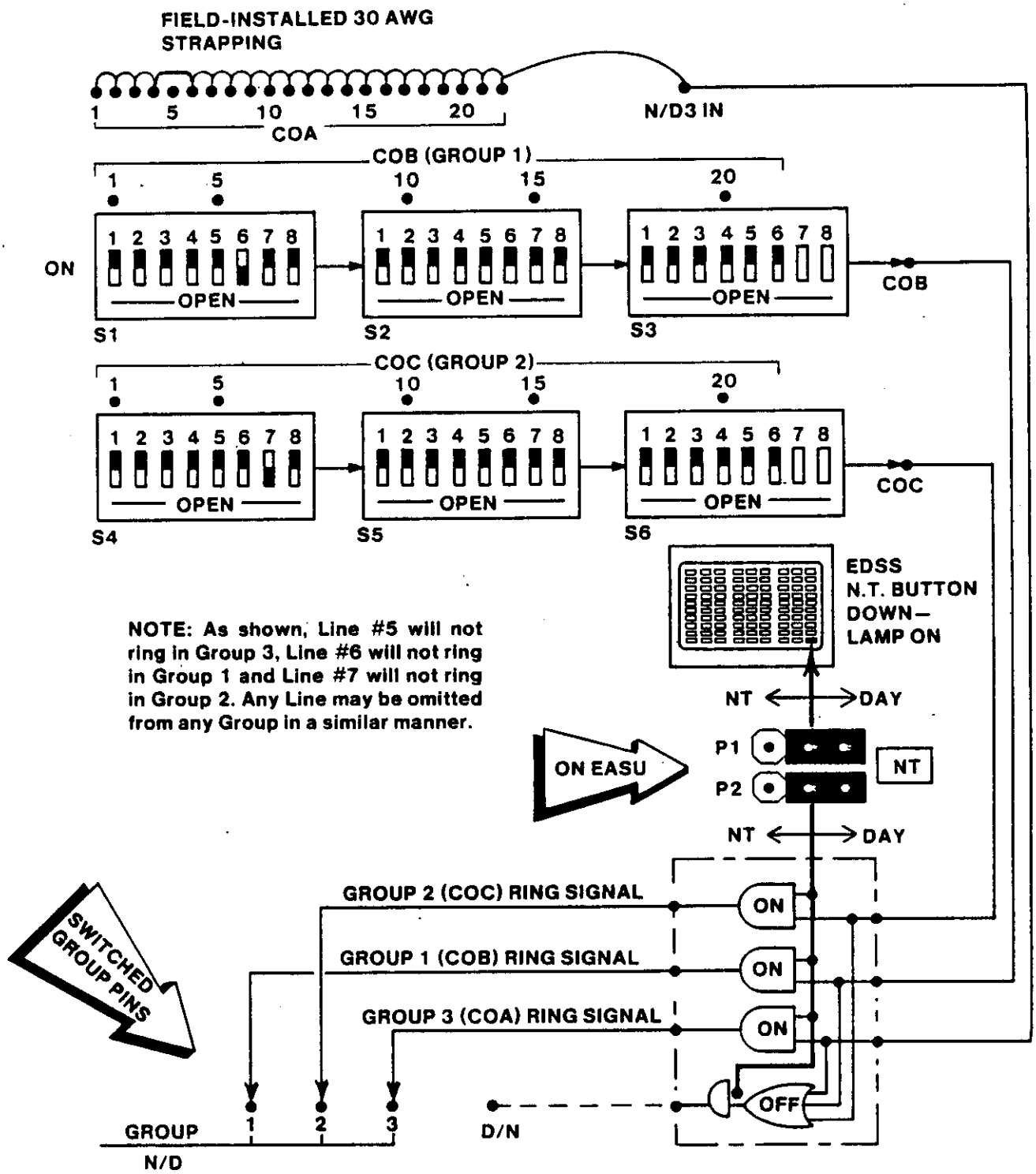


FIGURE 4—GROUPED RINGING WITH N.T. FEATURE ON

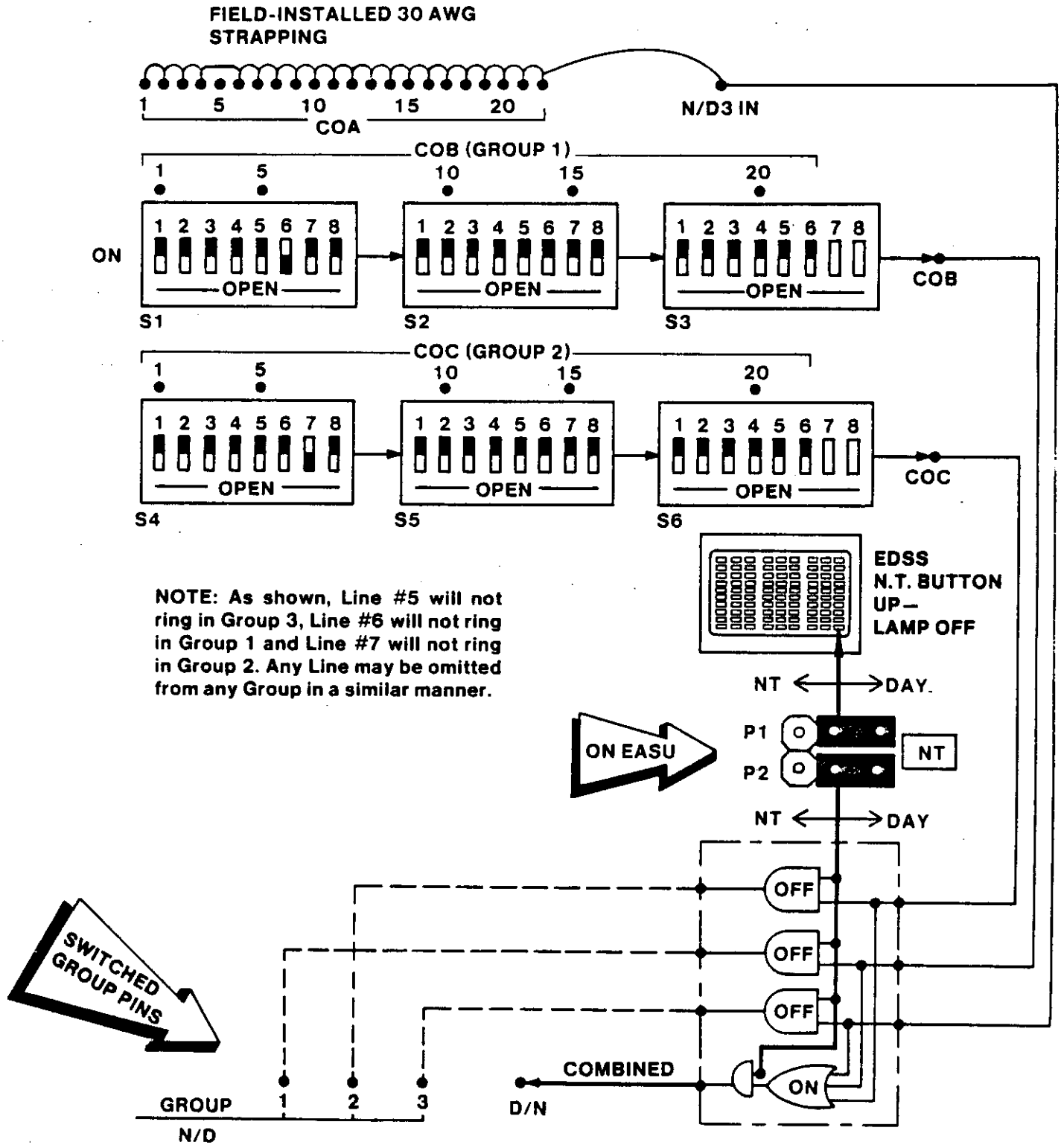


FIGURE 5—COMBINED RINGING WITH N.T. FEATURE OFF

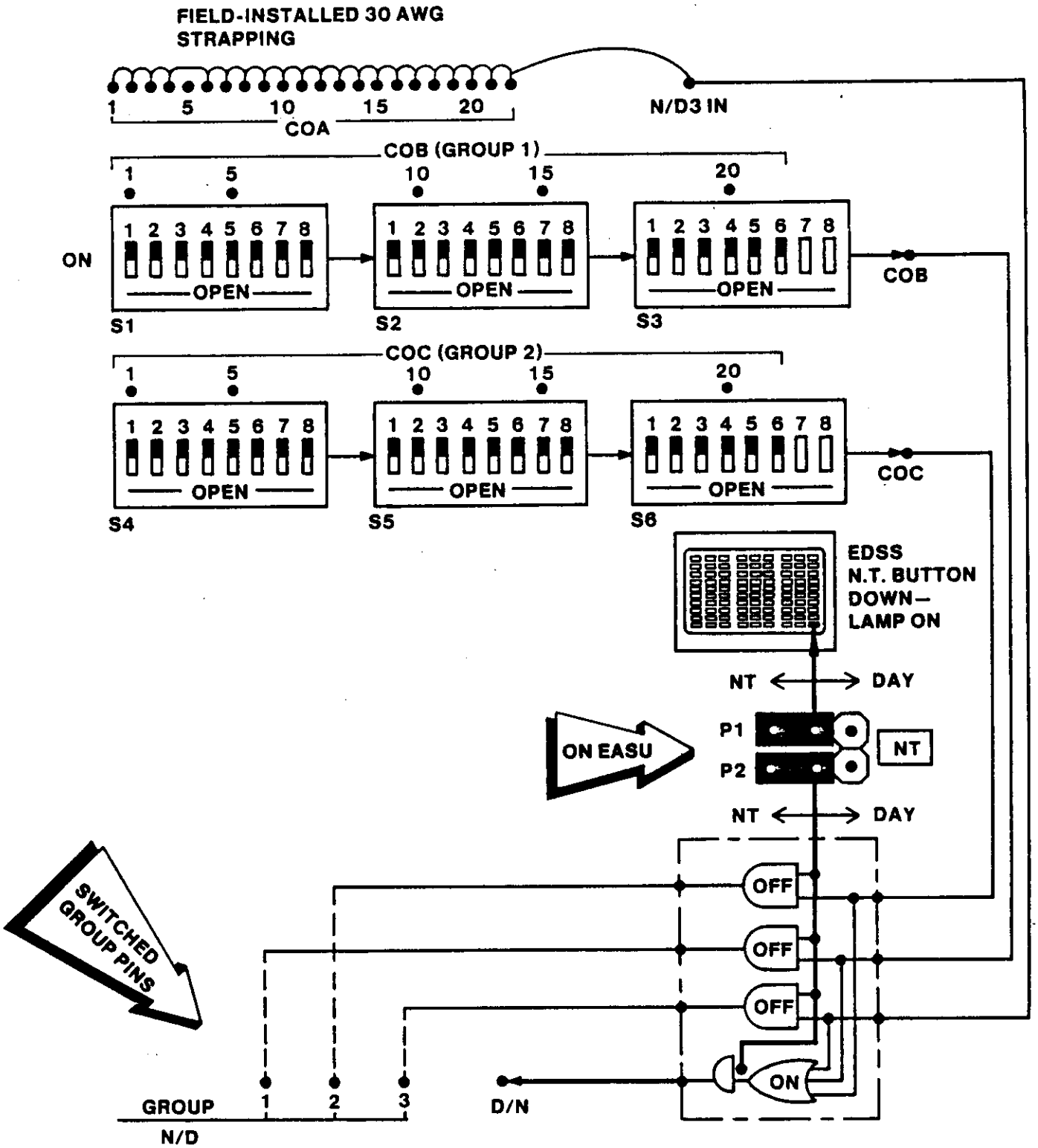


FIGURE 6—COMBINED RINGING WITH N.T. FEATURE ON

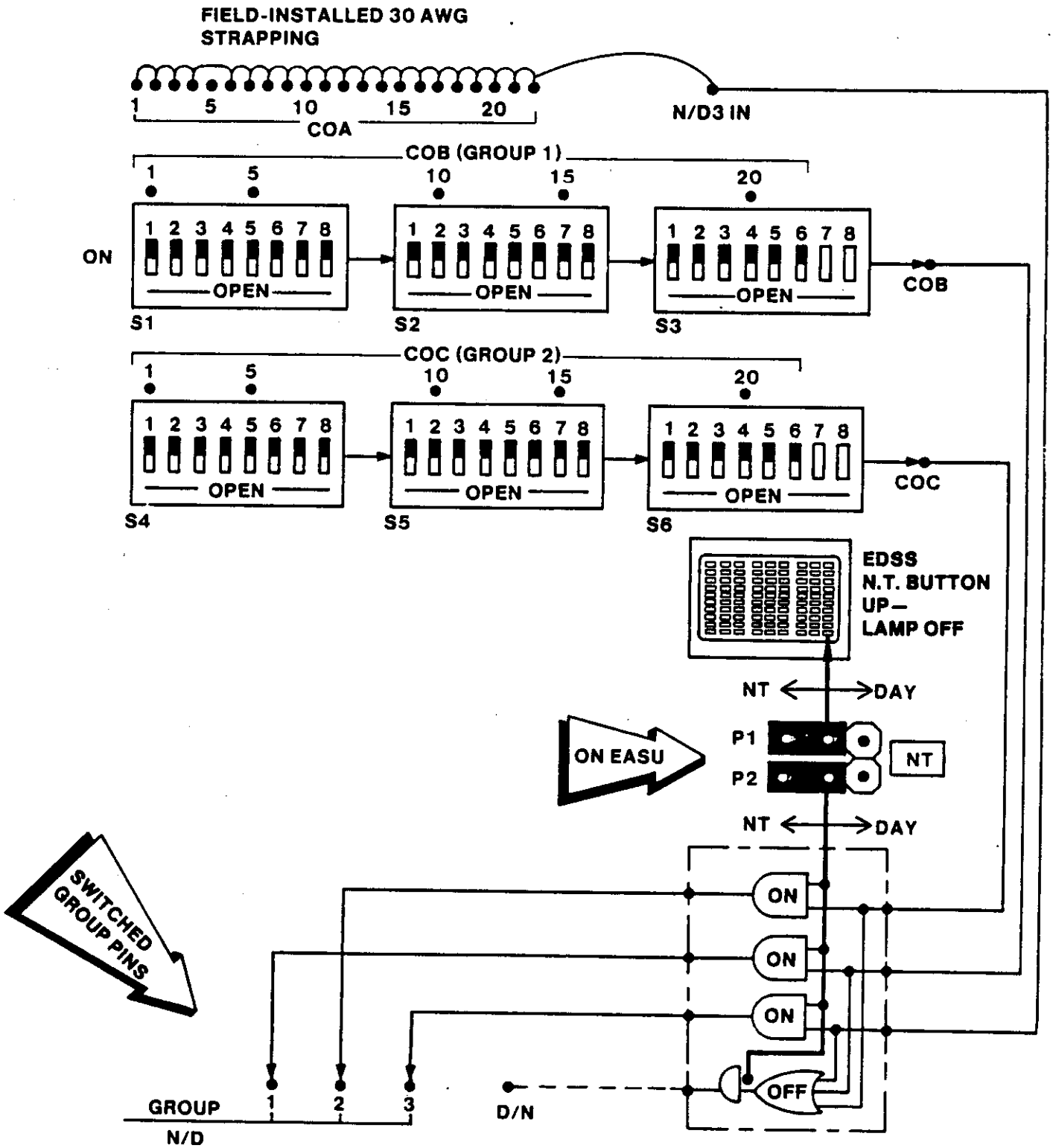


FIGURE 7—GROUPED RINGING WITH N.T. FEATURE OFF

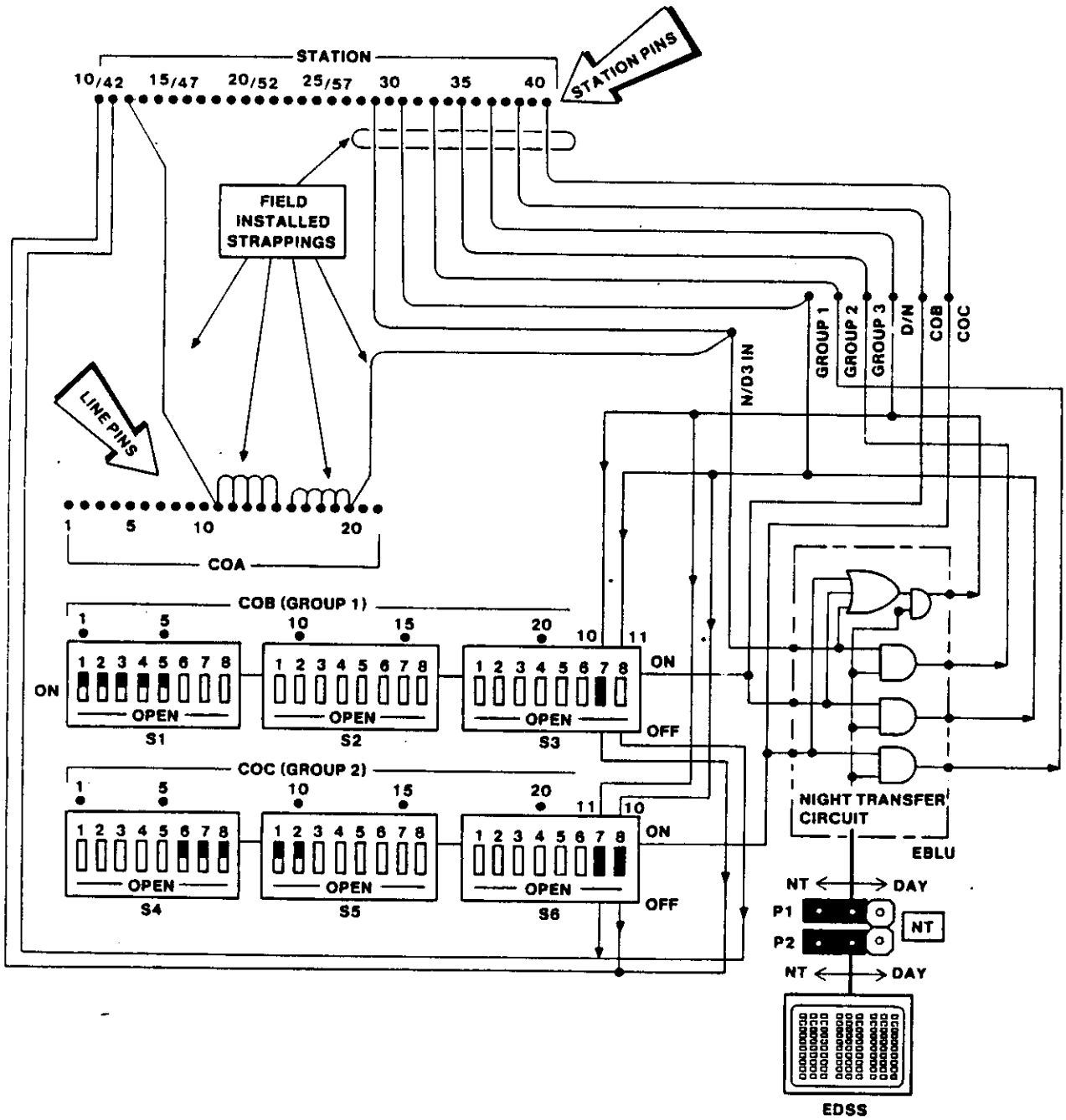


FIGURE 8—MULTIPLE EASU RING PROGRAMMING