WIN MARATHON & MARATHON-CTX
INSTALLATION MANUAL

WIN COMMUNICATIONS CORPORATION

Technical Manual
March 1991

MARATHON
INSTALLATION MANUAL

INTRODUCTION

This manual provides the information required to install, program and service the **MARATHON** Electronic Key Telephone System.

The **MARATHON** may be equipped with a **CPU-A** or one of three currently available central processor units; **CPU-B, CPU-B2,** or **CPU-C.** The appropriate CPU is selected based upon the user's need.

This manual is divided into 10 chapters as follows:

CHAPTER 1: MARATHON ELECTRONIC KEY TELEPHONE SYSTEM

Chapter 1 includes information pertaining to the **MARATHON** including:

- Regulatory Information
- Installation procedures
- Features and programming data for CPU-A

CHAPTER 2: MARATHON CPU-B

Chapter 2 includes information pertaining to:

- Installation of CPU-B
- Features and programming data for the enhanced functions provided by CPU-B

Note: All features and general installation information included in Chapter 1 are applicable to CPU-B and should be referenced as required.

CHAPTER 3: MARATHON CPU-B2

Chapter 3 includes information pertaining to:

- Installation of CPU-B2 and related hardware.
- Features and programming data for the enhanced functions provided by CPU-B2.

Note: All features and general installation information included in Chapter 1 and Chapter 2 are applicable (except where noted) to CPU-B2 and should be referenced as required.

CHAPTER 4: MARATHON CPU-C

Chapter 4 includes information pertaining to:

- Installation of CPU-C
- features and programming data for the enhanced function provided by CPU-C.
- CTX COU wiring

Note: All features and general installation information included in Chapter 1 and Chapter 2 are applicable (except where noted) to CPU-C and should be referenced as required.

CHAPTER 5: LEAST COST UNIT (LCU)

Chapter 5 includes information pertaining to the application, installation and programming of the optional LCU package.

CHAPTER 6: OFF-PREMISES EXCHANGE (OPX)
Chapter 6 includes information pertaining to the application, installation and programming of the optional OPX package.

CHAPTER 7: DOOR PHONE INSTALLATION (DPI)
Chapter 7 includes information pertaining to the application, installation and programming of the optional DPI unit.

CHAPTER 8: STATION MESSAGE UNIT (SMU)
Chapter 8 includes information pertaining to the application, installation and programming of the optional SMU package.

CHAPTER 9: REMOTE MAINTENANCE UNIT (RMU)
Chapter 9 includes information pertaining to the application, installation and programming of the optional RMU package.

CHAPTER 10: TROUBLESHOOTING GUIDE
Chapter 10 includes useful techniques designed to simplify and improve the technician's troubleshooting procedures for the **MARATHON.**

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APPENDIX B
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APPENDIX C
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CHAPTER 1
MARATHON ™ ELECTRONIC TELEPHONE SYSTEM

SECTION 110
MARATHON ™ OVERVIEW

110.1 GENERAL

This chapter contains installation, operation and programming instructions for the MARATHON ™ Electronic Telephone System equipped with a basic central processing unit (CPU-A). (From this point on, MARATHON ™ will be referred to as "MARATHON".)

110.2 MARATHON is a stored program microprocessor controlled space division switching system that can be installed with Rotary or Dual Tone Multi Frequency (DTMF) dialing lines, or a combination of the two.

MARATHON has many features, most of which are program controlled. The system is delivered with a permanent factory program that may be modified at the time of installation to suit customer requirements. Program changes are performed from the station connected to port 1 of the KSU.

110.3 KEY SERVICE UNIT CAPACITY

The MARATHON Key Service Unit (KSU) is equipped with printed wiring boards to support a maximum of six Central Office (CO) lines, 12 stations, and two intercom (ICM) paths. (Refer to Figure 1-1 and Figure 1-3.)

110.4 EXPANSION SERVICE UNIT CAPACITY

In addition, two optional Line Expansion Service Units (ESUs) may be added to expand the MARATHON to 30 CO lines, 60 stations and 10 intercom paths.

	Total CO	Total Sta.	Total ICM
Basic KSU	6	12	2
1st ESU	18	36	6
2nd ESU	30	60	10

(Refer to Figure 1-1 and Figure 1-3.)

110.5 PROPRIETARY STATION EQUIPMENT

When equipped with a CPU-A card, MARATHON CPU-A supports several multiline telephones including:

- 6 CO button
- 18 CO button
- 30 CO button
- 18 CO button executive telephones.

Each telephone, except the executive telephone, can be equipped with an optional speakerphone module. The executive telephone is provided with a speakerphone as standard equipment.

The KSU can support a maximum of one set of Direct Station Select (DSS) consoles. One is for the first group of 30 stations and one is for the second group of 30 stations. Each ESU can support 2 sets of DSS consoles in the same configuration as the KSU. The total sets of DSS consoles are five, providing a maximum of ten DSS/BLF units.

110.6 ENVIRONMENTAL SPECIFICATIONS

This section defines environmental considerations for MARATHON.

1. Temperature

Continuous operating temperature: 32°-104 °F (0°-40 °C)
Storage Temperature: 0°-150 °F (-17.9 °-65 °C)

2. Relative Humidity

Continuous operating relative humidity:. 10%-90% (non-condensating)

3. Heat Dissipation

6 x 12 (KSU only): 31 BTUs Max
30 x 60: 133 BTUs Max
PS2A Power Supply: 41 BTUs Max @ Rated Power
PS10A BB Power Supply: 355 BTUs Max @ Rated Power

110.7 TELEPHONE DIMENSIONS

Length:	8.75 inches (214 mm)
Width:	8.12 inches (199.1 mm)
Depth:	2.58 inches (65.5 mm) (without handset in cradle)

Note: All telephones and the DSS console have the same dimensions.

110.8 TECHNICAL SPECIFICATIONS

Refer to Table 1-1 for technical and operational parameters for the MARATHON System.

110.9 SYSTEM SPECIFICATIONS

Refer to Table 1-2 for system specification.

110.10 KSU DIMENSIONS AND SPECIFICATIONS

Length: 18.5 inches
Width: 9.5 inches
Depth: 6.35 inches
Refer to Table 1-3 for KSU specifications.

110.11 ESU DIMENSIONS AND SPECIFICATIONS

Length: 18.5 inches
Width:. 9.5 inches..
Depth: 4.5 inches
Refer to Table 1-4 for the ESU specifications.

110.12 MARATHON CONFIGURATOR

The information provided in Table 1-5 is designed to assist in configuring a system. Upon initial inspection, and before installation, compare your inventory with the table below in order to determine the necessary system components for the installation.

110.13 SERVICE REQUIREMENTS

On-site trouble shooting may be performed by the installing company (Refer to Chapter 10 for Trouble Shooting Guide) with corrective action being limited to replacement of printed circuit boards, power supplies, cable, or telephones only. For all integral repairs required to the above-mentioned parts, these parts must be returned to the manufacturer for service.

110.14 WARRANTY

For twelve (12) months from the date of original installation, WIN Communications Corp. (WIN) warrants that the Material will be free from defects in

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material and workmanship, and **WIN**'s liability is limited solely to the repair or replacement, at **WIN**'s option, of such defective parts which are:

(i.) returned, shipping and handling charges prepaid, to the warehouse designated by **WIN**, properly packed and in good mechanical condition, together with a statement describing the defect; and

(ii.) proven to be defective upon **WIN**'s inspection.

The cost of labor to inspect and remove defective parts shall by borne by the installing or servicing party.

The above Warranty does not apply to Materials used outside of the Territory or to parts normally consumed in operation.

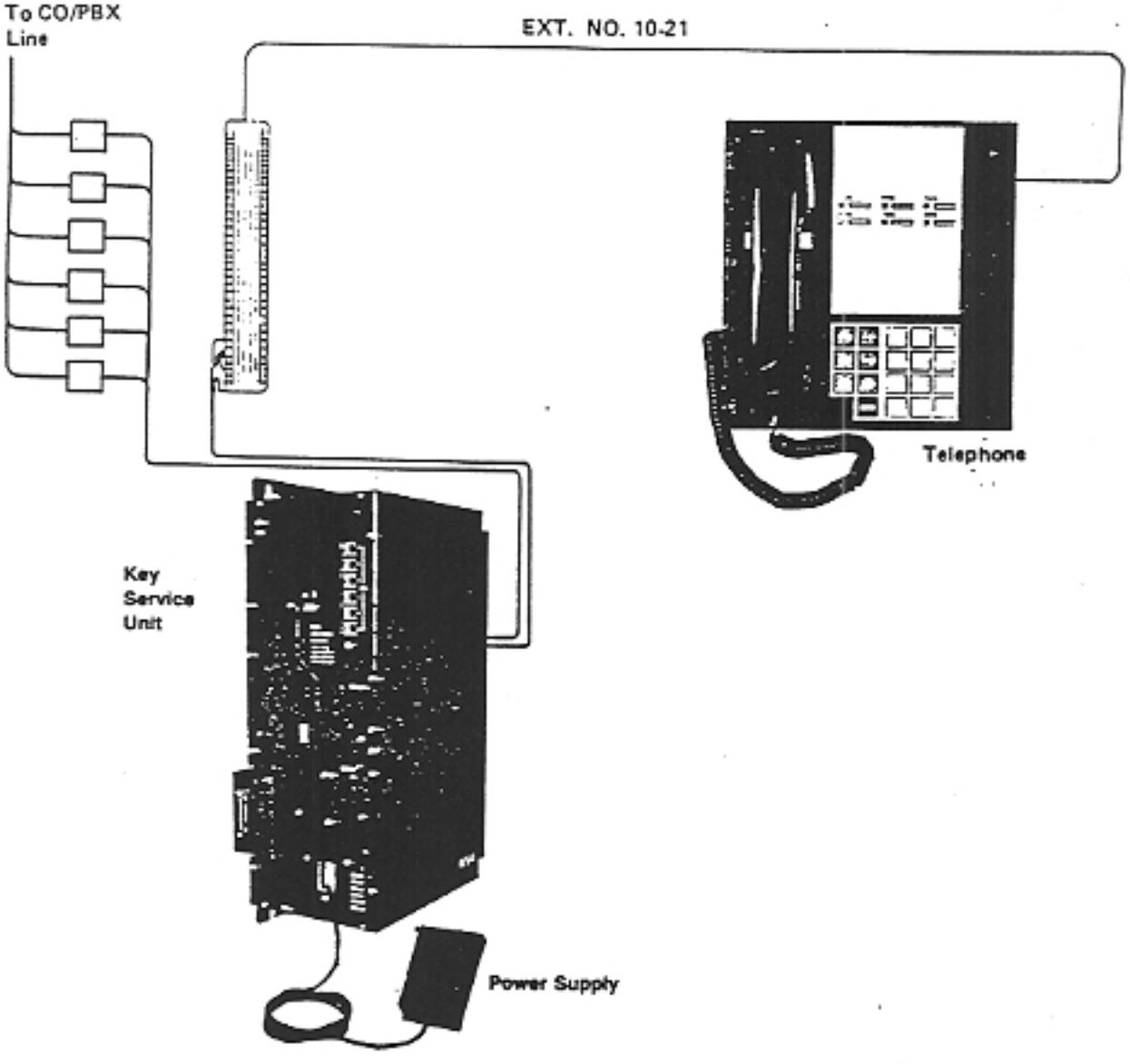


Figure 1-1 MARATHON Electronic Key Telephone System (KSU)

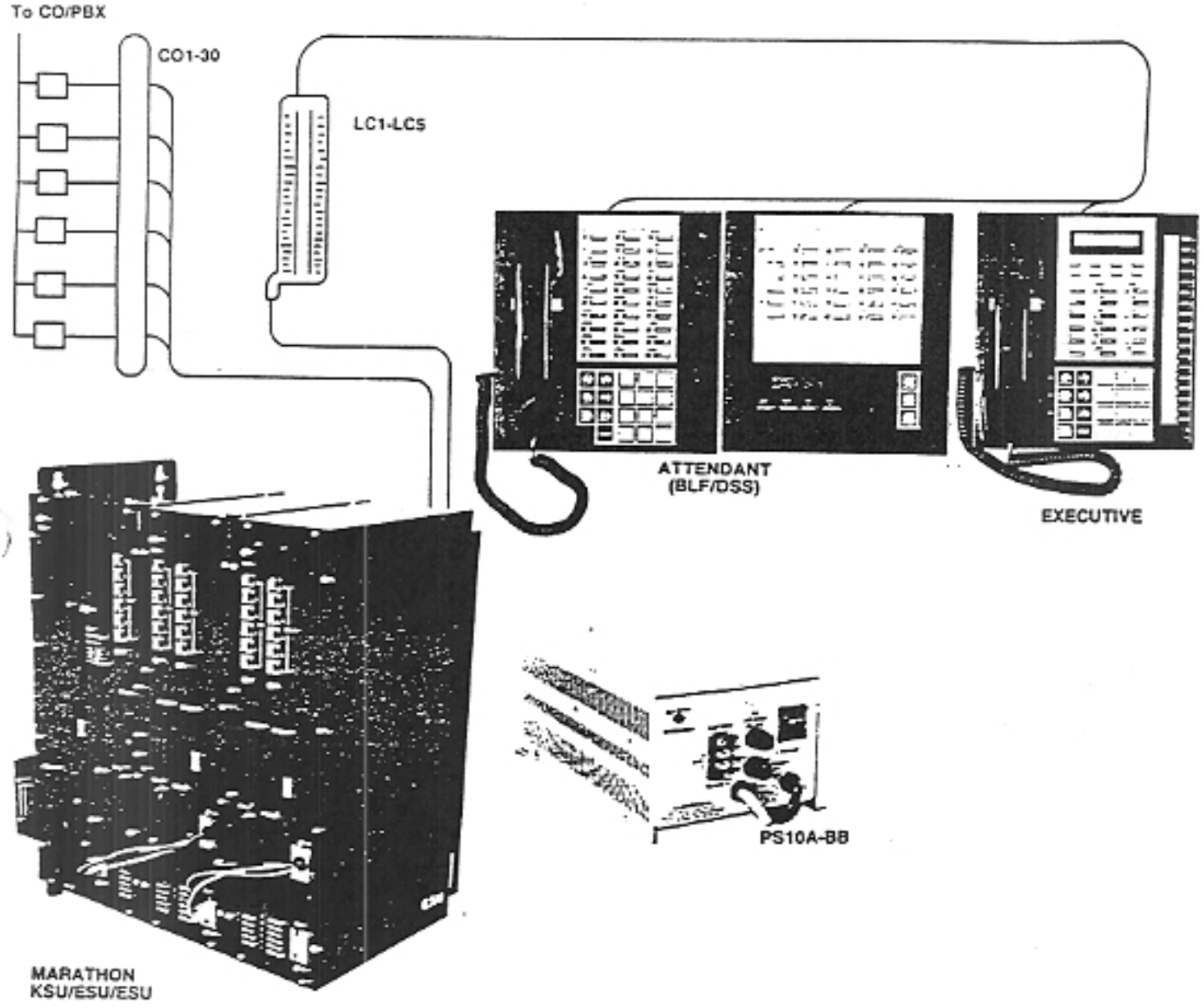


Figure 1-2 MARATHON KSU/ESU Interconnection Diagram

Table 1-1

TECHNICAL SPECIFICATIONS

Type of Equipment:	MARATHON Electronic Key Telephone System
Control:	Stored Program, Microprocessor Control
Switching:	Space Division C-MOS
Transmission:	Analog

ELECTRICAL CHARACTERISTICS

Input Power:	117 VAC, 60 Hz + or - 10%
Output Power:	24 VDC, + or - 10%

CENTRAL OFFICE INTERFACE CHARACTERISTICS

AC Impedance at CO Interface:	600 ohms
DC Resistance at CO Interface:	300 ohms

Note: Key Service Unit must be within 25 feet of CO interface.

CONNECTION AND CABLE REQUIREMENTS

Telephone Company Connections:	FCC approved RJ-11C (USOC) connectors, provided by the Telephone Company (1 per CO trunk)
Connection Blocks:	Standard type 66 M1-50
Cable Requirements:	One 25-pair minimum per station line card (STU) from STU to 66 M1-50 One 2-pair (Quad J-K or equivalent) from the 66 M1-50 to each station One 2-pair flat ribbon cable per CO line
Telephone Station Connections: (inc. DSS/BLF)	Type 625 modular jack (2 pair)

Maximum Station Cable Length*: (No. 24 AWG x 2 pair)	6-button telephone	= 2000 ft.
	18-button telephone	= 1500 ft.
	30-button telephone	= 1000 ft.
	DSS/BLF	= 1000 ft.
	Executive telephone	= 1000 ft.

**Note: Maximum station cable length may vary depending on environmental conditions.*

Table 1-2

SYSTEM SPECIFICATIONS

Specifications	Maximum	Description
CO/PBX Lines	30	- 6 circuits per one CO (COU) card for tone and/or outpulsing.
Intercom Paths	10	- 2 ICM paths are standard with the KSU. - 4 additional ICM paths are provided with each ESU.
Station Codes	60	- 12 station codes per station card (STU). - 5 station cards (STU) per system totalling 60 station codes. - 8 Executive telephones per STU, maximum 40 per system.
DSS/BLF Consoles	5-pair	- 2 DSS/BLF ports per STU. - 5 pair of 2 DSS consoles each. - Each console supports 30 stations connected to port #2 and #3 of each STU for sequential access to approximately 60 stations (Depending upon the number of DSS/BLFs in the system). - Reduces station capacity on a one-for-one basis. Reduces Executive station capacity on a one-for-one basis.
Executive Telephones	40	- 8 per STU (first 8 ports of each STU only).
Control	—	- Decentralized Microprocessor Common Control from KSU
Switching	—	- Space Division C-MOS Analog

Table 1-3

KSU SPECIFICATIONS

Specifications	Maximum	Description
CO/PBX Lines	6	- 6 circuits per 1 CO Card (COU) for tone and/or outpulsing.
Intercom Paths	2	- 2 ICM paths are standard with the KSU.
Station Codes	12	- 12 stations per 1 STU. - 8 stations may be Executive telephones.
DSS/BLF Consoles	1 pair	- Reduces station capacity on a one-for-one basis. - Each DSS/BLF provides access to 30 stations. - Reduces Executive station capacity on a one-for-one basis. - DSS/BLF connects to port #2 (port #3 may also be used for systems with an excess of 30 stations).
Executive Telephones	8	- 8 per STU (first 8 ports of the STU)

Table 1-4

ESU SPECIFICATIONS

Specifications	Maximum	Description
CO/PBX Lines	12	- 6 circuits per CO card (COU) for tone and/or outpulsing.
Intercom Paths	4	- 4 ICM paths are provided with each ESU.
Station Codes	24	- 12 station codes per STU. - 5 STUs per system, totalling 60 station codes. - 8 Executive telephones per STU, maximum 40.
DSS/BLF Consoles	2-pair per ESU	- 2 DSS/BLF ports are standard with the KSU (port #2 and port #3). - 2 additional DSS/BLF ports are provided with each STU (also ports #2 and port #3 of each STU). - 5 STU station cards per system totalling 5 pair of 2 DSS consoles each. - Each console supports 30 stations. One console may be connected to port #2 and another for port #3 of each STU for sequential access to approximately 60 stations (depending on the number of DSS/BLFs used in the system).
Executive Telephones	16	- 8 per STU (first 8 ports of each STU).

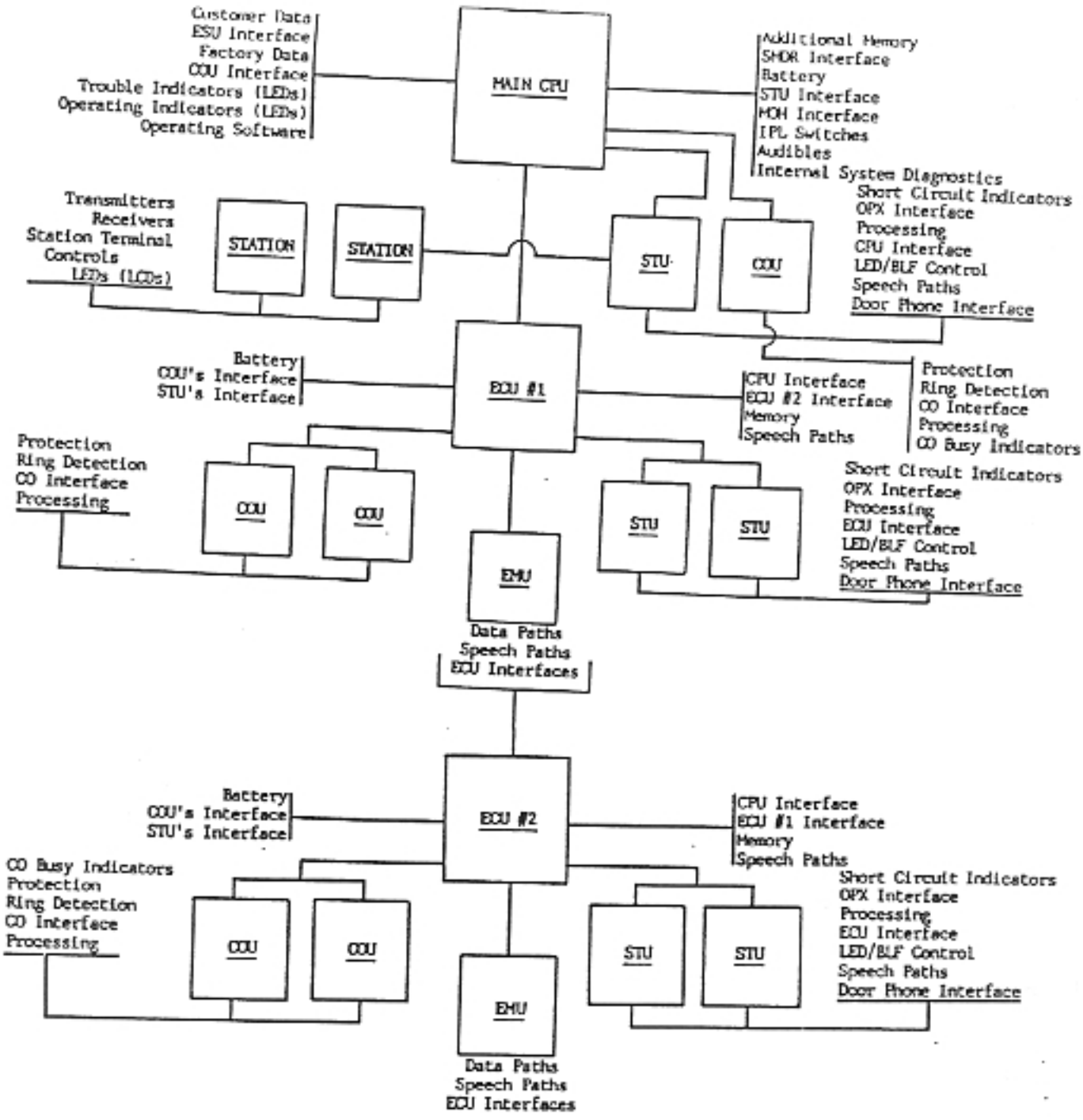


Figure 1-3 Basic System Electronic Architecture

Table 1-5

MARATHON CONFIGURATOR

CO Lines	COU	KSU	ESU	EMU	CPU
6	1	1	0	0	1
12	2	1	1	0	1
18	3	1	1	0	1
24	4	1	2	1-2nd ESU	1
30	5	1	2	1-2nd ESU	1

Stations	STU	KSU	ESU	EMU	CPU
12	1	1	0	0	1
24	2	1	1	0	1
36	3	1	1	0	1
48	4	1	2	1-1st ESU	1
60	5	1	2	1-1st ESU	1

NOTES:

- PS2A (power supply) is required for a 6 x 12 configuration.
- The PS2A must be replaced with a PS10A-BB for systems with one or more ESUs or when battery-backed system operation is required.
- Each ESU is shipped from the factory equipped with one Expansion Control (ECU) circuit.

SECTION 120
REGULATORY INFORMATION

120.1 IMPORTANT PRELIMINARY CONSIDERATIONS

The following paragraphs describe equipment and regulations regarding the Federal Communications Commission (FCC) and local telephone company that must be considered before installation.

120.2 FCC REQUIREMENTS

The FCC has established rules which permit the Electronic Key Telephone System to be connected directly to the telephone network. The jack for connection is provided by the telephone company.

120.3 TELEPHONE COMPANY IDENTIFICATION

Before installing the device to the telephone network, the telephone company must be provided with the following:

- End user's telephone number
- FCC registration number - BAQ9IT-15578-KF-E
- Ringer equivalence number 1.OB
- USOC jack requirement - RJ-11C (one per CO trunk)

120.4 EMITTED RADIO FREQUENCY INTERFERENCE

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

120.5 INCIDENCE OF HARM

If MARATHON develops a malfunction, it could damage the telephone network. The system must be disconnected until the source of the problem can be determined and the necessary repair made.

NOTE: If the malfunction causing interference is not corrected, the telephone company may temporarily disconnect service. The telephone company can change its technical operations procedures. If these changes affect the compatibility or use of the device, the telephone company must provide adequate notice of the changes.

SECTION 130
INSTALLATION

130.1 GENERAL

This section provides installation instructions for the MARATHON Electronic Key Telephone System. The contents of the section are arranged in the recommended order of installation.

130.2 UNPACKING

Remove all equipment from the cartons as follows:

1. Carefully open all cartons. It is highly recommended that you affix a grounding strap to your wrist or arm before unpacking electronic circuit cards.

2. Remove packing material and shipping receipts.

3. Check equipment for damage:
   a. Inspect circuit cards for cracks and/or damage.
   b. Inspect housings and cabinets for any damage which may have been incurred during shipping.
   c. Inspect station terminals for external damage.

CAUTION: All circuit cards are static sensitive. Before handling any circuit card, perform one of the following two precautions:

- Discharge the static electricity from your body by touching metal that is earth grounded.
- Attach a grounding strap (wire) to your wrist which is secured to an earth ground such as a cold water pipe.

130.3 LOCATION SELECTION

Consider the following when selecting a location for MARATHON:

1. Availability of a 117 VAC, 60-Hz single-phase dedicated power outlet capable of safely delivering 12 Amps. An isolated outlet is recommended.

2. It is also highly recommended that a high quality surge protector be used on the power line to protect the system against damage from lightning surges on the power lines. In addition, precautions should be taken in accordance with local practices.

3. The location of the Central Office/ Private Branch Exchange (CO/PBX) line terminations must be within 25 feet of the Central Office interface. The system uses a single two-pair cable per CO line for connecting to the telephone company lines. These cables plug into FCC approved RJ-11C (USOC code) connectors provided by the telephone company, and the modular jacks at the KSU.

4. Ventilation and temperature: the equipment is designed to operate within 32°-104 °F (0°-40 °C).

5. The Key Service Unit must not be placed near a strong magnetic field such as a heavy motor or generator, copying machine, high power cable, etc.

6. The system must not be placed in an environment where a high concentration of radio frequency energy is present, due to the possibility of interference with the equipment.

7. The equipment must not be exposed to hazards such as flammable materials, caustic fluids, possible flooding, etc.

8. Provide adequate lighting and space for operation and maintenance.

130.4 EQUIPMENT ARRANGEMENT

Refer to Table 1-6 for the equipment arrangement for the MARATHON system.

130.5 KEY SERVICE UNIT MOUNTING

The KSU is designed for wall mounting and may not be floor mounted. Figure 1-4 shows the mounting hole spacing dimensions for wall mounting the Key Service Unit. Use appropriate fasteners that can safely sustain the weight of a fully loaded (with two ESU's piggybacked) 40 pound unit.

CAUTION:

1. Ensure that the KSU cabinet is connected to a good earth ground, and that the ESUs are grounded (wired) to the KSU using the appropriate grounding screws. The ESU must be grounded to the KSU; otherwise a problem may occur due to varying ground potentials.

2. Make sure to leave adequate room (12") on each side of KSU from any obstructions for ease of removing PC boards and interface.

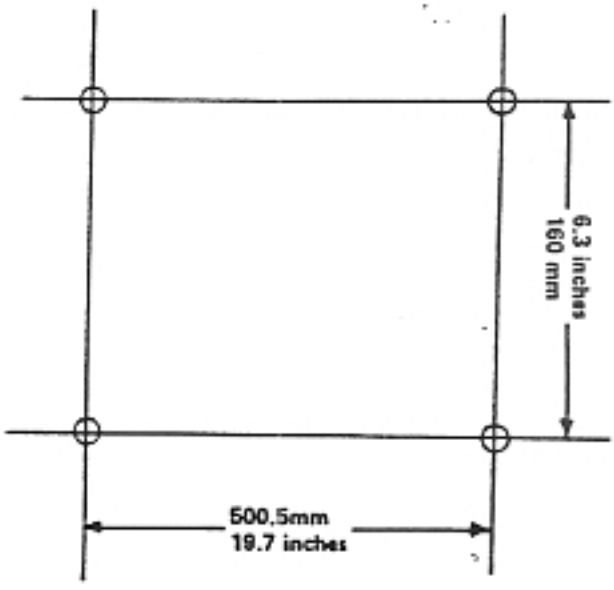


Figure 1-4 KSU Mounting Holes

Table 1-6

EQUIPMENT ARRANGEMENT

UNIT DESIGNATION	DESCRIPTION	MAXIMUM QUANTITY	BASIC OR OPTIONAL
MARATHON KSU	Key Service Unit	1	Basic
MARATHON ESU	Expansion Service Unit	2	As Required (A/R)
MARATHON 6-TEL	6 CO Key Telephone	60	Basic A/R
MARATHON 18-TEL	18 CO Key Telephone	60	A/R
MARATHON 30-TEL	30 CO Key Telephone	60	A/R
MARATHON EXEC	18 CO Executive Key Telephone	40	A/R
MARATHON DSS/BLF	30 Button Direct Station Selection/Busy Lamp Field	5 pair 2 each	A/R
STU	12 Circuit Station Line Line Card	5	Basic A/R
COU	6 Circuit CO/PBX Line Card for DTMF or Dial-pulse Dialing	5	Basic A/R
PS2A	24 Volt Power Supply	1	Basic
PS10A-BB	24 Volt Power Supply with Battery Back-up Switch Circuit	1	Option*

** Required for ESU or Battery-Backed system power. It is necessary to use only the PS10A-BB (omit PS2A) for systems equipped with an ESU.*

130.6 GROUNDING THE SYSTEM

The KSU and power supply must be properly grounded to an earth ground. A screw on the left side of the KSU must be connected to a good earth ground such as a metallic cold-water pipe using AWG 14 or larger. Do not use the ground (green) wire of the AC cord for KSU earth ground. A screw on the left side of the ESU should be bridged to the KSU grounding screw with a jumper wire. If two ESUs are required, a second jumper should be used between the ESUs to completely ground all three cabinets as shown in Figure 1-5. In addition, star washers are provided with the ESU mounting screws to insure grounding continuity between cabinets.

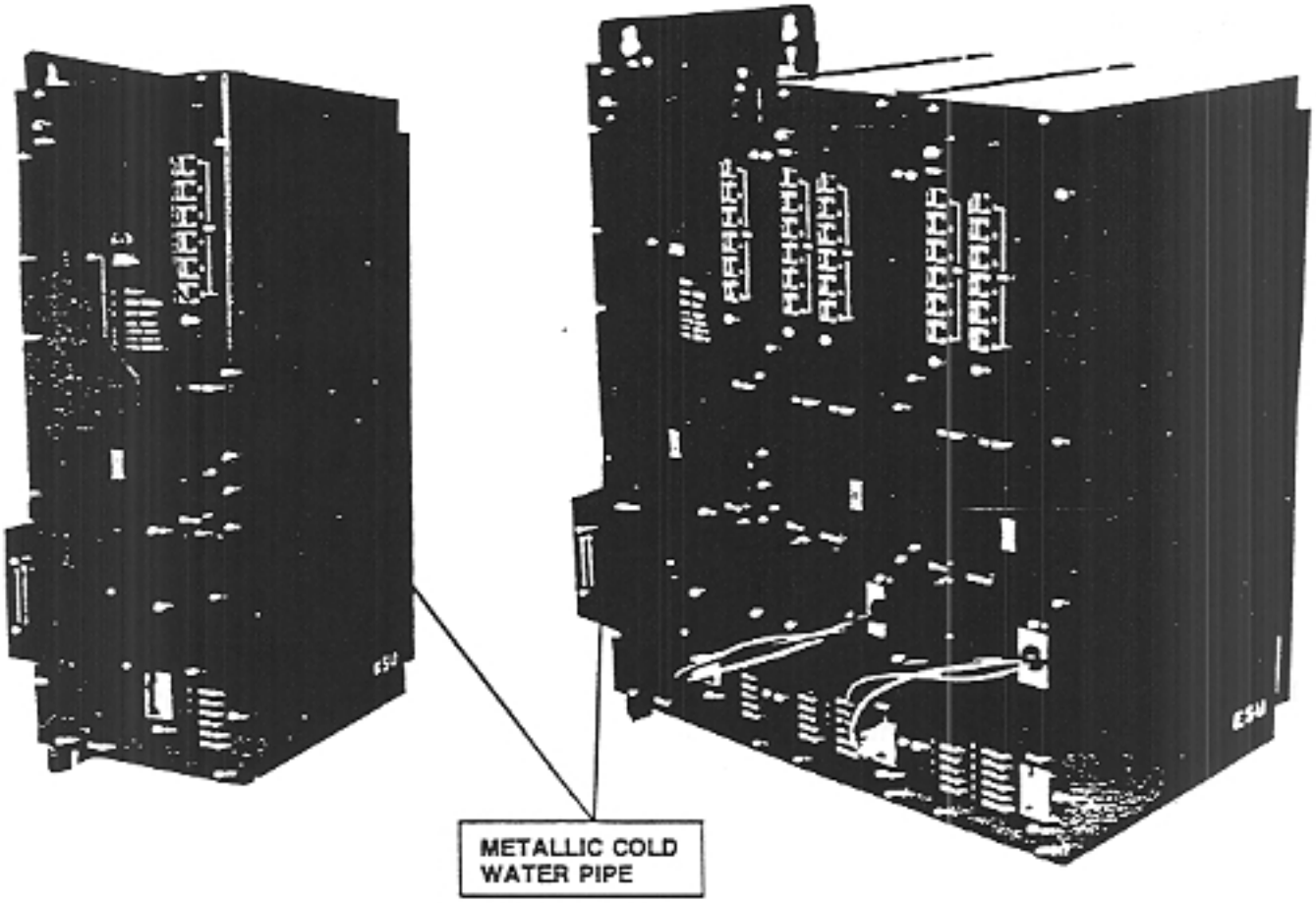


Figure 1-5 System Grounding

130.7 EXPANSION SERVICE UNIT (ESU) MOUNTING

The ESUs are designed for piggyback mounting and may not be individually located or floor mounted. Figure 1-6 shows the mounting arrangement. Use the bolts provided as fasteners in the designated locations to insure secure mounting when the system is fully loaded (weight approximately 40 lbs). Four bolts are provided with each ESU (taped to the power cord). The two cylindrical studs are to be used at the top end of the ESU and the two remaining screws (standard phillips) on the bottom side.

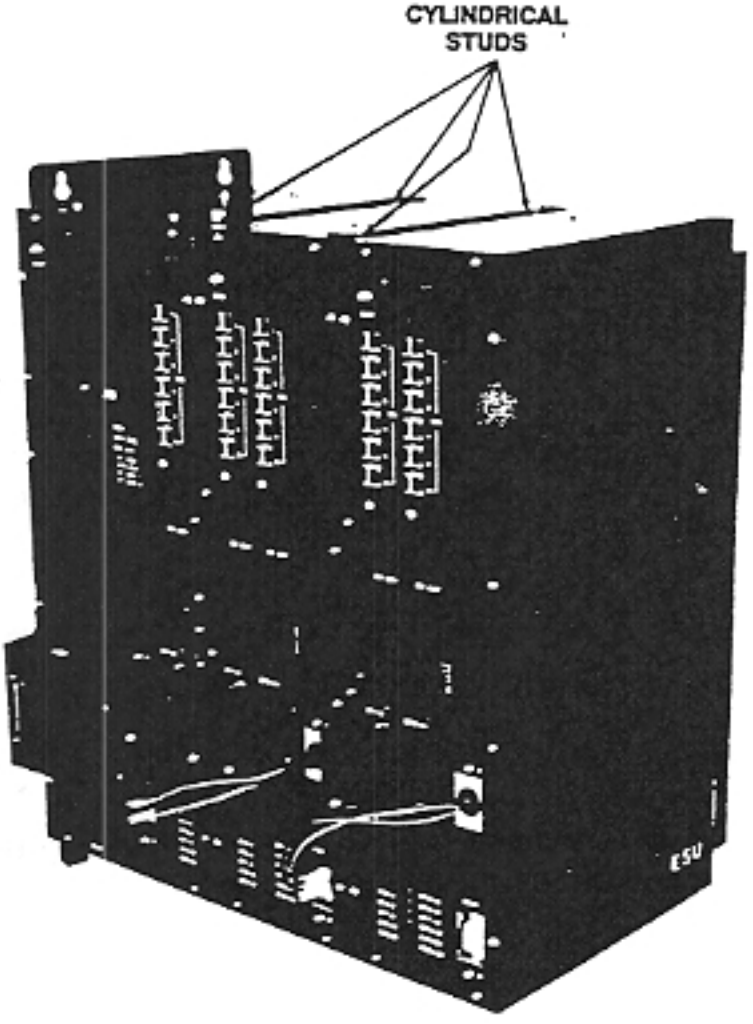


Figure 1-6 ESU Mounting Arrangement

130.8 CABLE INSTALLATION

Table 1-7 lists the cables required to install MARATHON. The cables are interconnected as shown in Figure 1-7 for a KSU and Figure 1-8 for KSU plus ESU. One 25-pair cable is connected between the KSU/ESU connecting blocks and the KSU/ESU 25-pair connectors. The male connector of this cable mates with the female connectors of the KSU/ESU. The KSU/ESU 25-pair connectors are located on the left side of each KSU and ESU (1 per STU card). The other end of these cables have individual wires which are terminated at the station blocks (66MI-50). Up to 6 two-pair modular cables are connected between the KSU and CO/PBX interface. Up to 12 two-pair modular cables are connected between each ESU and the CO/PBX interface. Figure 1-9 shows the KSU connector locations, and Figure 1-10 shows the KSU/ESU connector locations.

Table 1-7

CABLE REQUIREMENTS

QUANTITY	CABLE TYPE	FROM	TO
Per # of COs (30 maximum)	2-Pair modular (25 ft. maximum)	CO/PBX (RJ11c) 6 per COU	KSU/ESU Connectors (COU)
Per # of STU (5 maximum)	25-Pair A25B or equivalent 1 per STU	Connecting Block 66M1-50 1 per STU	KSU/ESU connectors (STU)
Per # of stations (60 maximum)	2-Pair per telephone station	Connecting Block 66M1-50	Telephone stations type 625A modular jacks

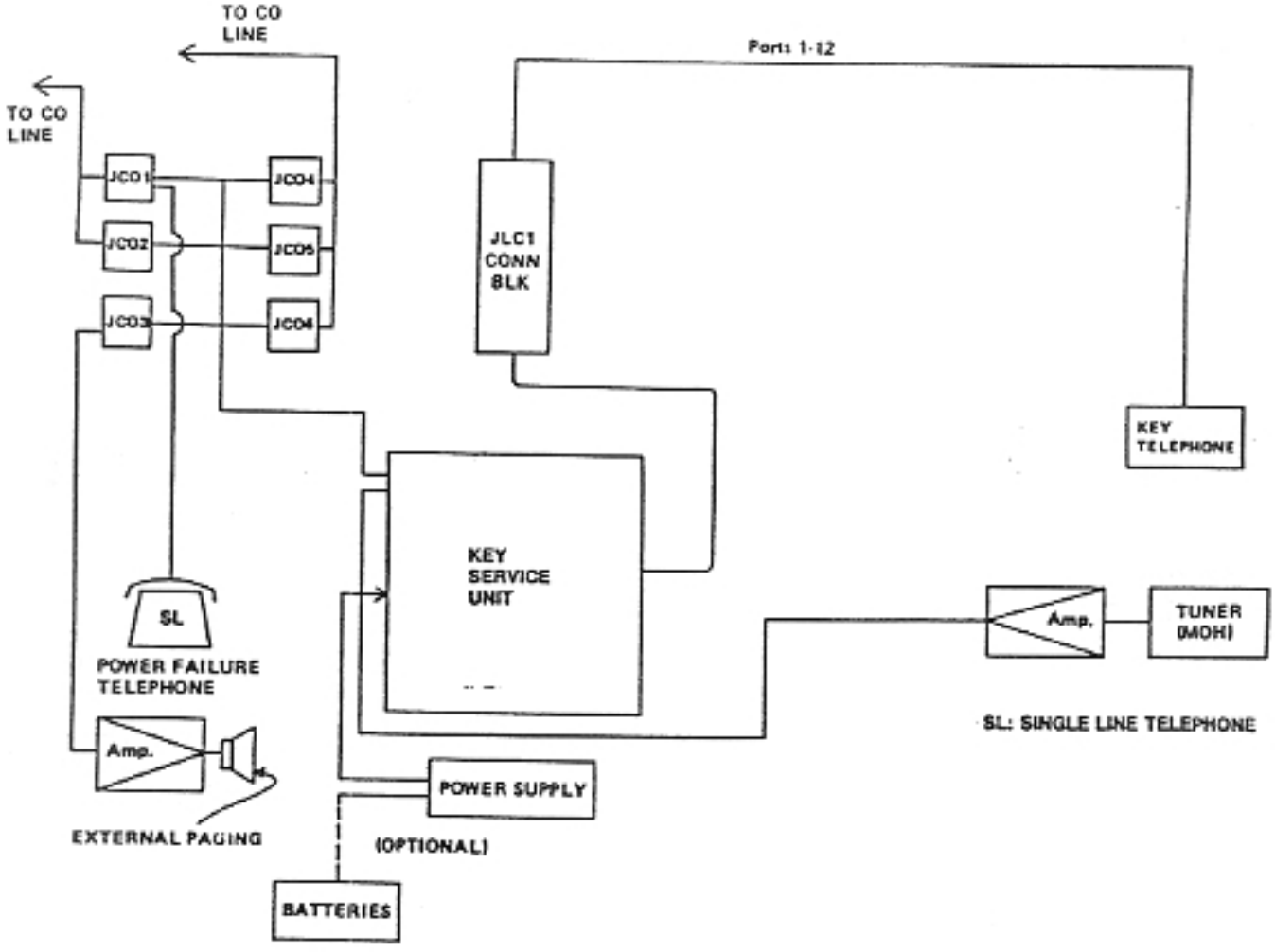


Figure 1-7 MARATHON KSU Interconnection Diagram

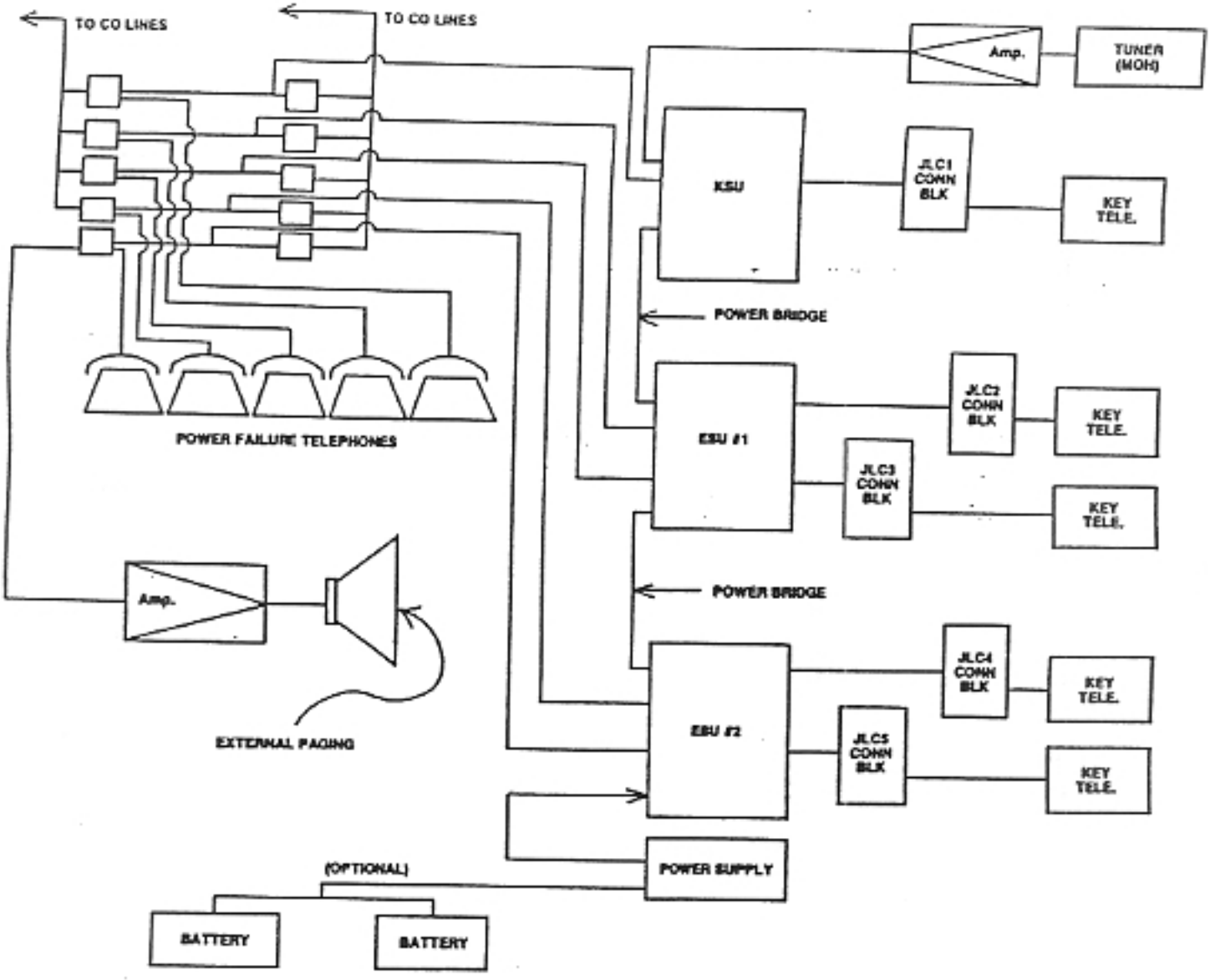


Figure 1-8 MARATHON KSU/ESU Interconnection Diagram

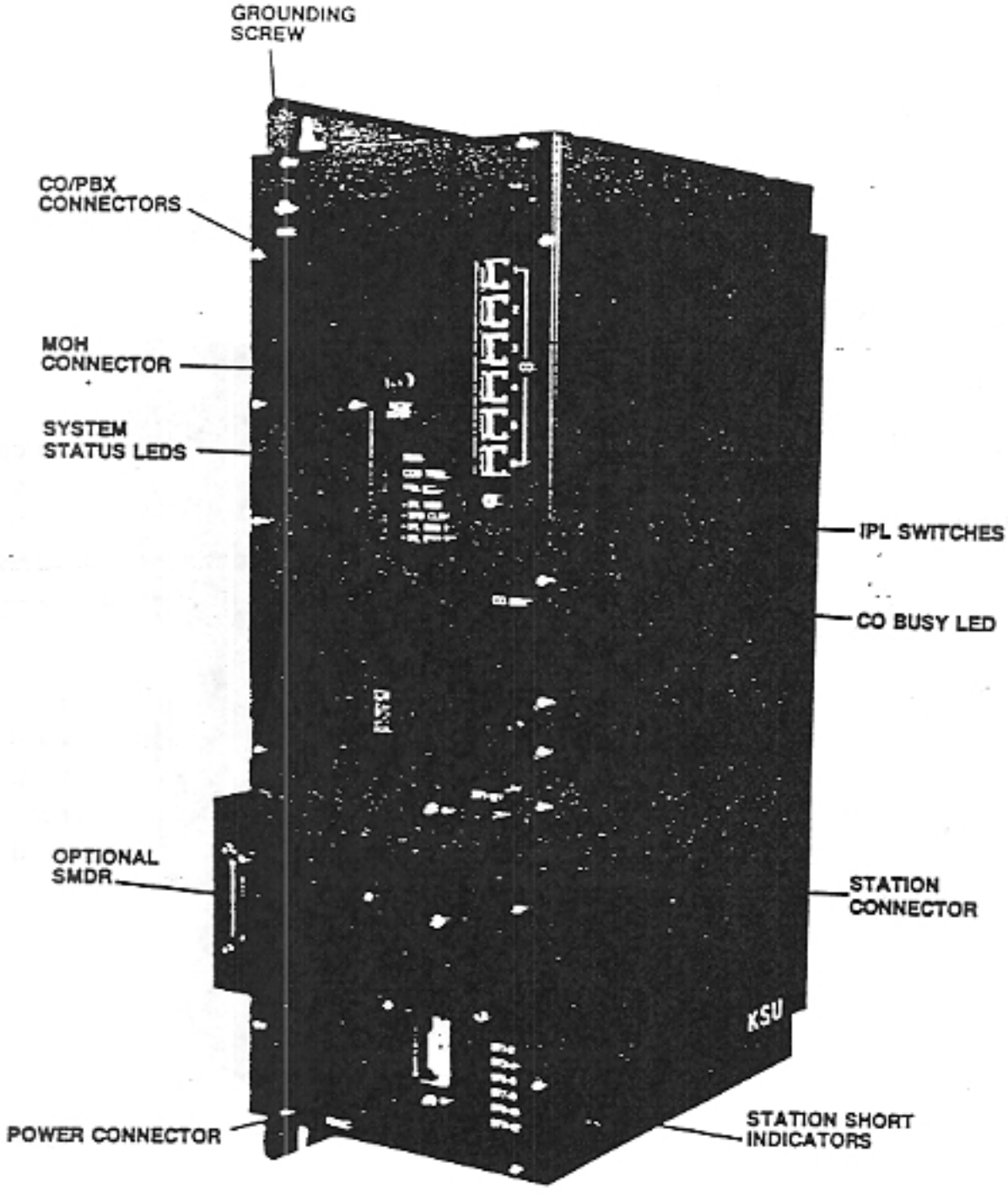


Figure 1-9 KSU Layout and Connector Location

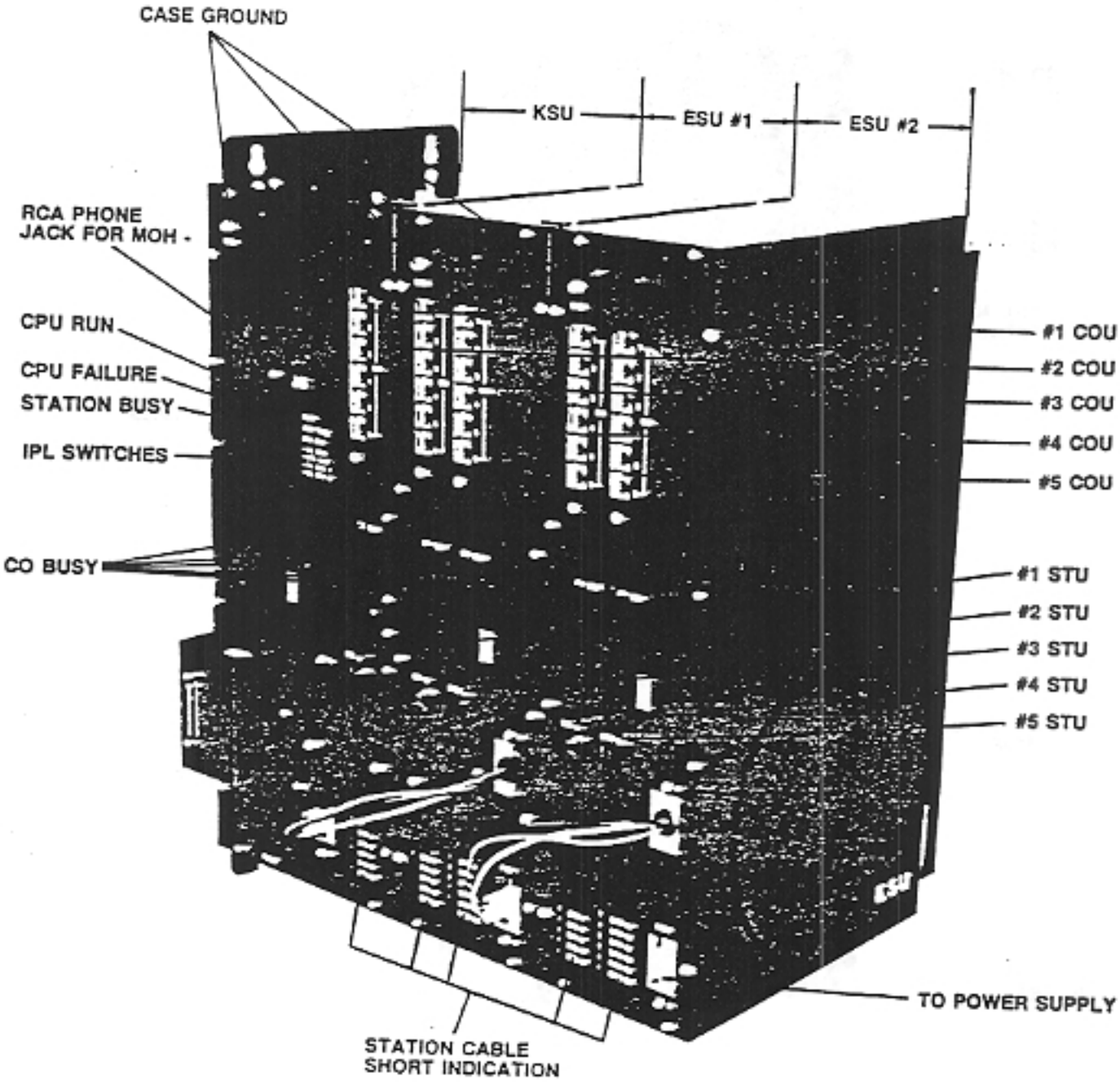


Figure 1-10 KSU/ESU/ESU Layout and Connector Location

130.9 CONNECTING BLOCKS

Standard type 66M1-50 connecting blocks provide the tie points between each KSU and ESU and the station equipment. Standard type RJ-11C modular connectors provide the tie points between the KSU/ESU and the CO interface (refer to Figures 1-11 and 1-12).

130.10 CABLING BETWEEN THE LC CONNECTING BLOCKS AND THE KSU/ESUs

The 25-pair cable mates with the associated connectors on the side of each KSU and ESU. The other end of the cable has individual wires which are connected to each connecting block. One cable and one connecting block are required for each 50 pin connector. **Table 1-9** lists all cabling connections between the LC connecting blocks and each KSU/ESU. **Figure 1-13** illustrates station line connections.

130.11 STATION AND MODULAR JACK CONNECTIONS

A two-pair cable is required between the connecting block and the type 625A modular jack of each telephone station port. A modular line cord is connected between the type 625A modular jack and the telephone set. **Figure 1-13** illustrates the station line connections. **Table 1-8** lists the station modular jack connections.

130.12 CABLING BETWEEN THE CO CONNECTING BLOCKS AND THE KSU

Up to six two-pair modular cables are required for connection to the telephone company provided connector(s) RJ-11C jack(s) in accordance with FCC rules, part 68. **Figure 1-14** illustrates the CO/PBX line connections, and **Table 1-10** lists all cabling connections between the KSU/ESUs and the CO/PBX interface.

Table 1-8

STATION MODULAR JACK CONNECTIONS

Modular Jack Color	Two-Pair Cable Color	Connecting Block Terminal Designation
Bk (Black)	Black	DTA 2-12
R (Red)	Red	VR 1-12
G (Green)	Green	VT 1-12
Y (Yellow)	Yellow	DTB 1-12

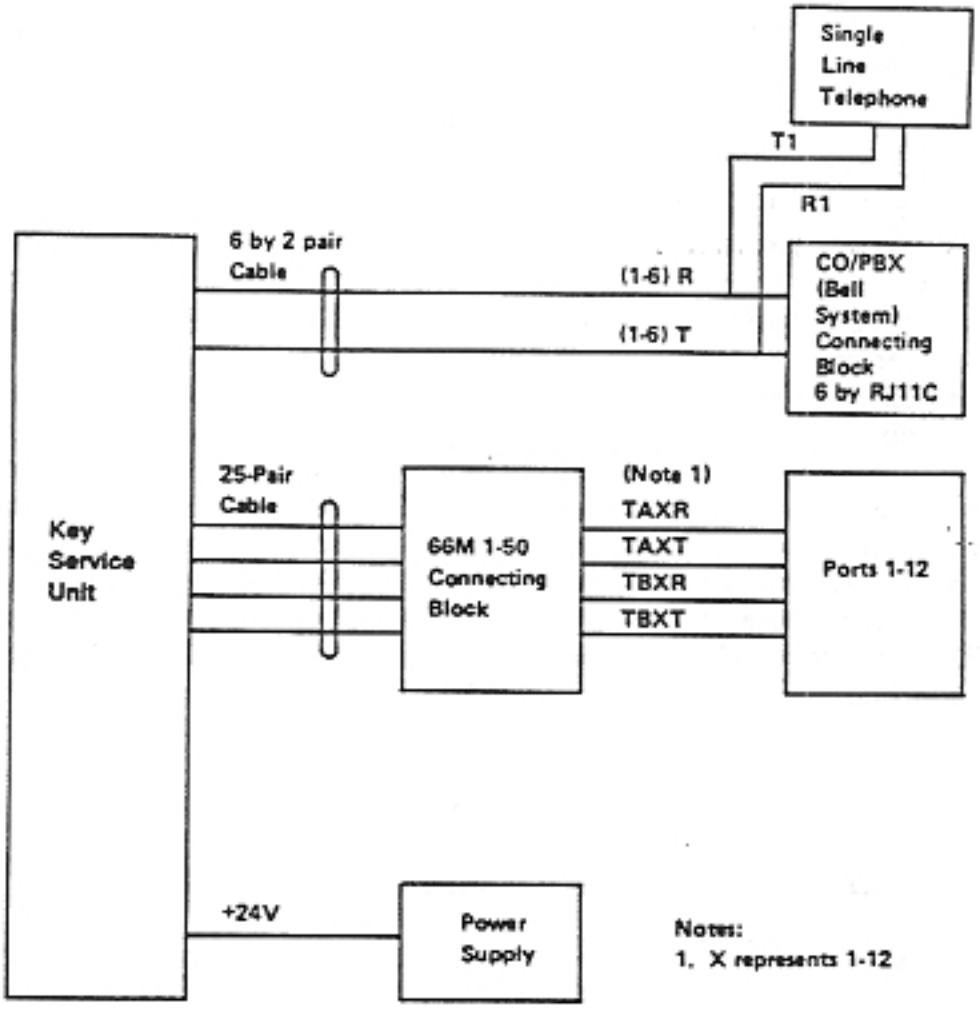


Figure 1-11 Cable Connections from Connecting Block to Equipment (KSU)

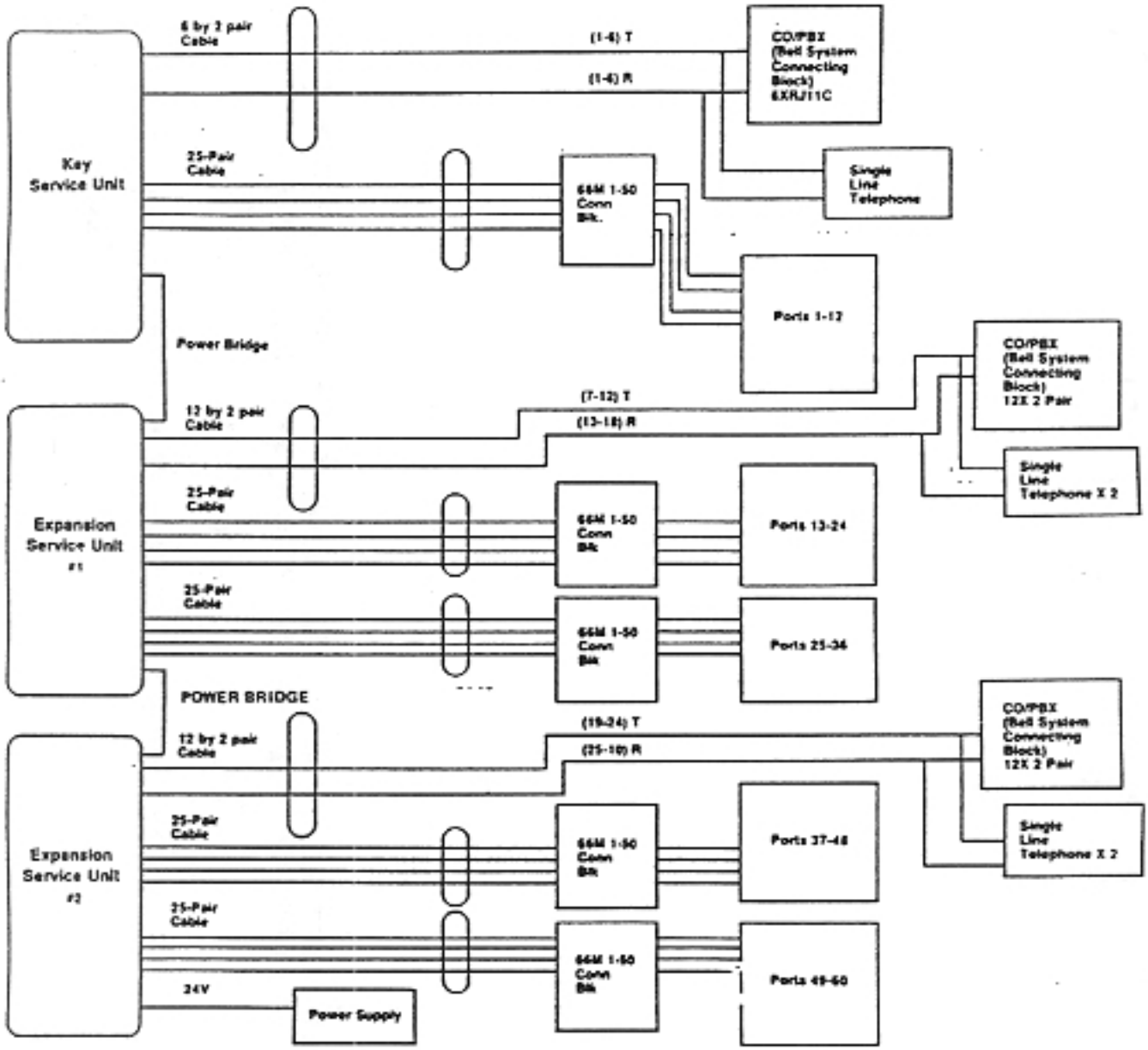


Figure 1-12 Cable Connections from Connecting Block to Equipment (ESU)

Table 1-9

STATION BLOCK CONNECTIONS

STU #1

PORT NUMBER	TELE-PHONE EXT. NUMBER	LEAD DESIG.	JACK J1 CONN PIN NO.	B25B CONN CABLE COLOR	CONN BLK ROW NO.	6, 18 OR 30 TEL ANY PORT	MESSAGE & EXEC TELS PORT 1-6	DSS CONSOLES PORT 2&3
1	(10)	VT1	26	W-BL	1			
		VR1	1	BL-W	2			
		DTA1	27	W-O	3			
		DTB1	2	O-W	4			
2	DSS #1 (11)	VT2	28	W-G	5			BLF FOR STA. 10-39
		VR2	3	G-W	6			
		DTA2	29	W-BR	7			
		DTB2	4	BR-W	8			
3	DSS #2 (12)	VT3	30	W-S	9			BLF FOR STA. 40-69
		VR3	5	S-W	10			
		DTA3	31	R-BL	11			
		DTB3	6	BL-R	12			
4	(13)	VT4	32	R-O	13			
		VR4	7	O-R	14			
		DTA4	33	R-G	15			
		DTB4	8	G-R	16			
5	(14)	VT5	34	R-BR	17			
		VR5	9	BR-R	18			
		DTA5	35	R-S	19			
		DTB5	10	S-R	20			
6	(15)	VT6	36	BK-BL	21			
		VR6	11	BL-BK	22			
		DTA6	37	BK-O	23			
		DTB6	12	O-BK	24			
7	(16)	VT7	38	BK-G	25			
		VR7	13	G-BK	26			
		DTA7	39	BK-BR	27			
		DTB7	14	BR-BK	28			
8	(17)	VT8	40	BK-S	29			
		VR8	15	S-BK	30			
		DTA8	41	Y-BL	31			
		DTB8	16	BL-Y	32			
9	(18)	VT9	42	Y-O	33			
		VR9	17	O-Y	34			
		DTA9	43	Y-G	35			
		DTB9	18	G-Y	36			
10	(19)	VT10	44	Y-BR	37			
		VR10	19	BR-Y	38			
		DTA10	45	Y-S	39			
		DTB10	20	S-Y	40			
11	(20)	VT11	46	V-BL	41			
		VR11	21	BL-V	42			
		DTA11	47	V-O	43			
		DTB11	22	O-V	44			
12	(21)	VT12	48	V-G	45			
		VR12	23	G-V	46			
		DTA12	49	V-BR	47			
		DTB12	24	BR-V	48			
SPARE			50	V-S	49			
			25	S-V	50			

Table 1-9

STATION BLOCK CONNECTIONS (CONT.)

STU #2

PORT NUMBER	TELE-PHONE EXT. NUMBER	LEAD DESIG.	JACK J1 CONN PIN NO.	B25B CONN CABLE COLOR	CONN BLK ROW NO.	6, 18 OR 30 TEL ANY PORT	MESSAGE & EXEC TELS PORT 1-8	DSS CONSOLES PORT 2&3
13	(22)	VT1	26	W-BL	1			
		VR1	1	BL-W	2			
		DTA1	27	W-O	3			
		DTB1	2	O-W	4			
14	DSS #3 (23)	VT2	28	W-G	5			BLF FOR STA. 10-39
		VR2	3	G-W	6			
		DTA2	29	W-BR	7			
		DTB2	4	BR-W	8			
15	DSS #4 (24)	VT3	30	W-S	9			BLF FOR STA. 40-69
		VR3	5	S-W	10			
		DTA3	31	R-BL	11			
		DTB3	6	BL-R	12			
16	(25)	VT4	32	R-O	13			
		VR4	7	O-R	14			
		DTA4	33	R-G	15			
		DTB4	8	G-R	16			
17	(26)	VT5	34	R-BR	17			
		VR5	9	BR-R	18			
		DTA5	35	R-S	19			
		DTB5	10	S-R	20			
18	(27)	VT6	36	BK-BL	21			
		VR6	11	BL-BK	22			
		DTA6	37	BK-O	23			
		DTB6	12	O-BK	24			
19	(28)	VT7	38	BK-G	25			
		VR7	13	G-BK	26			
		DTA7	39	BK-BR	27			
		DTB7	14	BR-BK	28			
20	(29)	VT8	40	BK-S	29			
		VR8	15	S-BK	30			
		DTA8	41	Y-BL	31			
		DTB8	16	BL-Y	32			
21	(30)	VT9	42	Y-O	33			
		VR9	17	O-Y	34			
		DTA9	43	Y-G	35			
		DTB9	18	G-Y	36			
22	(31)	VT10	44	Y-BR	37			
		VR10	19	BR-Y	38			
		DTA10	45	Y-S	39			
		DTB10	20	S-Y	40			
23	(32)	VT11	46	V-BL	41			
		VR11	21	BL-V	42			
		DTA11	47	V-O	43			
		DTB11	22	O-V	44			
24	(33)	VT12	48	V-G	45			
		VR12	23	G-V	46			
		DTA12	49	V-BR	47			
		DTB12	24	BR-V	48			
SPARE			50	V-S	49			
			25	S-V	50			

Table 1-9

STATION BLOCK CONNECTIONS (CONT.)

STU #3

PORT NUMBER	TELE-PHONE EXT. NUMBER	LEAD DESIG.	JACK J1 CONN PIN NO.	B25B CONN CABLE COLOR	CONN BLK ROW NO.	6, 18 OR 30 TEL ANY PORT	MESSAGE & EXEC TELS PORT 1-8	DSS CONSOLES PORT 2&3
25	(34)	VT1	26	W-BL	1			
		VR1	1	BL-W	2			
		DTA1	27	W-O	3			
		DTB1	2	O-W	4			
26	DSS #5 (35)	VT2	28	W-G	5			BLF FOR STA. 10-39
		VR2	3	G-W	6			
		DTA2	29	W-BR	7			
		DTB2	4	BR-W	8			
27	DSS #6 (36)	VT3	30	W-S	9			BLF FOR STA. 40-69
		VR3	5	S-W	10			
		DTA3	31	R-BL	11			
		DTB3	6	BL-R	12			
28	(37)	VT4	32	R-O	13			
		VR4	7	O-R	14			
		DTA4	33	R-G	15			
		DTB4	8	G-R	16			
29	(38)	VT5	34	R-BR	17			
		VR5	9	BR-R	18			
		DTA5	35	R-S	19			
		DTB5	10	S-R	20			
30	(39)	VT6	36	BK-BL	21			
		VR6	11	BL-BK	22			
		DTA6	37	BK-O	23			
		DTB6	12	O-BK	24			
31	(40)	VT7	38	BK-G	25			
		VR7	13	G-BK	26			
		DTA7	39	BK-BR	27			
		DTB7	14	BR-BK	28			
32	(41)	VT8	40	BK-S	29			
		VR8	15	S-BK	30			
		DTA8	41	Y-BL	31			
		DTB8	16	BL-Y	32			
33	(42)	VT9	42	Y-O	33			
		VR9	17	O-Y	34			
		DTA9	43	Y-G	35			
		DTB9	18	G-Y	36			
34	(43)	VT10	44	Y-BR	37			
		VR10	19	BR-Y	38			
		DTA10	45	Y-S	39			
		DTB10	20	S-Y	40			
35	(44)	VT11	46	V-BL	41			
		VR11	21	BL-V	42			
		DTA11	47	V-O	43			
		DTB11	22	O-V	44			
36	(45)	VT12	48	V-G	45			
		VR12	23	G-V	46			
		DTA12	49	V-BR	47			
		DTB12	24	BR-V	48			
SPARE			50	V-S	49			
			25	S-V	50			

Table 1-9

STATION BLOCK CONNECTIONS (CONT.)

STU #4

PORT NUMBER	TELE-PHONE EXT. NUMBER	LEAD DESIG.	JACK J1 CONN PIN NO.	B25B CONN CABLE COLOR	CONN BLK ROW NO.	6, 18 OR 30 TEL ANY PORT	MESSAGE & EXEC TELS PORT 1-8	DSS CONSOLES PORT 2&3
37		VT1	26	W-BL	1			
		VR1	1	BL-W	2			
	(46)	DTA1	27	W-O	3			
		DTB1	2	O-W	4			
38		VT2	28	W-G	5			BLF FOR STA. 10-39
	DSS #7 (47)	VR2	3	G-W	6			
		DTA2	29	W-BR	7			
		DTB2	4	BR-W	8			
39		VT3	30	W-S	9			BLF FOR STA. 40-69
	DSS #8 (48)	VR3	5	S-W	10			
		DTA3	31	R-BL	11			
		DTB3	6	BL-R	12			
40		VT4	32	R-O	13			
		VR4	7	O-R	14			
	(49)	DTA4	33	R-G	15			
		DTB4	8	G-R	16			
41		VT5	34	R-BR	17			
		VR5	9	BR-R	18			
	(50)	DTA5	35	R-S	19			
		DTB5	10	S-R	20			
42		VT6	36	BK-BL	21			
		VR6	11	BL-BK	22			
	(51)	DTA6	37	BK-O	23			
		DTB6	12	O-BK	24			
43		VT7	38	BK-G	25			
		VR7	13	G-BK	26			
	(52)	DTA7	39	BK-BR	27			
		DTB7	14	BR-BK	28			
44		VT8	40	BK-S	29			
		VR8	15	S-BK	30			
	(53)	DTA8	41	Y-BL	31			
		DTB8	16	BL-Y	32			
45		VT9	42	Y-O	33			
		VR9	17	O-Y	34			
	(54)	DTA9	43	Y-G	35			
		DTB9	18	G-Y	36			
46		VT10	44	Y-BR	37			
		VR10	19	BR-Y	38			
	(55)	DTA10	45	Y-S	39			
		DTB10	20	S-Y	40			
47		VT11	46	V-BL	41			
		VR11	21	BL-V	42			
	(56)	DTA11	47	V-O	43			
		DTB11	22	O-V	44			
48		VT12	48	V-G	45			
		VR12	23	G-V	46			
	(57)	DTA12	49	V-BR	47			
		DTB12	24	BR-V	48			
SPARE			50	V-S	49			
			25	S-V	50			

Table 1-9

STATION BLOCK CONNECTIONS (CONT.)

STU #5

PORT NUMBER	TELE-PHONE EXT. NUMBER	LEAD DESIG.	JACK J1 CONN PIN NO.	B25B CONN CABLE COLOR	CONN BLK ROW NO.	6, 18 OR 30 TEL. ANY PORT	MESSAGE & EXEC TELS PORT 1-8	DSS CONSOLES PORT 2&3
49		VT1	26	W-BL	1			
		VR1	1	BL-W	2			
	(58)	DTA1	27	W-O	3			
		DTB1	2	O-W	4			
50		VT2	28	W-G	5			BLF FOR STA. 10-39
	DSS #9 (59)	VR2	3	G-W	6			
		DTA2	29	W-BR	7			
		DTB2	4	BR-W	8			
51		VT3	30	W-S	9			BLF FOR STA. 40-69
	DSS #10 (60)	VR3	5	S-W	10			
		DTA3	31	R-BL	11			
		DTB3	6	BL-R	12			
52		VT4	32	R-O	13			
		VR4	7	O-R	14			
	(61)	DTA4	33	R-G	15			
		DTB4	8	G-R	16			
53		VT5	34	R-BR	17			
		VR5	9	BR-R	18			
	(62)	DTA5	35	R-S	19			
		DTB5	10	S-R	20			
54		VT6	36	BK-BL	21			
		VR6	11	BL-BK	22			
	(63)	DTA6	37	BK-O	23			
		DTB6	12	O-BK	24			
55		VT7	38	BK-G	25			
		VR7	13	G-BK	26			
	(64)	DTA7	39	BK-BR	27			
		DTB7	14	BR-BK	28			
56		VT8	40	BK-S	29			
		VR8	15	S-BK	30			
	(65)	DTA8	41	Y-BL	31			
		DTB8	16	BL-Y	32			
57		VT9	42	Y-O	33			
		VR9	17	O-Y	34			
	(66)	DTA9	43	Y-G	35			
		DTB9	18	G-Y	36			
58		VT10	44	Y-BR	37			
		VR10	19	BR-Y	38			
	(67)	DTA10	45	Y-S	39			
		DTB10	20	S-Y	40			
59		VT11	46	V-BL	41			
		VR11	21	BL-V	42			
	(68)	DTA11	47	V-O	43			
		DTB11	22	O-V	44			
60		VT12	48	V-G	45			
		VR12	23	G-V	46			
	(69)	DTA12	49	V-BR	47			
		DTB12	24	BR-V	48			
SPARE			50	V-S	49			
			25	S-V	50			

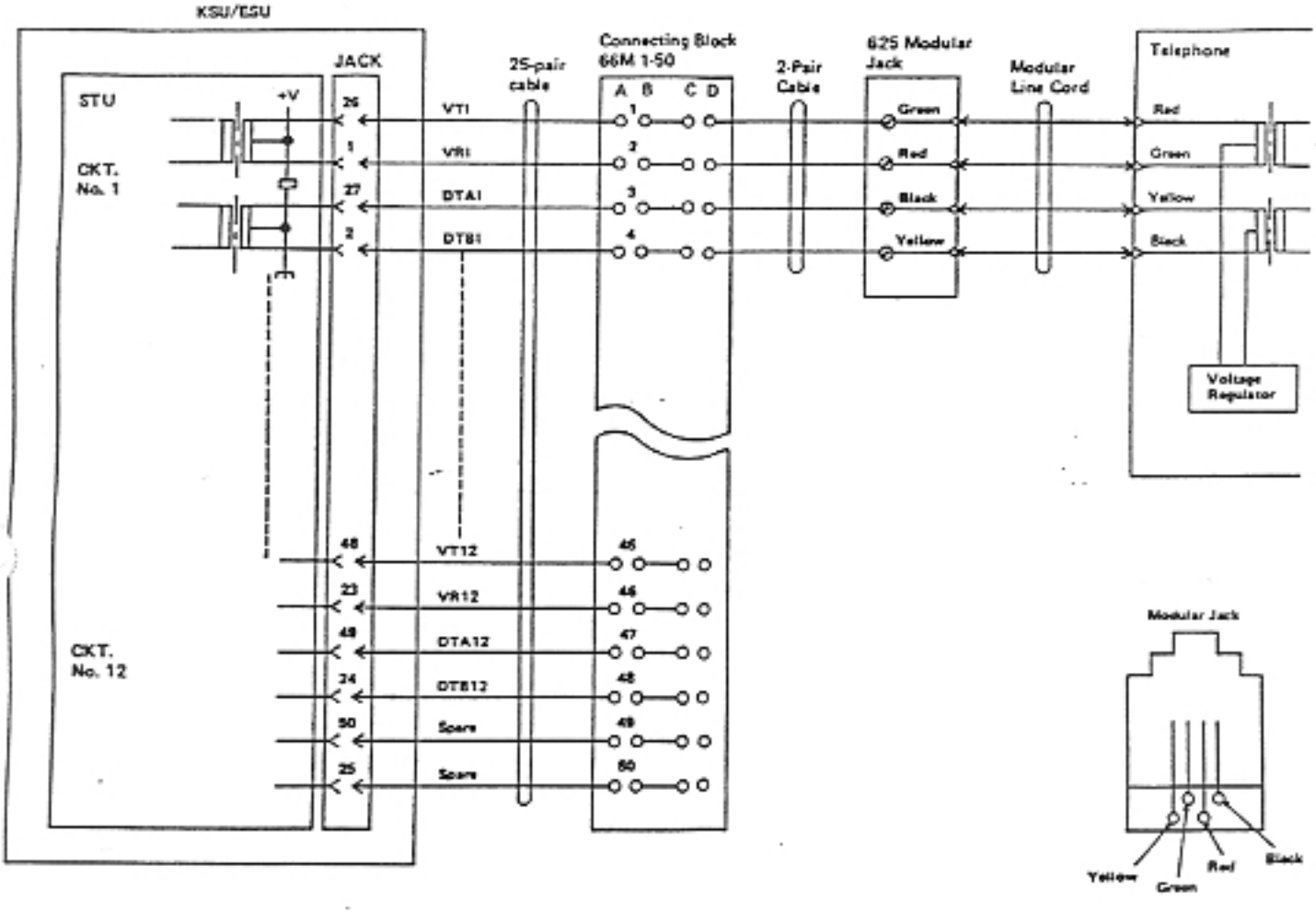


Figure 1-13 Station Interconnect Diagram

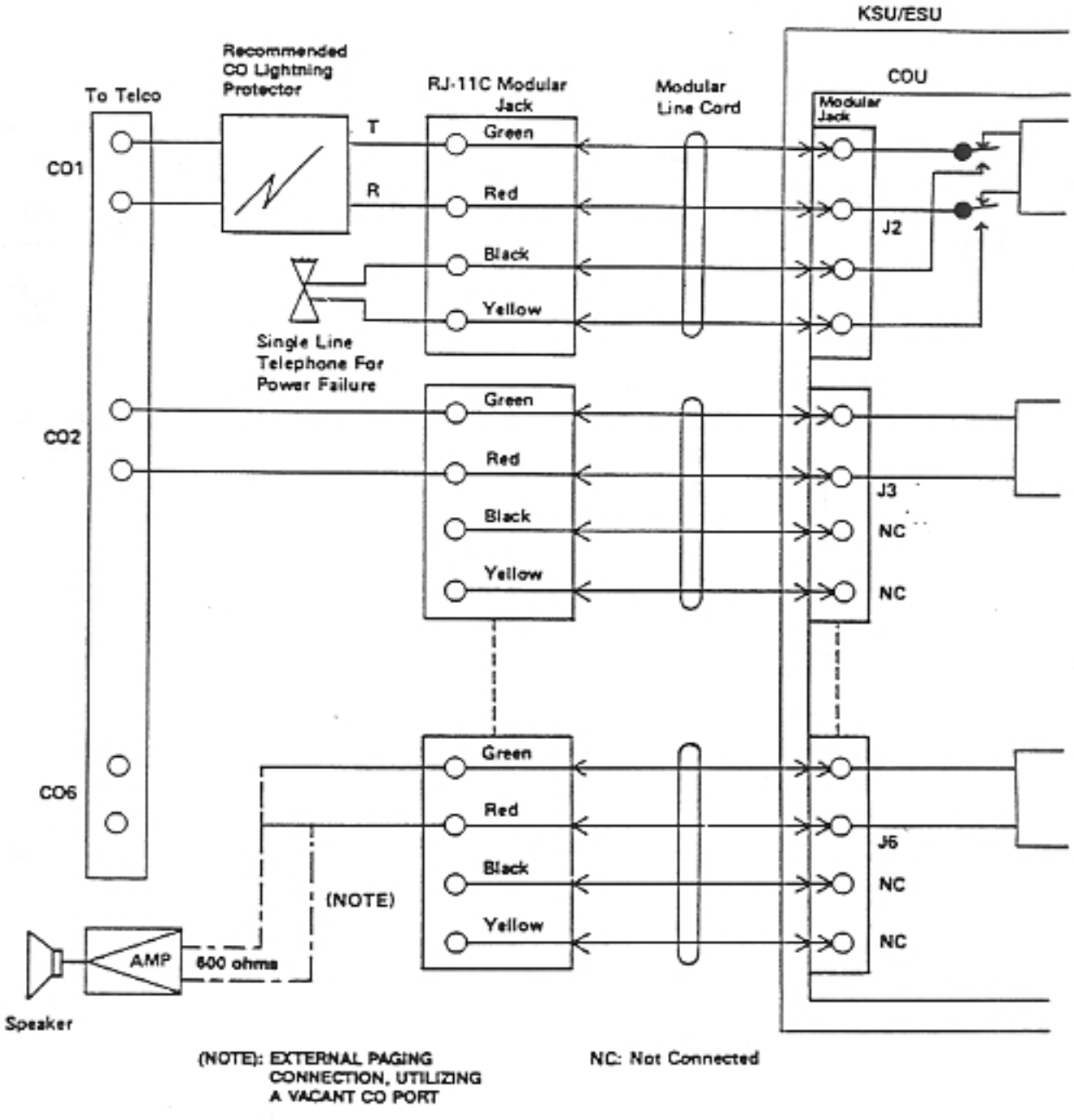


Figure 1-14 CO/PBX Line Connections

Table 1-10

CO/PBX LINE CONNECTIONS

KSU			TRUNK NO.	LEAD DESIG.	MODULAR LINE CORD
POWER FAILURE TRUNK	1PF 2PF	YELLOW BLACK	1	1T	GREEN
				1R	RED
			2	2T	GREEN
				2R	RED
			3	3T	GREEN
		COU #1		3R	RED
			4	4T	GREEN
				4R	RED
			5	5T	GREEN
				5R	RED
ESU #1			6	6T	GREEN
				6R	RED
POWER FAILURE TRUNK	1PF 2PF	YELLOW BLACK	7	7T	GREEN
				7R	RED
			8	8T	GREEN
				8R	RED
			9	9T	GREEN
		COU #2		9R	RED
			10	10T	GREEN
				10R	RED
			11	11T	GREEN
				11R	RED
			12	12T	GREEN
				12R	RED
POWER FAILURE TRUNK	1PF 2PF	YELLOW BLACK	13	13T	GREEN
				13R	RED
			14	14T	GREEN
				14R	RED
			15	15T	GREEN
		COU #3		15R	RED
			16	16T	GREEN
				16R	RED
			17	17T	GREEN
				17R	RED
ESU #2			18	18T	GREEN
				18R	RED
POWER FAILURE TRUNK	1PF 2PF	YELLOW BLACK	19	19T	GREEN
				19R	RED
			20	20T	GREEN
				20R	RED
			21	21T	GREEN
		COU #4		21R	RED
			22	22T	GREEN
				22R	RED
			23	23T	GREEN
				23R	RED
			24	24T	GREEN
				24R	RED

Table 1-10

CO/PBX LINE CONNECTIONS (CONT.)

ESU #2				TRUNK NO.	LEAD DESIG.	MODULAR LINE CORD
POWER FAILURE TRUNK	1PF	YELLOW	COU #5	25	25T	GREEN
	2PF	BLACK			25R	RED
				26	26T	GREEN
					26R	RED
				27	27T	GREEN
					27R	RED
				28	28T	GREEN
					28R	RED
				29	29T	GREEN
					29R	RED
				30	30T	GREEN
					30R	RED

130.13 TELEPHONE INSTALLATION

To install the telephone, connect the four-conductor line cord provided with the telephone between the telephone and the modular jack, as shown in Figure 1-15. If speakerphone is required, refer to **Appendix B** for installation instructions. If wall mount is required, refer to **Appendix C.** (Refer to **Figures 1-36** through **1-40** for individual telephone illustrations.)

130.14 POWER SUPPLY CONNECTIONS

As the power supply is equipped with a connector-ended cable, this cable must be connected to the three-conductor connector provided on the KSU. The three-conductor power connector is located on the left side of the KSU. The power supply connects directly to the KSU connector. (A PS2A may be used except when Battery Backed System operation is required, or when an ESU is added. Refer to **Figure 1-16** for power connection required for ESU operation. A PS 10A-BB must be used in this case.)

130.15 BATTERY BACKED SYSTEM OPERATION

This type of power backup allows full system operation. The power supply has two terminals, one positive (+) and one negative (-). These terminals are the connections for the batteries to be terminated. The system requires two 12 VDC, 40 amp-hour wet cell or two 80 amp-hour gel cell type batteries.

Wire the positive of the first battery to the negative of the second battery. Then wire the negative of the first battery to the negative terminal of the power supply. Lastly, place a wire from the positive terminal of the second battery to the positive terminal of the power supply.

At this point, you will have 24 VDC that will provide approximately four hours of system operation if A/C power is lost. A PS10A-BB power supply must be used for this type operation. Refer to **Figure 1-17.**

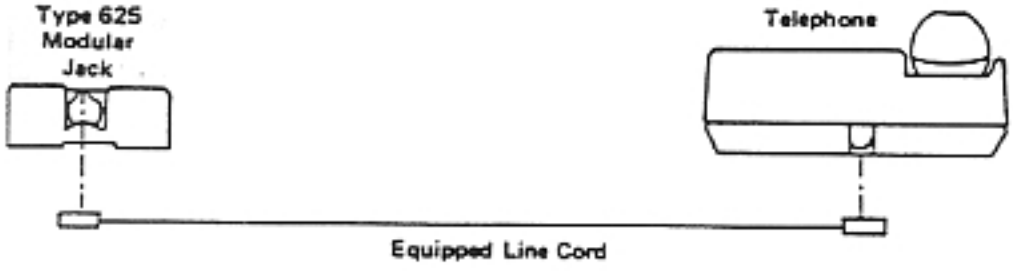


Figure 1-15 Station Connection

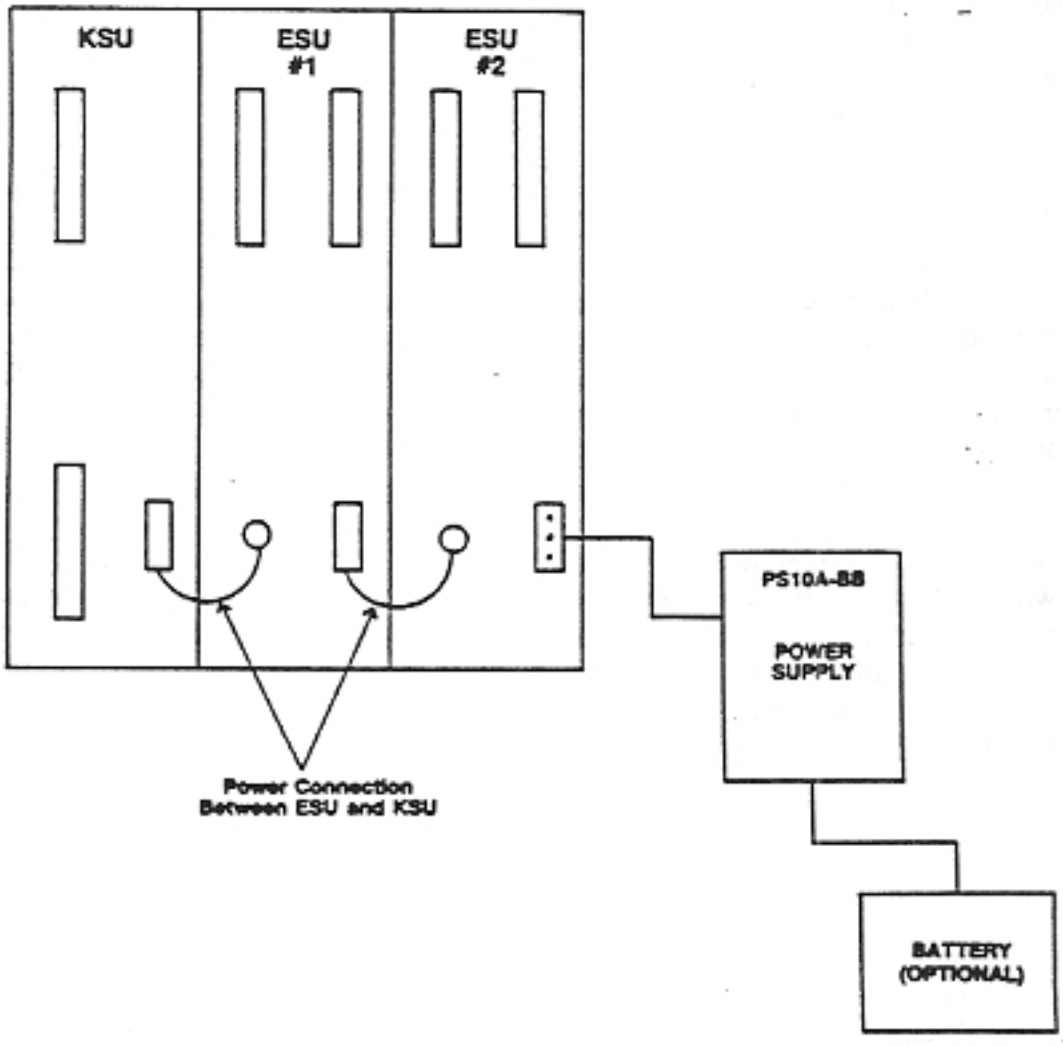


Figure 1-16 Power Supply Connections

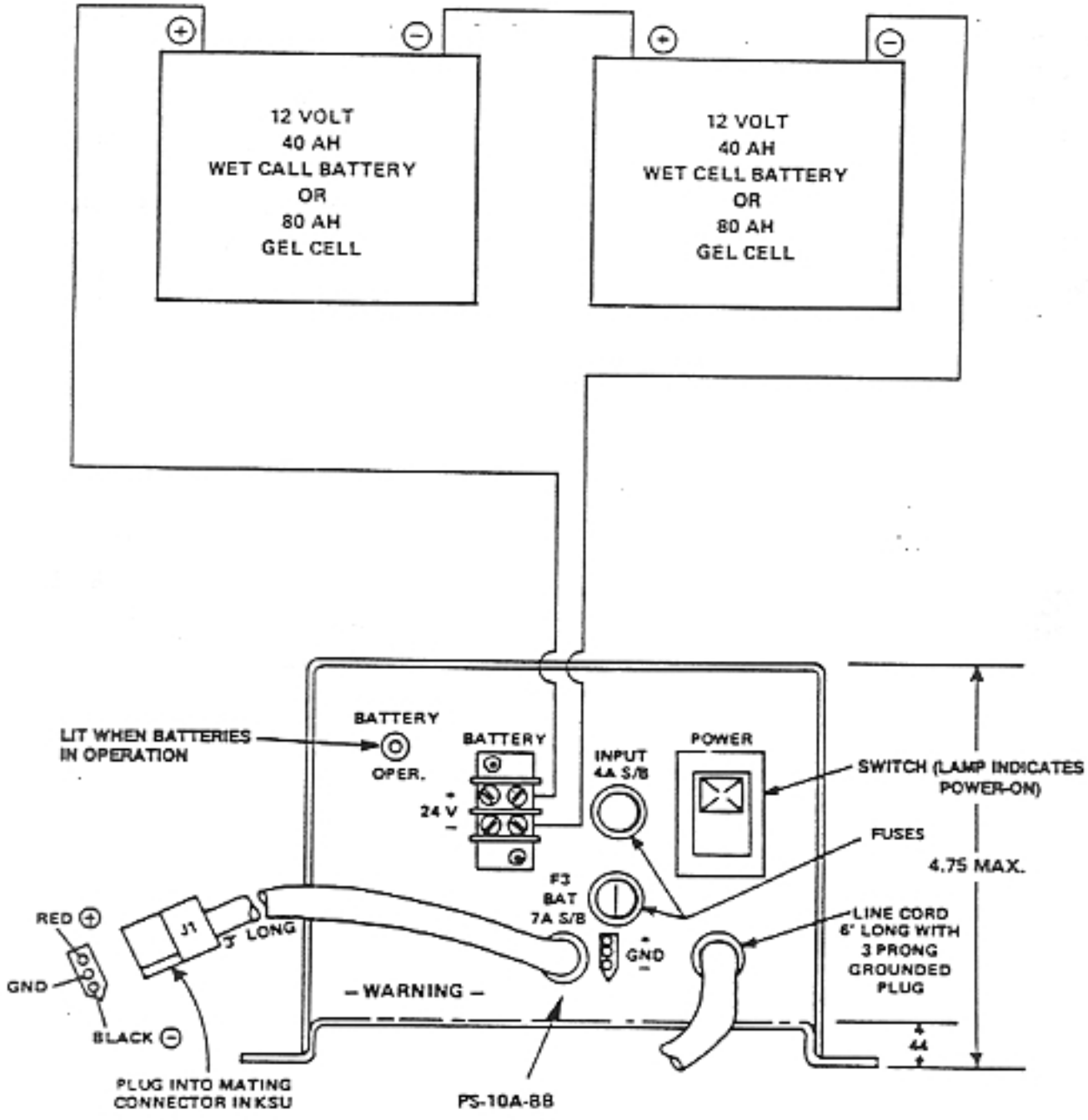


Figure 1-17 Wiring for Battery Back-Up
Utilizing PS-10A-BB Power Supply

130.16 POWER FAILURE CONNECTIONS

The first line of the COU is equipped for power failure connection to a standard single line telephone. In the event of a power failure, Tip and Ring of the first line of each COU will automatically be transferred from the inside conductors of the RJ-11C to the outside conductors for connection to a single line telephone.

To provide power failure connection to a single-line instrument, connect a type 267A parallel adaptor to the line 1 RJ-11C jack, as shown in Figure 1-18. Remove the cover of the standard single-line telephone and connect the black and yellow wires to the same connections as the red and green wires, as shown in Figure 1-19. Reassemble the single-line telephone. Connect the modular cord from the single line telephone to one side of the parallel adaptor. Connect the line 1 modular cord from the COU card to the other side of the parallel adaptor, as shown in Figure 1-18.

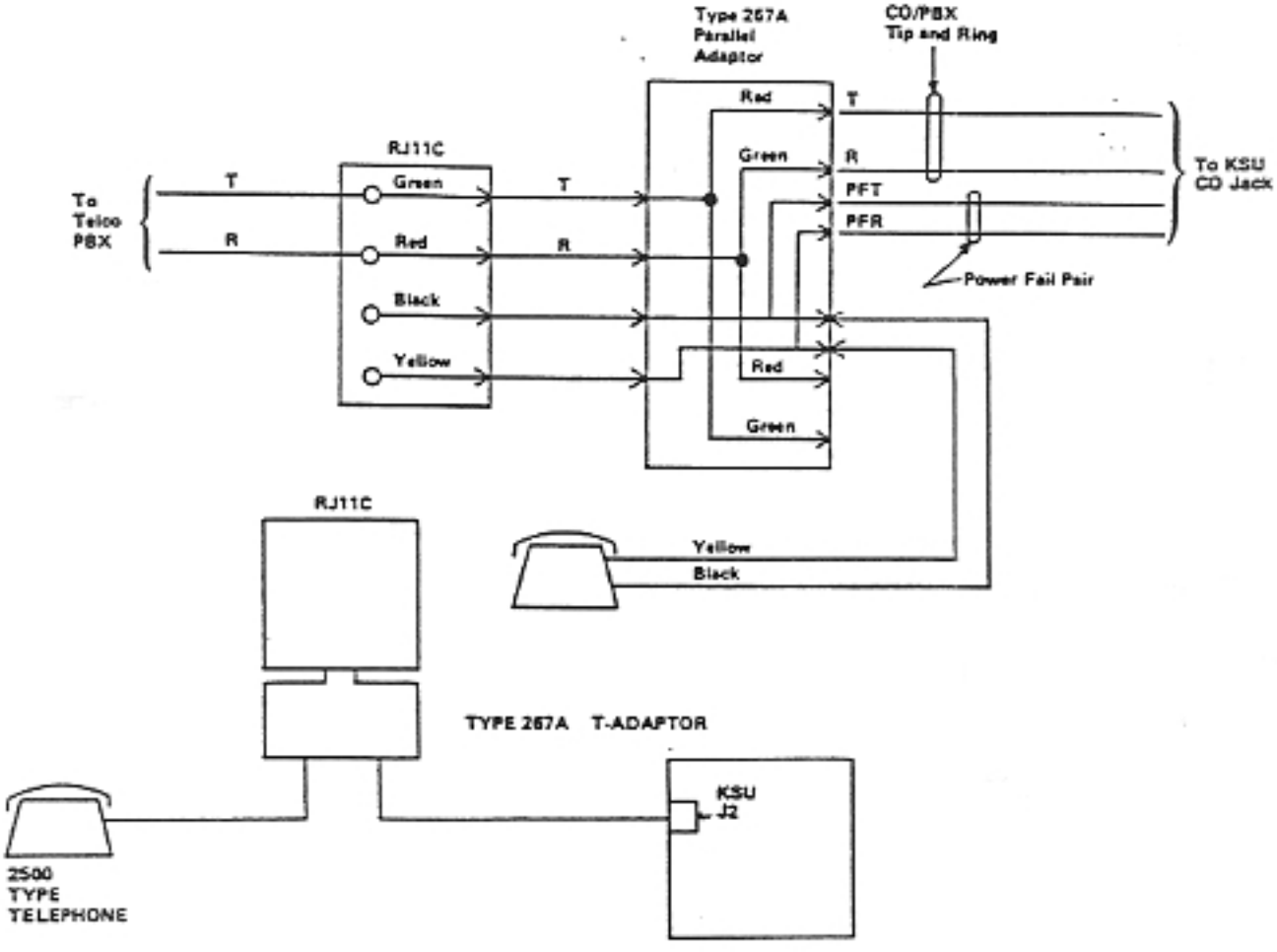


Figure 1-18 CO Line Wiring For Power Failure

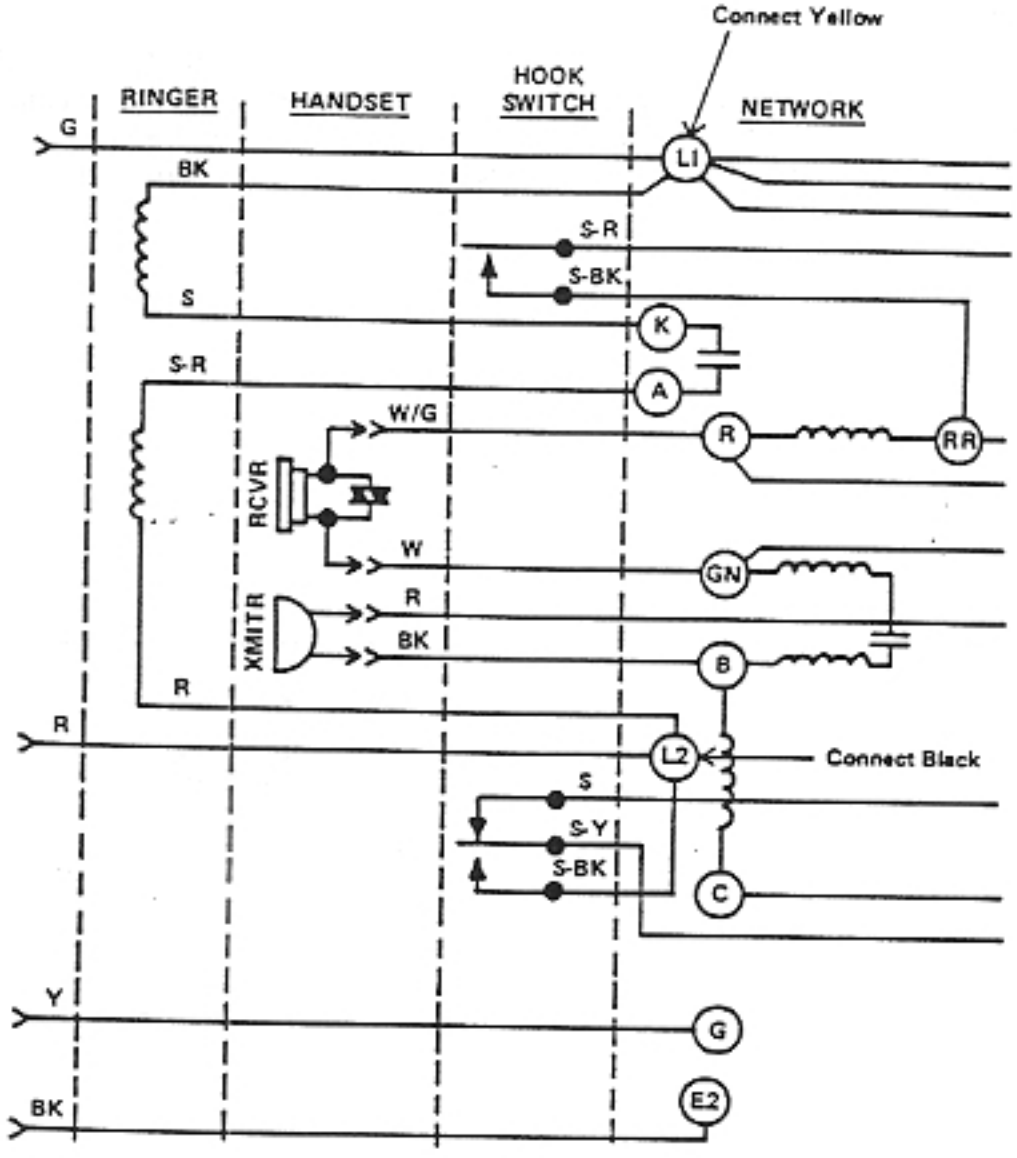


Figure 1-19 Typical 2500 Telephone Wiring Diagram

130.17 MUSIC-ON-HOLD CONNECTIONS

The CPU card is equipped with Music-on-Hold interface circuitry. When Music-on-Hold is required, connect the RCA jack marked MOH on the KSU to the customer provided music source output terminals. One-pair shielded cable is recommended for connections. The recommended output for the MOH source is 8 ohms, amplified (2-5 watts). When a radio is used as a music source, the radio must be located a minimum of ten feet from the Key Service Unit, since the radio receivers generate radio frequencies which may cause interference to the system. (Refer to Figure 1-20).

NOTE: Consult WIN Technical Service Department for additional information concerning possible music sources and amplifiers.

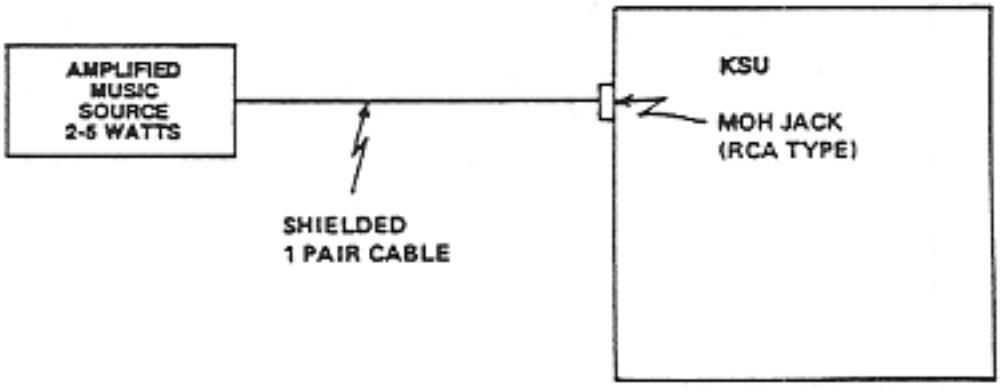


Figure 1-20 Music-On-Hold Connections

130.18 EXTERNAL PAGING CONNECTIONS

A spare port is required for external paging. When external paging is required, connect the paging equipment (600 ohm interface) to the modular jack associated with the spare CO output.

There is no "ON/OFF" control for external paging amplifiers. The input to the paging amplifier may be controlled via the CO line key associated with the paging port. One-pair shielded cable is recommended for paging amplifier connections. (Refer to Figure 1-21.)

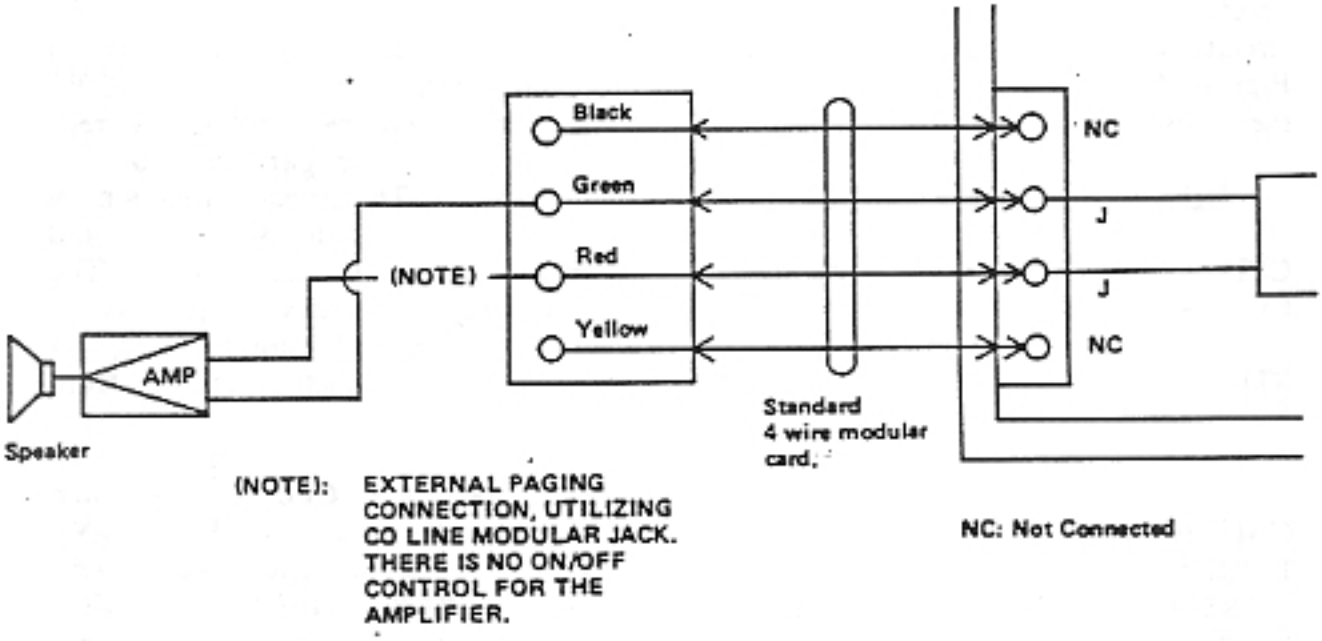


Figure 1-21 External Page Connections

SECTION 140
KSU CIRCUIT CARD INSTALLATION

140.1 GENERAL

The following paragraphs provide a brief description and installation instructions for each basic and optional circuit card for connection to the KSU.

140.2 INSTALLATION OVERVIEW

The Central Processing Unit (CPU) card has DIP switches which may be set before the card is installed. The options and associated switch settings are described on the following pages. The circuit cards are listed below and Figure 1-22 indicates the location of the cards in the Key Service Unit.

CIRCUIT CARDS FOR KSU

CPU - Central Processing Unit
COU - Central Office Unit (6 CO Lines Max.)
STU - Station Unit (Line Card for 12 Stations)

CAUTIONS:

1. REMOVE ALL POWER BEFORE INSTALLING THE CIRCUIT CARDS.

2. ALL CIRCUIT CARDS ARE STATIC SENSITIVE. Before handling any circuit card, perform one of the following two precautions:
   - Discharge the static electricity from your body by touching a metal that is earth grounded.
   - Attach a wire from an earth grounded metal to your wrist which is secured by tape or a clip.

3. WHEN INSTALLING THE CIRCUIT CARDS, CHECK THAT THE CARDS ARE PROPERLY POSITIONED IN THE CARD FILE TRACKS. Ensure that all cables are properly connected before fully inserting the cards into the cabinet. Inserting a card that is not positioned correctly or connected correctly will damage the card. Refer to Figure 1-23 for proper card positioning.

140.3 CPU CARD

This circuit card is the central processing and control unit. One CPU Card (refer to Figure 1-24) is required in any system regardless of its configuration. The primary function of the CPU card is to supervise and maintain control of the system. The CPU accomplishes this by processing and communicating stored data, or stored programs, which it accesses from Eprom.

Note: Several CPU cards are available for the MARATHON system. The appropriate card (i.e. CPU-A, CPU-B, CPU-B2 or CPU-C) should be selected to address user requirements. For specific information on each of these CPU cards, refer to the appropriate chapter of this Installation Manual:

CPU-A	*Chapter 1*
CPU-B	*Chapter 2*
CPU-B2	*Chapter 3*
CPU-C	*Chapter 4*

Figure 1-22 MARATHON Key Service Unit Internal Construction

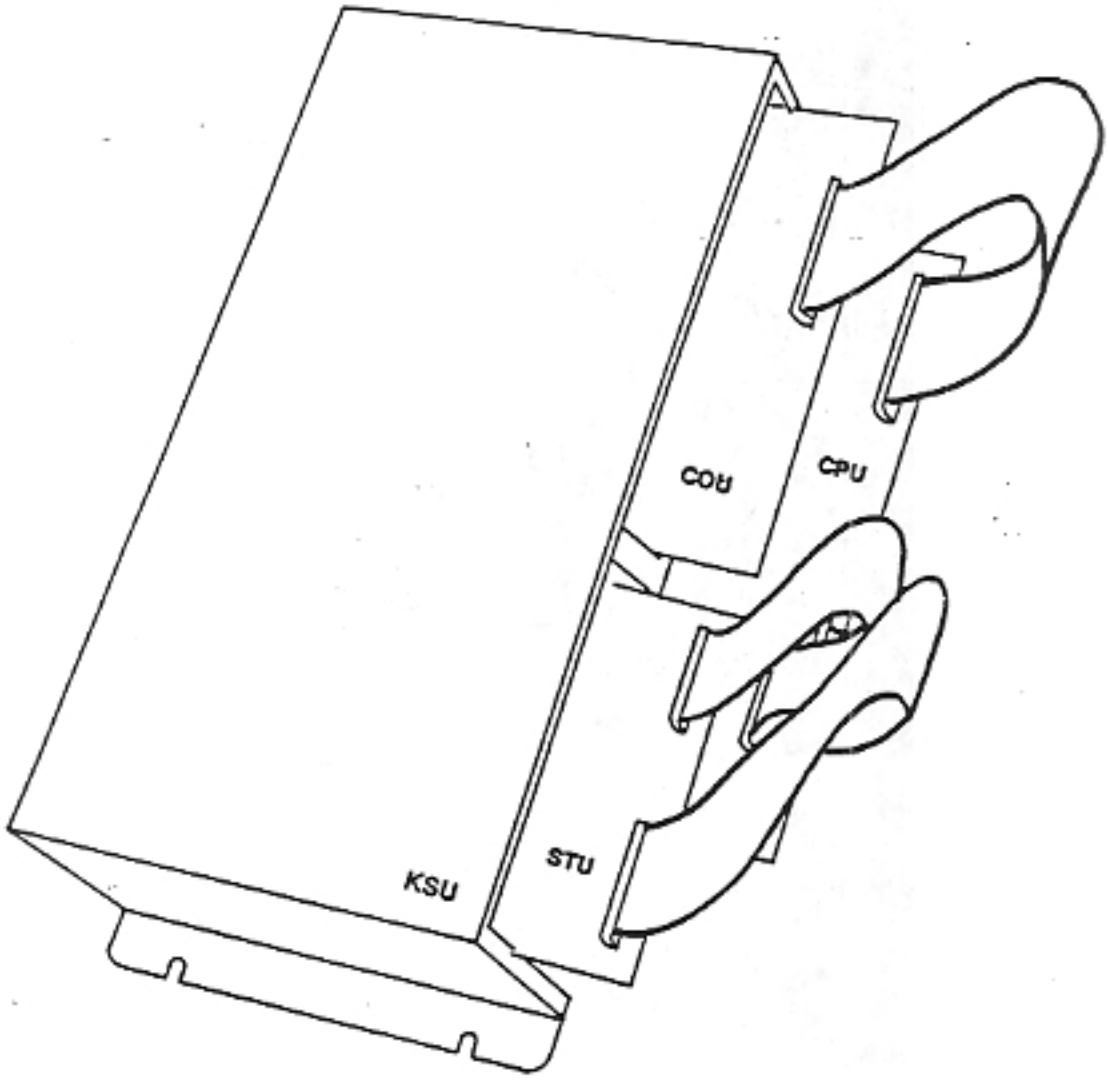


Figure 1-23 Circuit Card Positioning (KSU)

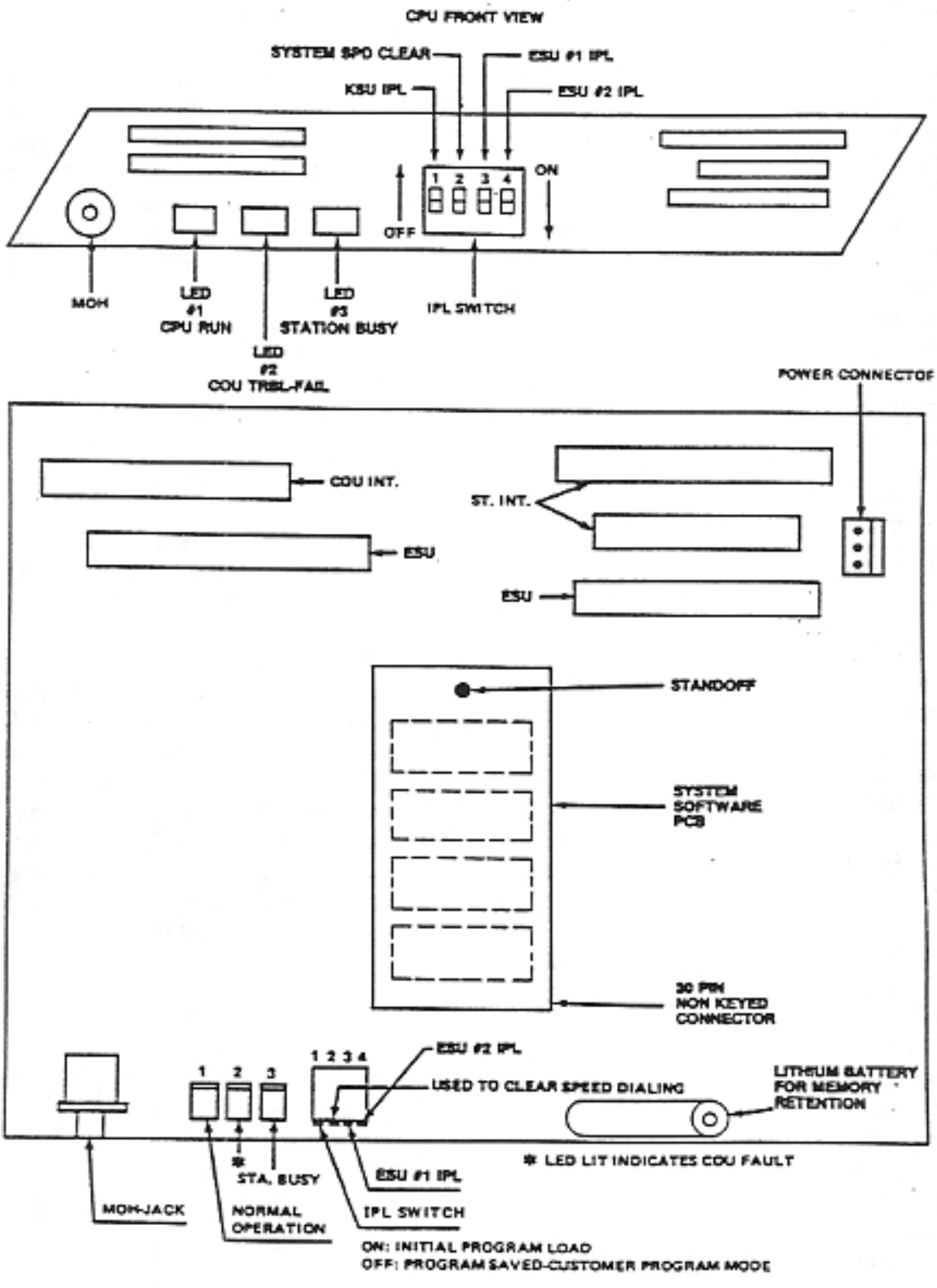


Figure 1-24 MARATHON CPU Card

140.4 MAIN DATABASE

The main data base contains the system's operational and factory data, which is used for basic system operations. The main data base is permanently stored in integrated circuits (Eprom Chips) located on a 2 x 5 inch printed circuit board which is retrofitted (mounted) face down in a piggyback fashion onto the main CPU's circuit board. The factory data must be transferred (loaded) into the CPU main memory (RAM) upon power-up and before normal operation of the system can take place. This transfer or Initial Program Load (IPL) is performed upon initial power-up with the use of a 4 Bit Switch, SW1, located on the CPU board. ("SW3" for ESU #1 and "SW4" for ESU #2).

140.5 CUSTOMER DATABASE

A customer data base is determined by the end user when modifications are made to the factory (default) data. Subsequently, the customer data may be a combination of unmodified factory (default) data and customer data, and is stored in Random Access Memory (RAM).

140.6 SYSTEM INITIALIZATION

Upon initialization "Booting up the System" (by way of SW1 - refer to Table 1-11 which outlines the Switch SW1 Functions), the factory data base is loaded into system random access memory (RAM) located on the main CPU board and the ECU boards. If the system is not initialized properly (refer to the Initialization Flow Chart, Figure 1-41), erratic operation will occur. Once the factory data base is loaded into system RAM, then modification (programming) of the customer data base may take place.

140.7 CPU SECONDARY FUNCTIONS

The secondary function of the CPU is to provide common audibles (tone signals) to the integral parts of the system (except DTMF), and to serve as a voice and data communications network to the various intercom paths, internal paging links, ECUs, STUs, COUs, and SMU.

140.8 CPU PARTS

Some of the integral parts of the main CPU are described as follows:

1. CPU
   8 bit microprocessor and control logic.
2. Random Access Memory
   Used for storing operational software and customer or factory data bases.
3. DIP SWITCHES
   SW1 Bits 1-4 are used for system initialization and station and system speed dial (except Executive) clearing. It also controls system use of factory data or both customer and factory data by allowing or disallowing customer programming mode. (Refer to Figure 1-25)

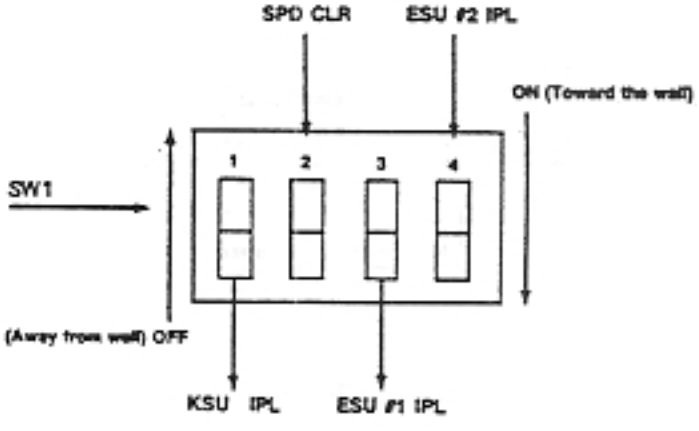


Figure 1-25
Dip Switch Settings

Table 1-11

SWITCH SW1 FUNCTIONS

SELECTOR #	Switch SW1 State OFF	ON
1	CPU run by Customer program entered	CPU run by Factory program (Initial KSU program load)
1+2	System/Station and Station/Station SPD Banks program	All KSU System and Station SPD banks clear
3	ESU #1 Run by Customer data	ESU #1 Run by Factory Data (Initial ESU #2 program load)
2+3	ESU #1 Station/Station SPD Banks program	ESU #1 Run by Factory Data and ESU #1 Station/Station SPD banks clear
2+4	ESU #2 Station/Station SPD Banks program	ESU #2 Run by Factory Data and ESU #2 Station/Station SPD banks clear

4. Operational Software Circuit Card - (Eprom)

This card mounts face down on the CPU card in a piggybacked fashion. It connects via a 40 pin non-keyed dual connector and a plastic pushdown plug. This card provides operational software and factory data base in the form of read only memory to be loaded into system memory upon initialization. (Refer to Figure 1-26.)

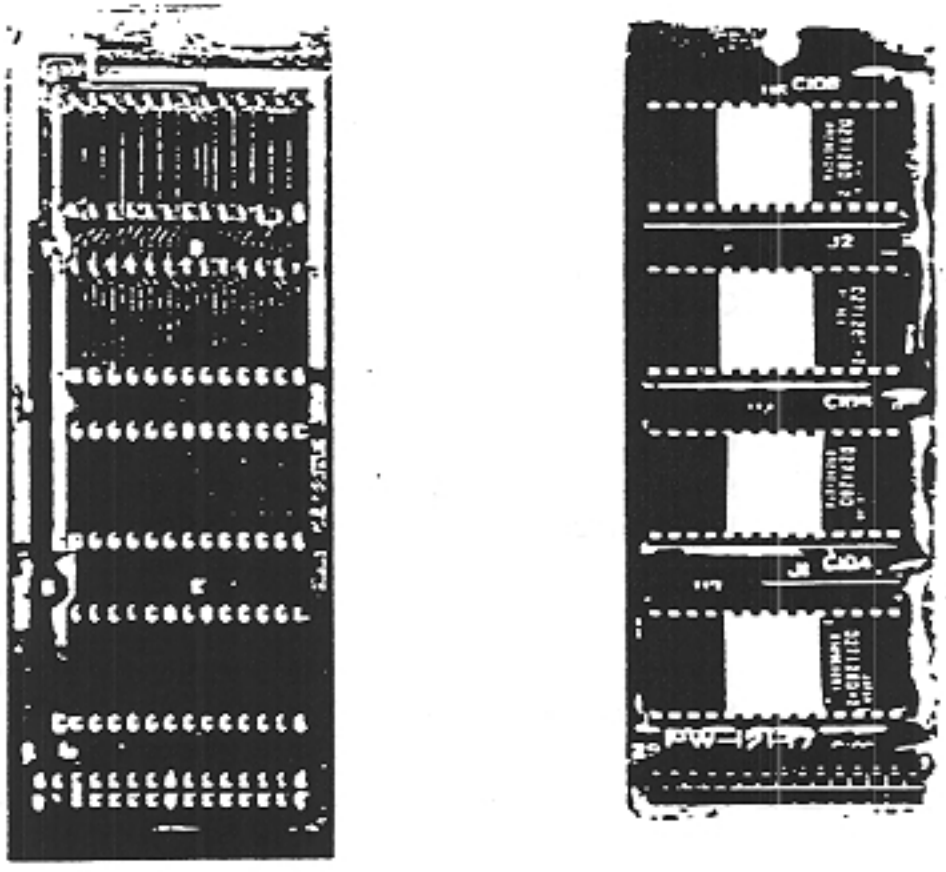


Figure 1-26 EPROM

5. Connectors (Interfaces)

CNA--60 pin connector for connection to CNO of #1 ECU Board or SMU
CNB--40 pin connector for connection to CN1 of #1 ECU Board
CNC--50 pin connector for connection to J1 of #1 STU Board
CND--34 pin connector for connection to J2 of #1 STU Board
CNE--50 pin connector for connection to J1 of #1 COU Board

6. Power Interface

Connects power jack from inside KSU cabinet to main power converter located on the printed circuit board. (Refer to Figure 1-27.)

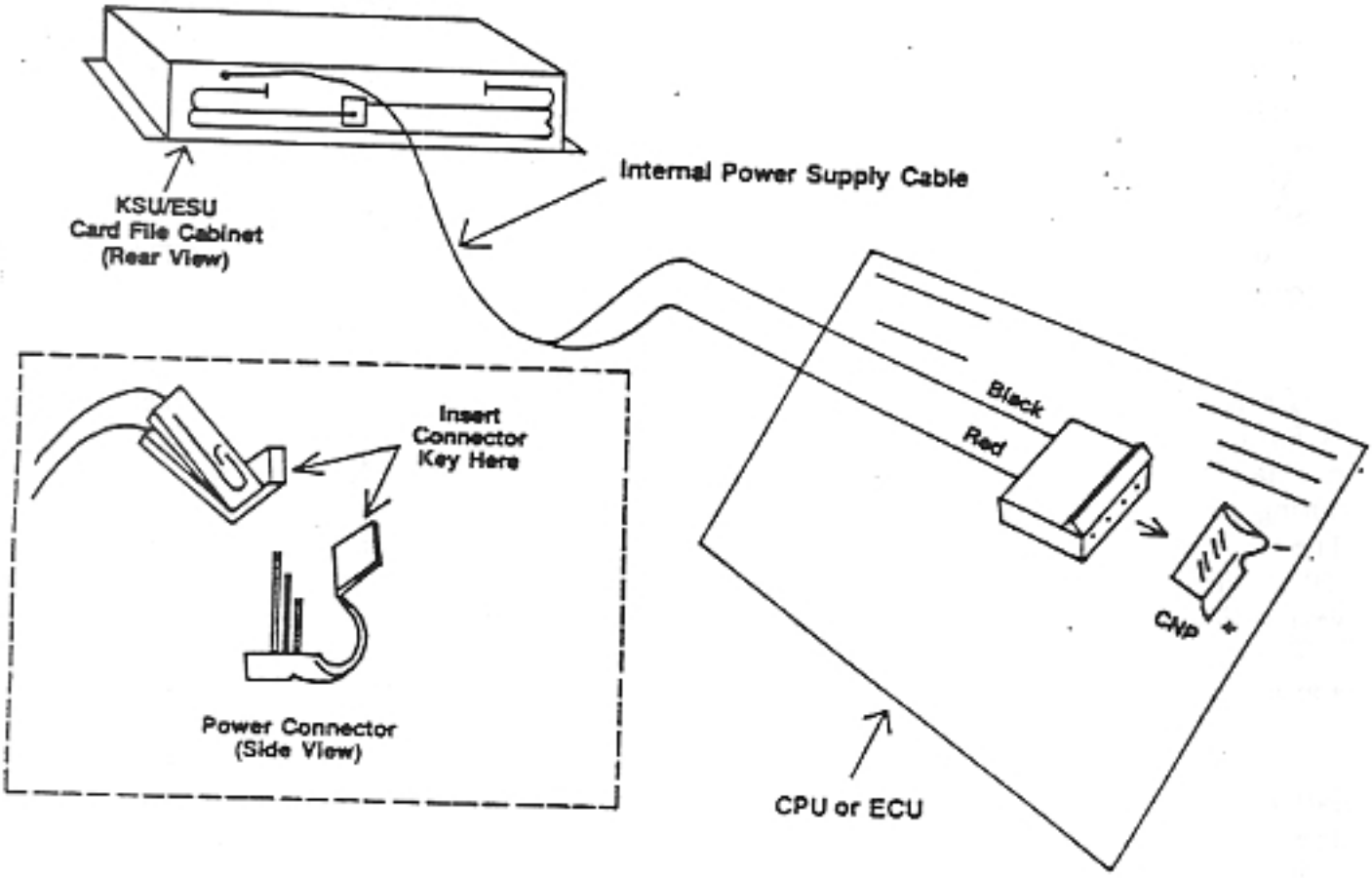


Figure 1-27 Internal Power Interface

7. MOH Jack
Female RCA type jack which interfaces once CPU is mounted into KSU card file to music on hold amplified source (radio, etc.).

8. Light Emitting Diodes (LEDs)
There are three LEDs associated with the CPU as follows:
- #1 LED: CPU Run Indicator Lights steady to show CPU normal operation. Will flash upon system reset or power failure.
- #2 LED: COU Fault Indicator Will flash to indicate COU trouble due to software programming errors, or malfunctioning COU computer.
- #3 LED: Lights solid to indicate system is busy. Flashes to indicate STU trouble due to software programming errors or STU computer failure.

9. Battery
A 3-volt lithium battery is supplied for maintaining CPU random memory during storage and/or power failure. The battery will provide power to the CPU memory continuously for up to one year. Under normal system operation the lithium battery will last approximately 5 years.

140.9 COU CARD
The COU card provides control for six CO lines. All modular jacks (USOC code RJ 11C) and connections for six CO/PBX interfaces are found on the COU card. The first of six CO/PBX jacks is a power failure port which facilitates the use of the outside pair of conductors for direct connection to the CO/PBX line in the case of a power failure. This card can be programmed by system option for either dial pulse output signalling and/or DTMF output signalling (it is factory programmed for DTMF). An associated LED indicates a busy condition on any one of the CO/PBX lines on the COU card. (Refer to Figure 1-28.) The KSU comes equipped with one COU. (None are provided with the ESU).

140.10 STU CARD
The STU card provides control for up to 12 stations. An RJ21X type connector is provided for station interface. The KSU comes equipped with one STU. (None are provided with the ESU.) (Refer to Figure 1-29.)

140.11 ST 1-2 – ST 11-12 LEDS
These LEDs are provided on the STU card and indicate a short circuit condition on the power and transmission path for each key telephone. One LED incorporates two stations for trouble indicating either one or both stations associated with each LED as shown on Table 1-12. If a LED is lit, a short is present and must be found and corrected. (It is highly recommended that both stations associated with the trouble LED be disconnected immediately.) After the short has been cleared, both stations associated with the trouble LED must be disconnected to extinguish the LED. There is no need to replace fuses since positive temperature coefficiant varistors (PTC's) are used for faster response time and higher reliability.

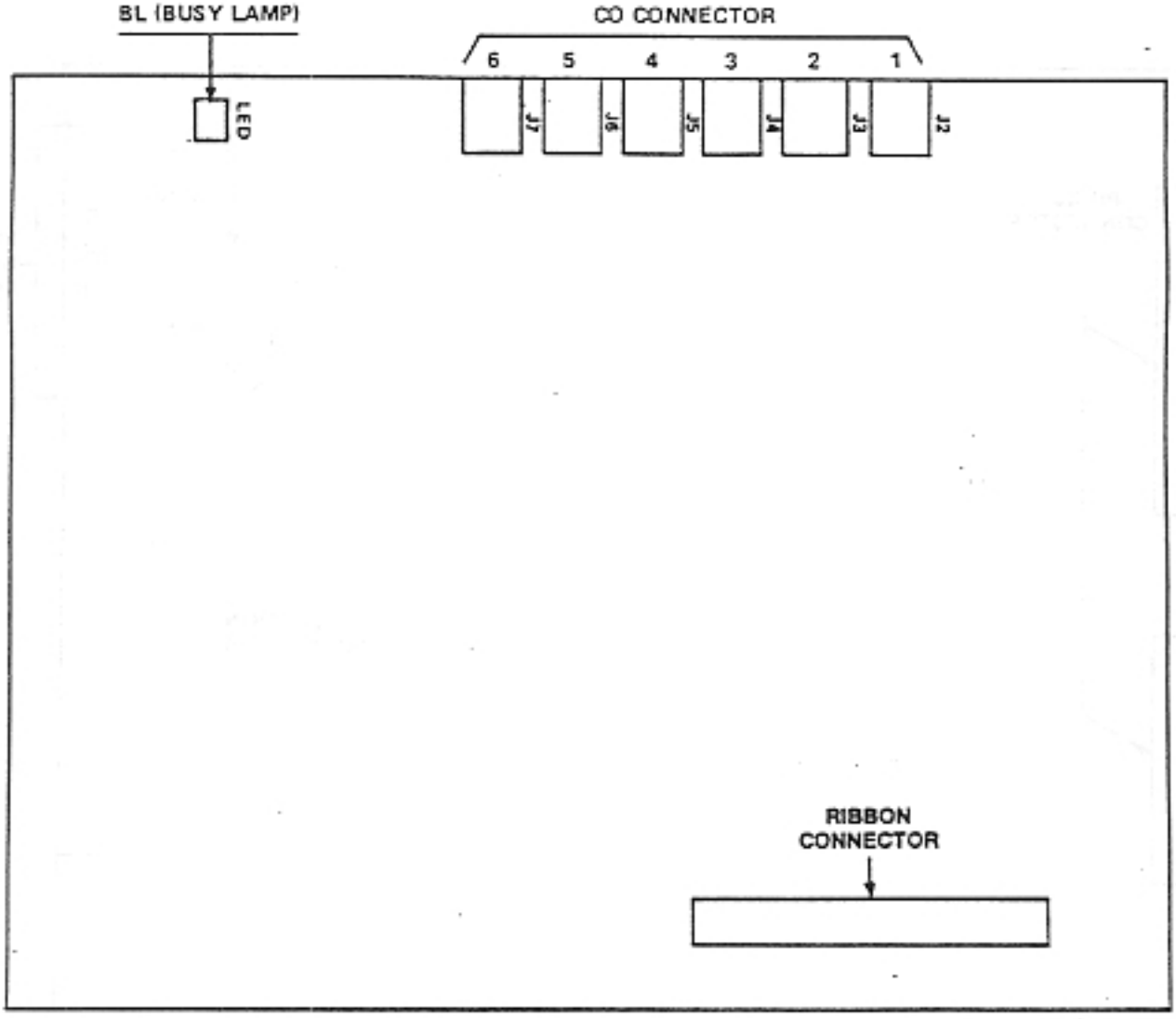


Figure 1-28 MARATHON COU Card

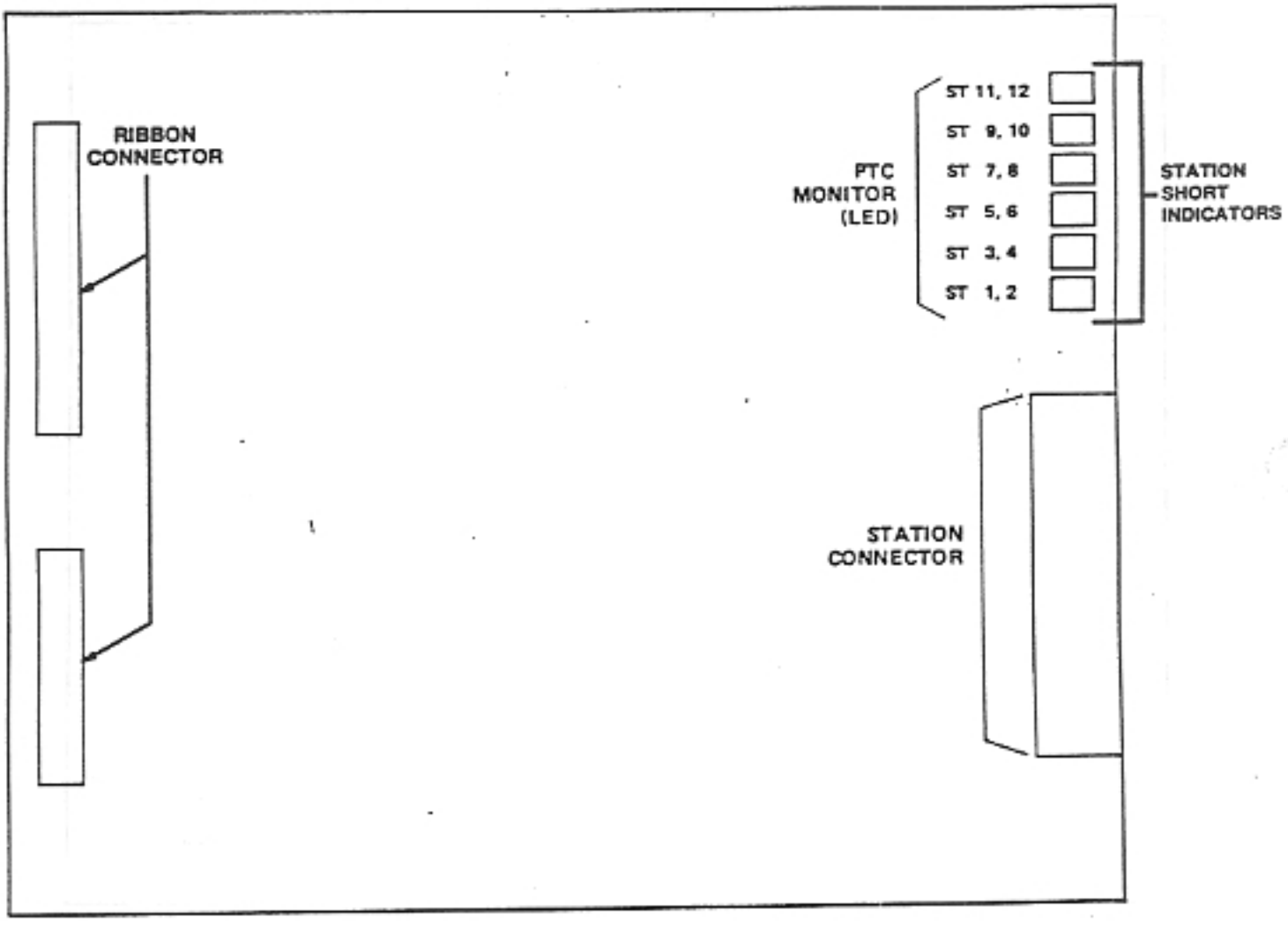


Figure 1-29 MARATHON STU Card

Table 1-12

STATION LINE SHORT-CIRCUIT

LED Lamp	Short-Circuited Station
ST 1-2	Station 1, 2
ST 3-4	Station 3, 4
ST 5-6	Station 5, 6
ST 7-8	Station 7, 8
ST 9-10	Station 9, 10
ST 11-12	Station 11, 12

SECTION 150
ESU CIRCUIT CARD INSTALLATION

150.1 GENERAL

The following paragraphs provide a brief description and installation instructions for the basic and optional cards in the ESU and how they interface with the KSU.

150.2 ESU OVERVIEW

The ESU cabinet is a card file type cabinet with an internal/external power supply interface. The circuit cards associated with the ESU are to be inserted in the appropriate place as indicated on the ESU card file tracks. The circuit cards are interfaced with ribbon cables. (The ribbon cables are the preferred, and more dependable replacement for a main distribution frame "MDF".)

Table 1-13 lists the circuit cards in the ESU and the cable designations and interface. Figure 1-30 illustrates the internal construction of the ESU. Figure 1-31 shows the positioning of the cards. Figure 1-32 shows the proper cable connections between each ESU and the KSU.

150.3 *CAUTIONS:*

1. REMOVE ALL POWER BEFORE INSTALLING THE CIRCUIT CARDS.
2. ALL CIRCUIT CARDS ARE STATIC SENSITIVE. Before handling any circuit card, perform one of the following two precautions:
   - Discharge the static electricity from your body by touching a metal that is earth grounded.
   - Affix a grounding strap (wire) from an earth grounded metal to your wrist.
3. WHEN INSTALLING THE CIRCUIT CARDS, CHECK THAT THE CARDS ARE PROPERLY POSITIONED IN THE CARD FILE TRACKS. Ensure that all cables are properly connected before fully inserting the cards into the cabinet. Inserting a card that is not positioned or connected correctly will damage the card. Secure all cards with the card file sliding bracket. Refer to Figure 1-33 for proper card positioning.

Table 1-13*

LIST OF CABLE DESIGNATIONS AND INTERFACE

Circuit Card	Card File	Connector Designation (From)	Connector Designation (To)	Interface to Circuit (Card Designation)	Cabinet (Card File)
CPU	KSU	CNA	CNO	ECU #1	ESU #1
		CNB	CN1	ECU #1	ESU #1
		CNC	J1	STU #1	KSU
		CND	J2	STU #1	KSU
		CNE	J1	COU #1	KSU
STU #1		J1	CNC	CPU	KSU
		J2	CND	CPU	KSU
COU #1		J1	CNE	CPU	KSU
ECU #1	ESU #1	CNO	CNA	CPU	KSU
		CN1	CNB	CPU	KSU
		CN2	CNO	ECU #2	ESU #2
		CN3	CN1	ECU #2	ESU #2
		CN4	J1	STU #3	ESU #1
		CN5	J2	STU #3	ESU #1
		CN6	J1	STU #2	ESU #1
		CN7	J2	STU #2	ESU #1
		CN8	J1	COU #3	ESU #1
		CN9	J1	COU #2	ESU #1
		CN10	CN11	ECU #2	ESU #2
		CN11	CN10	ECU #2	ESU #2
EMU #1	ESU #1	N/A	CN12	ECU #1	ESU #1
		N/A	CN13	ECU #1	ESU #1
STU #2	ESU #1	J1	CN6	ECU #1	ESU #1
		J2	CN7	ECU #1	ESU #1
COU #2	ESU #1	J1	CN9	ECU #1	ESU #1
STU #3	ESU #1	J1	CN4	ECU #1	ESU #1
		J2	CN5	ECU #1	ESU #1
COU #3	ESU #1	J1	CN8	ECU #1	ESU #1

* Also refer to Figure 1-33

Table 1-13 cont.*

LIST OF CABLE DESIGNATIONS AND INTERFACE

Circuit Card	Card File	Connector Designation (From)	Connector Designation (To)	Interface to Circuit (Card Designation)	Cabinet (Card File)
ECU #2	ESU #2	CNO	CN2	ECU #1	ESU #1
		CN1	CN3	ECU #1	ESU #1
		CN2	EMPTY		
		CN3	EMPTY		
		CN4	J1	STU #5	ESU #2
		CN5	J2	STU #5	ESU #2
		CN6	J1	STU #4	ESU #2
		CN7	J2	STU #4	ESU #2
		CN8	J1	COU #5	ESU #2
		CN9	J1	COU #4	ESU #2
		CN10	CN11	ECU #1	ESU #1
		CN11	CN10	ECU #1	ESU #1
EMU #2	ESU #2	XXX	CN12	ECU #1	ESU #2
		XXX	CN13	ECU #2	ESU #2
STU #4	ESU #2	J1	CN6	ECU #2	ESU #2
		J2	CN7	ECU #2	ESU #2
STU #5	ESU #2	J1	CN4	ECU #2	ESU #2
		J2	CN5	ECU #2	ESU #2
COU #4	ESU #2	J1	CN9	ECU #2	ESU #2
COU # 5	ESU #2	J1	CN8	ECU #2	ESU #2

*Also refer to Figure 1-33

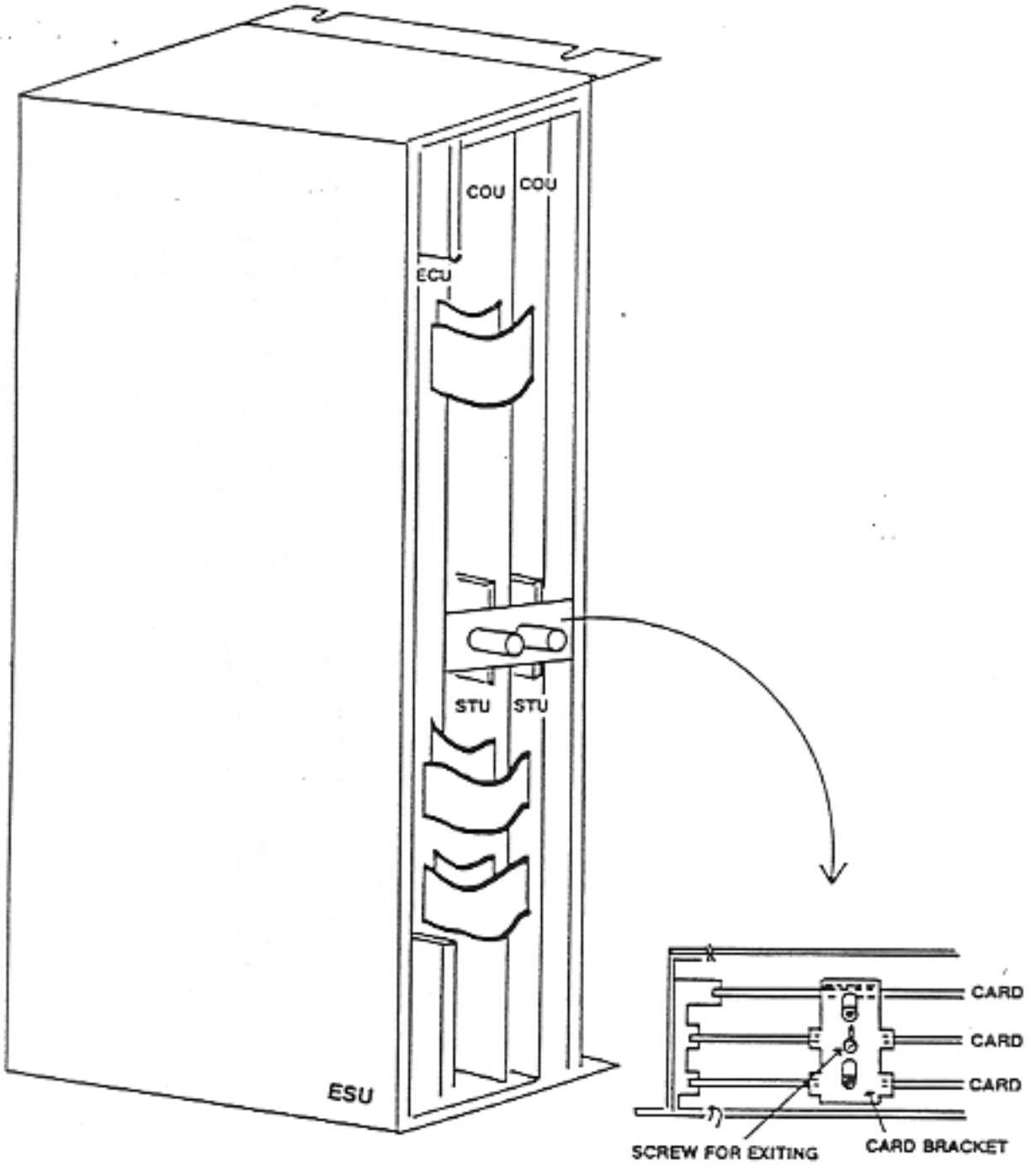


Figure 1-30 ESU Internal Construction

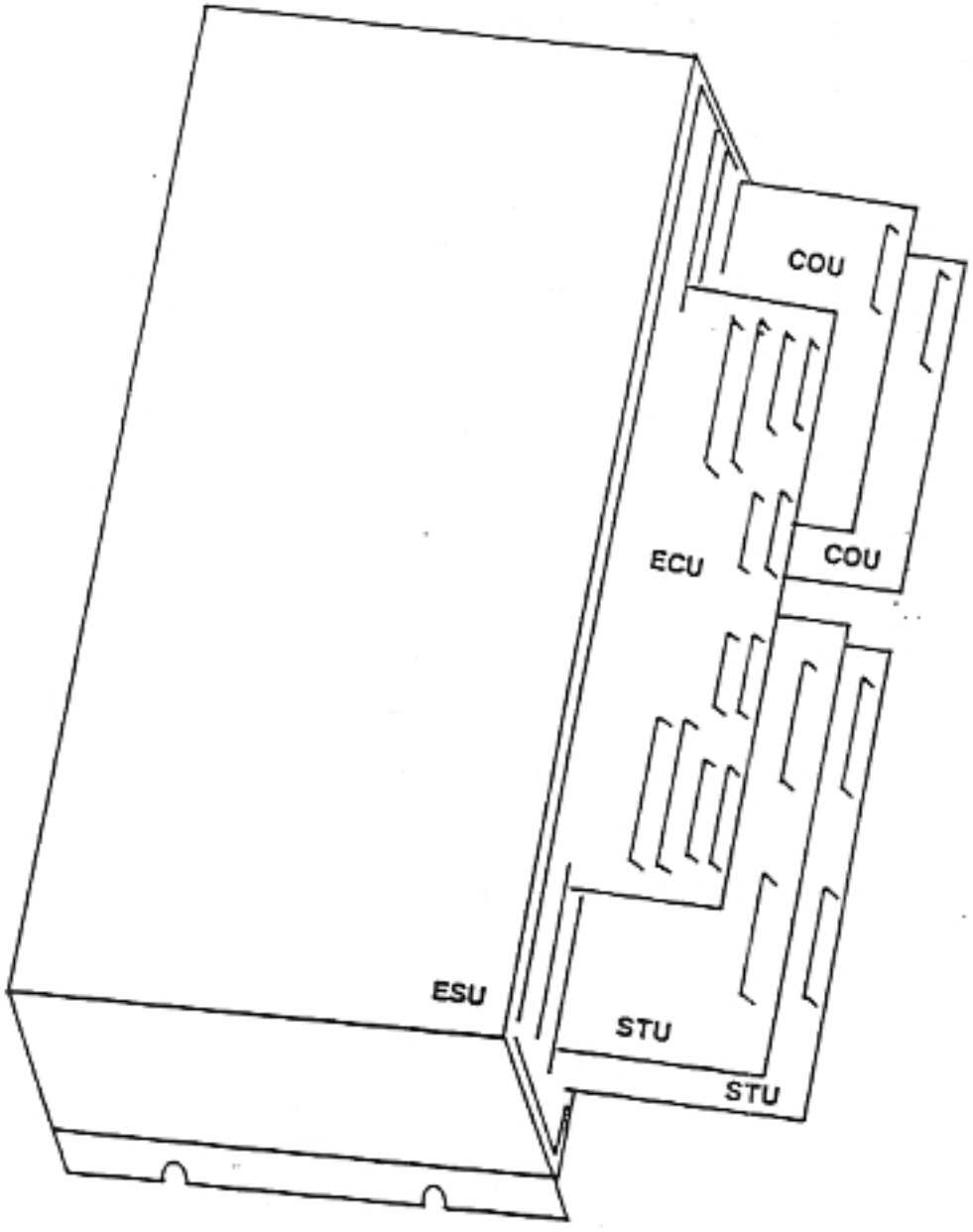


Figure 1-31 Circuit Card Positioning (ESU)

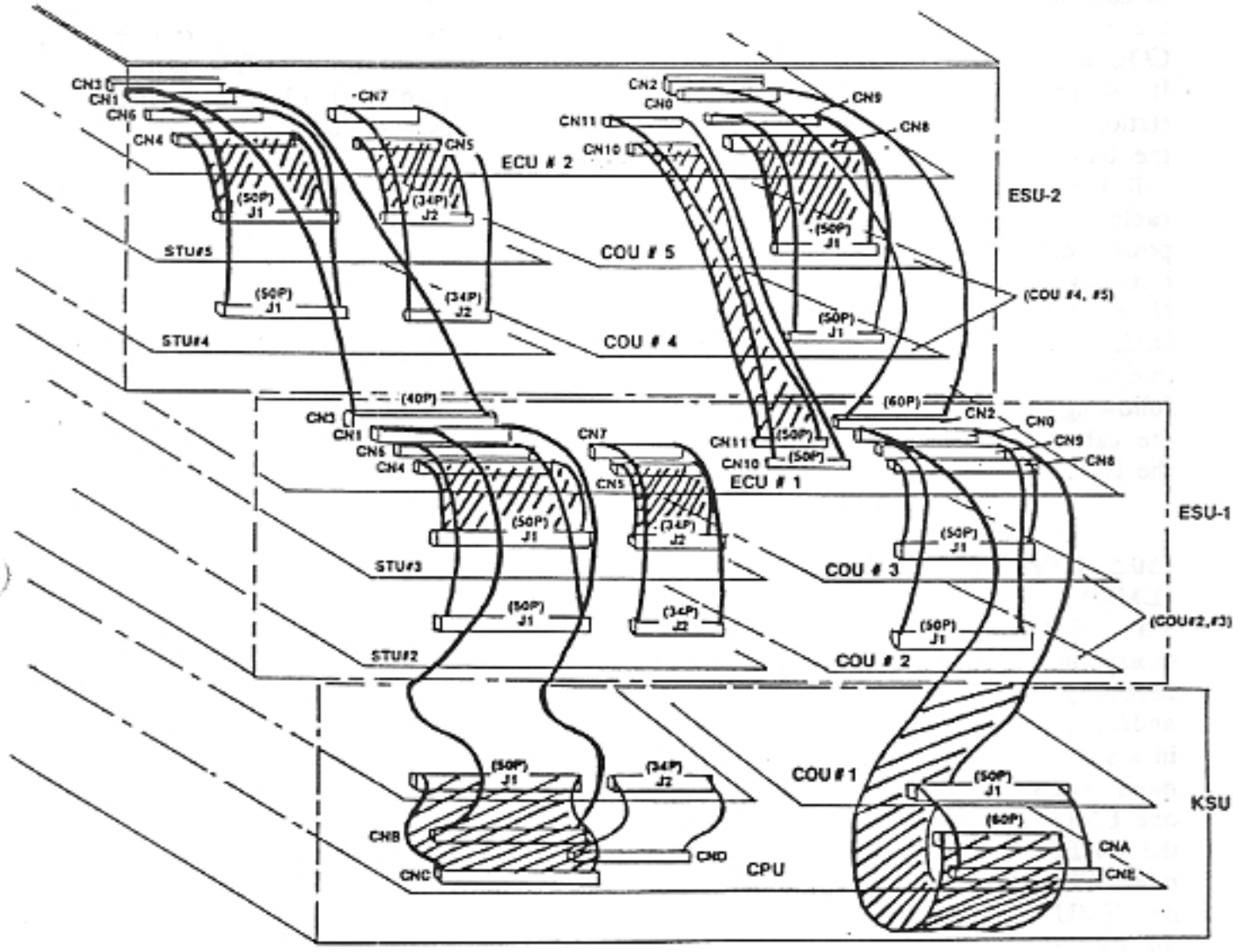


Figure 1-32 Cabling Between the ESU/ESU and KSU

150.4 EXPANSION CONTROL UNIT (ECU)

This card is the decentralizing control unit for the ESU. Its primary function is to communicate with the CPU card in the KSU as it maintains control of the COU cards and STU cards in the ESU. It also provides expansion matrices for station additions. **Figure 1-33** shows the basic construction of the ECU. It will be necessary to interface the power cable provided inside the ESU with the power connector on the ECU card while installing the ECU into the card file. Note the standoffs provided on the ECU card. These standoffs will be used for interface with the EMU described in the following paragraph. **Table 1-13** lists the cable interfaces for installation of the ECU.

150.5 EXPANSION MATRIX UNIT (EMU)

The EMU provides additional crosspoint matrices which are only necessary when additional CO lines and/or additional stations are utilized in a system. In the case where four or more STUs are present in the system, one EMU is required to be installed in the #1 ESU. In the case where four or more COUs are present in the system, one EMU is required to be installed in the #2 ESU. **Table 1-13** lists the cable interfaces for the EMU. **Figure 1-34** shows the layout of the EMU. The EMU is to be installed in a piggyback configuration onto the ECU. (Refer to **Figure 1-35** utilizing the snap-on type standoffs provided on the ECU.)

150.6 COU CARD

Refer to **Figure 1-28.** Each ESU can be equipped with up to two COU cards. Refer to **Table 1-13** for cable interfacing designations.

150.7 STU CARD

Refer to **Figure 1-29.** Each ESU can be equipped with up to two STU cards. Refer to **Table 1-13** for cable interfacing designations.

*Three cables are provided with each ESU. When installing one ESU, a spare 50 pin cable and connectors will remain unused. Save this cable as it will be required when expanding with ESU #2 takes place.

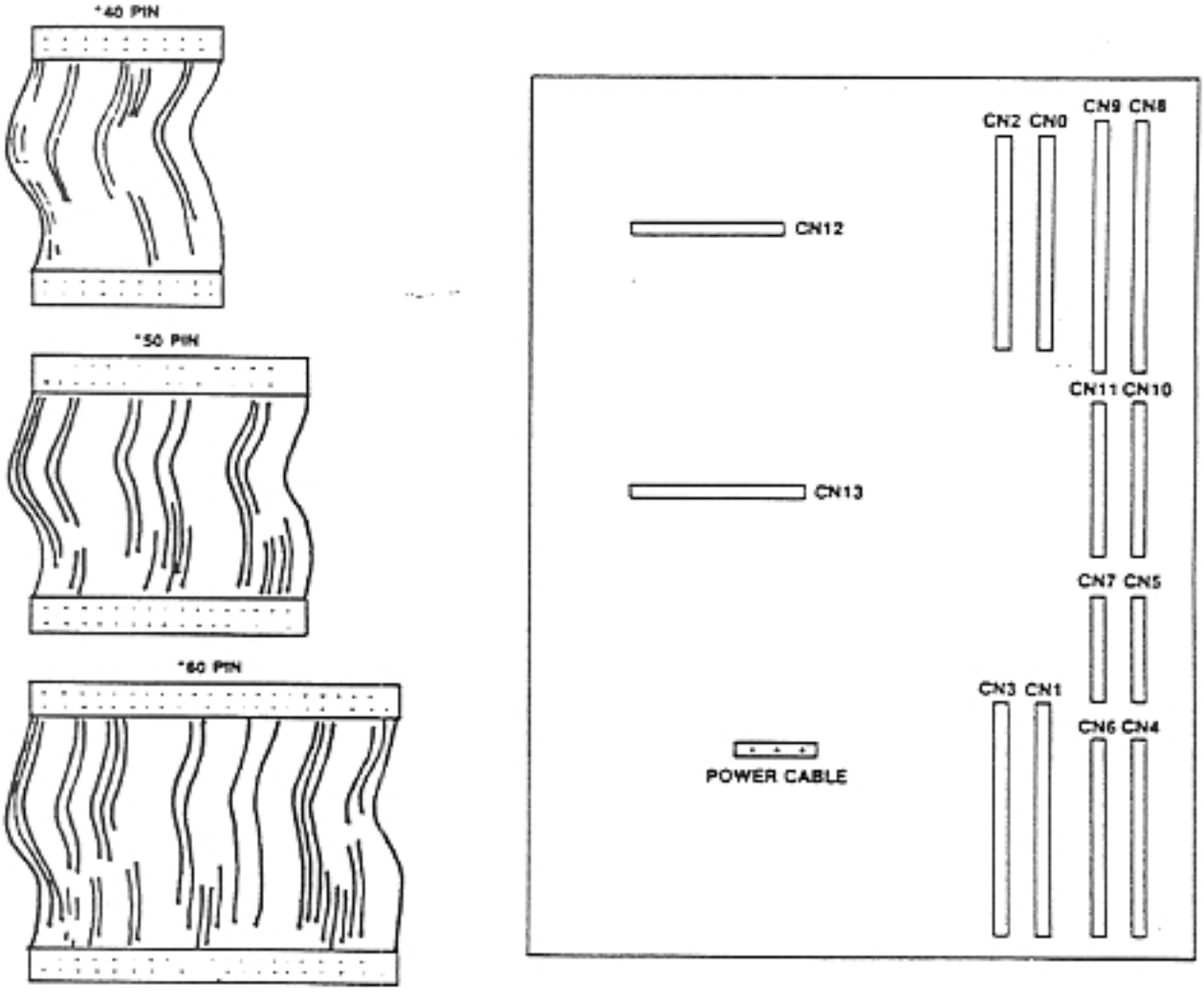


Figure 1-33 Expansion Control Unit

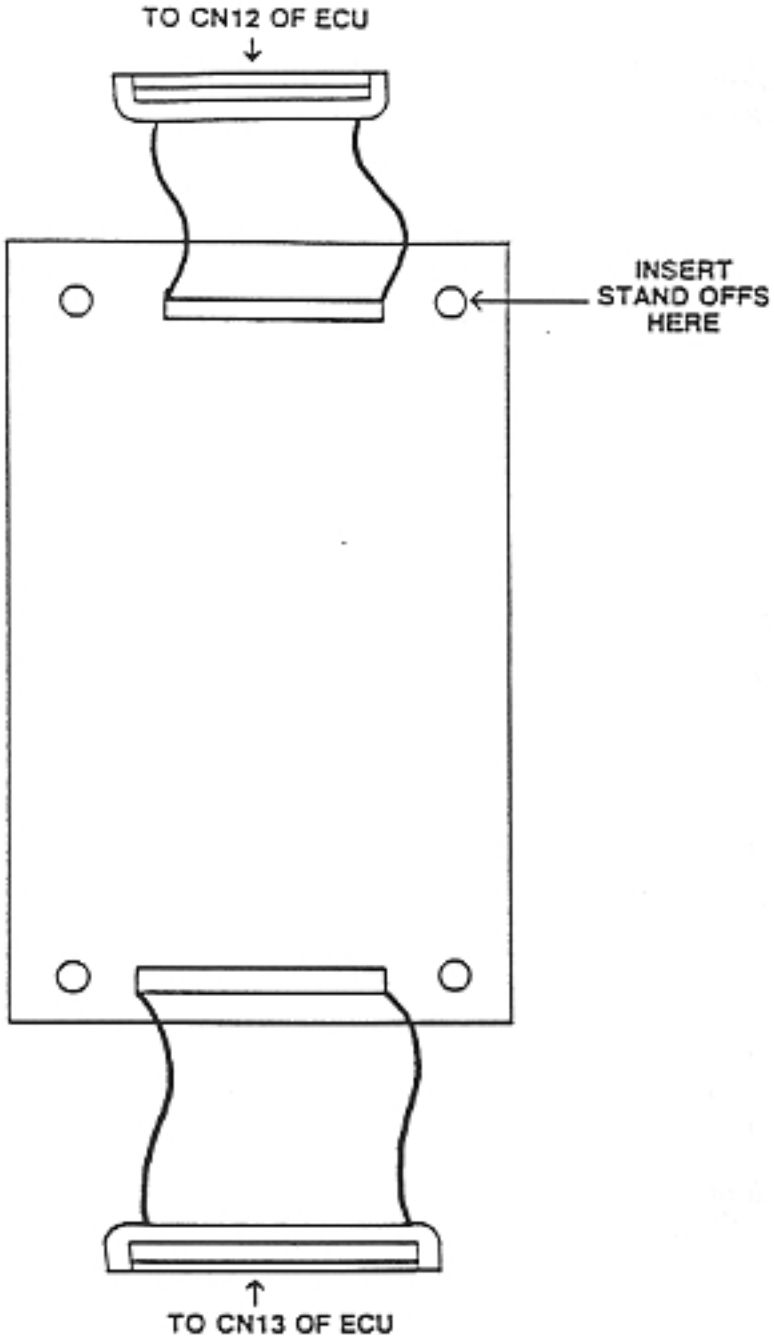


Figure 1-34 Expansion Matrix Card

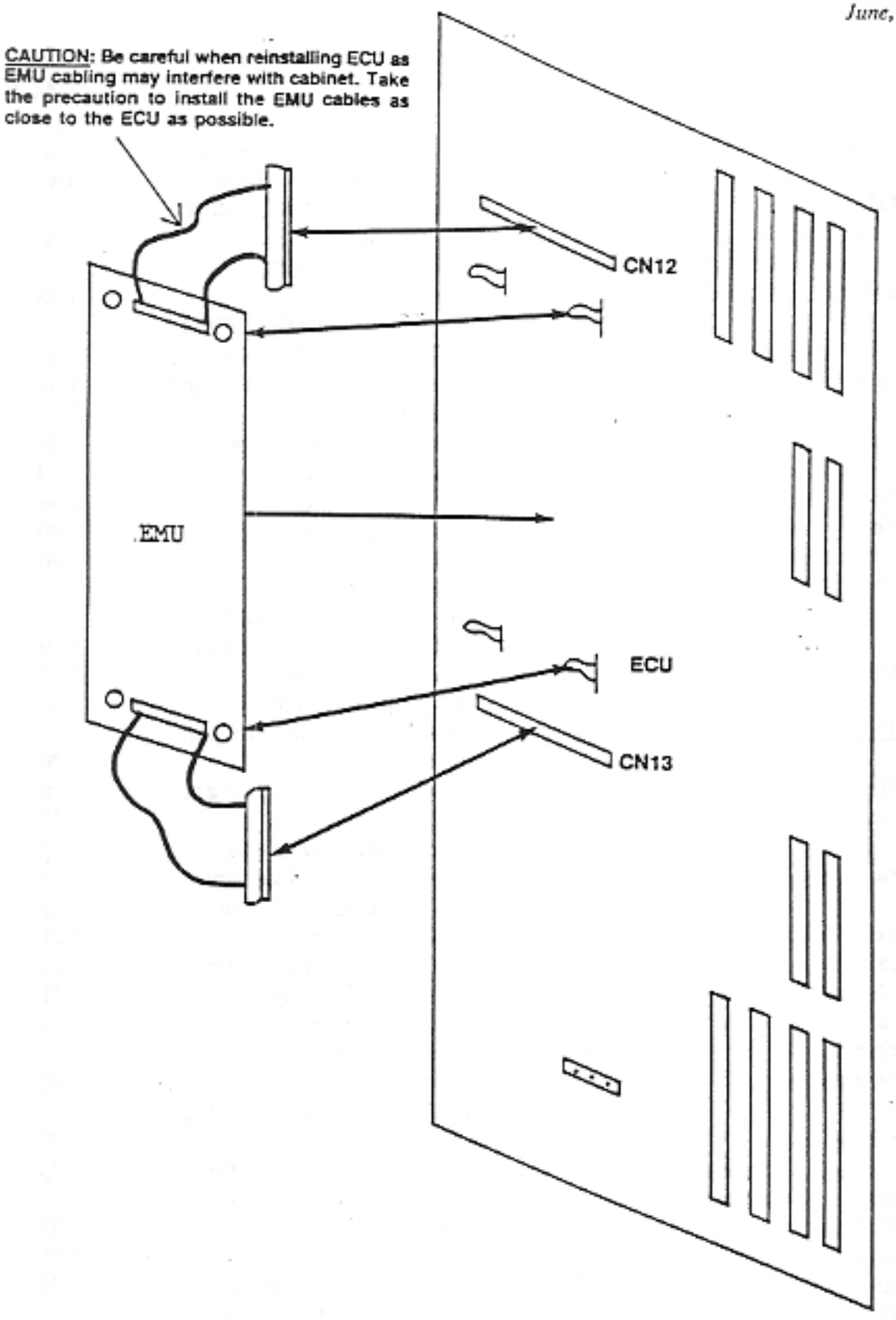


Figure 1-35 Installation of the EMU

SECTION 160
FEATURE DESCRIPTION AND OPERATION

160.1 GENERAL

The definition and operating procedures for the following features are described in this section.

Note: The features described in this section are provided by CPU-A, as well as all other available CPU cards (i.e. CPU-A, CPU-B, CPU-B2, CPU-C). Refer to the appropriate chapter in the Installation Manual for additional features provided by a particular CPU.

160.2 FEATURE LIST

160.3 AUTOMATIC HOLD OF CO CALL

This feature allows any station user to automatically place a CO call on hold by pressing the ICM line button while on a CO line.

160.4 AUTOMATIC PRIVACY OF CO/PBX CALL

This feature protects the busy station from an accidental or intentional interruption of a telephone call. The station user is completely assured of privacy on all types of outside calls. This feature is especially useful in a shared tenant environment.

160.5 AUTOMATIC PRIVACY OF INTERCOM CALL

This feature protects the busy station from accidental or intentional interruption of an intercom call. The station user on an intercom call is completely guaranteed of the privacy of the call.

160.6 AUTOMATIC TIMED RECALL OF HELD CALL (FIRST RECALL)

A held call which has remained unanswered for a specific time is automatically recalled to the initiating station. The unanswered or recall time period can be set at 30 second intervals from 30 seconds to 9.5 minutes. The system may also be programmed to eliminate recall entirely.

160.7 BUILT-IN SPEAKERPHONE (OPTIONAL)

A "built-in" speakerphone is available as an optional printed circuit board and can be installed in 6, 18, and 30 button sets (Executive phones are factory equipped with speakerphone) to allow fully switched handsfree operation and two-way communication on CO lines.

160.8 CALL BACKUP

The Call Backup feature allows an attendant to activate all CO incoming (ringing) calls at a specified backup station. Since there are five possible attendant positions available in the system, programming for five call backup stations is provided.

To activate the Call Backup feature, depress the CBU button located on the DSS/BLF. Any or all attendants may activate a backup station (assigned by system programming) to answer calls in their absence. A LED associated with the CBU button will light indicating that incoming calls assigned to ring at the DSS/BLF will also ring at the backup station. The DSS station will continue to receive ringing or call waiting signals.

160. 9 CALL FORWARDING

This feature allows a station user to forward (divert) ICM calls to any of 60 stations by the following procedure:
To forward incoming ICM calls to another station, press the MON button, then press "#" and dial "1" on the dialpad. Dial the station number you wish to have your calls forwarded to. The Executive stations will display "CF" on the LCD. The message lamp will flash to indicate call forwarding has been initiated. Press MON button to activate the call forward. To cancel the forwarding, press MON and dial "#" then "0" on the dialpad and press the MON button. The call forwarded station is also indicated by a flashing LED on the DSS/-BLF at the forwarded station's location.

160.10 CALL SPLIT

A station user may choose to answer a station camp-on (call waiting tone in the speaker) while on a CO call. Putting the CO on hold automatically connects the user to the camped-on station. If the originating ICM station is transferring a call, the CO call will automatically be connected after the new caller has announced the call and returns the handset to the cradle (the previously held call will remain on hold).

For example: To split a CO call to a camped-on call, press HOLD to place the CO call on hold and be automatically connected to the originating station. After the new caller has spoken with you, they may hang up, thus you are connected to the transferred outside caller while the original call remains on "HOLD". The previously held call will remain on hold. To reconnect the previously held call, press the CO button associated with the held call.

160.11 CO LINE KEYS

Any station user may originate or receive a call to or from the CO by pressing the line button associated with the CO line. The line button may be pressed before or after the handset is lifted. If the CO button is depressed before picking up the handset, the CO line will automatically be seized and the station will be in the monitor mode.

160.12 CONFERENCING--EXTERNAL

To establish a conference call with two COs and one station, first establish a CO call, then press HOLD to place the first CO on hold. Select an idle CO and place your second call. In order to connect the COs in a conference, you must press the FEAT button and then the HOLD button and a three-way conference call will be established.

To release either CO from the conference at any time, press the button associated with the CO to be released.

To establish a conference call with one CO and two stations, first establish an outside call, then press the ICM to automatically place the CO on hold and connect to ICM dialtone. Dial the ICM code (two digits). When the called station answers, instruct the user of your intention to conference. (The called station must lift the handset.) Press the FEAT button and then the HOLD button, and a three-way conference is now established. If you wish to release the conference, press the CO button and the CO will be released.

160.13 CONFERENCING--INTERNAL

To establish a conference call with three internal stations, first initiate an ICM

call. Then press FEAT and HOLD to put the called station on hold temporarily. Press the ICM key and dial the second station ICM number. Finally, press FEAT and then HOLD and a three-way internal conference will be established. All stations must lift the handset in order for conference to operate.

160.14 DIAL CALL PICKUP

To use the dial call pickup function to access a call, press the "*" key, then dial the two-digit station code number of the station where the call is on exclusive hold, unscreened transfer ringing or incoming CO ringing. In order to access the call, the CO line must appear at that station. (This is also the preferred method to answer an unscreened transfer.)

160.15 DIRECT STATION SELECT/BUSY LAMP FIELD

This feature allows one button direct selection of ICM and transferred calls to any of 60 stations. By use of a DSS/-BLF, access to 30 stations is available. Two DSS/BLFs (pair) will facilitate access to all 60 stations. There are five pairs of DSS/BLFs allowed in the system. Port #2 and Port #3 on each station card (STU) will each support a 30 station DSS. Two DSS/BLFs are required in sequence for 60 stations.

160.16 DO-NOT-DISTURB

By engaging this procedure, any call (including paging, intercom calls, intercom call waiting and DSS calls) directed from another station will receive a busy from the DND station. All off-hook ringing signals (including camp-on, transfer recall, and request to split, excepting hold recall) will be cancelled at the DND station. The DO-NOT-DISTURB feature is programmable in system programming on a per station basis and may be denied or allowed for use at a particular station.

To engage DND, go off hook, press the "#" button twice. The station will automatically be put into DND and the MON LED will flash. The DSS LED associated with the DND station will flash. The DND station may make outgoing and select incoming CO calls while remaining in the DND mode.

To disengage DND, go off hook and press "#", "*".

160.17 ENHANCED TOLL RESTRICTION

An enhanced toll restriction package is provided which incorporates 19 types of toll restrictions, 16 classes of service, two 4-digit/40 entry semi-restrict allow tables, and two 4-digit/40 entry semi-restrict disallow tables. Toll restrictions are configured on a trunk group class of service, per-station basis. 5-digit, 7-digit, 8-digit forced OCC, 0, 1411, 411, non-restrict, and outgoing restrictions are also provided.

160.18 EXECUTIVE SPEED DIALING

Executive telephones are provided with 18 auto soft keys which allow the user one touch dialing on outgoing CO calls and Direct Station Select for ICM calls. After a station user selects a CO, pressing the auto buttons will automatically access the speed dial banks.

When a station user chooses to place an ICM call, the auto keys automatically become direct station select keys. A total of 27 stations speed banks are also provided for dial-up speed dialing. These banks are 20 digits and designated 10-36. Along with the 14 available system speed call banks (00-13), and two system special speed banks (50 and 51), the executive stations effectively have 77 station speed dial banks.

160.19 EXTERNAL PAGE ACCESS

Spare CO line appearances may be used for direct connection to external paging equipment with an input impedance of 600 ohms. Paging equipment is directly accessed by the same procedure as is used to directly access CO Lines.

To access external paging equipment, press a CO key corresponding to the spare CO line to which the external paging equipment is connected. The paging equipment is directly connected to the CO port, and thereby connected to the station user through the CO switching matrix.

160.20 FLEXIBLE STATION RINGING ASSIGNMENT

This feature allows any station, including the primary station, to receive incoming ringing assignments. CO ringing is assignable on a per line, per station basis, with a maximum of six stations per CO line. (Refer to System Program #22.)

160.21 FORBIDDEN INTERNAL ALL OR ZONE PAGE

By system option, a station may be programmed to accept or not accept an internal page through the station speaker. (Refer to System Program #21.)

160.22 FORBIDDEN OFF-HOOK SIGNALLING

Off-hook signalling for incoming CO calls may be allowed or disallowed on a per station basis.

To disallow off-hook signalling at a station, lift handset, press the "*" key, then dial "04" on the dialpad.

To allow off-hook signalling at a station, lift handset, press the "*" key, then dial "05" on the dialpad.

160.23 FORBIDDEN SPEAKER PAGE (Disallow ICM Voice Call)

An incoming ICM call may be controlled to ring at all times as an alternative to the voice (HF answerback) announced call (which is programmed on a system wide basis for either voice or tone at all stations).

To disallow voice call at a station, lift handset, press the "*" button, then dial "03" on the dialpad.

To allow voice call at a station, lift handset, press the "*" button, then dial "02" on the dialpad.

Note: This procedure does not affect internal paging which is allowed or disallowed on a per station basis by system programming (refer to System Program #21).

160.24 INTERCOM CALL

To call another station, lift the handset and press the ICM button. Listen for ICM dial tone, then dial the two-digit

station number. When a splash tone is heard, the calling station may make an announcement and the called station may respond hands free. (The calling station must lift the handset to place an ICM hands free answerback call.) The called station may also lift the handset to initiate handset conversation. If the calling station dials any additional digit after the station number, the hands free operation is disabled and tone signals are sent to the called station. To respond to this type of intercom call, the called station must lift the handset to speak.

A station user on an outside line can receive an intercom call but cannot respond hands free. Instead, the user will receive an intercom call-waiting tone through the station speaker. The user may split to the intercom call by depressing the Hold button. The called station is then automatically connected to the calling party.

A station user not wishing to respond hands free on an intercom call may turn off the microphone (the microphone off is indicated by the microphone LED "ON" or lighted) to disallow a voice call. (Refer to Forbidden Speaker Page.)

160.25 INTERCOM CALL FORWARDING

This feature allows a station user to reroute an incoming ICM call to any desired station. A distinctive LED flash rate (approximately 100 flashes per minute) on the DSS indicates that the station is in the "call forwarding" mode.

A station can be put into the Call Forward mode by going off-hook and depressing "#", "1" then the ICM code associated with the forwarded-to station. CO calls transferred to a station in call forward mode will be forwarded providing the CO line is assigned to the forwarded-to station.

160.26 INTERCOM HOLD

To place an intercom on hold, press the HOLD button. The called station must lift handset in order for Hold to operate. To go back to party on hold, press ICM.

160.27 INTERNAL PAGING

Any station user may make a paging announcement to all idle stations simultaneously (via a dedicated paging path to the speakers built into the telephone) by lifting the handset and dialing the proper code number.

All Page: To page all stations simultaneously, dial "80". This initiates one-way internal paging to all idle stations allowed to receive an internal speaker page.

Zone Page: To page one of five fixed zones, dial "81-85". The second number dialed (1-5) indicates which zone is being paged. Zones are set up by station port assignment:

Dial	Zone	Station Numbers
80	All	STA-10 to STA-69
81	1	STA-10 to STA-21
82	2	STA-22 to STA-33
83	3	STA-34 to STA-45
84	4	STA-46 to STA-57
85	5	STA-58 to STA-69

Meet-me Answer--To answer a page, pick up the handset, press the "*" button, then dial "8". You will then be

automatically connected to the paging path.

160.28 LED INDICATORS

All lamp indicators on the face of the telephone are long lasting, light-emitting diodes, and provide system feature distinctive indications. (Refer to System Distinctive Signalling.)

160.29 LINE KEYS

Any station user may originate or receive a call to or from the CO or ICM path by pressing the line key associated with the CO or ICM line. The line key may be pressed before or after the handset is lifted. If the CO button is depressed before picking up the handset, the CO line will automatically be seized and the station will be in the monitor mode.

160.30 MANUAL EXCLUSIVE OR NON-EXCLUSIVE HOLD OF CO/PBX AND ICM CALL

Any station can place either an incoming or an outgoing CO call on hold by pressing the HOLD key. Depending on system programming, either one or two pushes of the HOLD button will allow for system or exclusive hold. (Factory program is one push for system hold.)

160.31 MESSAGE WAITING

All telephones are equipped with a message lamp which may be activated by the attendant at any time to indicate that there is a message waiting at the attendant console. The message LED will flash at a rate of approximately 60 indications per minute.

To activate the message waiting feature, depress the MSG key on the DSS/BLF and the DSS key associated with the Message Waiting Station. A message lamp is provided at each station except for the Executive telephones. The Executive telephones will display "CALL OP" on the LCD. The station receiving the message waiting indication (indicated by a flashing message light at the top of the station) call the operator (attendant) by going off-hook and dialing "0" (or ext. 10, 22, 34, 46, 58). At this point, the LCD on the DSS/BLF will display the number of the station calling. To cancel the message waiting, the attendant presses the message key and the DSS button associated with the message waiting. MSG can be activated from all (5) DSS/Attendant locations.

160.32 MICROPHONE MUTE

The station user may disable the built in answer back microphone by pressing the MIC key off. The station will then receive an ICM voice announcement, but the user must lift the handset or turn on the microphone to reply. The microphone LED will light to indicate that the microphone has been muted (off).

160.33 MULTI-LINK/SINGLE-BUTTON INTERCOM

A single ICM key is provided on all station instruments to allow access to all stations via multiple intercom paths. Any station may call another station by pressing the ICM key and dialing a two-digit code (i.e. 10-69).

160.34 MUSIC-ON-HOLD INTERFACE

The system provides terminals (RCA type jack) for connection to a 600 ohm

(amplified) external music source, allowing an outside party placed on hold by any station user to hear music.

160.35 NIGHT ANSWER

This feature allows a flexible night ringing mode which can be programmed to distribute incoming ring signals to any station. Each CO/PBX line can be assigned a maximum of two night answer stations.

To activate the Night Answer Feature, press the NA button on the DSS/BLF. The associated LED will light, and incoming calls will be diverted to ring at the stations programmed for night ringing (by system program option). The night answer mode may be initiated by the DSS NA control or by the #10 extension. In the case where a DSS/BLF is not configured in the system, night ringing may be activated from the Port #1 (EXT #10) station by going off-hook and pressing "0" on the dialpad.

The message lamp will light steady to indicate "NA" mode. To deactivate the night answer, go off-hook and press "0". The message lamp will be extinguished. In the case where more than one primary DSS is used in the system, consult **WIN Technical Field Support** for configuration.

160.36 NON-LOCKING BUTTONS

All buttons on the face are non-locking with long life LED lamps.

160.37 NON-SQUARED OPERATION

This feature allows flexible CO/PBX line key assignment. Any CO/PBX line may be assigned to appear and operate at any station on any CO button and in any order.

160.38 OFF-HOOK CO RINGING

Each ring assigned station has off-hook ringing. This is accomplished by a call waiting tone received through the station speaker.

If the station is assigned for incoming CO calls and is off-hook, then the station will receive a call waiting tone to indicate an incoming CO call, if the station is not in forbidden off-hook ringing mode. The LED associated with the incoming call will flash at the normal rate.

160.39 OFF-HOOK SIGNALLING

This feature allows a called station, when off-hook, to receive an audible signal through the station speaker indicating a waiting CO or ICM call.

160.40 OFF PREMISES EXTENSION (OPX)

Standard 2500 type telephones may be connected to the system as an OPX by the use of optional system OPX hardware. These single-line instruments may initiate and receive CO calls and ICM calls.

160.41 ON-HOOK DIALING

By pressing any CO line button, a station user automatically enters the monitor condition and accesses a CO dial tone. A CO number can then be dialed with the handset on-hook.

To preselect a line for a CO or ICM call, press either a CO key or the ICM key, depending on whether a CO or an ICM call is being made. When the key is pressed, the station is automatically connected to the CO or ICM line.

If the optional speakerphone board is installed in the station, performing the hands free dialing function allows two-way conversation without lifting the handset. The MIC/ON button can be used for transmit muting. When the "MIC" LED is on, the microphone is muted.

160.42 ON-HOOK MONITOR

A station user can monitor a call in progress by pressing the monitor button and placing the handset on-hook. To engage the monitor function, press the MON button and place the handset in the cradle. The monitor function enables listening to the called station through the built-in speaker. To speak to the called station, the handset must be lifted. If the station user lifts the handset while the MON button is engaged, the monitor speaker is turned off automatically. Note that if the station is equipped with a speakerphone, the microphone is active unless the MIC/ON LED is lighted.

160.43 OUTSIDE CALLS

To place an outside call, lift the handset and press an idle CO line button. When the dial tone is heard, dial the desired outside number.

To answer an incoming call, lift the handset and press the flashing outside CO line button. The LED associated with the incoming call will flash at a rate of 60 indications per minute.

To transfer a call while on an outside line, press the ICM button to automatically place the call on hold. Listen for ICM dial tone, then dial the desired station number. When the called station answers, announce the call. You may wait for the called party to answer by picking up the handset, or you may hang up. The called station will automatically be connected to the outside line if the called station answers the calling station by going off-hook (screened transfer) before the calling station hangs up. If the calling station goes on-hook before the called station lifts the handset (unscreened transfer) the called station may have access to the transferred call by dialing "*" and its own ICM (EXT) Code (i.e. 10-69) or, the called station may directly select the call by depressing the associated CO line key. The LED associated with a transferred call flashes at a rate of 100 indications per minute. The called station will automatically be connected to the outside line if the called station goes off-hook with the handset before the calling party goes on-hook.

160.44 PAUSE AND WAIT

A one second pause may be programmed into a station or system speed dial bank by pressing the FLA key while programming a speed bank. To increase the duration of the pause, program multiple pauses (each pause is one digit in length). A wait may also be programmed into speed banks by depressing HOLD while programming the speed bank. The wait may be released during speed dialing by depressing "#". (More than one pause can be programmed into the speed call location. However, each pause reduces speedcall digits by one.)

160.45 POOLED LINE ACCESS (P-KEY) OPERATION

This feature allows a station user to have access to any trunk within a particular trunk group which is assigned to a P-Key (CO buttons #6, 18) by depressing the P-Key. The station user may perform any function associated with CO/PBX type calls including transferring, queuing, conferencing, call split, forwarding, hold etc., providing the trunk is assigned to the station. Trunks are accessed in the order of the highest numbered to the lowest numbered, next available outgoing trunk assigned to the P-Key trunk group. Consequently, the lowest numbered trunks remain available for incoming calls.

To place an outside call, lift the handset and press the P-Key (CO buttons #6 or #18). (Only one P-Key per telephone may be assigned.) Alternatively, you may perform this function on-hook by preselecting the CO (P-Key). If all trunks are busy within the P-Key trunk group, a busy tone will be heard. (There is no visual indication of a busy P-Key trunk group.) You may then choose to queue onto the trunk group by following the "Trunk Group Queuing" procedure. Outgoing trunks are automatically accessed in order of the highest numbered trunk to the lowest numbered trunk, i.e. leaving lowest order trunks available for incoming calls.

To answer an incoming call ring assigned to the P-Key, lift the handset and press the P-Key. You will automatically be connected with the incoming CO. (The P-Key LED will flash at the incoming CO rate, approximately 60 flashes per minute, and the station will ring.) If your station is equipped with a speakerphone, you may perform this function while on-hook by pressing the P-Key.

To transfer a CO call assigned to a P-Key, refer to Outside Call transfer procedure. If a call has been transferred under a P-Key, the called station may put the call on hold and regain access to the held call by direct selection of the P-Key. Calls may not be "stacked" for future or sequential access under the P-Key.

160.46 POWER FAILURE TRANSFER

The first trunk on each COU card has been designed as a power failure line. This line provides for direct connection to 500/2500 type telephone if a power failure condition exists (Refer to **Chapter 1, Section 130** "Installation").

160.47 PROGRAMMABLE RECALL/HOOK FLASH

This feature allows you the option of programming the "Flash" key on a system basis for any timeout required. This becomes necessary when working in conjunction with CO/PBX and Centrex lines which may require a specific hook-flash timing.

Recall/Hook Flash is activated by the station user by depressing the FLA key. In a stand-alone key system, this button is used to re-access the dial tone on the CO line button controlled by the user station. Behind a PBX, this button will automatically provide hook switch flash timing, regardless of the amount of time the FLASH button is depressed.
Hook Flash timing is factory programmed for three seconds and may be programmed (Program #16) by system

option for several different timing options at the time of installation. 700 ms to 1 second is typically used where modern central office equipment and/or PBX equipment is used.

160.48 REMOTE CALL PICKUP

The station user may pick up a call on exclusive hold, a transferred call or an incoming call to the user's phone from another phone by pressing the "*" button and dialing the proper extension number.

160.49 SAVE LAST NUMBER REDIAL

Any station user may save the last CO number dialed by depressing the FEAT button and the "*" button on the dialpad before going on hook. The number can be redialed when the station user re-accesses the CO line and presses the SPD button and the "*" button on the push button dialpad. The "Save Last Number Dialed" may be moved to a station speed dial location for permanent storage by the "Station Speed Dial" programming procedure. This must be done before saving any future dialed numbers or before any future speed call numbers are stored.

To save a phone number, press the FEAT button and the "*" button before hanging up the phone.

To dial the saved number, select an idle CO line, press the SPD button and the "*" button.

To permanently store a saved number, press the FEAT button, followed by the SPD button, the two-digit location code, the SPD button, and the MON button.

160.50 SCREEN TRANSFER CO CALLS

If there is voice contact between a station transferring a CO call and the station receiving the call (cannot be hands-free; handset must be used), the call is automatically transferred, without having to press the CO line key, to the receiving station. A call may be transferred by depressing the ICM key and dialing the two digit station code or by depressing the DSS key associated with the called station. The call will then be put on temporary hold until the called station accepts the call. If the called station does not wish to accept the call, the calling station may retrieve the call by depressing the associated CO key or by dialing "*" and the calling station's two digit extension code.

160.51 SECOND RECALL OF HELD CALL

If the initiating station does not answer a recall of a held call, after a period of twice the hold recall timeout, a second recall tone will go to all primary stations (as well as to the initiating station). If there is a DSS/BLF available in the system, the LCD will display (flash) the CO and originating Station number. If there is more than one CO on second Hold Recall, the CO and Station number will appear in sequential order on the DSS/LCD. In the transition from the first Hold Recall period to the second Hold Recall period, a CO originally on exclusive hold or transfer hold at a station will automatically be put on system hold. In addition, the Executive station will display (flash on LCD) the CO number on second Hold Recall.

160.52 SPEAKERPHONE

All telephones in the system have hands free answerback capability. An optional speakerphone module is available for full speakerphone capability on outside calls. The Executive telephone comes factory equipped with full speakerphone capability.

160.53 SPECIAL SPEED BANKS

System and Station "Special Speed Banks" are provided for OCC access. In the case where a station is assigned one of the following types of dial restrictions, access to "Special Speed Banks" is allowed in order to force usage of OCC's and to override dial restrictions.

1-SR7	4-SR10	7-NR
2-SR8	5-SR11	8-OCC8
3-SR9	6-SR12	9-OCC7

Once a station user has accessed a "System Special Speed Bank" (50 or 51 system), depending on the restriction type, he or she may be allowed to continue dialing any number of digits, or chain dial "Station Special Speed Banks" or any other speed banks according to the following specifications:

1. User must use "System Special Speed Banks" first (before dialing any other digits).
2. Restriction types SR7 - SR12 restrict outward dialing and allow access to "System Special Speed Banks", providing the programmed digits in the "System Special Speed Banks" appear in the allow (or disallow) tables. Once access to "System Special Speed Banks" has been completed, dialing thereafter will be allowed (or disallowed) by table.
3. Any "Special" bank may be repeated at least once during one call.
4. Restriction types OCC7 and OCC8 allow non-restricted dialing once a "System Special Speed Bank" has been accessed.

160.54 SPEED DIALING - STATION

All individual station users may store up to 14 frequently called numbers of up to 20 digits each, and 2 special banks of 20 digits each. Each stored CO telephone number is identified by a two-digit code. If the system is used behind a PBX, a wait or a one second pause may be stored between the PBX access code number and the CO telephone number. The wait state must be manually released from the dial pad. The station user may consecutively access two speed-dial telephone numbers over the same CO line for convenient use of authorized common carrier codes. Two additional speed dial banks are reserved for seven digit OCC access.

To program a station speed call number, press the FEAT key followed by the SPD key. (The MON light will come on.) Then dial the two-digit storage location code (60-73) and dial the phone number (up to 20 digits, including pauses and waits. (Pause = one digit, Wait = one digit). Finally, press the SPD and MON key. Location 88 and 89 are provided for Station OCC access codes and are seven digits in length. (Refer to Special Speed Banks).

To program a pause, press the FLASH button. The duration of the Pause is one second. To extend the overall pause time, program multiple pauses. To program a wait, press the HOLD button. For dialpulse systems, an automatic

switch to DTMF occurs upon release of the wait. To release wait, push the "#" on the dialpad. An auto-matic switch back to dialpulse will occur by going back on-hook.

To dial out (the stored number), press an idle CO line button followed by the SPD button and the two-digit storage location code.

160.55 SPEED DIALING - SYSTEM

This feature also allows any station user to access up to 14 system speed dial numbers of up to 20 digits in each number, and two special banks of twenty digits in length. The station user may consecutively access system and individual station speed dial numbers.

To program system speed dial location 00-13, follow the procedure for station speed call programming by using the port 1 station. Any station allowed by class of service may access system speed dial by the same procedure as station speed dialing. Location 50 and 51 are provided for System OCC access codes and are 20 digits in length. (Refer to Special Speed Banks).

160.56 SQUARE OPERATION

The MARATHON system is factory programmed for square operation. Upon power-up, and original initialization of the system, every CO line appears in the same location on every station. For example, CO line 1 appears on the first line key of every station.

160.57 STATION CAMP-ON

A calling station, upon placing an intercom call to a station that is off-hook, will receive a busy tone and may be camped onto the busy station. If the calling station goes on-hook, the camp-on will automatically be cancelled. The called station will receive a camp-on tone to indicate another incoming call. The calling station, after camping onto a busy station, will automatically call that station when it becomes free.

To camp onto a station which is busy on a CO call, press ICM and dial the station number by the normal procedure. A busy tone will be returned. Press "#" on the dialpad to activate the camp-on function. The busy tone will then be removed if the camp-on is accepted. The called station will then hear the camp-on tone through the station speaker, and may answer the camp-on by the "Call Split" procedure. Going to the on-hook condition by the calling station cancels the camp-on function.

160.58 STATION DISTINCTIVE SIGNALLING

Differences in LED appearance, flash rates, and audible signals allow the station user to distinguish between incoming CO, intercom, call-waiting or call-announce calls. Refer to **Table 1-14** which describes the Station Signalling characteristics.

160.59 STATION QUEUING

This feature allows a station to queue onto another station which is busy on a CO line or ICM call. Once the dialed station resumes an idle condition, the calling station receives a ring tone. The calling station then lifts the handset and is automatically connected to the called station.

To queue onto a station, dial a station on ICM by the normal procedure. If the called station is busy, a busy tone will be returned. Press "*" and the busy tone will be removed if the queue is accepted. Go on-hook. When the busy station becomes idle, the queuing station will receive a ringback tone. Lift the handset and without taking any other action, a warning tone will be heard after which a call announce can be made and you may begin speaking.

160.60 TONE-PULSE SWITCHABLE DIALING

The system is programmable on a system basis per CO line to outpulse DTMF or dialpulse. The default mode is DTMF. When the system is in the "dialpulse" mode, it reverts to DTMF on a per line basis by dialing the "#" button on the dialpad. The line remains in the DTMF mode until the station connected to the CO line either goes into an idle state or reseizes another CO line.

To switch a CO line which is programmed for dialpulse to DTMF, press the "#" button. The "#" may be used to switch to DTMF for computer access, OCC access or any service requiring DTMF signalling. The CO line reverts back to dialpulse when the station goes on-hook.

160.61 TRUNK GROUP QUEUING

This feature allows a station user to queue onto a trunk group if all trunks in that group are busy. As soon a as trunk becomes available, the queued station will receive a ringing tone at which time the user may lift the handset or pressed the MON key to be connected to the available trunk.

When a station presses a trunk key in a busy trunk group, it can queue onto that trunk group by pressing the "*" button on the dialpad. When any trunk in that group becomes available, the station will receive a ringing tone, and upon lifting the handset, will receive a CO dialtone.

To queue onto a trunk group, press any busy CO button associated with the trunk group to be queued onto (indicated by a solidly lit lamp). Then listen for the busy tone and press "*" on the dialpad. If the queue is allowed, the busy tone will be removed. You may then go on-hook. The first idle trunk will be indicated by a flashing LED (60 flashes per minute) and the station will receive a special ringing signal. If your station becomes busy, you will not receive a queue signal when the trunk becomes available. To answer the queue, lift the handset or press the MON key. You will then receive a dialtone. The queue will timeout and be removed within ten seconds.

160.62 UNSCREEN TRANSFER CO CALLS

If there is no voice contact between a station transferring a CO call and the station receiving the call, the receiving station is alerted to the call by a ring and a distinctive lamp indication on a key telephone, after the calling station goes on-hook. On a single-line telephone, the call is automatically transferred to the receiving station. A hands free answerback is not considered voice contact and is therefore an unscreened transfer.

160.63 TELEPHONE OPERATING CONTROLS

All telephone operating controls, with the exception of the Hook-Switch and volume control, are constructed of a very durable and flexible conductive material. Unlike mechanical type controls, the **MARATHON** telephone operating controls have no moving parts; therefore defects due to mechanical failures are not existent. In addition, the controls have been proven to have a useable operating life of more than ten million cycles (ten million depressions). The controls also feature noiseless switching (unlike mechanical switches).

The below listed figures are provided as an accurate illustration and description of the **MARATHON** telephone operating controls:

Figure 1-36:
6-Button Electronic Key Telephone
Figure 1-37:
18-Button Electronic Key Telephone
Figure 1-38:
30-Button Electronic Key Telephone
Figure 1-39:
Executive Station Electronic Key Telephone
Figure 1-40:
Direct Station Select/Busy Lamp Field.

Table 1-14

	LED FLASH INTERVALS										
	ORIGINATING STATION					ALL OTHER STATIONS					ORIGINATING STATION VISUAL
	*ON	OFF	ON	OFF	IPM**	ON	OFF	ON	OFF	IPM**	
E-6, 18 30, EXEC											CO (LED)
										System Clock Start ►	
I-Use	840	120	120	120	50					Steady	XXXXXXXXX XX XXXXXXXXX
Busy (In Use)					Steady					Steady	XXXXXXXXXXXXXXXXXXXXXXXXX
Line Hold Recall	120	480	120	480	10					Steady	XX XX XX XX
Transferred Call	120	480	120	480	10					Steady	XX XX XX XX
Exclusive Hold	120	120	120	120	250					Steady	XX XX XX XX XX XX
I-Hold	480	120	480	120	100	120	120	120	120	250	XXXXX XXXXX XXXXX XXXXX
Incoming Call	480	480	480	480	62.5	480	480	480	480	62.5	XXXXX XXXXX
System Hold	120	120	120	120	250	120	120	120	120	250	XX XX XX XX XX XX
CO Group Que Call Back	840	120	120	120	50					Steady	XXXXXXXXX XX XXXXXXXXX
											ICM (LED)
										►	
I-Hold	480	120	480	120	100					None	XXXXX XXXXX XXXXX XXXXX
I-Use	840	120	120	120	50					None	XXXXXXXXX XX XXXXXXXXX
Incoming Call	480	480	480	480	62.5					None	XXXXX XXXXX
All Paths Busy					Steady					Steady	XXXXXXXXXXXXXXXXXXXXXXXXX
Station Que Call Back	840	120	120	120	50					Steady	XXXXXXXXX XX XXXXXXXXX

STATION DISTINCTIVE SIGNALLING

Table 1-14

DSS/ELF							STATIONS ELF/LCD
Busy (In Use)				Steady		N/A	XXXXXXXXXXXXXXXXXXXXXXXX
Line Hold Recall			LCD FLASH IN ORDER OF RECALL				CO/STATION
MSG Waiting	480	480	480	480	62.5	N/A	XXXXX XXXXX
ICM Call Forwarded	120	480	120	480	100	N/A	XX XX XX
NA						Steady	XXXXXXXXXXXXXXXXXXXXXXXX
Incoming Call						N/A	XXXXXXXXXXXXXXXXXXXXXXXX
Call Backup						Steady	
EXECUTIVE							LCD DISPLAY
Incoming ICM Call							"Incoming Extension No."
Call Forward						N/A	CF
Message Waiting						N/A	CALL OP
OTHERS							MESSAGE LAMP
Message Waiting	480	480	480	480	62.5	N/A	XXXXX XXXXX
ICM Call Forward	120	480	120	480	100	N/A	XX XX XX
Night Answer					Steady	Primary Station Only	XXXXXXXXXXXXXXXXXXXXXXXX

* Milliseconds

** Indications Per Minute

STATION DISTINCTIVE SIGNALLING (CONT.)

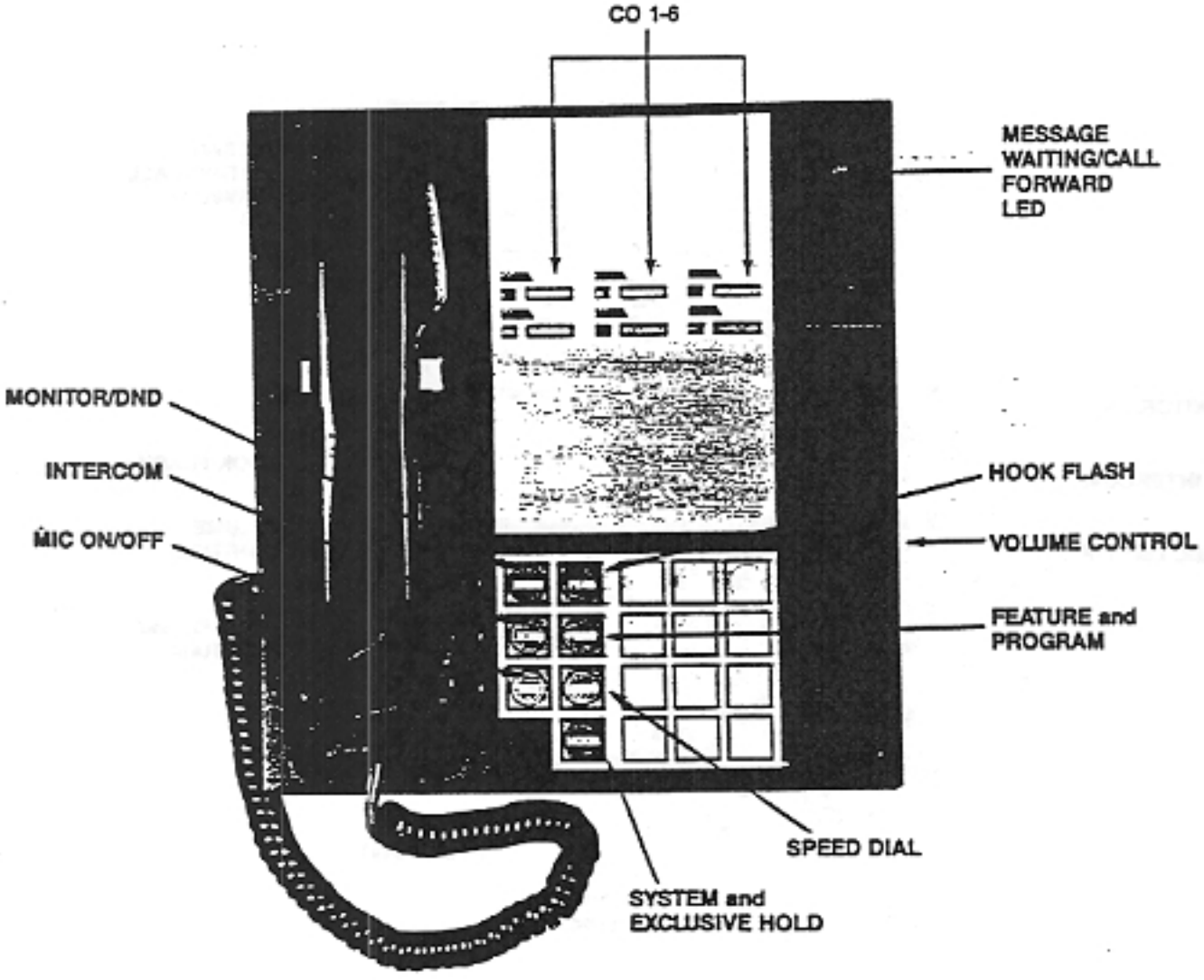


Figure 1-36 6-Button Electronic Key Telephone

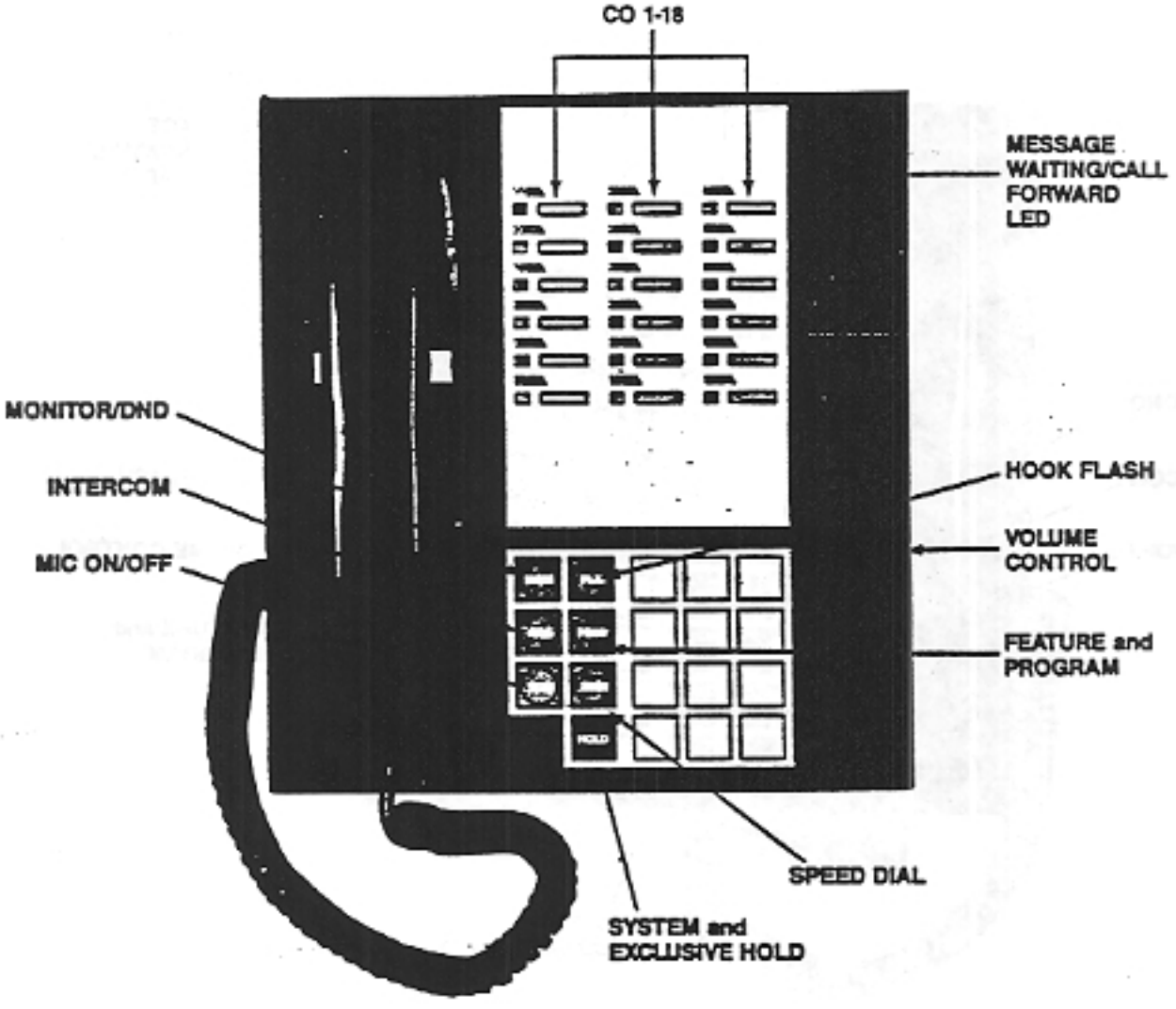


Figure 1-37 18-Button Electronic Key Telephone

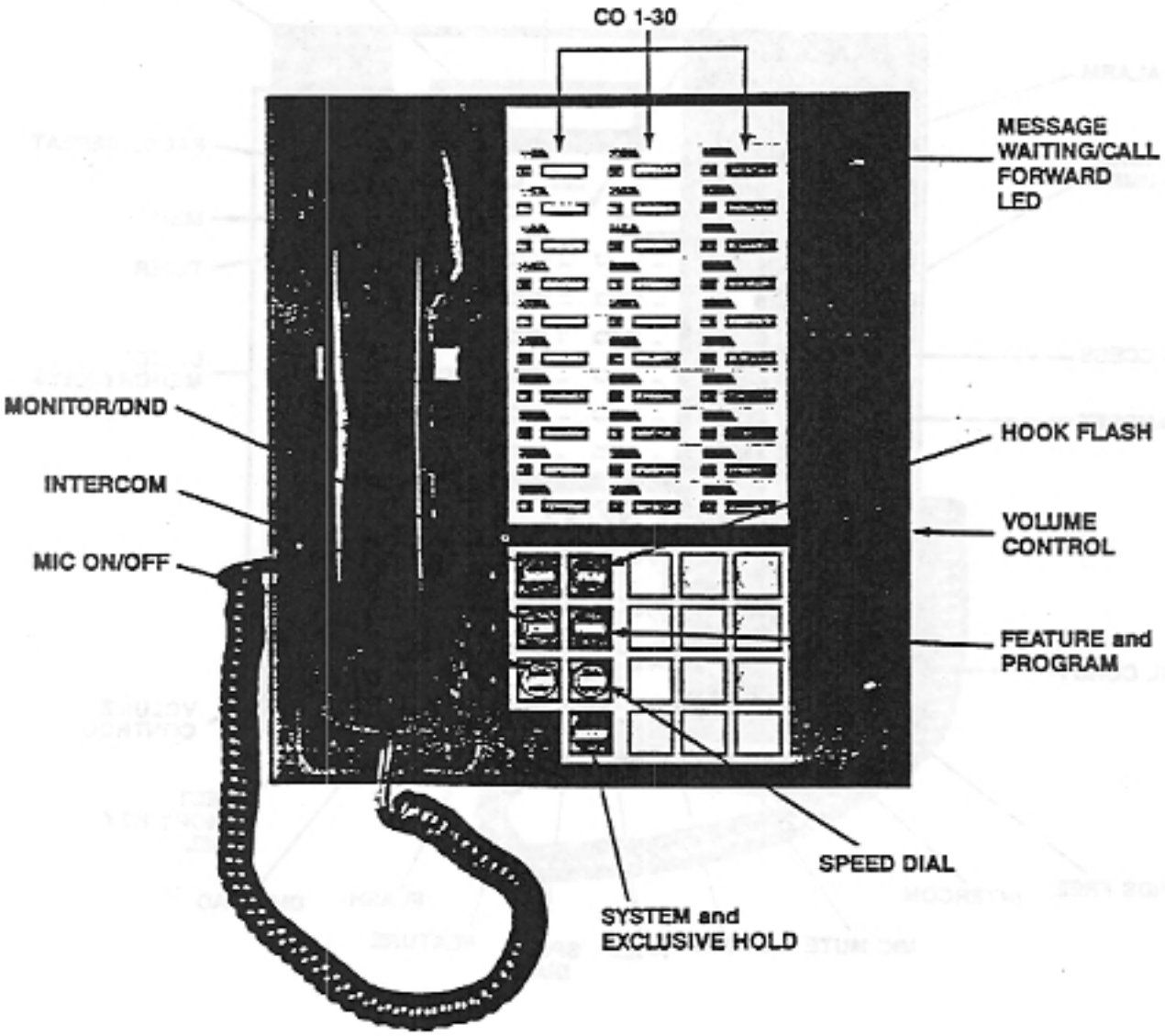


Figure 1-38 30 Button Electronic Key Telephone

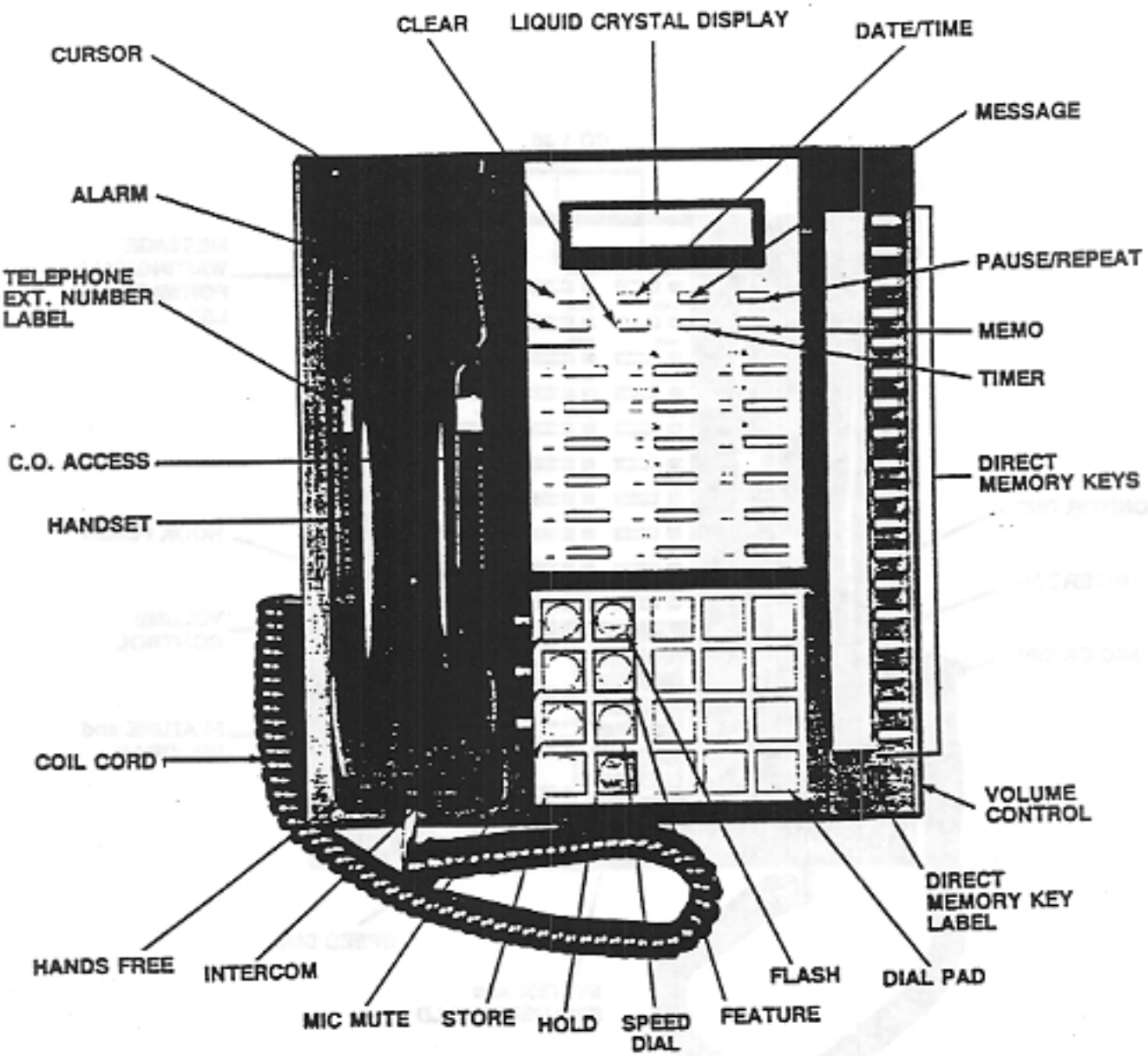


Figure 1-39 Executive Station Electronic Key Telephone

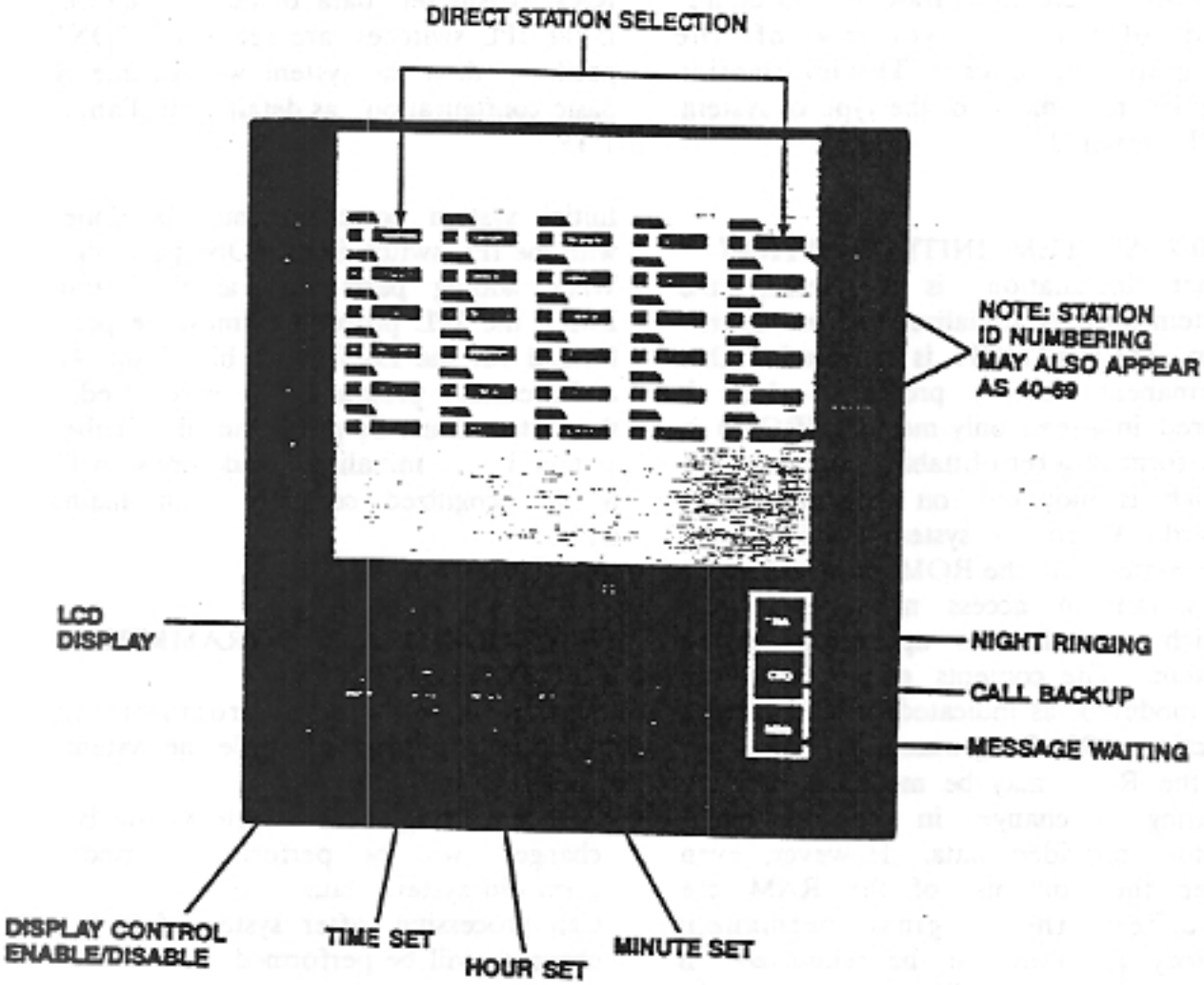


Figure 1-40 Direct Station Select/Busy Lamp Field

SECTION 170
SYSTEM INITIALIZATION

170.1 GENERAL

This section addresses the MARATHON system initialization procedure and offers an overview of the programming concept. This information applies regardless of the type of system CPU installed.

170.2 SYSTEM INITIALIZATION

When installation is completed, the system must be initialized before operation. MARATHON is delivered with a permanent factory program, which is stored in a read only memory (ROM) in the form of a retrofittable circuit board which is mounted on the main CPU board. When the system is initialized, the contents of the ROM are transferred to a random access memory "RAM", which controls the operation of the system. The contents of the RAM can be modified as indicated in **Chapter 1, Section 190, Programming.** Any part of the RAM may be modified without causing a change in the remaining factory provided data. However, even after the contents of the RAM are modified, the original permanent factory program can be reinserted in place of the modified program by performing the following initialization procedure. If the system is not initialized properly (refer to **Figure 1-41** System Initialization Flow Chart), erratic operation will result, possibly causing a system reset and/or failure.

170.3 METHOD OF VALIDATING PROGRAM AND DEFAULT (FACTORY) CONFIGURATION

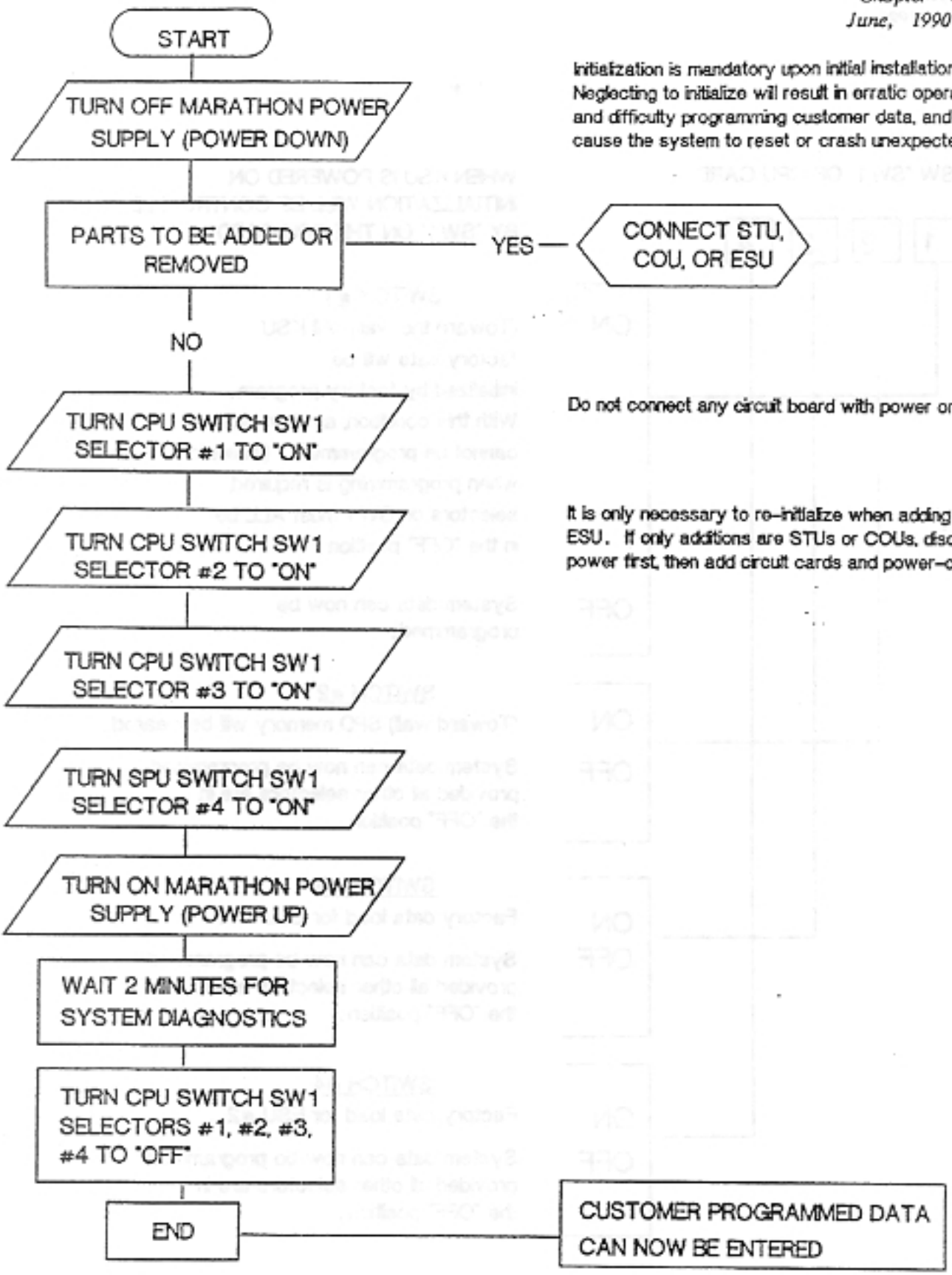
Upon power-up, the system CPU checks the status of the Initial Program Load (IPL) switch--SW1 Selectors #1, 2, 3, 4 (refer to **Figure 1-42** Initialization Chart). If the IPL selectors are not set to the "ON" position, the system will assume the configuration dictated by the RAM (customer data or random data). If the IPL switches are set to the "ON" position, then the system will assume a basic configuration as detailed in Table 1-15.

Initial system power-up must be done with the IPL switch in the "ON" position. When adding parts such as ESU and EMU, the IPL procedure must be performed for the ESU (SW1 bits 3 and 4) and if custom programming is required, the system must be programmed. If the system is not initialized, additions will not be recognized correctly by the main CPU.

170.4 ON-LINE PROGRAMMING FOR SYSTEM DATA

In the case where programming operation is performed while the system is call processing:

- Call processing before system data is changed will be performed based upon old system data.
- Call processing after system data is changed will be performed upon new system data.



Initialization is mandatory upon initial installation. Neglecting to initialize will result in erratic operation and difficulty programming customer data, and may cause the system to reset or crash unexpectedly.

Do not connect any circuit board with power on.

It is only necessary to re-initialize when adding an ESU. If only additions are STUs or COUs, disconnect power first, then add circuit cards and power-on.

Figure 1-41 System Initialization Flow Chart

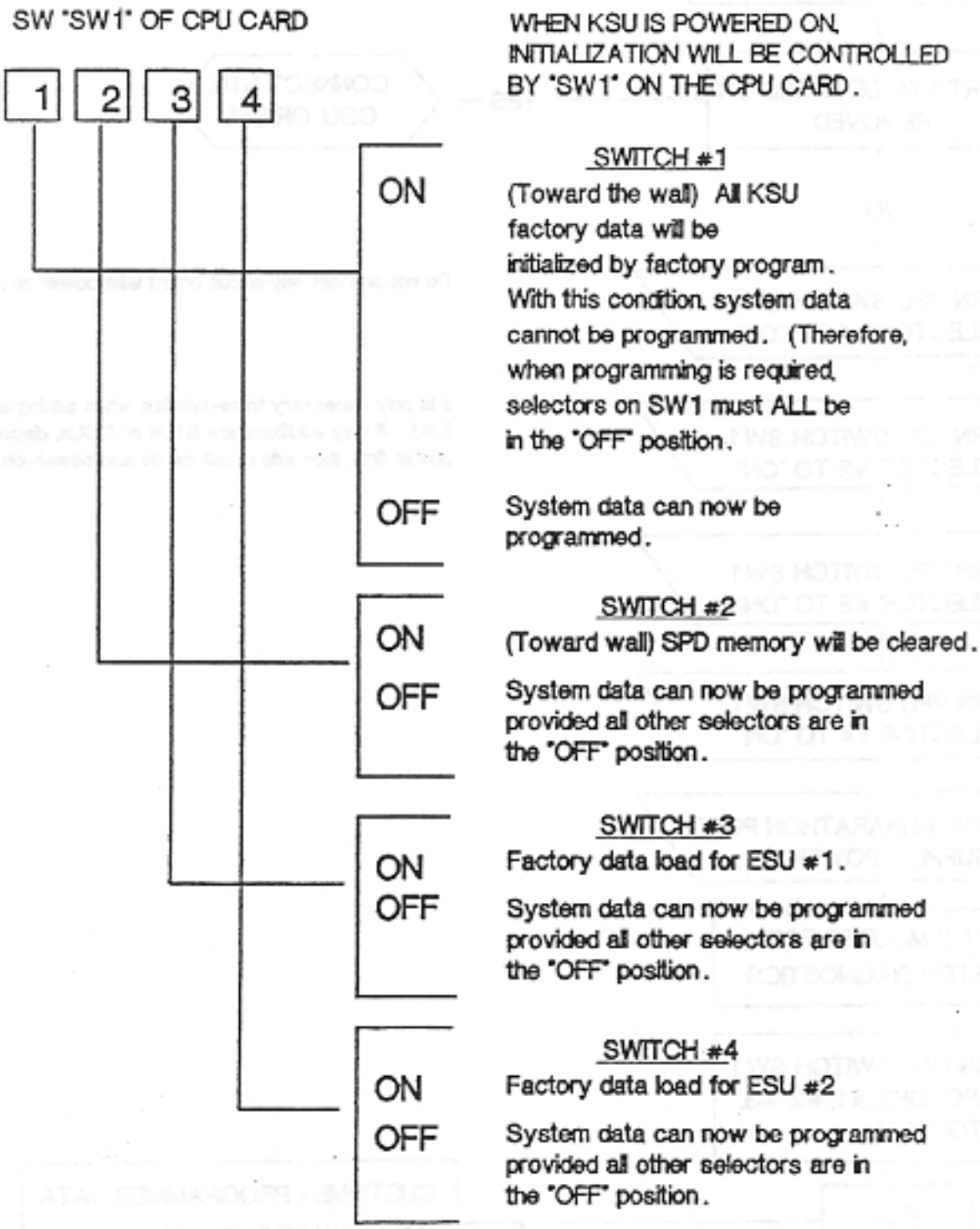


Figure 1-42 Initialization Chart

SECTION 180
SYSTEM PROGRAMMING

180.1 GENERAL

This section describes the permanent factory program and contains programming information using the primary (EXT #10) station.

180.2 PERMANENT FACTORY PROGRAMMING

MARATHON is delivered with a permanent factory program (refer to Table 1-15 Factory Program Data), stored in a read only memory (ROM). This program must be loaded when first powering the system up or when adding an ESU to insure proper system operation. When the system is initialized, the contents of the ROM are transferred to a random access memory (RAM), which controls the operation of MARATHON. This RAM can be modified according to customer requirements by using the port 1 station. Modifying the program data will not erase already existing factory data. However, even after the contents of the RAM are modified, the original permanent factory program can be reinserted in place of the modified program by performing the initialization procedure as indicated in Figure 1-41, System Initialization Flow Chart. The permanent factory program that resides in the ROM is described in programming operations and includes the program numbers, title and factory program description.

NOTE: IT IS IMPORTANT TO FOLLOW THE PROPER INITIALIZATION PROCEDURE WHEN INSTALLING MARATHON OR WHEN ADDING AN ESU.

180.3 SYSTEM PROGRAM ENTRY

All system programming is performed from the port 1 station (Ext #10). If a DSS/BLF is available in the system, programmed data will be displayed on the DSS/BLF's liquid crystal display. It is strongly recommended to use a DSS console for programming. Programming is performed by using the "FEAT" and the dialpad only, while in the "Monitor" mode. All other buttons are inactive during the programming function. Error entry is indicated by a split-warning tone (multiple beep-like tones). Valid entry is indicated by a confirmation tone (single beep-like tone). All program modifications can be performed while the system is fully operational. Refer to Appendix A for some useful Programming Tips.

180.4 PROGRAMMING USING THE PORT 1 STATION

The primary station communicates with MARATHON to enable access to each piece of stored information in the system memory and to modify the memory contents.

To ENTER the system programming mode, perform the following from the port 1 station (EXT #10):

1. Press MON button;
2. Press the "*" button and dial "0" and "1" on the keypad;
3. Press the "#" button and the "FEAT" button twice. (At this point, confirmation tone should be heard.)
4. If a busy tone is heard, check "S-1" switch positions 1,2,3 and 4; they must be off (away from the wall) to enter program mode.

programming mode.

At this point in the programming sequence, all other stations remain active. ["*", 01, "#", FEAT, FEAT)]

To EXIT the system programming mode, press the MON button from the port 1 station.

180.5 PROGRAMMING HINTS

1. Confirmation tones will be heard after pressing "#" and FEAT buttons when entering programming mode.

2. Multiple warning tones will be heard if:
   a. Invalid entry such as invalid program, illegal value for the program data is entered, etc.
   b. End of a programming sequence such as last key entry for station button assignment, ring assignment, etc.
   c. Station off-hook while attempting to change the station data of that station.

(Refer to Programming Tips - Appendix A)

3. On-Line Programming
   a. On-line programming can be performed as long as the "S-1" switch selectors 1-4 are all off.

   b. When trying to change the program of an off-hook station, a warning tone (multiple beep-like tones) will be heard the first time an attempt is made to enter the data. If it is necessary to enter the data when the station is off-hook, simply re-enter the affected data.

4. The use of "X" as a Program Data Variable:
   a. In many instances, a choice of customer data for use is available by the end user in accordance with a particular program. Therefore, the alphanumeric symbol "X" is used to denote an unknown digit (variable). A variable (unknown) character will only become known once the data has been decided upon by the end user.

5. The Purpose of Programs 28-31:
   a. To allow the user to formulate reference tables for semi-restrictions (outward dialing restrictions).
   b. These tables are used by the system to determine what telephone numbers, area codes, and central office exchanges which may be allowed or disallowed from outward dialing at a particular station. Depending on the trunk group class of service (Programs #26 and #27) assigned to a particular station, the system may reference one or two combinations of tables for dialing information. Since the system analyzes the first four digits dialed (in the semi-restrict mode), it will be necessary to input only four digits (for area, toll and exchange) in each entry (1-40) of a particular table. For customer convenience, wild card digits have been provided for use when the digits 0-9 or 2-9, * and # are to be restricted or allowed in a four digit sequence. For example, all area codes beginning with the digits 2-9 with subsequent digits 0-9 may be entered as follows:

KEY	NOTES
SPD	P=2, 3, 4, 5, 6, 7, 8, 9
FLA	A=0-9, #, *
FLA	A=0-9, #, *
FLA	A=0-9, #, *

6. Program Groups
   All programs in this system are grouped into four categories. Access to each program requires that two digits be entered into the dialpad. Table 1-16 provides examples.

7. Program 26 (Class of Service Configuration)
   a. The purpose of this program is to allow the user to formulate classes of service for dialing restrictions. Since in most applications, specific COs (trunks) are assigned to particular departments or tenants, trunk (CO) groups may be formed (refer to Program #25 to simplify class of service, dial restriction assignments).
   b. There are 16 available classes of service provided which may be custom designed by the user (on a trunk group basis) for later assignment (refer to Program #27 on a per station basis).
   c. When trunks (COs) have been assigned to trunk groups, (Refer to Program 25) dial restrictions (01-19) may be assigned to each trunk group (1-9) in a particular class of service (01-16) by use of the "Trunk Group Class of Service Restrictions" (refer to Table 1-18).

Table 1-15
FACTORY (DEFAULT) PROGRAM DATA

Program		Default Data	Program No.
1 Auto H-Flash Timing	=	3 seconds	16
2 Ring Timeout	=	8 Seconds	17
3 Dial Pulse Break Ratio	=	60 %	20
4 Intercom Priority	=	Voice	13
5 1st Depression of Hold	=	System Hold	14
6 Dial Pulse Speed	=	10pps	19
7 Hold Recall	=	No Timeout	15
8 CO Type Dial	=	DTMF	18
9 Trunk Group Assignment	=	All COS to #1 Group	25
10 Station Class of Service	=	COS #1 (All stations)	27
11 Forbidden Speaker Page	=	"0" = allowed	21
12 Ring Assignment	=	Station #10, 21, 22, 34, 46, 58	22
13 Night Answer	=	Station #10, 21	23
14 Toll Restriction Type per Trunk Group	=	#13 (non restricted)	28 to 31
15 CO Line Assignment to Station CO Line Keys (non squared) operation	=	Square Operation	32
16 DND Allow/Disallow	=	Allow	33
17 Trunk Group Class of Service	=	# 13 All Groups Non Restricted	26
18 Assignment of Class of Service Per Station	=	01 All Stations	27

180.6 PROGRAM ENTRY CHARTS

The program charts on the following pages describe the procedure for modifying the system data. Table 1-17 provides a list of these programs.

Table 1-17

PROGRAM CHARTS

Table 1-16
PROGRAM PROFILE

PROGRAM #	DATA ENTERED	GROUP
1	01	0
11	11	1
12	12	1
13	13	1
14	14	1
15	15	1
16	16	1
17	17	1
18	18	1
19	19	1
20	20	2
21	21	2
22	22	2
23	23	2
24	24	2
25	25	2
26	26	2
27	27	2
28	28	2
29	29	2
30	30	3
31	31	3
32	32	3
33	33	3

190.2 PROGRAM #11 CLEAR ALL PROGRAM DATA

1. This program step is used to clear the present system data, and replace it with factory (default) data.

2. Caution must be taken since this procedure completely destroys all customer data and reloads factory data.

3. The program sequence takes the following form:

KEY	NOTES
*	
11	
00	If "00" is not entered, the system will not perform the procedure
#	
FEAT	
FEAT	

Note: This program is not a substitute for System Initialization.

190.3 PROGRAM #12 CLEAR SELECTED PROGRAM DATA

1. This program step is used to clear the data of specific programs. In some instances, factory (default) data is reloaded in place of the customer data. In other instances "00" is inputted in place of factory date. Refer to Note below.

2. Caution must be taken since this procedure completely destroys selected customer data.

3. The Clear Selected Program Data code takes the following form:

KEY	NOTES
*	
12	
XX	Program number to be cleared
#	
FEAT	
FEAT	

Note: In some instances this program completely clears the selected program. The selected program must be re-entered after clearing it.

4. Only Program 32 can be completely cleared.

5. All other programs will be restored to factory data.

SECTION 190
PROGRAMMING DATA

190.1 PROGRAM #1 ENTRY TO PROGRAMMING MODE

1. This program allows entry to the programming mode from the port 1 station (Ext #10). In order to program, the system main CPU switch, SW 1 Selector #1, #2, #3 and #4 must be in the off position (away from wall).

2. System programming must be performed from the port 1 station (Ext #10) including System SPD Dial banks 00-13, 50 and 51 are system special banks. Station speed dial banks are 60-73, 88 and 89 are station special banks.

3. The entry code takes the following form and must be entered from the dial pad with the monitor button in the "ON" condition (LED on):

KEY

*
01
#
FEAT
FEAT

A confirmation tone should be heard upon depressing the "#" button and upon depressing the FEAT button (second time). If a busy tone is heard, check the initialization DIP switches to insure they are in the proper position ("OFF" or away from the wall) and then re-enter the program.

4. Once the system is in the programming mode, any program sequence may be accessed.

5. All programming is on-line and does not affect the operation of the system. However, the port 1 station will remain inactive while in the programming mode.

6. When programming a particular station (other than Ext #10) while it is in use, it may be necessary to enter specific data twice. If error tones are heard during normal programming, refer to **Appendix A** Programming Tips for further details.

190.4 PROGRAM #13 CHANGE IN PRIORITY OF ICM CALLS

1. This program allows changing ICM call priority system wide from Voice to Tone or Tone to Voice.

2. The program sequence takes the following form:

KEY	NOTES
*	
13	
X	ICM ID
#	
FEAT	
FEAT	

3. The system is factory programmed for Voice priority on all ICM calls (Hands free Answerback).

4. ID Definition:
   X = 0 Voice Call
   X = 1 Tone Call

Note: Origination of a hands free ICM call must be performed by using the handset (off-hook).

190.5 PROGRAM #14 DEFINITION OF FIRST DEPRESSION OF THE HOLD BUTTON AS SYSTEM HOLD OR EXCLUSIVE HOLD

1. This program defines the first depression of the HOLD Button as System Hold or Exclusive Hold.

2. The program sequence takes the following form:

KEY	NOTES
*	
14	
X	HOLD ID
#	
FEAT	
FEAT	

3. The system is factory programmed for the first depression of the HOLD Button to be System Hold.

4. ID Definition:
   X = 0 Exclusive Hold
   X = 1 System Hold

190.6 PROGRAM #15 CHANGING HOLD RECALL TIMEOUT PERIOD

1. This program allows changing of the (first and second) Hold Recall Timeout. The second Hold Recall Timeout is automatically determined as twice the duration of the (first) Hold Recall Timeout.

2. The program sequence takes the following form:

KEY	NOTES
*	
15	
XX	Hold Recall ID
#	
FEAT	
FEAT	

3. The system is factory programmed for no timeout.

Example:

KEY	NOTES
*	
15	
25	Hold Recall ID
#	
FEAT	
FEAT	

With this ID entry of "25" hold recall would be 2 min. 30 sec.

Note: Second Hold Recall: after two hold recall time periods, the hold recall tone will also be heard at all primary (attendant) stations.

Hold Recall XX ID	Timeout
0	No Timeout
05	30 sec.
10	1 min.
15	1.5 min.
20	2.0 min.
25	2.5 min.
30	3.0 min.
35	3.5 min.
40	4.0 min.
45	4.5 min.
50	5.0 min.
55	5.5 min.
60	6.0 min.
65	6.5 min.
70	7.0 min.
75	7.5 min.
80	8.0 min.
85	8.5 min.
90	9.0 min.
95	9.5 min.

190.7 PROGRAM #16 CHANGING HOOK FLASH TIMING

1. This program allows changing the automatic Hook Flash Timing.

2. The program sequence takes the following form:

KEY	NOTES
*	
16	
XX	Hook Flash ID
#	
FEAT	
FEAT	

3. The system is factory programmed for three seconds. In many cases a shorter timing may be used; i.e. 500-700 milleseconds.

Note: Timing can be changed from 0.1 sec. to 9.9 sec. in one tenth of a second increments.

Example:

KEY
*
16
10
#
FEAT
FEAT

With this ID entry of "10", flash will be 1 second.

4. Hook Flash ID Timing

X =	01	0.1 second
	02	0.2 second
	:	:
	30	3.0 seconds
	:	:
	99	9.9 seconds

190.8 PROGRAM #17 CHANGING RING TIMEOUT

1. This program allows changing the abandon incoming call ringing timeout period. The purpose of the "Ring Timeout" is to prevent false ring detection; i.e. false ringing.

2. The program sequence takes the following form:

KEY	NOTES
*	
17	
XX	Ring Timeout ID
#	
FEAT	
FEAT	

3. Since most modern Central Offices have six second ring cycles (4 seconds on and 2 seconds off), the system is factory programmed for an eight second timeout.

Ring Timeout

XX ID	Timeout
05	5.0 sec.
08	8.0 sec.
11	11.0 sec.
14	14.0 sec.
17	17.0 sec.
20	20.0 sec.
23	23.0 sec.
26	26.0 sec.

190.9 PROGRAM #18 SELECTION OF DP OR DTMF PER CO LINE

1. This program allows selection of DP or DTMF signalling on a per CO line basis.

2. The program sequence takes the following form:

KEY	NOTES
*	
18	
XX	CO Line (01-30)
Y	DP or DTMF
#	Step
FEAT	
FEAT	

Note: After CO Line number is entered, present signalling status of the CO line will be displayed in the first LCD position.

3. The system is factory programmed for DTMF signalling on all lines.

4. Refer to **Table 1-27** for programming worksheet.

Example:

KEY	NOTES
*	
18	
01	CO Line
1	DP or DTMF
#	
FEAT	
FEAT	

With this program entry of "1" CO Line "1" would be dial pulse.

5. DP or DTMF ID Definition
   Y = 0 DTMF
   Y = 1 DP

190.10 PROGRAM #19 CHANGING DIAL PULSE SPEED

1. This program allows changing the dial pulse speed from 10pps or 20pps.

2. The program sequence takes the following form:

KEY	NOTES
*	
19	
XX	Pulse Speed Value
#	
FEAT	
FEAT	

3. The system is factory programmed for 10 pps.

4. Speed Values:
   XX = 10 10pps
   XX = 20 20pps

190.11 PROGRAM #20 CHANGING DIAL PULSE BREAK RATIO

1. This program allows changing the dial pulse break ratio from 58 percent top 72 percent in one percent increments.

2. The program sequence takes the following form:

KEY	NOTES
*	
20	
XX	Break Ratio Value
#	
FEAT	
FEAT	

3. The system is factory programmed for 60 percent break.

4. Break Ratio Values

XX Value	Break Ratio
58	58%
59	59%
60	60%
70	70%
71	71%
72	72%

190.12 PROGRAM #21 ALLOWING OR FORBIDDING INTERNAL SPEAKER ALL PAGE AND ZONE PAGE PER STATION

1. This program allows each station to be programmed to allow or forbid internal all-page and zone-page.

2. The program sequence takes the following form:

KEY	NOTES
*	
21	
XX	Ext No. (10-69)
Y	0 = Allowed 1 = Forbidden
#	
FEAT	
FEAT	

3. The system is factory programmed to allow internal all-page and zone-page at each station.

4. Value
   Y = 0 Allow
   Y = 1 Forbidden

Example:

KEY	NOTES
*	
21	
13	Ext No.
1	Allow or Forbid
#	
FEAT	
FEAT	

With this program entry station "13" would be disallowed internal page.

190.13 PROGRAM #22 RING ASSIGNMENT OF STATIONS

1. This program allows each station to be ring assigned to any or all of the CO/PBX lines. However, only six stations may be ring assigned to any one CO/PBX line.

2. The program sequence takes the following form:

KEY	NOTES
*	
22	
YY	CO No. (01-30)
XX	Ext No. (10-69)
#	Step 6 times
FEAT	
FEAT	

3. All CO lines may be ring assigned to any station, a maximum of six stations may be assigned to ring each CO line.

4. Refer to **Table 1-26** for Ring Assignment Worksheet.

5. The system is factory programmed for extensions 10, 21, 22, 34, 46, and 58 to ring on all CO lines.

Example:

KEY	NOTES
*	
22	
01	CO No. (01-30)
10	Ext No. (10-69)
#	
12	
#	
13	
#	
28	
#	
00	
#	
00	Enter "00" to erase factory data 5th and 6th stations
#	
FEAT	
FEAT	

With this program entry stations 10, 12, 13, and 28 will ring on CO #1.

190.14 PROGRAM #23 NIGHTTIME ANSWER ASSIGNMENT

1. This program allows assignment of night answer stations per CO line. A maximum of two extension numbers can be assigned to any one CO line.

2. The program sequence takes the following form:

KEY	NOTES
*	
23	
YY	CO No. (01-30)
XX	Ext No. (10-69)
#	
FEAT	
FEAT	

3. All CO lines may be ring assigned to any station. A maximum of two stations may be assigned to ring each CO line.

4. The system is factory programmed for extensions 10 and 21 to ring on all CO lines.

5. Refer to Table 1-26 for programming worksheet.

Example:

KEY	NOTES
*	
23	
01	CO No. (01-30)
10	Ext No. (10-69)
#	
18	Ext. No. (10-69)
#	
FEAT	
FEAT	

With this program entry, stations 10 and 18 will ring on CO #1.

190.15 PROGRAM #24 ASSIGNMENT OF CALL BACKUP STATION TO DSS CONSOLES

1. This program allows assignment of a call backup station to each DSS console.

2. The program sequence takes the following form:

KEY	NOTES
*	
24	
#	
Y	DSS Console (1-5)
XX	Call Backup Ext (10-69)
#	
FEAT	
FEAT	

3. If there is no CB station, "00" will show on the display.

4. The system is factory programmed for no call backup stations assigned.

Example:

KEY	NOTES
*	
24	
#	
1	DSS
16	CBU Station (10-69)
#	
2	DSS #2
00	CBU Station (10-69)
#	
3	DSS #3
00	CBU Station (10-69)
#	
FEAT	
FEAT	

With this program entry DSS 1 would have station "16" assigned as its CBU. DSS #2 and 3 have no CBU stations assigned.

190.16 PROGRAM #25 ASSIGNMENT OF CO LINES TO TRUNK GROUP

1. This program allows assignment of CO lines to trunk groups.

2. Each CO line may be assigned to one of nine trunk groups. The first eight trunk groups may be assigned class of service restrictions.

3. The program sequence takes the following form:

KEY	NOTES
*	
25	
#	
YY	CO Line (01-30)
X	Trunk Group No. (1-9)
#	
FEAT	
FEAT	

4. The system is factory programmed for all CO lines to be assigned to trunk group #1.

5. CO Numbers = 01-30
   Trunk Group Numbers = 1-9.

6. Refer to **Table 1-22** for programming worksheet.

Example:

KEY	NOTES
*	
25	
#	
01	CO Line
1	Trunk Group No.
#	
02	CO Line
1	Trunk Group No.
#	
03	CO Line
2	Trunk Group No.
#	
FEAT	
FEAT	

With this program entry CO Lines "01" and "02" are in trunk group number "1" CO Line 03 is in trunk group number "2".

190.17 PROGRAM #26 TRUNK GROUP CLASS OF SERVICE ASSIGNMENT

1. This program allows COS configuration on a Trunk Group basis.

2. There can be 16 COS. Each COS is configured by assignment of one of 19 restriction designators to each of eight trunk groups. (Restrictions may not be assigned to trunk group #9.)

3. The restriction class designator defines the type of restriction to be featured. (Refer to Tables 1-18 and 1-19.)

4. There are 19 possible types of restrictions that can be assigned to each trunk group. (Refer to Table 1-19.)

5. The programming sequence takes the following form:

KEY	NOTES
*	
26	
YY	COS (01-16)
#	Step 9 times
XX	Restriction Class designator
#	
FEAT	
FEAT	

6. The system is factory programmed for all trunk groups in all COS as non-restricted (Restriction Class Designator 13).

7. Refer to associated Program #25 and #27.

8. Refer to Programming Hints–Section 180.5.

Example:

KEY	NOTES
*	
26	
01	COS
#	
01	Trunk Group
13	Restriction Designator
#	
COS	
02	Trunk Group
17	Restriction Designator
#	
FEAT	
FEAT	

With this program entry Trunk Group "1" in COS "1" is assigned designator "13", (Non-restricted) Trunk Group "2" is assigned designator "17". (Toll restricted 7-digits).

190.18 PROGRAM #27 2ASSIGNMENT OF CLASS OF SERVICE PER STATION

1. This program allows assignment of COS to stations.

2. Each station may be assigned 1 of 16 classes of service. Each station COS is associated with trunk group COS and assigns the station access restrictions for eight trunk groups.

3. The program sequence takes the following form:

KEY	NOTES
•	
27	
YY	Ext No. (10-69)
XX	Station COS (01-16)
#	
FEAT	
FEAT	

4. The system is factory programmed for all stations to COS #1.

5. Refer to associated System Programs #25 and #26.

6. Refer to Table 1-24 for programming worksheet.

7. Refer to Table 1-23 for COS assignments by trunk group.

Example:

KEY	NOTES
•	
27	
13	Ext No.
02	Station COS
#	
FEAT	
FEAT	

With this program entry, station "13" will be in station class of service "02".

190.19 PROGRAM #28, 29, 30, 31 ALLOW AND DISALLOW RESTRICTION TABLE CONFIGURATION

1. The purpose of this program is to configure semi-restrict, allow and disallow tables for allowing or restricting certain numbers.

2. Each program number (28-31) corresponds directly to one of four tables, e.g.:

Program #28 = Allow Table #1
Program #29 = Allow Table #2
Program #30 = Disallow Table #1
Program #31 = Disallow Table #2

3. There are 40 entries of four digits in each table (including Wild Card Digits "WCDs"). Each entry may be programmed for all tables.

4. Two WCDs are available for programming. They are "P" and "A". These digits may be programmed by depressing the SPD and FLA buttons, respectively.

SPD Key="P"=2,3,4,5,6,7,8 and 9.
FLASH Key="A"=0,1,2,3,4,5,6,7,8, 9,* and #

5. The purpose of the WCDs is to represent the decimal numbers "2-9" and "0-9". They may be used to represent a group of numbers with a single entry. For example, entering "POPA" will represent all area codes with middle digit "0".

6. The program sequence takes the following form:

KEY	NOTES
*	
YY	Program No. (28-31)
#	Step 40 times
XXXX	Digits to be allowed or disallowed including "P" and "A"
#	
FEAT	
FEAT	

To clear data, press "*". "FFFF" indicates no data entered at the present location.

7. Refer to Table 1-20 for programming examples and Table 1-21 for Programming Worksheet.

8. Refer to associated System Programs #25, #26 and #27.

Note: It is highly recommended that a DSS console be used for this program.

Example:

KEY
*
28
#
1800
#
911A
#
FEAT
FEAT

This program entry will allow only 1 800 numbers and 911 to be dialed.

Example:

KEY
*
30
#
976A
#
411A
#
FEAT
FEAT

This program entry will disallow 976 numbers and 411 to be dialed.

190.20 PROGRAM #32 CO AND P-KEY ASSIGNMENT (NON-SQUARED)

1. This program allows changing the CO lines and assignment of any CO key.

2. P-Key or Pooled Line assignment is allowed for keys 6 or 18 of all telephones. All keys succeeding the assigned P-Key will be rendered inoperative.

3. The program sequence takes the following form:

KEY	NOTES
*	
32	
XX	Ext No. (10-69)
#	Step
YY	Trunk No. (01-30) or P-Key (9, 1-8)
#	Program
FEAT	
FEAT	

4. The system is factory programmed for squared operation. Therefore, CO Number 01-30 corresponds to CO Line Keys 01-30.

5. Trunk No. assignment follows this format: YY = 00-30 (00=No assignment). If line key #1 assignment changes, for example, to Trunk #10, then CO line key #10 is automatically assigned Trunk #1. If line key #2 is assigned to Trunk #11, then CO line key #11 is automatically assigned Trunk #2 etc.

6. P-Key assignment follows this format: YY = P-Key Designator = "9"/Y = Trunk Group desired (1-9).

7. Refer to **Table 1-25** for programming worksheet.

Note: P-keys are assigned on a per station basis (one P-Key per station), and may be assigned to any trunk group on a per key basis. COs may be transferred to any P-Key in the system, providing that Trunk has been assigned to the P-Key trunk group.

Example:

KEY	NOTES
*	
32	
15	Ext No. (10-69)
#	
01	Button No.
01	CO No.
#	
02	Button No.
02	CO No.
#	
03	Button No.
07	CO No.
:	:
06	Button No.
92	P-Key Trunk Group #2
#	
FEAT	
FEAT	

With this program station number "15" is squared on CO button number "01 and 02". CO button number "03" is nonsquared, with CO "07" appearing on it. CO button number "06" is assigned on a P-Key, trunk group number "2".

190.21 PROGRAM #33 DO-NOT-DISTURB (ALLOW OR DISALLOW STATION)

1. This program allows a station to use the Do-Not-Distrub feature.

2. This program sequence takes the following form:

KEY	NOTES
*	
33	
XX	Ext No. (10-69)
Y	DND 0=Allowed 1=Disallowed
#	
FEAT	
FEAT	

3. Variables
   Y = 0 Allow
   Y = 1 Disallow

Table 1-18

TRUNK GROUP CLASS OF SERVICE RESTRICTIONS
ALLOW TABLE/DISALLOW TABLE

Restriction Class Designator ***	PGM 28 A1	PGM 29 A2	PGM 30 D2	PGM 31 D2	System Special Speed Banks
*01	1	0	0	0	0**
*02	0	1	0	0	0
*03	1	1	0	0	0
*04	0	0	1	0	0
*05	0	0	0	1	0
*06	0	0	1	1	0
*07	1	0	0	0	1
*08	0	1	0	0	1
*09	1	1	0	0	1
*10	0	0	1	0	1
*11	0	0	0	1	1
*12	0	0	1	1	1
13	N/R Non-Restricted				1
14	OCC 8 other common carrier 8-digits				1
15	OCC 7 other common carrier 7-digits				1
16	T/R 8 toll restrict 8-digits				0
17	T/R 7 toll restrict 7-ditits				0
18	O/R 5 outgoing restrict 5-digits				0
19	O/R outgoing restrict "0"-digits				0

Notes:

* *The number "1" is used to indicate "yes" when program searches a table.*
The number "0" is used to indicate table not assigned when the program searches for tables.

** *The number "1" is used to indicate dialing from System Special Speed Banks allowed.*
The number "0" is used to indicate dialing from System Special Banks not allowed.

*** *These are the associated program numbers for allowed and disallowed tables.*

Table 1-19

ALLOWED DIALING PATTERNS FOR RESTRICTION COS

Restriction Class Designation	Class Type	DIALING PATTERN					
		Outgoing Restriction	1st "0", 411, 1411 Dial Restriction	Restriction By Allow Table	Restriction By Disallow Table	Digits Restricted to 5, 7 or 8	Special SPD Bank Access
01	SR1			X			
02	SR2			X			
03	SR3			X			
04	SR4				X		
05	SR5				X		
06	SR6				X		
07	SR7			X			X
08	SR8			X			X
09	SR9			X			X
10	SR10				X		X
11	SR11				X		X
12	SR12				X		X
13	NR						X
14*	OCC8		X			8 Digit	X
15*	OCC7		X			7 Digit	X
16	TR8		X			8 Digit	
17	TR7		X			7 Digit	
18	OR5		X			5.Digit	
19	OR	X				0 Digit	

*These classes of service restrict 7 and 8 digit calls except when special SPD Banks 88, 89 (Station) and 50, 51 (System) are accessed prior to dialing long distance. (See Section 3 Features Operation). In this case all restrictions are overridden.

SEMI-RESTRICTED ALLOW AND DISALLOW

	PROG. #28				PROG. #29				PROG. #30				PROG. #31			
Table No. / Entry No.	ALLOW 1				ALLOW 2				DISALLOW 1				DISALLOW 2			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	1	2	1	2	5	2	A	P								
2	P	P	P	A	6	A	A	P								
3	P	A	A	P	P	P	P	P								
4									1	P	P	P	1	2	P	2
5									0	P	P	P	1	3	P	P
6									P	P	P	P	P	P	P	P
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
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28																
29																
30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40																

Table 1-20

EXAMPLES OF ENTRIES FOR SEMI-RESTRICTED ALLOW AND DISALLOW TABLES

SEMI-RESTRICT ALLOW and DISALLOW

Table No. / Entry No.	ALLOW 1				ALLOW 2				DISALLOW 1				DISALLOW 2			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
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28																
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30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40																

Table 1-21

WORKSHEET FOR SEMI-RESTRICTED ALLOW AND DISALLOW TABLES

Program #25

TRUNK	GROUP
CO #	*1-9
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

*NOTE: 1-8 TRK GRP can have class of service. TRK GRP No. 9 has no class of service.

Table 1-22

WORKSHEET FOR CO TRUNK GROUP ASSIGNMENT

Program #26

C.O.S. ON TRUNK GROUP								
C.O.S.	TRUNK GROUP #							
	1	2	3	4	5	6	7	8
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								

Table 1-23

WORKSHEET FOR TRUNK
GROUP/STATION COS ASSIGNMENT

Program #27

Station C.O.S.			
STATION NO.	01-16	STATION NO.	01-16
10		40	
11		41	
12		42	
13		43	
14		44	
15		45	
16		46	
17		47	
18		48	
19		49	
20		50	
21		51	
22		52	
23		53	
24		54	
25		55	
26		56	
27		57	
28		58	
29		59	
30		60	
31		61	
32		62	
33		63	
34		64	
35		65	
36		66	
37		67	
38		68	
39		69	

Table 1-24

WORKSHEET FOR STATION COS ASSIGNMENT

BLANK FOR FOLDOUT

LINE KEY	10	11	12	13	14	15	16	17	18	19	20	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
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16																										
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21																										
22																										
23																										
24																										
25																										
26																										
27																										
28																										
29																										
30																										

Program #22
FLEXIBLE STATION RINGING ASSIGNMENT (10-69)

CO #	1st	2nd	3rd	4th	5th	6th
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

Program #23
NIGHT STATION ASSIGNMENT (10-69)

CO #	1st	2nd
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Table 1-26

WORKSHEETS FOR STATION RINGING ASSIGNMENT AND NIGHT RINGING ASSIGNMENT

CO NO.		DT O ROT (1
1		
2		
3		
4		
5		
6		
7		
8		
9		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

P-KEY ASSIGNMENT									
N	✓ YES P-KEY	P-KEY NO.	TRK GRP	STA. NO.	6, 18 BUTTON	✓ YES P-KEY	P-KEY NO.	TRK GRP
				40				
				41				
				42				
				43				
				44				
				45				
				46				
				47				
				48				
				49				
				50				
				51				
				52				
				53				
				54				
				55				
				56				
				57				
				58				
				59				
				60				
				61				
				62				
				63				
				64				
				65				
				66				
				67				
				68				
				69				

PRG

13	ICM	VOICE = C
14	TYPE OF HOLD	EXCL = O/
15	HOLD RECALL	30 sec. – OR NO RE
16	FLA	0.1 SEC. 1
17	RING DET.	05, 08, 11, 20
19	PULSE SPEED	10/20
20	PULSE BK (%)	58 TO 73

CHAPTER 2
MARATHON CPU-B

SECTION 210
CPU-B OVERVIEW

210.1 GENERAL

This chapter contains the installation, feature definition and operation and programming information for the MARATHON Electronic Key Telephone System CPU-B and associated circuit cards.

210.2 The CPU-B is a direct replacement for the MARATHON CPU-A card. Information pertaining to the system installation and CPU-A in Chapter 1 is applicable to CPU-B.

210.3 ENHANCED FEATURE LIST

The CPU-B card facilitates the use of the following enhanced feature operations.

** Note: Specialized hardware or specific telephone instruments are required for these features. Refer to Table 2-1, Hardware Configuration.*

210.4 EQUIPMENT REQUIREMENTS

It should be noted that the operation of certain features related to the CPU-B card may also depend on additional equipment in the form of hardware, being added to the system and/or upgrades made to existing equipment. Refer to the information regarding equipment arrangements and requirements in Section 230.

SECTION 220
FEATURE DESCRIPTION AND OPERATION

220.1 976 DIAL RESTRICTION

Disallowing dial access to 976 numbers, such as "weather" and "time" is a function of system programming and is accomplished on a system wide basis, according to station class of service. This feature, when system programmed will prevent a station user, who has been assigned any of the Toll Restriction or Semi Restriction toll restriction classes of service, from being able to dial local, extended area, and long distance 976 service calls.

220.2 AUTOMATIC ROUTE SELECTION (ARS)

Automatic route selection provides a comprehensive method of cost reduction through automatic selection of outgoing CO lines based on the type and geographic location of the outgoing call. A user can have outgoing CO calls routed through specific types of CO lines (i.e. WATS, OCC, DDD, FX, etc.) on a priority basis depending on the traffic conditions in the system and the types of lines available in the industry today. Automatic route selection requires an LCU to be present in the system in order to utilize this feature.

220.3 BROKERAGE SERVICE (NON-PRIVATE OPERATION)

This feature must be system programmed on a per station basis. This feature allows up to four users to barge in on a CO line already in progress. By depressing the "FEAT" (feature) key and the appropriate CO line, (which has an in-use indication), up to 4 additional users may join in the same conversation in a 5-way communication path. A barge-in tone will be heard at the station originating the CO call when another station user joins the conversation. When the Brokerage Service is enabled at a station, it is also possible for a station user to insure privacy (disable Brokerage Service) at his or her station (on a per call basis) by depressing the "FEAT" (feature) key and then the CO line key during the call. You may then wish to release privacy (return to Brokerage Service enabling) by depressing the CO line key any time during the call. Privacy will only remain for the duration of the CO call.

220.4 CALL FORWARDING OF RING ASSIGNED CO LINE KEYS

Allows ring assigned CO lines to be forwarded to another station within the system when the call forwarding procedure is used. One operation of the procedure forwards both ring assigned CO lines and ICM calls. If a CO line is assigned to ring at a particular extension the ringing will be forwarded to a predetermined station if the telephone station has been placed into the call forwarding mode by the station user. In the case of the message and executive telephone a flashing "#" will be displayed in the LCD display indicating a call forwarding in progress. All other stations will have a "MSG" led flashing indicating call forwarding mode. A station's call forwarding status will be indicated at the DSS by a flashing led associated with the forwarded station.

220.5 CO RING PREFERENCE

By enabling this feature in system programming all stations programmed to ring on incoming CO calls will, in the day and night mode and Call Forward mode, provide the user with the ability to answer incoming CO calls by simply lifting the telephone handset. There is no longer the need to depress a CO key. Multiple incoming CO calls will be answered by simply lifting the handset at the ring assigned stations starting at lowest to highest (1 through 30).

220.6 DSS FEATURES ON SPARE CO LINE KEYS

DSS/BLF locations (extensions) may be programmed to appear on any spare CO line button position. These DSS/BLF buttons provide busy visual display of the stations and direct selection of any associated station in the same fashion as the standard DSS. In addition, calls may be transferred by directly selecting a DSS/BLF (CO line buttons position programmed as DSS key) in the normal way.

220.7 ENHANCED RINGING ASSIGNMENT OF CO LINES

This feature provides daytime CO ringing assignment of up to 10 stations per CO line. In addition, 5 stations may be programmed to ring on any CO line in the night mode.

220.8 ENHANCED COS ASSIGNMENTS

A total of 32 classes of service may be created by the system programmer for assignment to the telephone stations.

220.9 ENHANCED SPEED DIAL

A total of 57 system speed dial locations are available. The system location numbers are 00-49 with 7 special speed banks 50 through 56. In addition, 30 station speed dial locations are available. The station location numbers are 60-87 with 2 special speed banks 88 and 89. (88, 89 can only be accessed after accessing system 50-56.)

220.10 EXTERNAL PAGING (DIAL UP)

Allows dial access to three zones plus all call external paging with meet-me capability.

By going off-hook at a telephone station and dialing a two digit code (i.e. 86-89) any or all of the external zones may be accessed for paging.

The external zones are configured as follows:

86 - Zone #1
87 - Zone #2
88 - Zone #3
89 - All External Zones

External paging equipment may be interfaced with vacant station ports which have been designated in system programming by the user to correspond with the two digit codes 86-89. A 600 OHM 2-wire audio interface is provided by way of the stations tip and ring connections at the station port. External paging amplifier and speaker are required, and must be furnished by the installing company.

Any person who wishes to directly answer a page by completing a two-way conversation with the paging party may do so by way of the meet-me page

feature. To answer a page (meet-me) go off-hook and dial "*" , then "8".

220.11 FIRST AND SECOND INDEPENDENT HOLD RECALL TIMING

A CO call on hold which has remained unanswered for a specific time is automatically recalled (2 short beeptones) to the station initiating the call hold. The time required for the call to be on hold at a particular station before a recall is sounded is called the first hold recall period. The actual duration of the first hold recall period may be determined in system programming. The first hold recall may be programmed at 30 second intervals from 30 seconds to 9.5 minutes maximum. The first hold recall is factory programmed at 30 sec. You may also choose to have no recall.

A CO call on hold which has remained unanswered for longer then the first hold recall period may again be recalled after a second predetermined time period known as the second hold recall period. The second hold recall period is independent of the first hold recall and is programmed separately. The second hold recall will sound after the first and second recall periods have timed out.

In addition to the second hold recall tone, which sounds (2 short beeptones) at the station originating the held call a second recall tone can be sounded (2 short beeps) at all primary stations if programmed. If the held call was originally put on exclusive hold, the held call will revert to a system hold condition with the second hold recall.

If there is a DSS/BLF console present in the system, the DSS/BLF's LCD display will flash the CO on hold along with the station number originating the held call. If there is more than one CO on second hold recall, the CO and station number will appear in sequential order on the DSS/BLF console's LCD. If the station originating the hold is an Executive telephone, the CO number associated with the held call will flash on the LCD display.

220.12 MESSAGING - ELECTRONIC

Electronic messaging provides an alternative to verbal and/or handwritten messages.

This feature allows a station user to receive, generate and transmit messages in the form of visible phrases (alphanumeric as well as numeric characters) which are displayed on the E-EXECs and E-MSGs liquid crystal displays.

These messages can be 16 characters in length and may be selected from any of four categories.

The first category consists of one message (dial code 01). The purpose of this message is to be used as an announcement. If another station were to dial (intercom) an unattended station with message 01 programmed, message 01 is automatically sent (transmitted) to the calling station. The station user may select any station or system message (02-39) and transfer that message into bank "01".

The second category of messages is provided for exclusive use by the station

user. The station user may use this area as a personal message buffer in which his, or her own personalized messages may be saved for future use. The station user may choose to transfer some of the standard system provided messages (10-39) into his or her own personal message area. The personal message area is defined as message banks 02-09.

Message numbers 10 through 39 are provided as system messages for access by all station users with the appropriate telephone stations. The first eight of the thirty system messages are factory provided as standard type messages.

These include:

Message #	Content
10	Out Until ??:????
11	Conf Til ??:????
12	Conf From ??:????
13	Vacation BK ??/??
14	Trip Until ??/??
15	Leave Message
16	Call ??????????
17	Call Ext ??

The remaining message locations 18-39 may be programmed by the system programmer.

A final category is provided for received messages. This area will allow memory space for messages which have been received from other stations. A station user may have as many as 10 messages received in the stations memory at one time.

In many cases, immediately prior to transmitting a message, additional data may be added to existing messages in station and system categories. This data may be in the form of date, time and extension number.

220.13 MULTIPLE POOLED LINE ACCESS

This feature provides bothway access to multiple trunks (pooled trunk keys) assigned on a trunk group basis to a CO line key on a telephone instrument. A maximum of 9 trunk groups can be assigned in the system, allowing a maximum of 9 pooled line keys on any telephone. Each trunk group can have up to 30 trunks assigned. Each trunk can be assigned to one trunk group only.

220.14 OFF-HOOK VOICE ANNOUNCE WITH HANDS FREE ANSWERBACK

If a telephone station is in use (off-hook) on an outside or intercom call and a calling party places an intercom call to the busy station, two-way communication between the calling party and the busy party can be achieved through the station speakerphone while the present call is in progress.

An audible beeptone will be heard through the intercom calling party's handset if the called party station's microphone is on. If the MIC is off, two beeps will alert the calling party that the called party's microphone is off.

220.15 PRIMARY STATIONS SECOND HOLD RECALL CONTROL

In addition to the second hold recall tone, which sound (2 short beeptones) at the station originating the held call a second recall tone can be sounded (2

short beeps) at all primary stations if programmed.

220.16 PROGRAM SELECTION USING DSS/BLF CONSOLE KEYS

This feature allows the programmer to directly select access to the desired program data via the DSS/BLF console keys. It is not absolutely necessary to have a DSS/BLF console present in the system to access program data, however, a DSS/BLF console will enhance the programming procedures.

220.17 REMOTE MAINTENANCE

Remote maintenance is available in the system providing a Remote Maintenance Unit (RMU) is present in the system. The remote maintenance capability allows the user to make program changes and update system status while on a line from a remote location. This is accomplished by way of modem communication from a remote location over a standard loop start CO line. The remote maintenance feature requires the user to furnish a data terminal (such as a Texas Instrument Silent 700) and a standard type modem (such as a Tandy DCM07). Refer to Chapter 9.

220.18 UNANSWERED CALLED STATION

Any station or the same station may be assigned to ring on any incoming CO call when a CO call has been unanswered and continues to ring at a particular answering position (extensions with ring assigned CO lines) for longer than the designated period of time.

This feature is completely automatic and is a function of the system software on a per CO line basis. If an "UN" station is assigned in the system ringing program to a particular CO line and the "UN" station timer is programmed for a designated period of time, the "UN" feature is then activated. Refer to System Program #23.

The "UN" feature may also be deactivated by entering "00" into the system "UN" station clock's data. This will deactivated all "UN" stations.

SECTION 230
INSTALLATION

230.1 GENERAL

This section provides installation instructions for the MARATHON CPU-B circuit card. This section should also be used in conjunction with the Chapter 1, Section 130 of this Installation Manual.

230.2 EQUIPMENT ARRANGEMENT

Equipment may be required as either a direct replacement to existing equipment or as an addition to existing equipment with respect to the user's requirements for the enhanced features and their operation. This equipment includes the RMU interface, LCU interface, "OA" (Off-Hook Answerback) telephones, and STU interface.

Table 2-1 has been provided as a reference for selecting the necessary hardware in accordance with the features contained in the system CPU-B software.

230.3 EXTERNAL PAGING CONNECTIONS

In addition to the standard external paging interface (spare CO port) (refer to Chapter 1 Figure 1-21) external all-call paging with meet-me feature is provided with the CPU-B circuit card.

External paging equipment interfacing is achieved through direct connection to the tip and ring of preassigned vacant station ports.

Vacant station ports may be assigned in programming (refer to Section 240.12) to accommodate external paging equipment on a per port/per zone basis. A total of three station ports may be assigned, each with one of three dial codes (86-88) corresponding to the paging equipment. Corresponding paging equipment will automatically be connected upon a station user dialing 86, 87, 88 or 89 for all zones simultaneously.

The vacant station port interface is a standard 600 OHM audio type interface (refer to Figure 2-1 for wiring details).

230.4 STATION CONNECTION

The maximum allowable cable length for "OA" (Off-Hook Answerback) type telephones is 1000 feet. The actual physical station connection locations remain unchanged. The E-MSG-OA, E-EXEC-OA, E-6, 18, 30-OA telephones and their related station ports are interchangeable with standard MARATHON telephones (with respect to physical location only) as follows:

	First 8 Ports of STU Only	All Ports of STU	Only Ports 2 & 3 of the STUs
*E-MSG-OA	X		
*E-EXEC-OA	X		
*E-6, 18, 30-OA		X	
E-DSS			X

*Requires CPU-B and the STU-C for off-book voice announce feature.

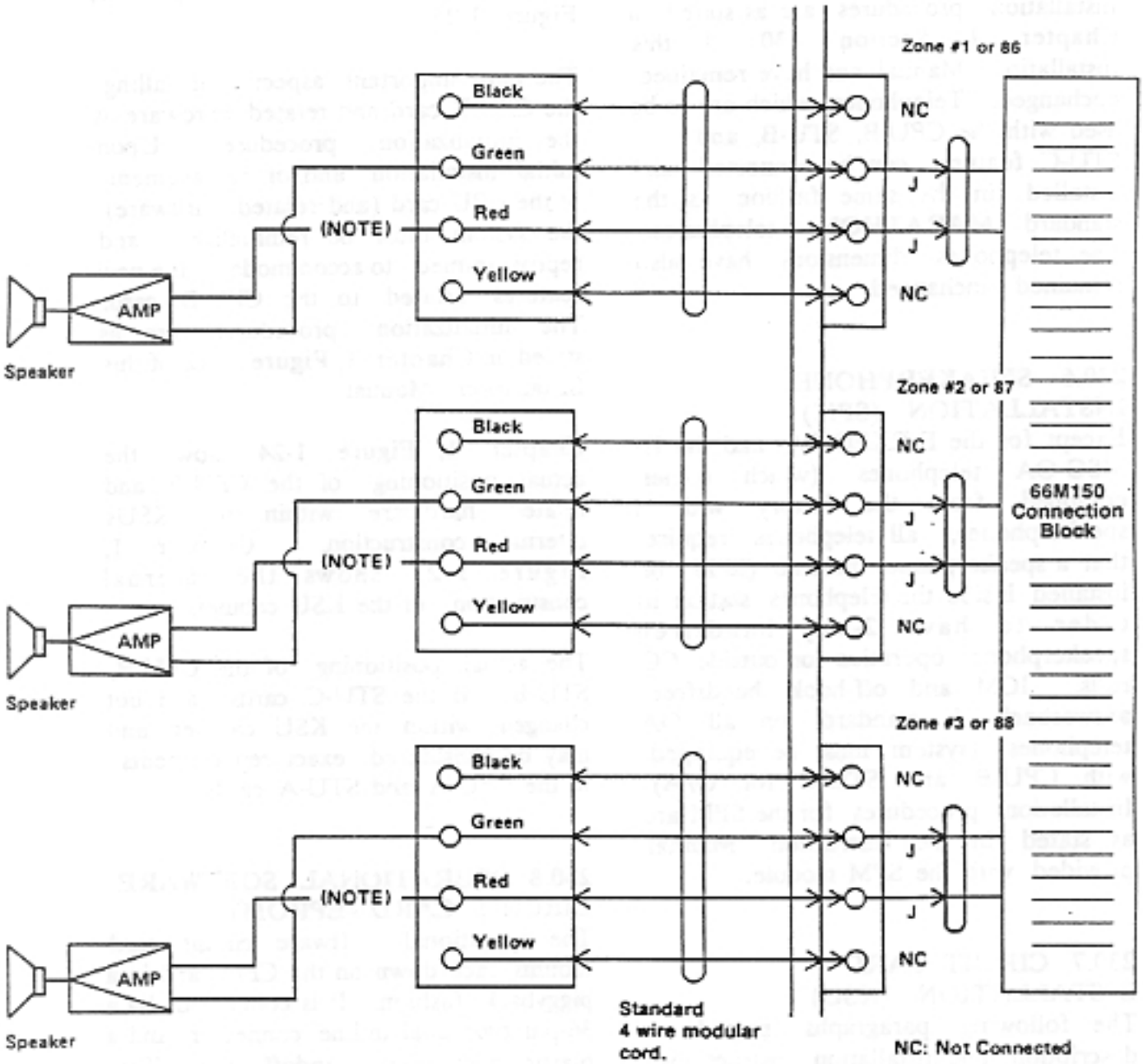
Note: Refer to Chapter 1, Table 1-9 for exact connecting block locations. Maximum distance from KSU to telephone station must be 1000 ft or less.

Table 2-1

CPU-B HARDWARE CONFIGURATION HARDWARE REQUIRED "X"

FEATURES	CPU-B	STU-A	STU-B	STU-C	E-MSG-OA OR E-EXEC-OA	E-OA TEL	LCU	RMU
Brokerage Service	X	*	X or	X				
Multiple Pooled Line Keys	X	*	X or	X				
CO Ringing Answer Preference	X	X or	X or	X				
Enhanced Speed Dialing	X	X or	X or	X				
DSS/BLF Features on Spare CO Line Keys	X	*	X or	X				
External Paging With Meet-Me	X	X or	X or	X				
Off-Hook Voice Announce With Handsfree Answerback	X	*	*	X	X	or X		
Enhanced CO Ringing Assignments	X	X or	X or	X				
Electronic Messaging	X	*	X or	X	X	*		
First and Second Independent Hold Recall Timers	X	X or	X or	X				
UN Station (Unanswered Call Station)	X	X or	X or	X				
Call Forwarding of Ring Assigned CO Line Keys	X	X or	X or	X				
976 Dial Restrictions	X	X or	X or	X				
Automatic Route Selection	X	*	X or	X			X	
Remote Maintenance	X	X or	X or	X				X
Program Selection Via DSS/BLF Keys	X	X or	X or	X				

* This hardware may be used in conjunction with hardware marked "X" but will not support the use of this feature.



NOTE: EXTERNAL PAGING CONNECTION, UTILIZING STATION MODULAR JACK

Figure 2-1 External Page Connections

230.5 TELEPHONE INSTALLATION

Installation procedures are as stated in Chapter 1, Section 130 of this Installation Manual and have remained unchanged. Telephones which are to be used with the CPU-B, STU-B, and STU-C features can be connected and installed in the same fashion as the standard MARATHON telephones. The telephones dimensions have also remained unchanged.

230.6 SPEAKERPHONE INSTALLATION (SPM)

Except for the E-EXEC-OA and the E-MSG-OA telephones (which comes equipped from the factory with a speakerphone), all telephones require that a speakerphone module (SPM) be installed inside the telephones station in order to have 2-way handsfree speakerphone operation on outside CO calls. ICM and off-hook handsfree answerback is standard on all OA telephones (system must be equipped with CPU-B and STU-C for O/A). Installation procedures for the SPM are as stated in the Instruction Manual provided with the SPM module.

230.7 CIRUIT CARD INSTALLATION (KSU)

The following paragraphs provide a description and installation instructions for the CPU-B circuit card and its related equipment. The Central Processing Unit (CPU) card has dip switches which may be set before the card is installed or after the installation and cabling of the system is completed. These switches can be accessed from a designated area on the "KSU" cabinet face (Refer to Chapter 1, Figure 1-9) as IPL switches. The associated switch settings are described in Chapter 1, Figure 1-25.

The most important aspect of installing the CPU-B card and related hardware is the initialization procedure. Upon initial installation and/or replacement of the CPU card (and related hardware) the system must be reinitialized and reprogrammed to accommodate the new features related to the CPU-B card. The initialization procedures are as stated in Chapter 1, Figure 1-42 of this Installation Manual

Chapter 1, Figure 1-24 shows the actual positioning of the CPU-B and related hardware within the KSUs internal construction. Chapter 1, Figure 1-23 shows the internal construction of the KSU cabinet.

The actual positioning of the CPU-B, STU-B and the STU-C cards have not changed within the KSU cabinet and may be considered exact replacements to the CPU-A and STU-A cards.

230.8 OPERATIONAL SOFTWARE CIRCUIT CARD (EPROM)

The operational software circuit card mounts face down on the CPU card in a piggyback fashion. It is connected by a 36-pin type dual in-line connector and a plastic push down standoff plug. This card provides operational software and factory data in the form of Read Only Memory (ROM) to be loaded into system memory upon initialization.

230.9 HARDWARE CHANGES AND ADDITIONS

In addition to some aspects of its physical appearance, electronic changes

have been made in order to provide control for the various tone output levels to the telephones which originate at the CPU. These variable controls are in the form of potentiometers located at the rear of the circuit board (refer to Figure 2-3). These controls are provided as optional adjustments and may be accessed from the rear of the KSU (refer to Figure 2-3). Should the output tone levels need to be increased or decreased (ringer volume and intercom volume) refer to Table 2-2 for control data. For more technical information such as level specifications, contact **WIN Technical Service Department.**

230.10 RIBBON CABLE CONNECTIONS

When recabling for installation, refer to the cabling information in Table 2-3.

230.11 POWER INTERFACE

Connects power jack from inside KSU cabinet to main power convertor located on PC board. (Refer to Figure 2-5.)

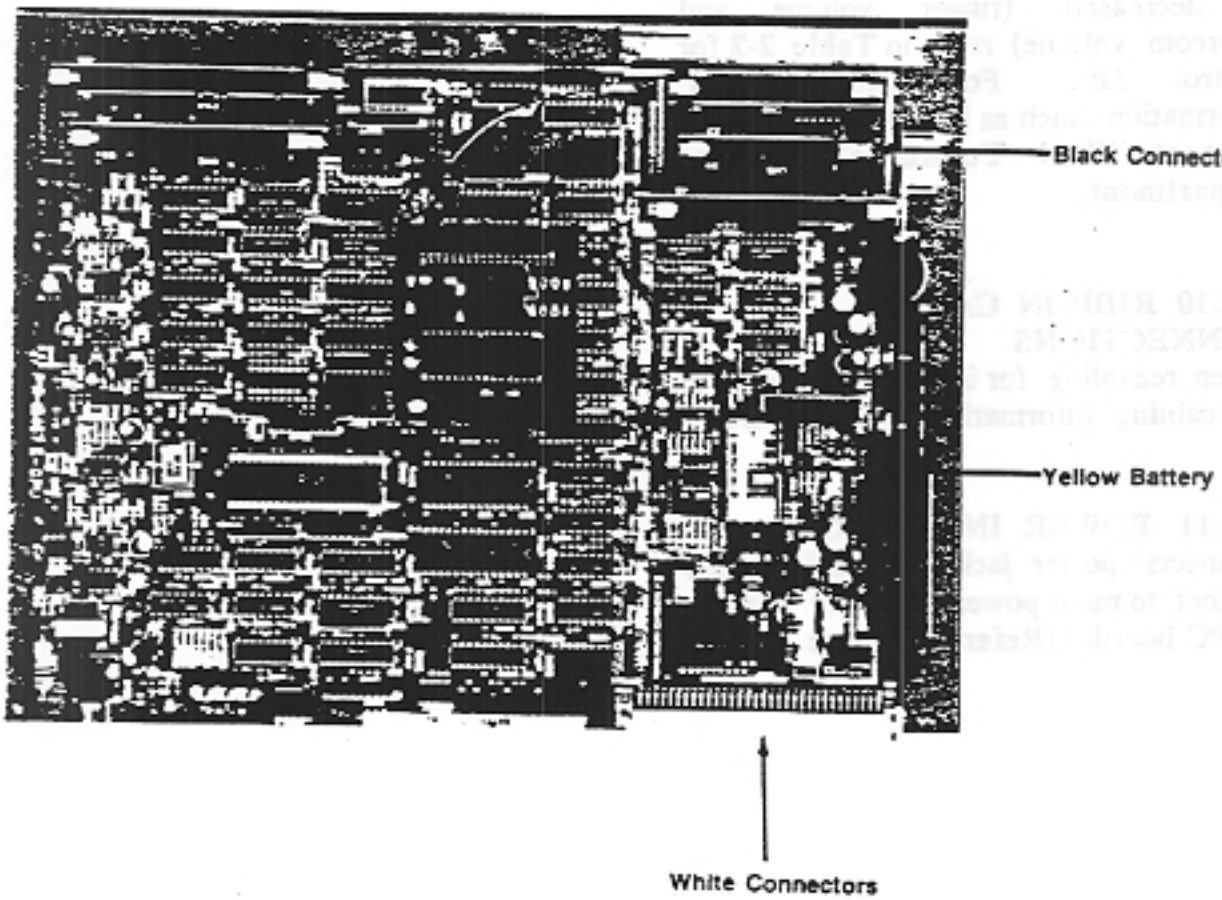


Figure 2-2 MARATHON CPU-B Card

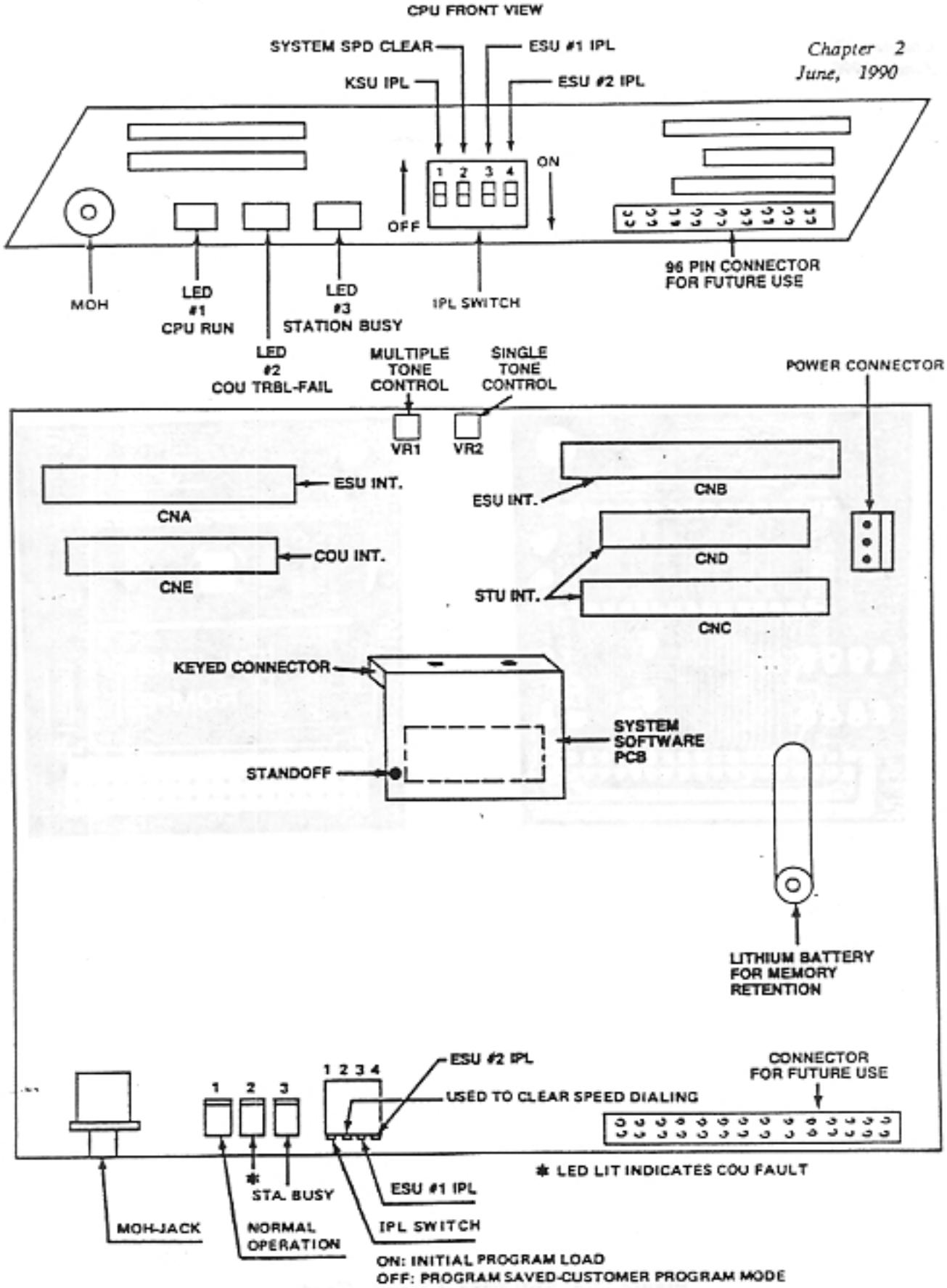


Figure 2-3 MARATHON CPU Card

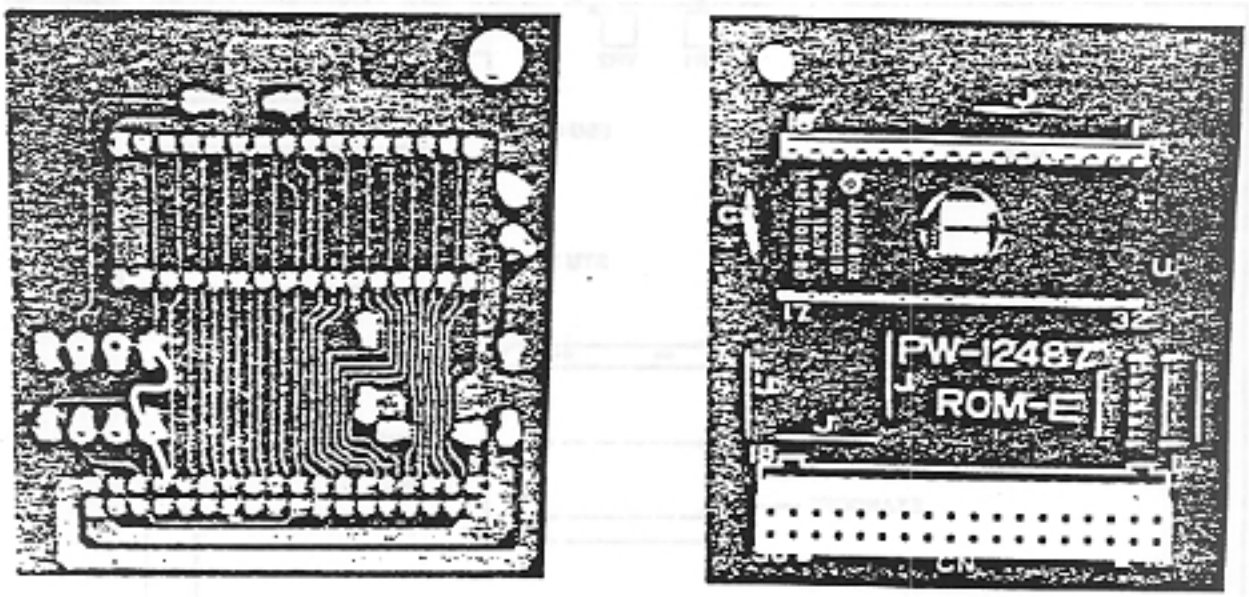


Figure 2-4 Software Circuit Card
Front (Left), Back (Right)

Table 2-2

SINGLE TONE AND MIXED TONES LEVEL ADJUSTMENT

Single Tone: Such as: ICM dialtone and CONF tone	Potentiometer VR2	Turn Clockwise to increase	Turn Counterclockwise to decrease level
Mixed Tones: Such as: ICM ringing and CO ringing	Potentiometer VR1	Turn Clockwise to increase level	Turn Counterclockwise to decrease level

Table 2-3

CONNECTOR DESIGNATION

CNA--60 pin connector for connection to CNO of #1 ECU Board or SMU

CNB--40 pin connector for connection to CN1 of #1 ECU Board

CNC--50 pin connector for connection to J1 of #1 STU Board

CND--34 pin connector for connection to J2 of #1 STU Board

CNE--50 pin connector for connection to J1 of #1 COU Board

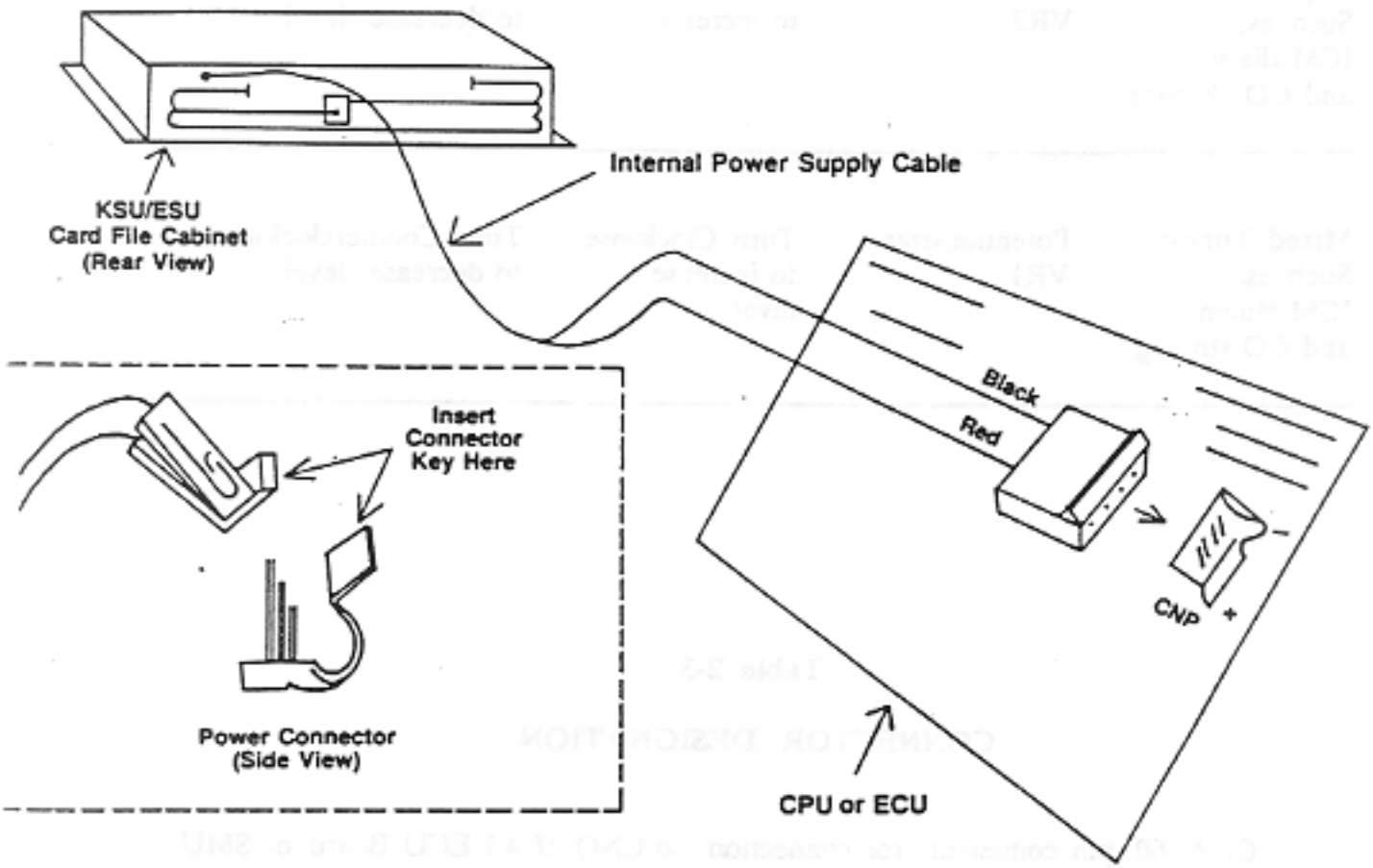


Figure 2-5 Internal Power Interface

SECTION 240
SYSTEM PROGRAMMING

240.1 GENERAL

This section should be used in conjunction with **Chapter 1, Sections 180 and 190.** It describes the permanent factory program and contains programming information using the primary station (Ext 10) of port number 1.

240.2 PROGRAM ENTRY CHARTS AND TABLES

The program charts on the following pages describe the procedures for modifying the system date. **Table 2-4** provides a list of these programs and is to be used in conjunction with **Chapter 1, Table 1-15** of this Installation Manual.

Table 2-4

CPU-B SYSTEM PROGRAMS

Note: It is ABSOLUTELY necessary for the Installation Company to reinitialize the system upon initial installation or replacement installation of the CPU-B card.

240.3 PROGRAM #15 CHANGING HOLD RECALL TIMING (1ST & 2ND)

1. This program determines the length of the hold recall periods.

2. The first and second hold recall timers are programmed independently via this program. (Refer to **Section 220** for feature description.)

3. It is possible to disable both of the hold recall features by entering zero in the X variable for the first hold recall data.

4. Both first and second hold recall timers may be programmed independently for a maximum of 9.5 minutes and a minimum of 30 seconds in 30 second increments.

5. The program sequence takes the following form:

KEY	NOTES
*	
15	or DSS Key #15
#	Step
XX	00-9.5 Refer to Timing IDs for Hold Recall
#	Step to Second Hold Recall Timer
FEAT	
FEAT	

Repeat for Second Hold Recall

Hold Recall Timing ID
X X Timing

00	= No Recall (Default Data)
05	= 30 seconds
10	= 60 seconds
15	= 1.5 minutes
20	= 2 minutes
25	= 2.5 minutes
:	:
:	:
95	= 9.5 minutes

6. This program replaces **Chapter 1, Section 190.6** Program #15.

Notes:

Transfer recall time is whatever appears in the second hold recall time only. Transfer recalls go to primary stations.

Second Hold Recall is the sum of the first and second hold recall.

240.4 PROGRAM #22 RING ASSIGNMENT OF STATIONS

1. This program allows each station to be ring assigned to any or all of the CO/PBX lines. However, 10 stations may be ring assigned to any one CO/PBX line.

2. The program sequence takes the following form:

KEY	NOTES
*	
22	or DSS #22
YY	CO No (01-30)
XX	New Station Data (10-69) (if desired)
#	Step 10 times
FEAT	
FEAT	

3. All CO lines may be ring assigned to any station, a maximum of ten stations may be assigned to ring each CO line.

4. Refer to **Chapter 1, Table 1-26** for Ring Assignment Worksheet.

5. The system is factory programmed for extensions 10, 21, 22, 34, 46, and 58 which are assigned to ring on all CO lines.

6. This program replaces Program #22 of **Chapter 1, Section 190.13.**

240.5 PROGRAM #23 NIGHTTIME RINGING ASSIGNMENTS (WITH UN STATION)

1. The purpose of this program is to assign night ringing stations as well as unanswered call (UN) stations on a per CO line basis.

2. A maximum of 5 night ringing stations may be assigned to ring on any incoming CO line when the system is placed in the night answer "NA" mode.

3. One UN station may also be assigned to ring on any incoming CO line in both the day and night modes. The unanswered call station assigned to a CO will ring only if the UN timer (refer to Program #37) is programmed.

4. The program sequence takes the following form:

KEY	NOTES
•	
23	or DSS #23
YY	*CO No. 01-30
XX	New Station Data (#10-69) (You may change factory data)
#	Step Repeat 5 times Last time (6th entry) for "UN" Station
FEAT	
FEAT	

5. The 6th (or last) station (XX) entry is designated as the UN station.

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6. If "00" is inputted for XX in the first 5 positions then there will be no station assigned to ring in the night mode.

7. If "00" is inputted for XX in the last station position then there will be no UN station assigned to that corresponding CO line.

8. Factory (default) data is as follows:

CO#	Station #XX	Repeat 6 times
		"UN" Station
01	10,21,00,00,00,	00
02	10,21,00,00,00,	00
03	10,21,00,00,00,	00
:	: : : : :	:
:	: : : : :	:
30	10,21,00,00,00,	00

YY represent any CO line 01-30
XX represent any RA or UN station 10-69

9. This program replaces Program #23 in **Chapter 1, Section 190.**

240.6 PROGRAM #26 TRUNK GROUP CLASS OF SERVICE ASSIGNMENT

1. This program allow COS configuration on a trunk group basis.

2. There can be 32 COS. Each COS is configured by assignment of one of 19 restriction designators to each of eight trunk groups. (Restrictions may not be assigned to trunk group #9.)

3. The restriction class designator defines the type of restriction to be featured. (Refer to **Chapter 1 Tables 1-18 and 1-19)**

4. There are 19 possible types of restrictions that can be assigned to each trunk group. (Refer to **Chapter 1 Table 1-19).**

5. The programming sequence takes the following form:

KEY	NOTES
•	
26	or DSS #26
XX	COS (01-32)
#	Step
XX	Trunk Group: these are constants and appear in sequential order and cannot be changed (01-08)
XX	New Restriction Class Designator (to be entered (01-19)
#	Step to next Trunk Group
FEAT	
FEAT	

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6. The system is factory programmed for all trunk groups in all COS as non-restricted (Restriction class designator 13).

7. Refer to associated System Programs #25 and #27.

8. This program replaces Program #26 in **Chapter 1 Section 190.17.**

240.7 PROGRAM #32 CENTRAL OFFICE, POOLED LINE, AND DIRECT STATION SELECT/BUSY LAMP KEY ASSIGNMENTS (NON-SQUARED)

1. This program defines the actual function of the telephone station's line keys as CO pick up keys, pooled line keys, or direct station (DSS) keys.

2. A maximum of nine P-keys may be assigned to any telephone. Pooled line keys allow the programmer to designate access to lines in a particular trunk group (1-9) by use of any single pick-up key on the telephone station. Since there are nine trunk groups allowed in the system, it is therefore conceivable to assign nine trunk groups to nine individual keys on the same telephone station. However, only the first eight trunk groups may be assigned class of service.

3. In addition, the telephone pick-up (line keys) may be defined (assigned) as Direct Station Select keys. In this case, any key defined as a DSS/BLF will assume a standard DSS/BLF type of operation complete with coordinated LED indications.

4. The line keys may also be assigned for normal CO line access, in a squared or nonsquared configuration.

5. The system is factory progammed for squared operation. Therefore, CO numbers "01-30" = CO line keys 01-30.

6. The program sequence takes the following form:

KEY	NOTES
•	
32	or DSS #32
XX	Station No. (10-69)
#	Step
XX	Line Key No. (These are a constant and appear in sequential order 01-30)
#	Step
Y	Type of Key 1 = CO key 2 = DSS key 3 = P-Key 0 = Disabled
ZZ	CO No. 1-30 or station No. for DSS access 10-69 or P-Key No. 91-99
#	
FEAT	
FEAT	

i.e.

If you were to select "2" for Y you must then enter the station number you wish to appear at that DSS/CO key. If you select "3" for Y you must enter "9" and select a trunk group 1-9 for P-Key Assignment.

If you select 1 for Y, you must assign a trunk number 01-30. If you select 0 for Y, you must input 00 for ZZ to disable a key for a "no function" condition.

7. This program replaces Program #32 in **Chapter 1, Section 190.20.**

240.8 PROGRAM #34 PRIMARY STATIONS' ASSIGNMENT OF SECOND HOLD RECALL AND/OR VOICE MAIL

1. The purpose of this program is to enable or disable the DSS Second hold recall. You may choose to enable a second hold recall or, disable a second hold recall on an individual basis at each of 5 DSS positions.

2. In addition, if the DSS port is used for interface with a **MARATHON** Voice Mail Processor (MVP), you must define this function in programming.

3. The program sequence is as follows:

KEY	NOTES
•	
34	or DSS #34
#	Step
X	DSS #1-5
Y	1 = Yes 0 = No 2 = For Voice Mail
#	Step 4 times•
FEAT	
FEAT	

4. The system is factory programmed (default data) for the DSS associated with the #1 primary position (ICM 10) only to enable display (station number and CO number) of the second hold recall along with associated tones (short beeps).

5. By inputting "2" for voice mail, the DSS port and primary port associated with that DSS will function hand in hand with the MVP.

6. When a MSG waiting indication is activated by the attendant, "Call Attend XX" will appear in the associated E-EXEC and E-MSG phones LCD display. When a message waiting indication is activated by the MVP, "Call MVP" will appear in the E-EXEC and E-MSG LCD display.

* First Step "#" is DSS #1
Second Step "#" is DSS #2
: : :
Fifth Step "#" is DSS #5

240.9 PROGRAM #35 BROKERAGE SERVICE (NON-PRIVATE) ALLOW OR DISALLOW

1. This program will allow or disallow the use of the brokerage (non-private) feature on a station for station basis.

2. In order for a station user to have access to the brokerage feature his or her station must be defined in system programming as an allowed station.

3. The program sequence takes the following form:

KEY	NOTES
*	
35	or DSS #35
XX	Station # 10-69
Y	Allow = 1 Disallow = 0
#	Step
FEAT	
FEAT	

4. The system is factory programmed for disallow, or **NO** access to the brokerage feature for all stations. (No station is allowed to barge into a CO line.)

240.10 PROGRAM #36 INCOMING/RINGING CO ANSWER PREFERENCE

1. The purpose of this program is to enable or disable ringing CO answer preference on a system wide basis.

2. If this feature is enabled in system programming, all telephone stations programmed to ring on incoming CO calls will provide the user with automatic access to incoming ringing CO calls. By going off-hook on a telephone station programmed for incoming CO ringing (while a CO is ringing) your telephone will automatically seize the ringing line without any further action on the user's part.

3. The program sequence takes the following form:

KEY	NOTES
*	
36	or DSS #36
X	0 = Off 1 = On
#	Step
FEAT	
FEAT	

4. The factory (default) data is "0" or off (disable this feature).

240.11 PROGRAM #37 UNANSWERED STATION RING TIMING

1. The purpose of this program is to specify the timing for the unanswered station recall from the ringing station.

2. The system may be programmed so that if a call ringing in at a particular station remained unanswered for a predetermined period of time, the call ringing would be diverted to the UN station position. This predetermined period of time is program selectable for between 00 seconds and 9.9 minutes.

Note: The system may also be programmed for no call diversion "00".

3. The factory (default) programmed timing is 05 or 15 seconds.

4. The program sequence takes the following form:

KEY	NOTES
*	
37	or DSS #37
XX	00-99 (01=3.0 sec) default=05 (15 sec) *Note: 00=no timer/no "UN" function*
#	Step
FEAT	
FEAT	

5. XX Value

00 = No timer/No "UN" operation
01 = 3 seconds
02 = 6 seconds
03 = 9 seconds
04 = 12 seconds
05 = 15 seconds
: :
99 = 297 seconds

240.12 PROGRAM #38 EXTERNAL PAGING/PORT ZONE ASSIGNMENTS

1. This program allows assignment for vacant station ports for use as external paging ports with the meet-me feature.

2. Three zones 86-88 are assigned to any three specific station ports 10-69.

3. Default data "00" is factory programmed for no allocation of station ports as paging ports.

4. The program sequence takes the following form:

KEY	NOTES
*	
38	or DSS #38
#	Step
X	Zone 1-3 (Factory Data)
YY	Vacant Station Extension No. (10-69)
#	Step 2 times for zones 87, 88
FEAT	
FEAT	

5. In this program there are three values for X and Y variables. By depressing the "#" key and entering three extension numbers the corresponding zones 86, 87, 88 are assigned.

i.e.
YY = Zone 86
YY = Zone 87
YY = Zone 88

6. Dial access code 89 is solely for all call and is automatically assigned to three paging ports 86, 87, 88.

7. Dial *8 on the telephone dialpad will automatically connect you (meet-me) with the paging party no matter what zone has been selected by the paging party.

240.13 PROGRAM #39 DIAL "976" RESTRICTION CONTROL

1. The purpose of this program is to allow or disallow "976" local, extended area and toll call restriction on a system wide basis.

2. Any station assigned a T/R or S/R class of restriction via a trunk group COS assignment (refer to Program #26 & #27) will either be allowed or disallowed "976" dial restriction depending on this area input.

3. The program sequence takes the following form:

KEY	NOTES
•	
39	or DSS #39
X	Allow Dialing of 976 calls = 0 Disallow Dialing of 976 calls = 1
#	Step
FEAT	
FEAT	

4. Factory Data = "0" all 976 calls are allowed.

240.14 PROGRAM #50 SYSTEM-WIDE STATION MESSAGE CLEAR (02-09)

1. This program allows the user to erase the data presently programmed in the station message memory area.

   Note: This program does not erase data in the received message area or the system data message area.

2. The station message buffer (memory area) is comprised of message banks 02 through 09 (a total of 8 banks).

3. Once this program procedure is completed, all station message banks are completely cleared.

4. The program sequence takes the following form:

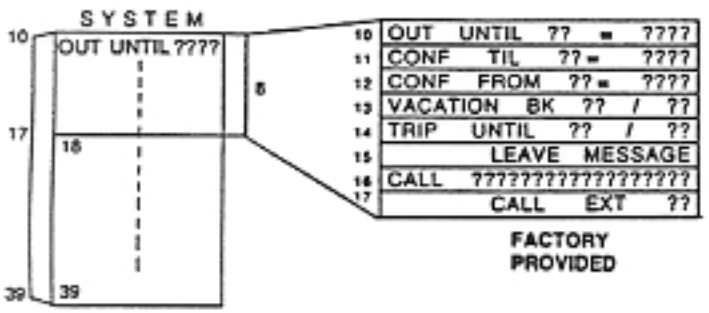
KEY	NOTES
•	
50	or DSS #50 or Button #20
#	Step (erase)
FEAT	
FEAT	

240.15 PROGRAM #51 SYSTEM MESSAGE EDIT

1. The purpose of this program is to delete, add or change the existing factory provided messages and/or create and input new and/or additional messages.

2. There are 30 message banks provided in the system message memory. The system message memory locations are designated by 2-digit codes numbered 10 through 39. The first eight locations, 10-17, are preprogrammed from the factory with standard type messages. Each message location is 16 characters in length.

3. The system message memory banks are configured as shown below.



4. Additional information such as time, dates, extension numbers, and telephone numbers may be added to the existing messages at the time of actual use by the station user via the station dialpad.

5. System messages must be edited at the time of programming from the primary station port in the usual way.

6. The program sequence takes the following form:

KEY	NOTES
*	
51	or DSS #51 or button #21
XX	System MSG #.10-39
Y	* DSS Keys and/or Telephone Station Dialpad
#	Step to next Message Location
FEAT	
FEAT	

* DSS/BLF keys are used to enter alphanumeric characters A-Z and "/", ":", "?" - the primary station dialpad is used to enter numeric characters 0-9.
* An E-EXEC or an E-MSG telephone is recommended for use with system message programming. The "FLA" and "HOLD" keys are used to set AM or PM respectively.

7. For the DSS and primary stations key functions (during programming only) refer to Table 2-5.

240.16 PROGRAM #52 STATION USER NAME EDIT

1. The purpose of this program is to allow the system programmer to assign person's names to their associated station or edit an existing name assigned to a station.

2. A person's name may be a total of 5 characters in length (so you may wish to abbreviate).

3. Alphanumeric characters may be programmed using the DSS/BLF keys (refer Program #51 Message Edit).

4. It is recommended that either an E-EXEC or E-MSG telephone be used when programming station user names.

5. The program sequence takes the following form:

KEY	NOTES
*	
52	or DSS #52 or button #22
XX	Station No 10-69
Y	DSS Alpha Character (5 times)
#	Step
FEAT	
FEAT	

6. For the DSS and primary stations key functions (during programming only) refer to Table 2-5.

Note: A DSS/BLF console must be present in the system in order to program station name assignments.

240.17 PROGRAM #56 L.C.R. CLASS OF RESTRICTION

1. This program defines the Class of Restriction to stations that have both direct CO lines and L.C.R. applied to them.

Note: Both Program 56 and Program 26 will work together to form a dialing pattern allowed to a specific station. A station user with direct CO lines appearing on his phone can be restricted from dialing using those buttons but still dial out using his L.C.R. key.

2. The program sequence takes the following form:

KEY	NOTES
*	
56	
#	
XX	Station number (10-69)
Y	Class of Restriction
#	
FEAT	
FEAT	

3. Class of Restriction

Class (Y)	LCR Key	Direct CO Appearances
1	Follows LCR table and station COS Program #26	Outgoing Restricted
2	Follows LCR table only	Follows station COS Program #26
3	Follows LCR table and station COS Program #26	Follows station COS Program #26

Table 2-5

DSS ALPHANUMERIC KEY CONFIGURATION

PRIMARY STATION		DSS		DSS	
KEY	DISPLAY	KEY	DISPLAY	KEY	DISPLAY
0	0	10	A	25	P
1	1	11	B	26	Q
2	2	12	C	27	R
3	3	13	D	28	S
4	4	14	E	29	T
5	5	15	F	30	U
6	6	16	G	31	V
7	7	17	H	32	W
8	8	18	I	33	X
9	9	19	J	34	Y
FLA	AM	20	K	35	Z
HOLD	PM	21	L	36	SPACE
		22	M	37	/
		23	N	38	:
		24	O	39	?

CHAPTER 3
MARATHON CPU-B2

SECTION 310
CPU-B2 OVERVIEW

310.1 GENERAL

This Chapter contains the feature description, installation and programming information for the MARATHON Electronic Key Telephone System CPU-B2 circuit card.

310.2 This software package can be used in place of CPU-B software. Currently, the software on the CPU-B card is contained on one 1-mega bit E-PROM (EROM-B); the new software card (E-CPU-B2) contains two 1-mega bit E-Proms (EROM-B2). The following information describes the feature enhancements and should be used in conjunction with Chapter 1 and Chapter 2 of this Installation Manual.

310.3 ENHANCED FEATURE LIST

310.4 EQUIPMENT REQUIREMENTS

It should be noted that the operation of certain features related to the CPU-B2 card may also depend on additional equipment in the form of hardware being added to the system and/or upgrades made to existing equipment. (Refer to Table 2-1 for details.)

SECTION 320
FEATURE DESCRIPTION AND OPERATION

320.1 GENERAL
This section provides descriptions and operation information for the features supported by the CPU-B2 circuit card.

320.2 DISALLOW AUTOMATIC CO HOLD
If a station user assigned Prime Line Outgoing, lifts the handset (seizes a CO line) but does not dial any digits and presses the ICM button; the CO line will not be placed on hold.

320.3 DSS/BLF ON SPARE CO KEYS
Spare (disabled) CO line keys can be assigned DSS/BLF functionality. To program a DSS/BLF, press the following keys in sequence: MON, FEAT, dial 2, Spare CO Key, dial two digit extension number or dial 00 to reset.

320.4 EXTERNAL PAGING WITH CO TRANSFER
This feature allows external paging with meet-me answer.

To transfer a CO call press ICM followed by the 2 digit paging code (86-89). Do not go on-hook until the meet-me has been completed.

Note:
86 = Zone 1
87 = Zone 2
88 = Zone 3
89 = All external paging zones

To answer a CO call transfer; lift the handset, press "*" and dial 8 to be automatically connected to the paging party. The paging party must go on-hook to complete the transfer. The CO must appear on both stations.

320.5 INTERNAL PAGING WITH CO TRANSFER
This feature provides internal paging with meet-me answer.

To transfer a CO call; press ICM followed by the 2 digit paging code (80-85). Do not go on-hook until the meet-me has been completed.

To answer a CO call transfer; lift the handset, press "*" and dial 8 to be automatically connected to the paging party. The paging party must go on-hook to complete the transfer. The CO must appear on both stations.

320.6 LAST NUMBER REDIAL
A telephone user may redial the last number dialed by depressing SPD, "*". You may also store the last number dialed in a permanent SPD dial bank by pressing FEAT, then SPD, entering the Bank Number to be programmed, and pressing SPD again.

320.7 PRIME LINE INCOMING: CO OR ICM
This feature allows the station to be automatically connected to an incoming ring assigned CO line or intercom path. Any CO line button may be programmed for incoming calls, outgoing calls, both incoming and outgoing calls or for no calls at all. Prime line incoming CO

lines must be ring assigned for automatic pick-up to be completed.

To program a CO line or intercom for prime line incoming, press the following keys in sequence: FLA, FEAT, dial 1, the appropriate CO line or ICM button, didal 1, then MON.

To disable a CO line or ICM as prime line incoming, press the following keys in sequence: FLA, FEAT, dial 1, the CO line or ICM button to be disabled, dial 0 and then MON.

320.8 PRIME LINE OUTGOING: CO OR ICM

This feature allows the station user to go off-hook and be automatically connected to a CO line or intercom path.

To program prime line outgoing, press the following keys: FLA, FEAT, dial 0, the desired CO line or ICM button, dial 1, and then MON.

To disable a CO line or intercom path as prime line outgoing, the following steps should be followed: press FLA, then FEAT, dial 0, press the CO line or ICM button to be disabled, dial 0, then press MON.

Any CO line button may be programmed for incoming calls, outgoing calls, both incoming and outgoing calls or for no calls at all.

320.9 SINGLE LINE TELEPHONE WITH FLASH OPERATION (OPX APPLICATION)

This feature offers the ability to provide a momentary disconnect on a CO line. To access this feature while on a CO line, press the hookflash momentarily to return to system dial tone. Dial "*", 5 to return to the CO line and put a momentary disconnect on the CO line (FLASH).

Note: The FLASH time is set in Program #16.

320.10 SOFT KEY PROGRAMMING

A maximum of 10 spare CO line keys may be used for feature access buttons. To allow soft key operation, the button must be assigned 000 in Program #32. A soft key can hold a maximum of 20 digits. The pause and wait count as digits.

To program soft keys from the station (after the button has been disabled) press the following keys in sequence: FEAT, SPD, the CO line key to be programmed, enter data, SPD and MON.

Note: *1 second pause* = **
manual wait = ##
to release wait = #

320.11 SPEED DIAL ALLOW/DISALLOW

With this assignment access to system and/or station speed dialing can be allowed or disallowed on a per station basis.

320.12 STATION TO STATION MESSAGING/MESSAGE CLEAR

A station user can send a message indication to another station by the following procedure: press ICM, dial the 2 digit station number, then dial 0. The called station's message lamp will light.

To respond to a flashing message light; press MON, lift the handset, press ICM and dial 0 to be connected to the station that originated the message.

The originating station can cancel the message by pressing FLA, FEAT, ICM, then dialing 0 and pressing MON.

320.13 SYSTEM DATA DUMP TO A PRINTER

A hard copy of the system program can be printed on the SMU printer by pressing the following keys in sequence; MON, "*", 00, "#", FEAT, FEAT.

The data dump can be stopped by pressing; MON, "*", 00, MON.

SECTION 330
SYSTEM PROGRAMMING

330.1 GENERAL

This section should be used in conjunction with **Chapter 1,** and **Chapter 2.** The following provides programming information for the features supported by the CPU-B2.

330.2 PROGRAM ENTRY CHARTS

The following list of programs must be used in conjunction with **Chapter 1, Section 190,** and **Chapter 2, Section 240.**

330.3 PROGRAM #36 ASSIGNMENTS OF PRIME LINES

This program can be executed from either the station user or through system programming.

1. The purpose of this program is to enable or disable prime line pickup of a CO call on a per CO per station basis.

2. Prime line outgoing gives a station user the ability to go off-hook and be connected to outgoing CO dial tone without depressing any buttons.

3. Prime line incoming gives a station user the ability to go off-hook and be connected to an incoming ring assigned CO line without depressing any buttons.

4. Each CO line can be programmed as a prime line incoming or outgoing or both.

5. A station that has intercom prime line programmed cannot have outgoing CO prime line.

6. The program sequence takes the following form:

KEY	NOTES
*	
36	or DSS #36
XX	Station Number 10-69
#	Step
01	CO Line Key Number 1, next step (#) goes to CO line key number 2
XX	Prime Line

00 = No Prime Line
10 = Outgoing only
01 = Incoming only
11 = Both outgoing and incoming

\# Step to next CO line key

FEAT
FEAT

7. The system is factory programmed as all stations having no prime lines (Data 00).

8. This feature may be programmed on a per station basis by the station user.

NOTES:

1. When prime line outgoing is set to extension 10, the FLASH key acts like the MON key to enable entry into the programming mode.

2. If a station user programmed for prime line outgoing, lifts the handset (seizes CO line), but does not dial any digits, then presses ICM, the CO will not be put on exclusive hold.

3. Prime line intercom is accomplished via station programming only (refer to Section 320.2 and 320.3 for station programming procedure).

4. Line Hunting Outgoing
   Multiple line keys can be programmed as outgoing prime lines at the station so the user is automatically connected to the next available outgoing line. This feature is programmable by the station user or by the system installer.

5. Line Hunting Incoming
   Multiple line keys can be programmed as incoming prime line at the station so the user is automatically connected to the next incoming line that is ringing. This feature is programmable by the station user or by the system installer.

330.4 PROGRAM #55 SPEED DIAL ALLOW/DISALLOW

1. The purpose of this program is to allow or disallow system and/or station speed dialing on a per station basis.

2. A station user may be allowed to access both station and system speed dialing, station speed dialing only, system speed dialing only, or no station and system speed dialing.

3. The program sequence takes the following form:

KEY	NOTES
*	
55	or DSS #55
XX	2 digit station number 10-69
YY	2 digit allow/disallow code 00 = both station and system SPD allowed 01 = station SPD allowed only 10 = system SPD allowed only 11 = both station and system SPD not allowed
#	Step
FEAT	
FEAT	

4. The system is factory programmed for all stations to be allowed both station and system speed dialing (Data 00).

Speed Dial Banks

System Banks	00-49 (50) total
System Special Banks	50-56 (7) total
Station Banks	60-78 (19) total
Station Special Banks	88-89 (2) total

5. All Speed banks can store a maximum of 20 digits. The station speed banks have been reduced 9 banks from the standard CPU-B. The station special speed banks still remain as 88 and 89 and can only be accessed after a system special speed bank has been accessed first.

CHAPTER 4
MARATHON CPU-C

SECTION 410
CPU-C OVERVIEW

410.1 GENERAL

This chapter contains installation, feature description, operation and programming information for the MARATHON CPU-C circuit card. This chapter is to be used in conjunction with Chapters 1, 2 and 3.

410.2 CENTREX APPLICATION

The MARATHON CPU-C circuit card is for Centrex application. It should be used in place of the MARATHON CPU-A, CPU-B or CPU-B2 circuit cards based upon application requirements.

410.3 ENHANCED FEATURE LIST

The MARATHON CPU-C circuit card offers features found on the CPU-A CPU-B and CPU-B2 cards with the addition of the following features:

SECTION 420
FEATURE DESCRIPTION AND OPERATION

420.1 A-LEAD CONTROL

The system COU circuit card can detect A-lead closure from a 1A2 type telephone and can provide A-lead closure to the 1A2 key system.

420.2 ALLOW OR DISALLOW STATION AND SYSTEM SPEED DIAL

It is possible on a per station basis, by system programming, to allow or disallow access to either the system station speed call, system speed call, or both. (Refer to Program #30.)

420.3 CO DISCONNECT OF ABANDON CALL ON HOLD

This feature will allow the system to automatically drop a CO line if there is any interruption in the loop current, during the time in which any CO line in the system is on hold. (Refer to Program #31.)

420.4 DISTINCTIVE RING OF INCOMING CO, CTX AND INTERCOM CALLS

All incoming calls will have a distinctive ring interval to identify the type of call.

420.5 EXTERNAL BARGE-IN

The MARATHON system may be programmed on a per system basis to allow access to a CO line in use by a 1A2 key system or 2500 type telephone. (Refer to Program #29.) To barge-in on a CO line in use: Lift handset, press the lit CO line button for the line you wish to barge in on.

420.6 FULL LINE PRIVACY DURING PARALLEL OPERATION

The system denies access from system instruments to lines in use by 1A2 or 2500 type instruments external to the system.

420.7 LAMP CONTROL DURING PARALLEL OPERATION WITH 1A2

The system COU circuit card can pass off-hook and held line information to the 1A2 for control of the 1A2 telephone lamps. This is done by duplicating the A-lead control of a 1A2 telephone.

420.8 LED CONTROL DURING PARALLEL OPERATION WITH 1A2

The system COU circuit card can detect off-hook and hold conditions from the 1A2. It passes line busy and hold information to the system station LED associated with the busy or held line.

420.9 LOOP CURRENT SENSING

The system COU circuit card can detect loop current to provide off-hook sensing of 1A2 and standard single line telephones.

420.10 PARALLEL OPERATION WITH 1A2 ELECTRO-MECHANICAL KEY SYSTEM

The system is fully compatible with and can operate in parallel with any 1A2 key system which uses the standard A-lead closure.

420.11 PARALLEL OPERATION WITH STANDARD SINGLE LINE TELEPHONES

The system is fully compatible with and can operate in parallel with standard single line telephones that can provide the standard A-lead closure.

420.12 PRIME LINE HUNTING-INCOMING

This program allows multiple line keys to be programmed as incoming CO prime lines at the station. This will allow the station user to be automatically connected to the next incoming ringing CO line. CO lines must be ring assigned for automatic pick-up to function.

420.13 PRIME LINE HUNTING-OUTGOING

This program allows multiple line keys to be programmed as outgoing CO prime lines at the station. When the station user goes off-hook the station will automatically be connected to the next available outgoing CO line.

420.14 PRIME LINE INCOMING

Allows the station user to be automatically connected on incoming ring assigned calls to any CO, PBX or Centrex lines of their choice, by simply going off-hook when the line rings in. This feature is system programmable on a per station, per CO line basis. This is similar to button down operation of a 1A2 instrument. Prime Line Incoming may be programmed at the station by the following sequence: FLA, FEAT, 1, X (CO line to be assigned), 1, MON.

To return the CO line to factory default (no Prime Line Incoming) follow this sequence: FLA, FEAT, 1, X (CO line to be unassigned), O, MON.

For system Prime Line Programming, refer to Program # 36.

Note: When Prime Line Incoming is assigned, a station user that desires to make an ICM call must press the ICM button before lifting the handset.

420.15 PRIME LINE OUTGOING

Allows the station user to be automatically connected on outgoing calls to any CO, PBX or Centrex lines of their choice by simply going off-hook. There is no need to press a CO line button. This feature is system and station programmable on a per station, per CO line basis. This is similar to button down operation of a 1A2 instrument. (Refer to Program #36.) Prime Line Outgoing may be programmed at the station by using the following sequence: FLA, FEAT, 0, X (CO line to be assigned), 1, MON.

To return a CO line to factory default (no Prime Line Outgoing): FLA, FEAT, O, X (CO line to be unassigned), O, MON.

For system prime line programming refer to Program #26.

Note: When Prime Line Outgoing on CO lines is assigned; a station user that desires to make an ICM call must press the ICM button before lifting the handset. For access to paging, press FLA followed by normal sequence for paging.

420.16 PROGRAMMABLE CTX ACCESS CODES AND PAUSE TIMER

The system installer has the ability through system programming to program up to three separate one or two digit CTX access codes as well as a pause timer of 00 to 25 seconds. This preset pause time will be automatically placed between the CTX access code and the phone number being dialed. (Refer to Program #28.)

420.17 SPARE CO BUTTONS USED AS PROGRAMMABLE CTX FEATURE ACCESS BUTTONS

Spare CO line buttons may be programmed on a per station basis to allow for one touch access to Centrex features. A maximum of six spare CO line buttons may be utilized. Spare CO line buttons may be programmed with access codes, CTX Call Forwarding Numbers and telephone numbers, etc., with a maximum of 20 digits per CO line button. CO line buttons must be cleared via Program #32 before using as feature access buttons.

To designate a CO line button as an access button: While on-hook, press FEAT, press SPD, press CO line button to be used as CTX access button, dial telephone number or access code to be stored, press SPD, press MON. (To store a one second pause press ** or to store a wait press ##.) To store system hook flash timing as one of the digits, press FLA in the desired sequence.
To place a call using an access button: Press any idle CO line button, press the CO line button designated as an access button.

To clear an access button: While on-hook, press FEAT, SPD, the access button to be cleared, SPD, MON.

420.18 TOLL RESTRICTION WITH SIX DESIGNATORS FOR CLASS OF SERVICE

A toll restriction is possible through system programming which will allow six types of toll restrictions and 32 Classes of Service. Toll restrictions are assigned on a trunk group Class of Service, per station basis. The six types of toll restriction available are as follows:

1. Non-restricted
2. CTX access code plus eight digits
3. CTX access code plus seven digits
4. CTX access code plus five digits
5. CTX access code denied
6. Outgoing restricted

The system also has the ability to deny 0, 976, 411, or 1411.

Note: The CTX access code may be one or two digits.

420.19 TRUNK GROUP COS ASSIGNMENTS

A total of 32 classes of service may be created by the system programmer for assignment to the telephone stations.

SECTION 430
WIRING

430.1 GENERAL

The CTX COU (COU-B) must be used with the CPU-C to enable appropriate feature operation.

All COU cabling instructions in Chapter 1 are superseded and replaced by the following cabling instructions when utilizing the CTX COU card. Tables 4-1 to 4-5 describe the CO numbers, lead designations, color codes, power connections and pin numbers for CO connections for COU card numbers 1-5. If there is any doubt regarding the wiring of the COU circuit card, contact **WIN Technical Service Department.**

430.2 WIRING BETWEEN THE COU CIRCUIT CARD AND A CO, PBX OR CTX LINE

The COU circuit card comes equipped with a 25 pair male ended amphenol connector for interface with a standard type 66M1-50 split block or equivalent type connector. (Refer to **Figure 4-1**). Each COU circuit card provides space for six CO circuits. It will be necessary to provide a 25 pair female ended cable for each COU circuit card installed. It is recommended to punch down all 50 wires (in the case of parallel operation with a single line A-lead control telephone, pins 25 and 50 will be utilized). Each CO circuit will need eight conductors. **Figure 4-1** illustrates the wiring of a CO, CTX, or PBX line to the MARATHON COU circuit card.

430.3 WIRING THE COU CIRCUIT CARD FOR PARALLEL OPERATION WITH A SINGLE LINE TELEPHONE

Wiring for parallel operation with a single line telephone is shown in Figure 4-2. It is important to punch down all 50 wires of the 25 pair cable. Pins 25 and 50 will be used to provide 24 volts DC to the single line telephone to enable the COU circuit card for A-lead control. This enables the system to show BLF for off-hook single line telephones. (It may be necessary in some cases to modify the single line telephone for A-lead control off the black and yellow leads.) The single line telephone must have a spare set of hookswitch contacts that provide a closure in the "off-hook" position.

430.4 WIRING THE COU CIRCUIT CARD FOR PARALLEL OPERATION WITH A 1A2 KEY SYSTEM

Figure 4-3 illustrates the wiring for parallel operation with a 1A2 key system using CTX COU (Rev 1 and higher) circuit card. It is recommended to punch down all 50 wires of the 25 pair cable. It will be necessary to splice into the ring lead (output) of the 1A2 system as well as the A1 lead for a full parallel operation.

430.5 WIRING THE COU CIRCUIT CARD FOR PARALLEL OPERATION WITH A 1A2 KEY SYSTEM AND A SINGLE LINE TELEPHONE

Figure 4-4 illustrates the wiring for parallel operation with a 1A2 key system and a single line telephone using the CTX COU (Rev 1 and higher) circuit card. It is recommended that all 50

wires of the 25 pair cable be punched down. It will be necessary to splice into the ring lead (output) of the 1A2 key system as well as the A1 lead for full parallel operation. The inputs of the single line telephone will be common with the 1A2 system to allow power for A-lead control of single line telephones. (It may be necessary in some cases to modify single line telephone for A-lead control.)

430.6 WIRING THE COU CIRCUIT CARD FOR POWER FAILURE WITH A SINGLE LINE TELEPHONE

The first and second circuits of each COU circuit card is equipped for power failure connection to a standard single line telephone. **Figure 4-5** illustrates the wiring for power failure with a single line telephone. It will be necessary to splice into the tip lead that goes from the COU circuit card to the tip lead of the single line telephone. To make the power failure operation complete, jumper JP1 (jumper for power failure circuit one) and/or jumper JP2 (jumper for power failure circuit two) on the COU circuit card must be cut. A CO that is used for power failure cannot be used for parallel operation. The single line telephone will only be active when there is a total power loss to the **MARATHON** System.

Note: A CO that is used for power failure transfer operation cannot be used for parallel operation.

Table 4-1

CO SPLIT BLOCK CONNECTIONS COU NO. 1

CO NUMBER	LEAD DESIGNATION	25 PAIR CABLE COLORS	25 PAIR CABLE PIN NUMBERS
1	T 1	W-BL	26
	R 1	BL-W	1
	RA 1	W-O	27
	IR 1	O-W	2
	BG 1	W-GR	28
	AG 1	GR-W	3
	BS 1	W-BR	29
	AL 1	BR-W	4
2	T 2	W-S	30
	R 2	S-W	5
	RA 2	R-BL	31
	IR 2	BL-R	6
	BG 2	R-O	32
	AG 2	O-R	7
	BS 2	R-G	33
	AL 2	G-R	8
3	T 3	R-BR	34
	R 3	BR-R	9
	RA 3	R-S	35
	IR 3	S-R	10
	BG 3	BK-BL	36
	AG 3	BL-BK	11
	BS 3	BK-O	37
	AL 3	O-BK	12
4	T 4	BK-GR	38
	R 4	GR-BK	13
	RA 4	BK-BR	39
	IR 4	BR-BK	14
	BG 4	BK-S	40
	AG 4	S-BK	15
	BS 4	Y-BL	41
	AL 4	BL-Y	16
5	T 5	Y-O	42
	R 5	O-Y	17
	RA 5	Y-GR	43
	IR 5	GR-Y	18
	BG 5	Y-BR	44
	AG 5	BR-Y	19
	BS 5	Y-S	45
	AS 5	S-Y	20
6	T 6	V-BL	46
	R 6	BL-V	21
	RA 6	V-O	47
	IR 6	O-V	22
	BG 6	V-GR	48
	AG 6	GR-V	23
	BS 6	V-BR	49
	AL 6	BR-V	24
POWER FOR SINGLE LINE TELEPHONE	GROUND	V-S	50
	24 VDC	S-V	25

Table 4-2

CO SPLIT BLOCK CONNECTIONS COU NO. 2

CO NUMBER	LEAD DESIGNATION	25 PAIR CABLE COLORS	25 PAIR CABLE PIN NUMBERS
7	T 1	W-BL	26
	R 1	BL-W	1
	RA 1	W-O	27
	IR 1	O-W	2
	BG 1	W-GR	28
	AG 1	GR-W	3
	BS 1	W-BR	29
	AL 1	BR-W	4
8	T 2	W-S	30
	R 2	S-W	5
	RA 2	R-BL	31
	IR 2	BL-R	6
	BG 2	R-O	32
	AG 2	O-R	7
	BS 2	R-G	33
	AL 2	G-R	8
9	T 3	R-BR	34
	R 3	BR-R	9
	RA 3	R-S	35
	IR 3	S-R	10
	BG 3	BK-BL	36
	AG 3	BL-BK	11
	BS 3	BK-O	37
	AL 3	O-BK	12
10	T 4	BK-GR	38
	R 4	GR-BK	13
	RA 4	BK-BR	39
	IR 4	BR-BK	14
	BG 4	BK-S	40
	AG 4	S-BK	15
	BS 4	Y-BL	41
	AL 4	BL-Y	16
11	T 5	Y-O	42
	R 5	O-Y	17
	RA 5	Y-GR	43
	IR 5	GR-Y	18
	BG 5	Y-BR	44
	AG 5	BR-Y	19
	BS 5	Y-S	45
	AL 5	S-Y	20
12	T 6	V-BL	46
	R 6	BL-V	21
	RA 6	V-O	47
	IR 6	O-V	22
	BG 6	V-GR	48
	AG 6	GR-V	23
	BS 6	V-BR	49
	AL 6	BR-V	24
POWER FOR SINGLE LINE TELEPHONE	GROUND	V-S	50
	24 VDC	S-V	25

Table 4-3

CO SPLIT BLOCK CONNECTIONS COU NO. 3

CO NUMBER	LEAD DESIGNATION	25 PAIR CABLE COLORS	25 PAIR CABLE PIN NUMBERS
13	T 1	W-BL	26
	R 1	BL-W	1
	RA 1	W-O	27
	IR 1	O-W	2
	BG 1	W-GR	28
	AG 1	GR-W	3
	BS 1	W-BR	29
	AL 1	BR-W	4
14	T 2	W-S	30
	R 2	S-W	5
	RA 2	R-BL	31
	IR 2	BL-R	6
	BG 2	R-O	32
	AG 2	O-R	7
	BS 2	R-G	33
	AL 2	G-R	8
15	T 3	R-BR	34
	R 3	BR-R	9
	RA 3	R-S	35
	IR 3	S-R	10
	BG 3	BK-BL	36
	AG 3	BL-BK	11
	BS 3	BK-O	37
	AL 3	O-BK	12
16	T 4	BK-GR	38
	R 4	GR-BK	13
	RA 4	BK-BR	39
	IR 4	BR-BK	14
	BG 4	BK-S	40
	AG 4	S-BK	15
	BS 4	Y-BL	41
	AL 4	BL-Y	16
17	T 5	Y-O	42
	R 5	O-Y	17
	RA 5	Y-GR	43
	IR 5	GR-Y	18
	BG 5	Y-BR	44
	AG 5	BR-Y	19
	BS 5	Y-S	45
	AL 5	S-Y	20
18	T 6	V-BL	46
	R 6	BL-V	21
	RA 6	V-O	47
	IR 6	O-V	22
	BG 6	V-GR	48
	AG 6	GR-V	23
	BS 6	V-BR	49
	AL 6	BR-V	24
POWER FOR SINGLE LINE TELEPHONE	GROUND	V-S	50
	24 VDC	S-V	25

Table 4-4

CO SPLIT BLOCK CONNECTIONS COU NO. 4

CO NUMBER	LEAD DESIGNATION	25 PAIR CABLE COLORS	25 PAIR CABLE PIN NUMBERS
19	T 1	W-BL	26
	R 1	BL-W	1
	RA 1	W-O	27
	IR 1	O-W	2
	BG 1	W-GR	28
	AG 1	GR-W	3
	BS 1	W-BR	29
	AL 1	BR-W	4
20	T 2	W-S	30
	R 2	S-W	5
	RA 2	R-BL	31
	IR 2	BL-R	6
	BG 2	R-O	32
	AG 2	O-R	7
	BS 2	R-G	33
	AL 2	G-R	8
21	T 3	R-BR	34
	R 3	BR-R	9
	RA 3	R-S	35
	IR 3	S-R	10
	BG 3	BK-BL	36
	AG 3	BL-BK	11
	BS 3	BK-O	37
	AL 3	O-BK	12
22	T 4	BK-GR	38
	R 4	GR-BK	13
	RA 4	BK-BR	39
	IR 4	BR-BK	14
	BG 4	BK-S	40
	AG 4	S-BK	15
	BS 4	Y-BL	41
	AL 4	BL-Y	16
23	T 5	Y-O	42
	R 5	O-Y	17
	RA 5	Y-GR	43
	IR 5	GR-Y	18
	BG 5	Y-BR	44
	AG 5	BR-Y	19
	BS 5	Y-S	45
	AS 5	S-Y	20
24	T 6	V-BL	46
	R 6	BL-V	21
	RA 6	V-O	47
	IR 6	O-V	22
	BG 6	V-GR	48
	AG 6	GR-V	23
	BS 6	V-BR	49
	AL 6	BR-V	24
POWER FOR SINGLE LINE TELEPHONE	GROUND	V-S	50
	24 VDC	S-V	25

Table 4-5

CO SPLIT BLOCK CONNECTIONS COU NO. 5

CO NUMBER	LEAD DESIGNATION	25 PAIR CABLE COLORS	25 PAIR CABLE PIN NUMBERS
25	T 1	W-BL	26
	R 1	BL-W	1
	RA 1	W-O	27
	IR 1	O-W	2
	BG 1	W-GR	28
	AG 1	GR-W	3
	BS 1	W-BR	29
	AL 1	BR-W	4
26	T 2	W-S	30
	R 2	S-W	5
	RA 2	R-BL	31
	IR 2	BL-R	6
	BG 2	R-O	32
	AG 2	O-R	7
	BS 2	R-G	33
	AL 2	G-R	8
27	T 3	R-BR	34
	R 3	BR-R	9
	RA 3	R-S	35
	IR 3	S-R	10
	BG 3	BK-BL	36
	AG 3	BL-BK	11
	BS 3	BK-O	37
	AL 3	O-BK	12
28	T 4	BK-GR	38
	R 4	GR-BK	13
	RA 4	BK-BR	39
	IR 4	BR-BK	14
	BG 4	BK-S	40
	AG 4	S-BK	15
	BS 4	Y-BL	41
	AL 4	BL-Y	16
29	T 5	Y-O	42
	R 5	O-Y	17
	RA 5	Y-GR	43
	IR 5	GR-Y	18
	BG 5	Y-BR	44
	AG 5	BR-Y	19
	BS 5	Y-S	45
	AS 5	S-Y	20
30	T 6	V-BL	46
	R 6	BL-V	21
	RA 6	V-O	47
	IR 6	O-V	22
	BG 6	V-GR	48
	AG 6	GR-V	23
	BS 6	V-BR	49
	AL 6	BR-V	24
POWER FOR SINGLE LINE TELEPHONE	GROUND	V-S	50
	24 VDC	S-V	25

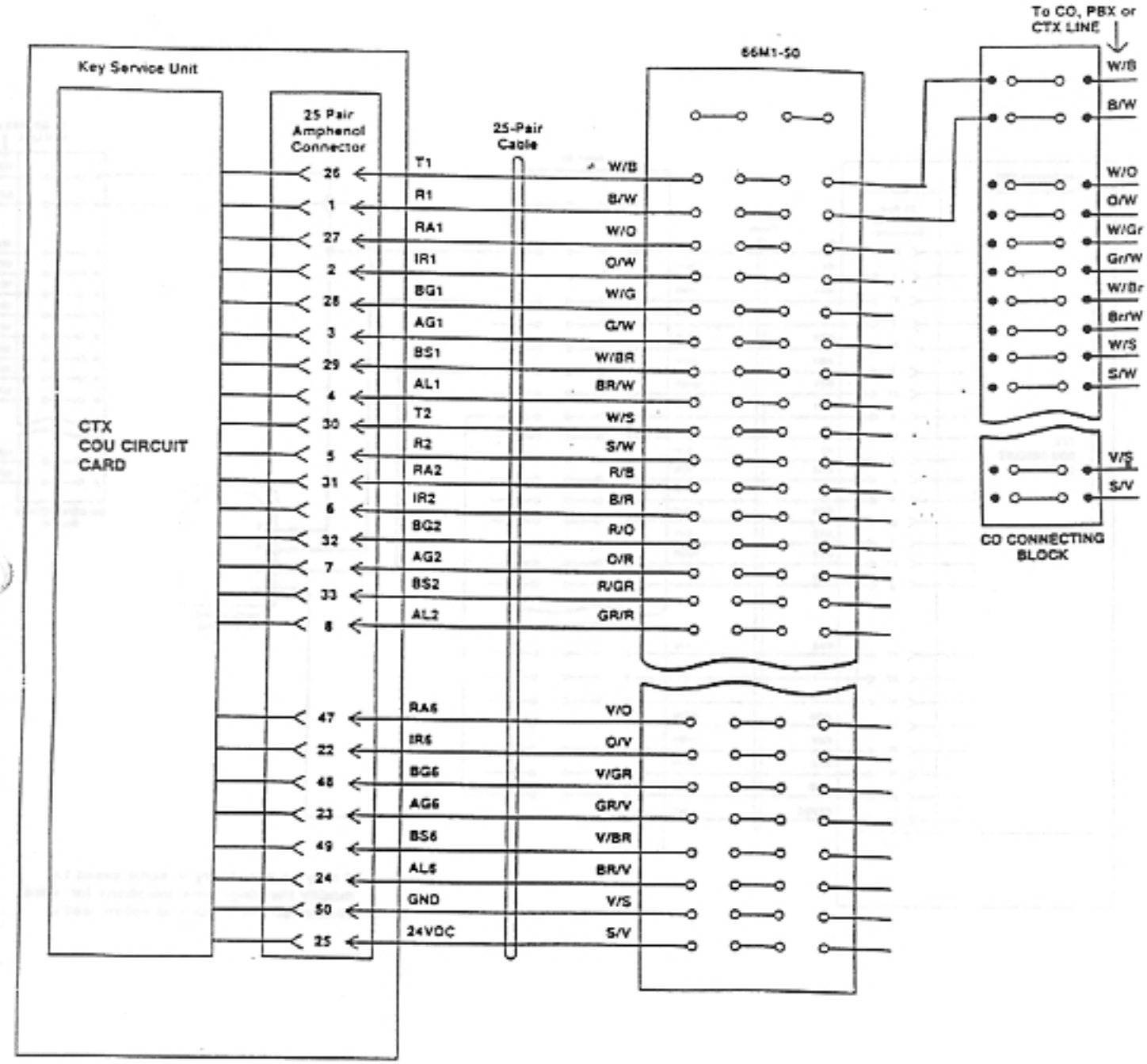


Figure 4-1 CTX COU Circuit Card Wiring with CO Line Termination

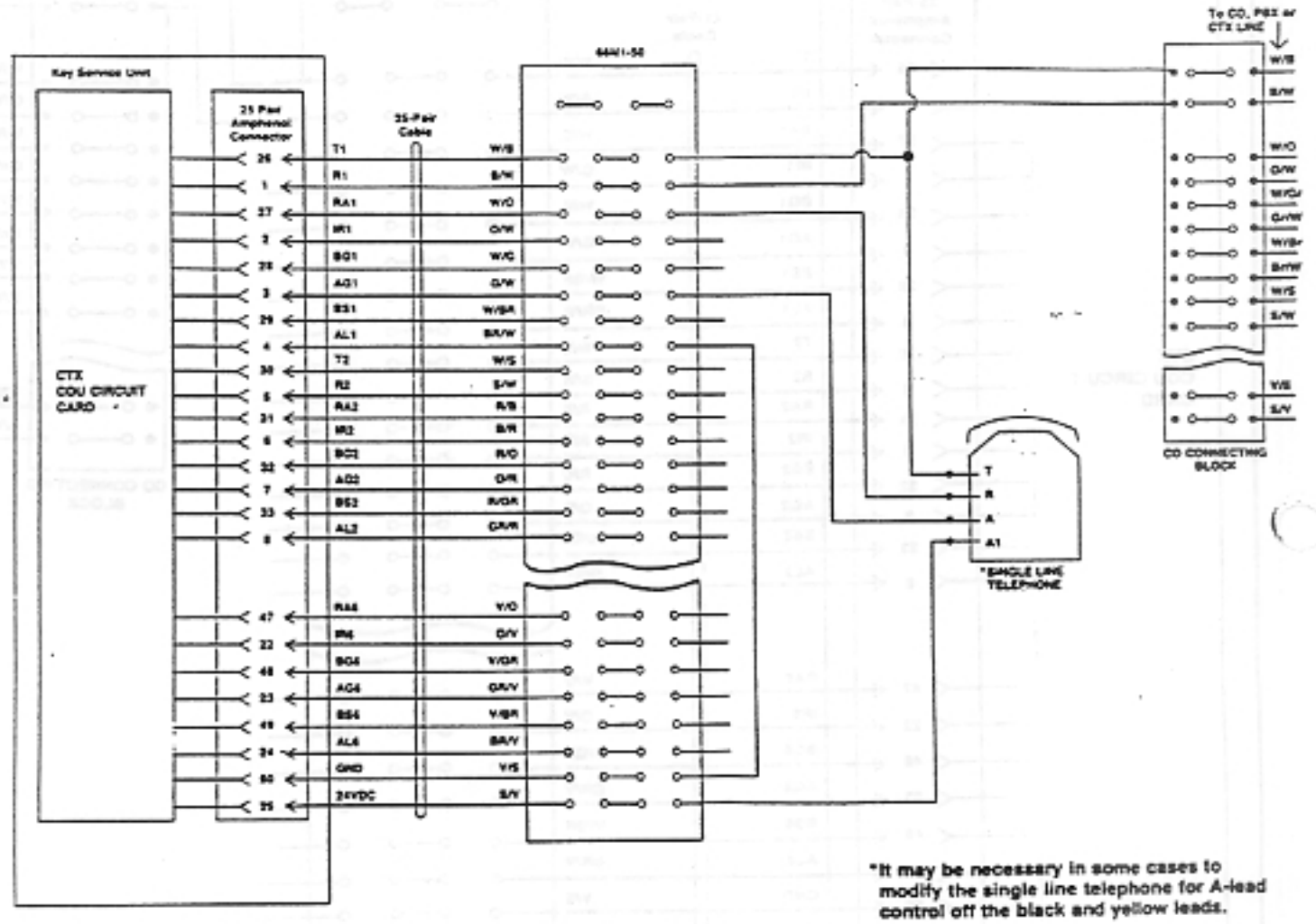
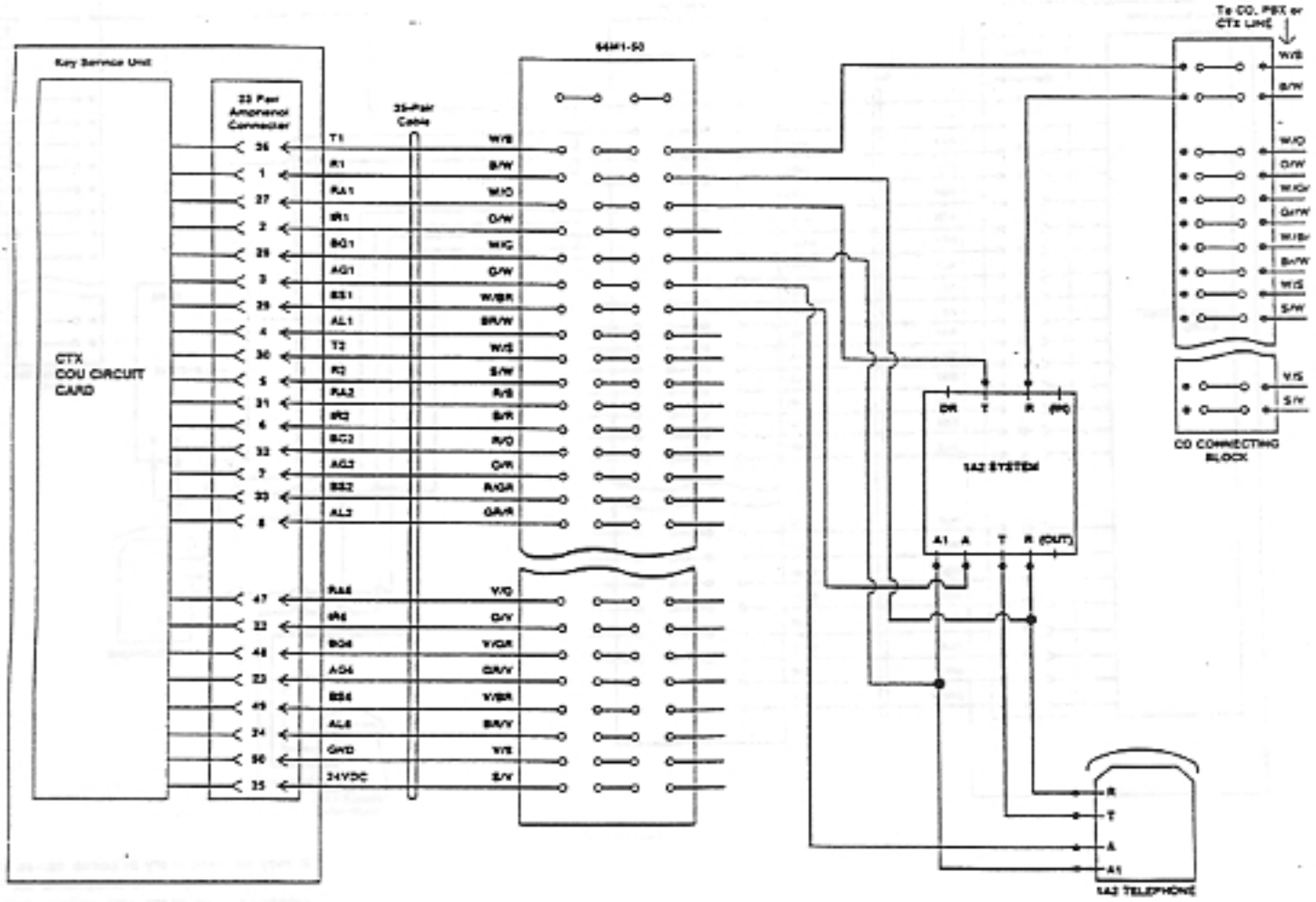
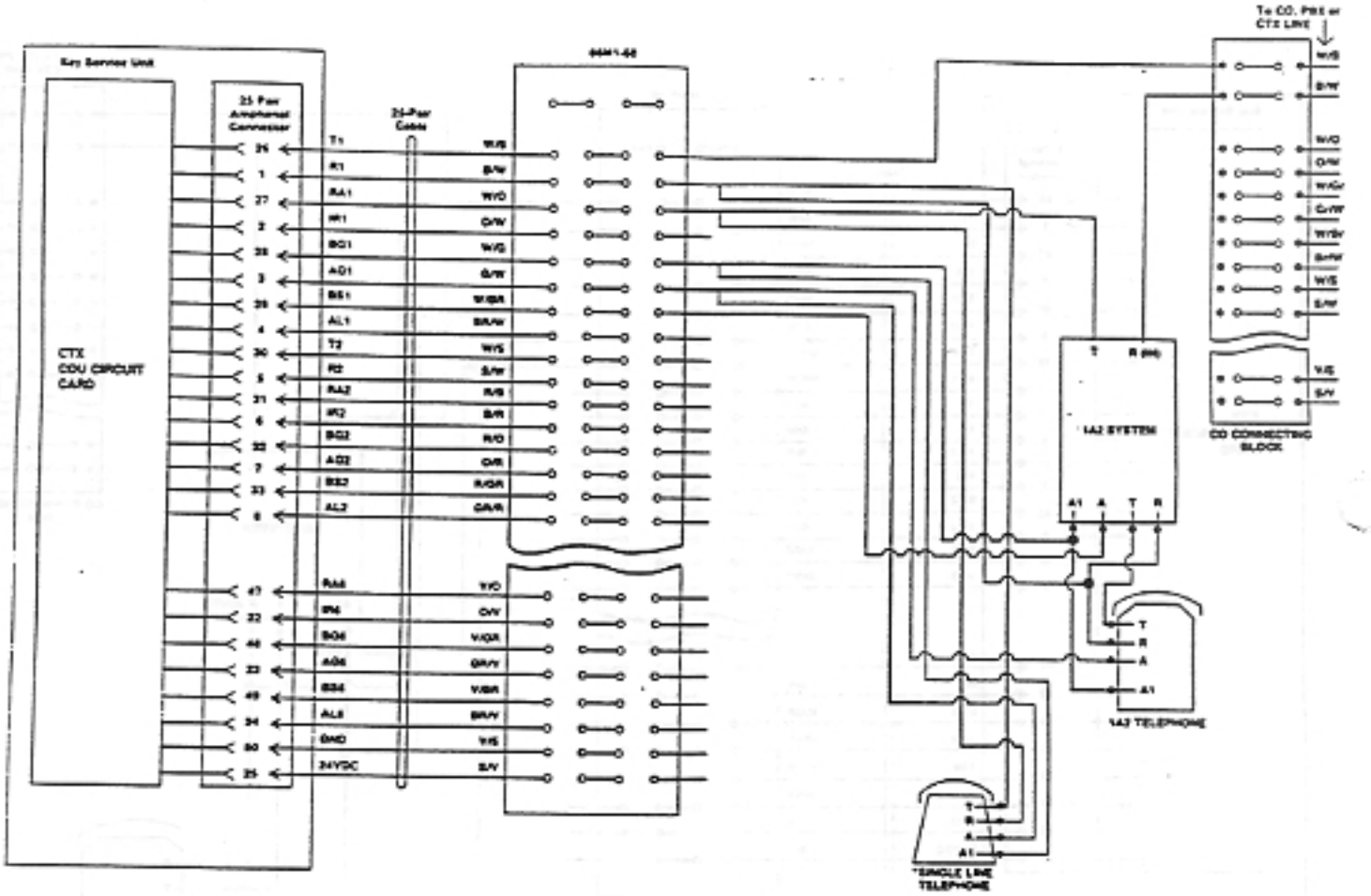


Figure 4-2 CTX COU Circuit Card Wiring for Parallel Operation with a Single Line Telephone



4-3 CTX COU Circuit Card (Rev 1 and Higher) Wiring for Parallel Operation with a 1A2 Key System



*It may be necessary in some cases to modify the single line telephone for A-lead control off the black and yellow leads.

4-4 CTX COU Circuit Card (Rev 1 and Higher) Wiring for Parallel Operation with a Single Line Telephone and 1A2 Key System

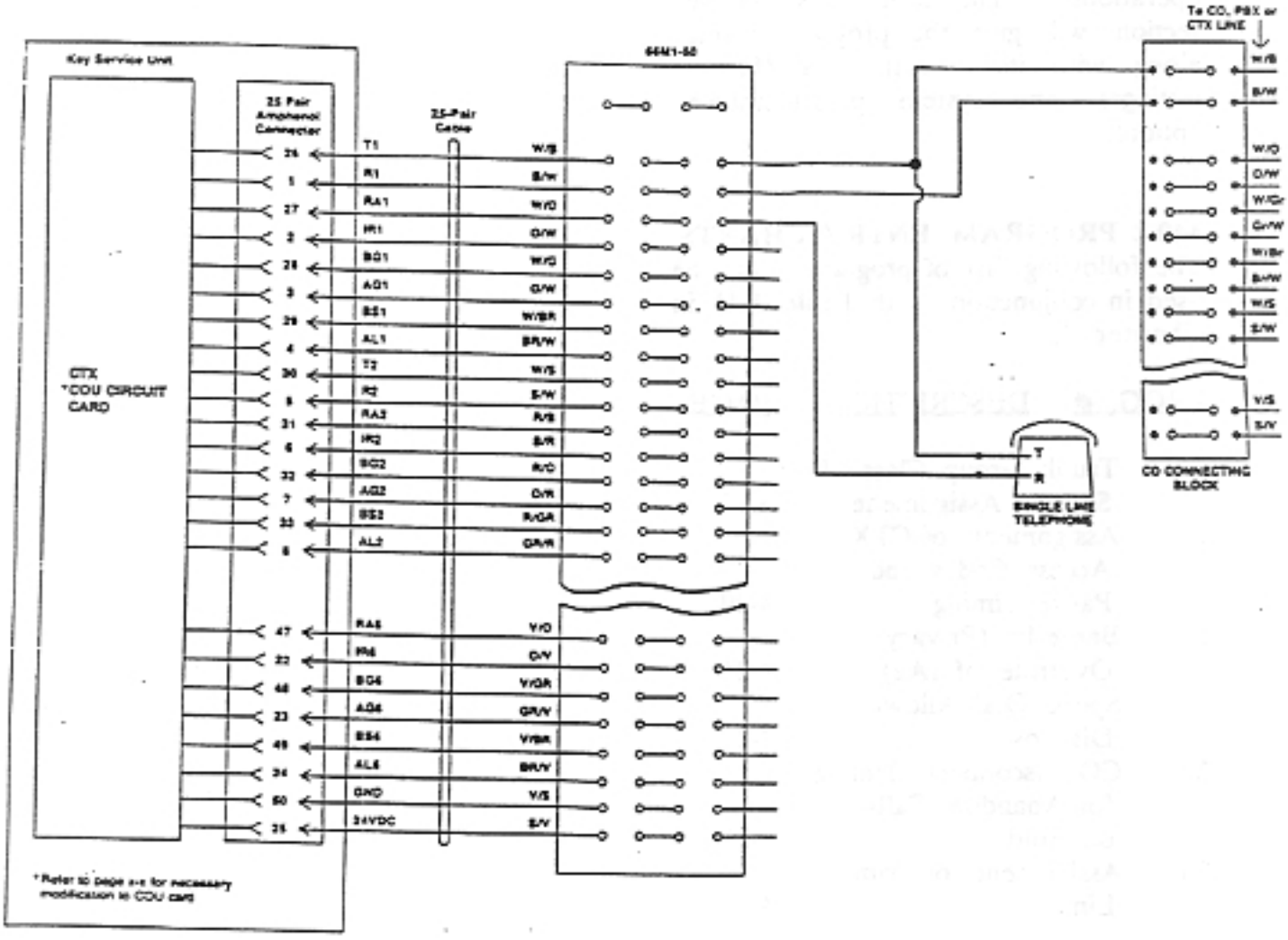


Figure 4-5 CTX COU Circuit Card Wiring for Power Failure Unit (PFU)

SECTION 440
SYSTEM PROGRAMMING

440.1 GENERAL

This section, used in conjunction with Chapter 1, Section 190 and Chapter 2, Section 240 describes all of the necessary programming procedures and operations. The procedures in this section will give the program format along with its default data (factory settings) and system programmable options.

440.2 PROGRAM ENTRY CHARTS

The following list of programs must be used in conjunction with Table 1-15 in Chapter 1.

With CPU-C these programs will directly replace and supersede Program numbers 26, 28, 29, 30, 31, 36 in Chapter 1, Section 190.

Note: It is absolutely necessary for the installation company to reinitialize the system upon initial installation or replacement installation of the CPU card.

440.3 PROGRAM #26 TRUNK GROUP CLASS OF SERVICE ASSIGNMENTS

1. This program allows COS configuration on a trunk group basis.

2. There can be 32 COS. Each COS is configured by assignment of one of 6 restriction designators to each of eight trunk groups. (Restrictions may not be assigned to trunk group no. 9.)

3. The restriction class designator defines the type of restriction to be featured. (Refer to Restriction Class Designator **Table 4-6.**)

4. The programming sequence takes the following takes the following form:

KEY	NOTES
*	
26	or DSS Key No. 26
XX	COS (01-32)
#	Step
XX	*Trunk Group
XX	New Restriction Class Designator (To be Entered 01-06)
#	Step to Next Trunk
FEAT	
FEAT	

* These are constants and appear in sequential order from 01-08 and cannot be changed.

5. The system is factory programmed for all trunk groups in all COS as non restricted (restriction class designator 01).

6. Refer to associated Program #25 and 27.

7. This program replaces Program #26 of Chapter 1, Section 190.17.

Table 4-6

RESTRICTION CLASS DESIGNATOR TABLE

RESTRICTION CLASS DESIGNATOR	DESCRIPTION
01 (N/R)	Non-restricted: allows all dialing
02 (T/R 8)	Toll restriction to 8 digit dialing: allows dialing of a 1 or 2 digit CTX access code plus 8 digits. (Ex. 1 + 7 digit calls)
03 (T/R 7)	Toll restriction to 7 digit dialing: allows dialing of a 1 or 2 digit CTX access code plus 7 digits. (Ex. 7 digit calls)
04 (T/R 5)	Toll restricted to 5 digit dialing: allows dialing of a 1 or 2 digit CTX access code plus 5 digits. (Ex. 5 digit calls)
05 (A/R)	Access code restriction: denies dialing of a 1 or 2 digit Centrex/PBX access code. CO calls will be denied. Only Centrex/PBX features or station numbers will be allowed.
06 (O/R)	Outgoing restricted: denies all outgoing calls. A CO line cannot be selected for dialing. Incoming CO calls may still be picked up.

440.4 PROGRAM #28 ASSIGNMENT OF CTX ACCESS CODES AND PAUSE TIMING

1. This program assigns up to 3 separate one or two digit CTX access codes, as well as, a programmable pause time.

2. When using only a 1 digit access code, FLA must be put in the 2nd digit position.

3. The pause time may be from 1-25 seconds. The programmed pause will be placed between the CTX access code and the number dialed when dialing out.

4. The program sequence takes the following form:

KEY	NOTES
*	
28	or DSS #28
#	Step
1	First CTX Access Code
XX	1 or 2 digit CTX Access Code X = 0-9 X = 0-9, or FLA For 1 digit CTX Access codes
#	
2	Second CTX Access Code
XX	Repeat Data from above XX
#	
3	Third CTX Access Code
XX	Repeat Data from above XX
#	Step
4	Fourth Position for Pause
XX	Pause Timing for All Access Codes 00-25 secs. in 1 second increments
#	Step
FEAT	
FEAT	

5. The system is factory programmed for the first CTX access code to be a 9 and a pause time of 5 seconds (data 05). There is no second or third access code programmed.

6. This program replaces Program #28 of **Chapter 1, Section 190.19.**

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440.5 PROGRAM #29 BARGE-IN (PRIVACY OVERRIDE OF 1A2)

1. This program allows all station users the ability to break into a CO call that is in progress on a 1A2 system or single line telephone.

2. The program sequence takes the following form:

KEY	NOTES
*	
29	or DSS Key #29
X	Barge-in allow or disallow 0 = disallow 1 = allow
#	Step
FEAT	
FEAT	

3. The system is factory programmed for barge-in disallowed (Data 0).

4. This program replaces Program #29 of **Chapter 1, Section 190.19.**

440.6 PROGRAM #30 SPEED DIAL ALLOW/DISALLOW

1. The purpose of this program is to allow or disallow system and/or station speed dialing on a per station basis.

2. A station user may be allowed to access both station and system speed dialing, station speed dialing only, system speed dialing only, or no station and system speed dialing.

3. The program sequence takes the following form:

KEY	NOTES
*	
30	or DSS #30
XX	2 digit station number 10-69
XX	2 digit allow/ disallow code: 00= both station and system SPD allowed 01=station SPD allowed only 10=system SPD allowed only 11= both station and system SPD not allowed
#	Step
FEAT	
FEAT	

4. The system is factory programmed for all stations to be allowed both station and system speed dialing. (Data 00).

5. This program replaces Program #30 of **Chapter 1, Section 190.19.**

440.6 PROGRAM #31 CO DISCONNECT TIMING FOR ABANDON CALLS ON HOLD

1. The purpose of this program is to set the disconnect time so that a call on hold that has been abandoned will be dropped from the system.

2. The timing can be set from 10-990 msec.

3. The program sequence takes the following form:

KEY	NOTES
*	
31	or DSS #31
XX	2 digit disconnect timing (see time table below)
#	Step
FEAT	
FEAT	

4. TIME TABLE FOR XX

XX	TIMING
01	10 msec
02	20 msec
03	30 msec
10	100 msec
:	:
:	:
:	:
95	950 msec
99	990 msec

5. The system is factory programmed at 600 milliseconds (Data 60).

6. This program replaces Program #31 of Chapter 1, Section 190.19.

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440.7 PROGRAM #36 ASSIGNMENT OF PRIME LINES

1. The purpose of this program is to enable or disable prime line pickup of a CO call on a per CO per station basis.

2. Prime line outgoing gives a station user the ability to go off-hook and be connected to outgoing CO dialtone without depressing any buttons.

3. Prime line incoming gives a station user the ability to go off-hook and be connected to an incoming ring assigned CO line without depressing any buttons.

4. Each CO line can be programmed as a prime line incoming or outgoing or both.

5. A station that has intercom prime line programmed cannot have outgoing CO prime line.

6. The program sequence takes the following form:

KEY	NOTES
*	
36	or DSS #36
XX	Station Number 10-69
#	Step
01	CO Line Key Number 1, next step (#) goes to CO line key number 2
XX	Prime Line 00 = No Prime Line 10 = Outgoing only 01 = Incoming only 11 = Both outgoing and incoming
#	Step to next CO line key
FEAT	
FEAT	

7. The system is factory programmed as all stations having no prime lines (Data 00).

8. This feature may be programmed on a per station basis by the station user.

CHAPTER 5

ALTERNATE ROUTE SELECTION

SECTION 510
LEAST COST UNIT (LCU)
OVERVIEW

510.1 GENERAL

The MARATHON Least Cost Unit (LCU) is an optional circuit card which may be installed in the MARATHON Key Telephone System to provide alternate route selection.

510.2 INTERFACE

The features of an LCU card are operated through the use of a preassigned CO line button. When the LCU button is pressed, the LCU and CPU circuit cards communicate to route a CO call to the least cost trunk group that is available at that moment.

510.3 INSTALLATION

When installing an LCU circuit card in a MARATHON system, a Mother Board (MBD) must be added to the system. (Refer to MBD installation procedures.)

The LCU circuit card does not require additional power sources to be present in the system.

NOTE: An LCU circuit card will only operate when used in conjunction with a CPU-B or higher revision circuit card.

SECTION 520
INSTALLATION

520.1 INSTALLATION REQUIREMENTS

When adding an LCU circuit card or an RMU circuit card to **MARATHON** it is necessary to install a Mother Board (MBD) first.

CAUTION: When working on an existing system, be sure to power down before removing or installing any circuit cards or ribbon cables.

520.2 INSTALLATION PROCEDURE

1. Loosen the four screws that secure the front cover to the KSU cabinet and remove cover.

2. Remove four screws securing the cover plate to the back of the KSU cabinet, and remove cover plate.

3. Loosen screw that secures lockdown plate (refer to **Figure 5-1**). Slide lockdown plate to right, so that the card slots are clear.

4. Pull the CPU circuit card out of the KSU cabinet approximately one inch.

5. Put MBD in place and secure with four screws. A package of five screws and star washers are included with a new MBD if needed.

NOTE: It is very important to fully seat all circuit cards in the MBD before powering up the system.

6. Remove pin protector on LCU circuit card (refer to **Figure 5-2**). Install the LCU circuit card into the slot marked LCU, push in until it is firmly seated in the MBD.

7. Push in CPU circuit card until it is firmly seated in the MBD.

8. If an RMU circuit card is utilized in the system, push in until it is firmly seated in the MBD.

9. Slide lockdown plate to left to cover circuit cards. Tighten lockdown plate screw.

10. Put front cover in place and tighten four screws.

11. Refer to **Chapter 1 Section 130** for the required installation procedures.

12. Refer to **Chapter 1 Section 180** and **190** for system programming and initialization procedures.

5-2 *Marathon* *WIN Communications*

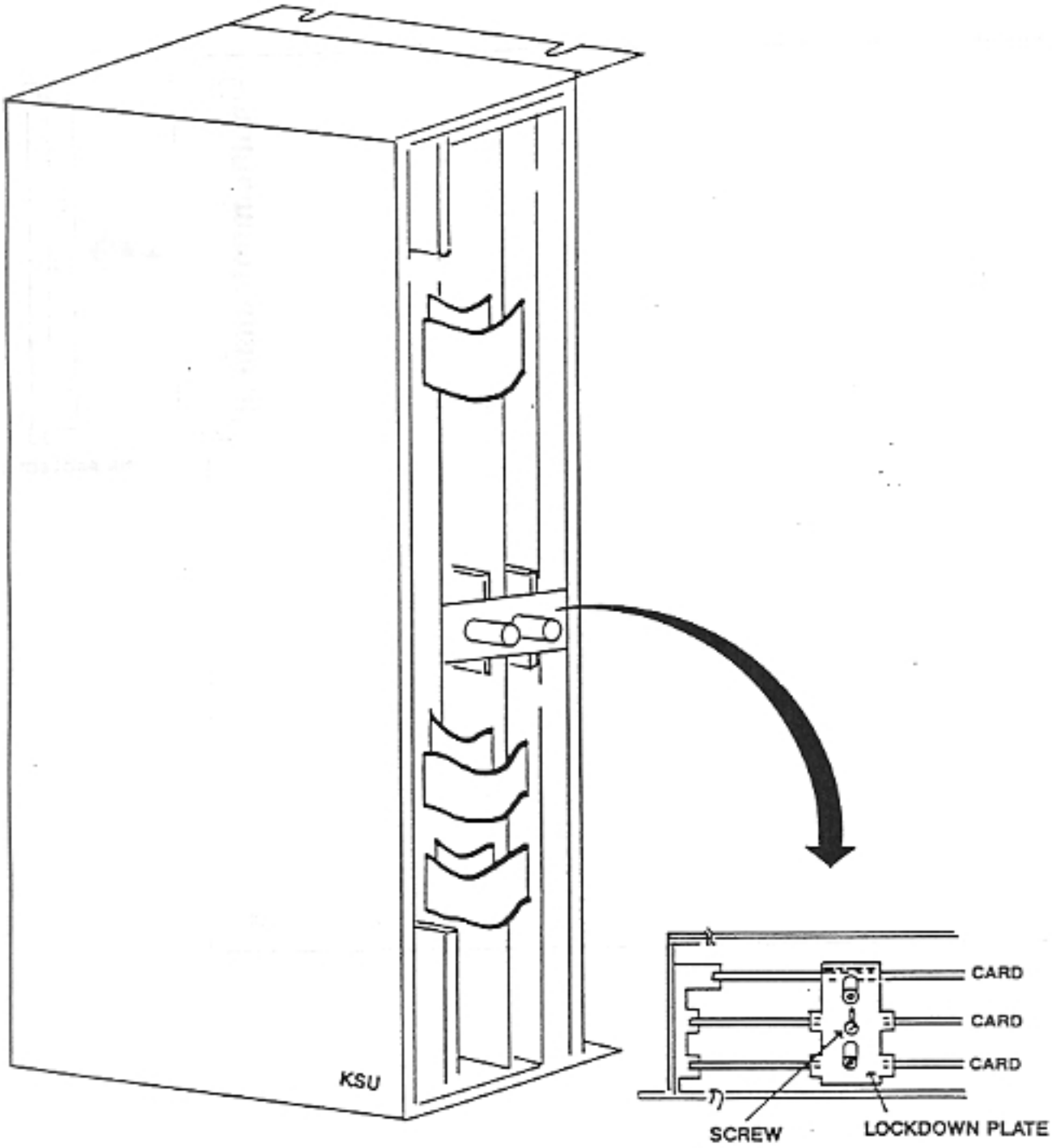

Figure 5-1 KSU Internal Construction

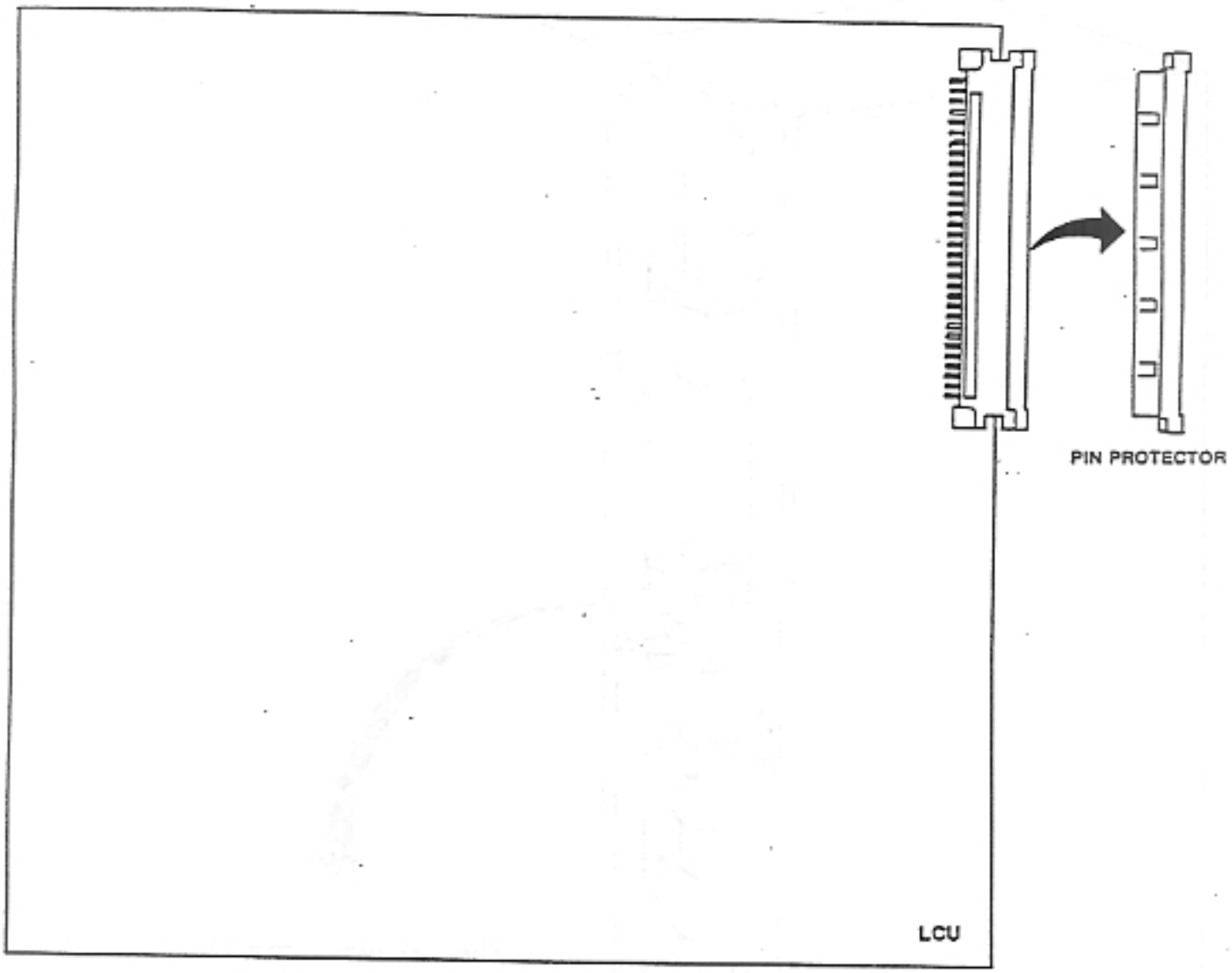

Figure 5-2 Pin Protector

SECTION 530
PROGRAMMING

530.1 GENERAL

Certain programs are required to be performed when installing an LCU circuit card into the system. The following programs (70-90) are used to set the LCU parameters. They must be entered from station 10 (port 1).

Programs (70-90) may also be entered by using a standard ASCII type data terminal (Texas Instruments Silent 700™) or equivalent, along with a stand alone modem (Tandy DCM-7, or Hayes Smart Modem) or equivalent. An ASCII type terminal equipped with an internal modem (Texas Instruments Silent 703™) may also be used.

Silent 700 is a Trademark of Texas Instruments.

530.2 PROGRAM #70 LCU VERIFICATION

1. The purpose of this program is to notify the system that there is an LCU card present.

2. The system is factory programmed for no LCU, which means that the default data is zero (No LCU card installed).

3. The program takes the following form:

KEY	NOTES
*	
70	
X	X=0 No LCU present X=1 LCU installed
#	
FEAT	
FEAT	

530.3 PROGRAM #71 SETTING LCU PAUSE TIMER

1. The purpose of this program is to define the length of the pause. In some instances it may be necessary to program a pause into a dialing sequence. An example of this would be in the case where OCC (MCI, Sprint) dialing takes place. When a pause is programmed into a dialing sequence the length of the pause will be determined by the data input into this program.

2. This program takes the following form:

KEY	NOTES
*	
71	
XX	Pause Timer
#	
FEAT	
FEAT	

3. Values for XX are as follows:

XX DATA		DEFINITION
01	=	3 Seconds
02	=	6 Seconds
03	=	9 Seconds
04*	=	12 Seconds (Factory Default)
:	=	: :
:	=	: :
:	=	: :
20	=	60 Seconds

**Note: Factory provided data is "04" which means the timer is programmed for a duration of 12 seconds.*

530.4 PROGRAM #72 ASSIGNMENT OF TENANT NUMBER

1. This program associates a particular tenant with each individual station class of service (COS).

2. In most system configurations multiple stations will be assigned the same class of service. These common stations may be treated as groups or "Tenants" by the LCU circuit card for the purpose of simplifying the call routing procedure.

3. There are five tenants provided in the system. It is necessary to assign a tenant to each individual class of service of which there are 32.

4. The program takes the following form:

KEY	NOTES
*	
72	
#	
X	Tenant No. 1 to 5 (may be entered 32 times for each COS)
#	
FEAT	
FEAT	

5. Factory default data is programmed for all classes of service (01 through 32) to be assigned to tenant group number "1". The system programmer may assign any tenant to any class of service. An example of multiple tenant assignments would be:

Class of Service		Tenant No.
01	=	1
02	=	2
03	=	3
04	=	4
05	=	5
06	=	1
07	=	2
08	=	4
:	=	:
:	=	:
:	=	:
32	=	5

Note: This is not Factory data represented. This is only an example configuration. Your system may be configured differently.

530.5 PROGRAM #73
LCU MEMORY RESET

1. The purpose of this program is to reset the LCU circuit card.

2. Resetting the LCU will interrupt any call processing taking place, restart the call processing procedure, and resume overall operation of the circuit card.

3. The program takes the following form:

KEY

*
73
#
FEAT
FEAT

530.6 PROGRAM #80
READ OR WRITE TENANT DATA

1. The purpose of this program is to read and write information into any tenant 1 to 5.

2. This program must be performed before inputting data into any of the Programs 81 to 90 for any given tenant 1 to 5.

3. A time of 40 seconds must be allowed before performing Programs 81 to 90.

4. After entering the necessary Programs 81 to 90, you must return back to Program 80 to write the information into the system.

5. Allow 40 seconds for the system to write the programmed data into the operating software.

6. The program takes the following form:

KEY	NOTES
*	
80	
M	0=Read, 1=Write
X	Tenant Number 1-5
#	
FEAT	
FEAT	

EXAMPLE:
Any of the LCU programs from 81-90 for tenant number 1 should be performed at this time.

To read information from tenant number one:

KEY
*
80
0
1
#
FEAT
FEAT

To write information into tenant number one:

KEY
*
80
1
1
#
FEAT
FEAT

530.7 PROGRAM #81-#83 ASSIGNMENT OF ORPN DATA (Out Routing Pattern)

1. The following programs are used to input allowable dialing digits on the LCU button. This sequence of programs will also assign a routing pattern to be taken. (Refer to Program #84.)

2. Program #81 is used to input three digit area codes or three digit prefixes in states that do not require a one to be dialed first.

3. Program #82 is used in states that require a 1 plus a three digit prefix or a 1 plus the three digit area code.
   NOTE: The system will automatically input the 1, do not enter the 1 before any prefixes or area codes.

4. Program #83 is used for any number that requires a 0 plus the three digit prefix and a 0 plus the three digit area code. This program is mainly designed for international phone numbers.
   NOTE: The system will automatically input the 0, do not enter the 0 before any prefixes.

5. The program takes the following form:

KEY	NOTES
*	
XX	Program 81-83
#	
YYY	Start Prefix No.
#	

YYY	End Prefix No.
#	
Z	Change ORPN Table 1-7
#	
FEAT	(Refer to Program
FEAT	#84.)

6. Factory default data. There is no data in Programs 81, 82 and 83.

7. To clear all data tables #81 to #83 to factory default data perform the following operations:

KEY

*
81
#
112
#
119
#
0
#
200
#
999
#
0
#
FEAT
FEAT

KEY

*
82
#
112
#
119
#
0
#
200
#
999
#
0
#
FEAT
FEAT

KEY

*
83
#
110
#
999
#
0
#
FEAT
FEAT

EXAMPLES:
To allow all area codes between 516 and 525 to be accessed:

KEY	NOTES
*	
81	
#	
516	All area codes
#	between 516 and
525	525 may be accessed
#	
1	ORPN Table 1 has been chosen for this example.
#	
FEAT	

FEAT
To program a 1 before all allowable three digit prefixes or three digit area codes between 516 and 525 to be accessed:

KEY	NOTES
*	
82	
#	
516	All prefixes and
#	area codes between
525	516 and 525 may be accessed
#	
1	ORPN Table 1 has been chosen for this example
#	
FEAT	
FEAT	

To program a 0 before all allowable three digit prefixes or three digit area codes between 516 and 525 to be accessed:

KEY
*
83
#
516
#
525
#
1
#
FEAT
FEAT

530.8 PROGRAM #84 ASSIGNMENT OF ORPN AND CALL CATEGORY TO TRUNK GROUP

1. This program is used to assign routing patterns (01 to 07) and its priorities using trunk groups.

2. There is a maximum of five priorities per ORPN.

3. Outgoing CO calls will be routed through the patterns according to the trunk group priorities programmed into the ORPN table (refer to Programs #81-83).

4. If the preferred trunk group is busy then the next available trunk group will be assigned to the outgoing CO call. If all trunk groups are busy a busy tone will be received.

5. The program takes the following form:

KEY	NOTES
*	
84	
XX	ORPN numbers (01-07)
#	
YYYY	May be entered 5 times YYYY=Call Category Numbers (01 to 41) and Trunk Group (01 to 08)
#	
FEAT	
FEAT	

* Refer to Figure 5-3 for call category assignment.

EXAMPLE:

KEY	NOTES
*	
84	
01	ORPN No. 1 has been chosen for this example
#	
02 03	Call Category Number 02 and trunk group 03 have been chosen for this example
#	
FEAT	
FEAT	

530.9 PROGRAM #85
ASSIGNMENT OF AREA OFFICE CODE

1. The purpose of this program is to assign your own three digit area code from (000 to 999).

2.The program takes the following form:

KEY	NOTES
*	
85	
#	
XXX	Area Code (000-999)
#	
FEAT	
FEAT	

530.10 PROGRAM #86 NON-EQUAL ACCESS, ACCESS CODE, AUTHORIZATION CODE AND TELEPHONE NUMBER

1.The purpose of this program is to assign a long distance service number and authorization number to a call category (01 to 05).

2.Non-equal access codes will be found on the call category list (**Figure 5-3**). Call category numbers 37 to 41 will be utilized for this program.

3.The long distance service number and authorization number must be entered in two digit intervals with three SPD's put in between them. There is a maximum of nine entries.

4.The program takes the following form:

KEY	NOTES
*	
86	
XX	Call Category (01-05) 01=Category No.37 02=Category No.38 03=Category No.39 04=Category No.40 05=Category No.41
#	
X3X4	
#	
X5X6	
#	
:	
X7X8	through X19-X20
#	
FEAT	
FEAT	

NOTE: X3-X20 may be entered 5 times.

Example: When dialing 555-1212 12345 enter the following:

KEY
*
86
01
#
55
#
51
#
21
#
2SPD
#
SPD
SPD
#
12
#
34
#
5
SPD
#
FEAT
FEAT

530.11 PROGRAM #87 EQUAL ACCESS, ACCESS CODE

1. The purpose of this program is to assign a three digit access code for Equal Access Codes.

2. Equal access codes will be found on the Call Category List (Figure 5-3). Call Category numbers 27 to 36 will be utilized for this program.

3. A maximum of 10 Equal Access Codes may be entered.

4. The program takes the following form:

KEY	NOTES
*	
87	
#	
XXX	3 digit access code may be entered 10 times
#	
FEAT	
FEAT	

530.12 PROGRAM #88 ASSIGNMENT OF OUTGOING WATS LINE BAND ACCESS CODE

1. The purpose of this program is to assign a two digit access code for outgoing WATS calls.

2. Access codes will be found on the Call Category List (Figure 5-3). Call Category Number 10 to 15 will be utilized for this program.

3. A maximum of six access codes may be entered.

4. The program takes the following form:

KEY	NOTES
*	
88	
#	
XX	* 2 digit WATS access code
#	Step Six Times
FEAT	
FEAT	

NOTE: The first access code refers to number 10 on the Call Category List, the second access code refers to number 11 on the Call Category List and so on.

530.13 PROGRAM #89 DIAL 1 REQUIRED

1. The purpose of this program is to inform the system whether or not a 1 is required before an area code or prefix.

2. Factory default data is set for "1" before area code or prefix not required.

3. The program takes the following form:

KEY	NOTES
*	
89	
X	0=No (Factory Data) 1=Yes
#	
FEAT	
FEAT	

530.14 PROGRAM #90 ASSIGNMENT OF TYPE OF NON-EQUAL ACCESS CODES

1.The purpose of this program is to assign Call Categories (37 to 41) to a particular type of Non-equal Access Code (0 to 5).

EXAMPLE:

Non-Equal Access Code	Call Categories
0	37 to 41 are MCI types
1	37 is ITT type, 38 to 41 are MCI types
2	38 is ITT type, 37, 39, 40 and 41 are MCI types
3	39 is ITT type, 37, 38, 40 and 41 are MCI types
4	40 is ITT type, 37, 38, 39 and 41 are MCI types
5	41 is ITT type, 37 to 40 are MCI types

2.The program takes the following form:

KEY	NOTES
*	
90	
X	Non-equal access code (0-5)
#	
FEAT	
FEAT	

NOTE: After all programs are performed for a particular tenant, the information must be written back to the LCU circuit card via Program #80.

No.		Description	No.		Description
01	STLC	Standard Local	22	FXTL1	FX Toll 1
02	HULC	High Use Local	23	FXTL2	FX Toll 2
03	FXLC1	FX Local 1	24	FXTL3	FX Toll 3
04	FXLC2	FX Local 2	25	FXTL4	FX Toll 4
05	FXLC3	FX Local 3	26	FXTL5	FX Toll 5
06	FXLC4	FX Local 4	27	EIC1	Equal Access 1
07	FXLC5	FX Local 5	28	EIC2	Equal Access 2
08	LCTL	Local Toll	29	EIC3	Equal Access 3
09	DDD	Direct Distance Dialing	30	EIC4	Equal Access 4
10	WATSC1	Wats Combined 1	31	EIC5	Equal Access 5
11	WATSC2	Wats Combined 2	32	EIC6	Equal Access 6
12	WATSC3	Wats Combined 3	33	EIC7	Equal Access 7
13	WATSC4	Wats Combined 4	34	EIC8	Equal Access 8
14	WATSC5	Wats Combined 5	35	EIC9	Equal Access 9
15	WATSC6	Wats Combined 6	36	EIC10	Equal Access 10
16	WATSD1	Wats Dedicated 1	37	NEIC1	No Equal Access 1
17	WATSD2	Wats Dedicated 2	38	NEIC2	No Equal Access 2
18	WATSD3	Wats Dedicated 3	39	NEIC3	No Equal Access 3
19	WATSD4	Wats Dedicated 4	40	NEIC4	No Equal Access 4
20	WATSD5	Wats Dedicated 5	41	NEIC5	No Equal Access 5
21	WATSD6	Wats Dedicated 6			

Figure 5-3 Call Category List

CHAPTER 6

OFF-PREMISES EXCHANGE

SECTION 610
OPX OVERVIEW

610.1 GENERAL

The MARATHON OPX-L is an optional ancillary unit (refer to Figure 6-1) which provides Tip and Ring for support of two (2 circuits) single line 2500 type DTMF telephones. The OPX automatically provides talk battery and intercom dialtone. The OPX interface can also be used to interface two or more MARATHON systems together by interfacing a trunk of one MARATHON to a station port of another MARATHON system.

The OPX unit may be mounted up to 1000 ft. from the Key Service Unit (refer to Figure 6-4). The MARATHON OPX also provides ring signals via its ring generator, for detection by all FCC registered class A and B devices. The OPX may be powered by the system's PS10ABB (refer to Figure 6-6) power supply or in the case of a remote installation with the PS2A power supply (refer to Figure 6-7).

610.2 OPX-2/OPX MODULE DIFFERENCES

The new OPX-L is a replacement for the prior OPX module. The advantage of this unit is that is gives you the ability to control dB gain via a 4-bit dipswitch for each circuit in the OPX module. There are three different types of modes you can select.

1. Normal Operation - without negative impedance converter
2. Low Gain - for normal long distance calling
3. High Gain - for extreme long distance calling

Table 6-1 provides dipswitch settings for various gains.

Table 6-1
OPX-L DIPSWITCH SETTINGS

OPEN

Normal Operation	Bit 1 Open	2 Closed	3 Closed	4 Open
Low Gain	Bit 1 Closed	2 Open	3 Closed	4 Open
High Gain	Bit 1 Closed	2 Closed	3 Open	4 Closed

CLOSED

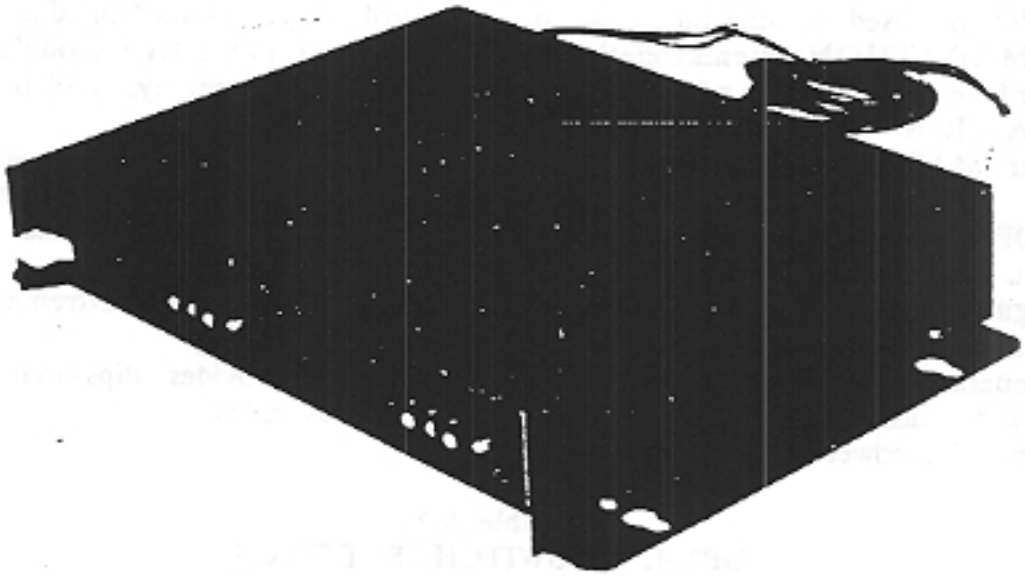

Figure 6-1 OPX Unit

610.3 EQUIPMENT

The OPX comes equipped with two modular RJ14C connectors for interfacing with two STU station terminal ports (via 625A station blocks). Refer to **Figure 6-4.**

OPX cabling interfaces (two wires per station) are provided in the form of screwdown terminals (refer to **Figure** 6-5) whereby an additional ground terminal for each station provides for added protection against power surges and lightning.

SECTION 620
INSTALLATION

620.1 GENERAL

This section provides the required information to install an OPX-L unit in a MARATHON system.

620.2 PRELIMINARY CONSIDERATIONS

1. Before installation, check the OPX for any visible signs of damage.
2. If installing the OPX at a location more than 3 feet from the KSU, be sure to have a PS2A power supply available (refer to **Figure 6-7**). In this case, it will not be necessary to power the system down in order to install the OPX unit.
3. If installation of the OPX requires the use of the existing PS10ABB power supply, it becomes necessary to power down the system and loop the power supply through the OPX unit as shown in **Figure 6-6**. (Only PS10ABB may be used in this particular application.) It is recommended that you complete all other cabling before powering the system down in order to minimize down time.

620.3 OPX UNIT MOUNTING

1. The OPX unit is designed for wall mounting and may not be floor mounted. **Figure 6-2** shows the mounting hole spacing dimensions for wall mounting the Key Service Unit. Use appropriate fasteners that can safely sustain the weight of the OPX unit.
2. Connect the cabling as shown in **Figure 6-3**. Once the cabling is completed, connect the 2500 type (or equivalent) telephone to the 625A blocks as shown in **Figure 6-5**.
3. Check power interfaces to be sure they are correct before powering up the system.
4. Power up the system. During the first few seconds the stations should ring indicating that the system's internal diagnostics are taking place.
5. Following the "Feature Operation" description in **Section 640**, test the OPX station for basic operation and overall performance. If you encounter any difficulties, contact **WIN Technical Service Department** for assistance.

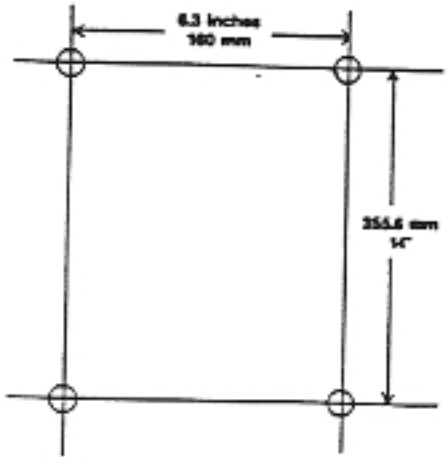

Figure 6-2 Mounting Hole Spacing

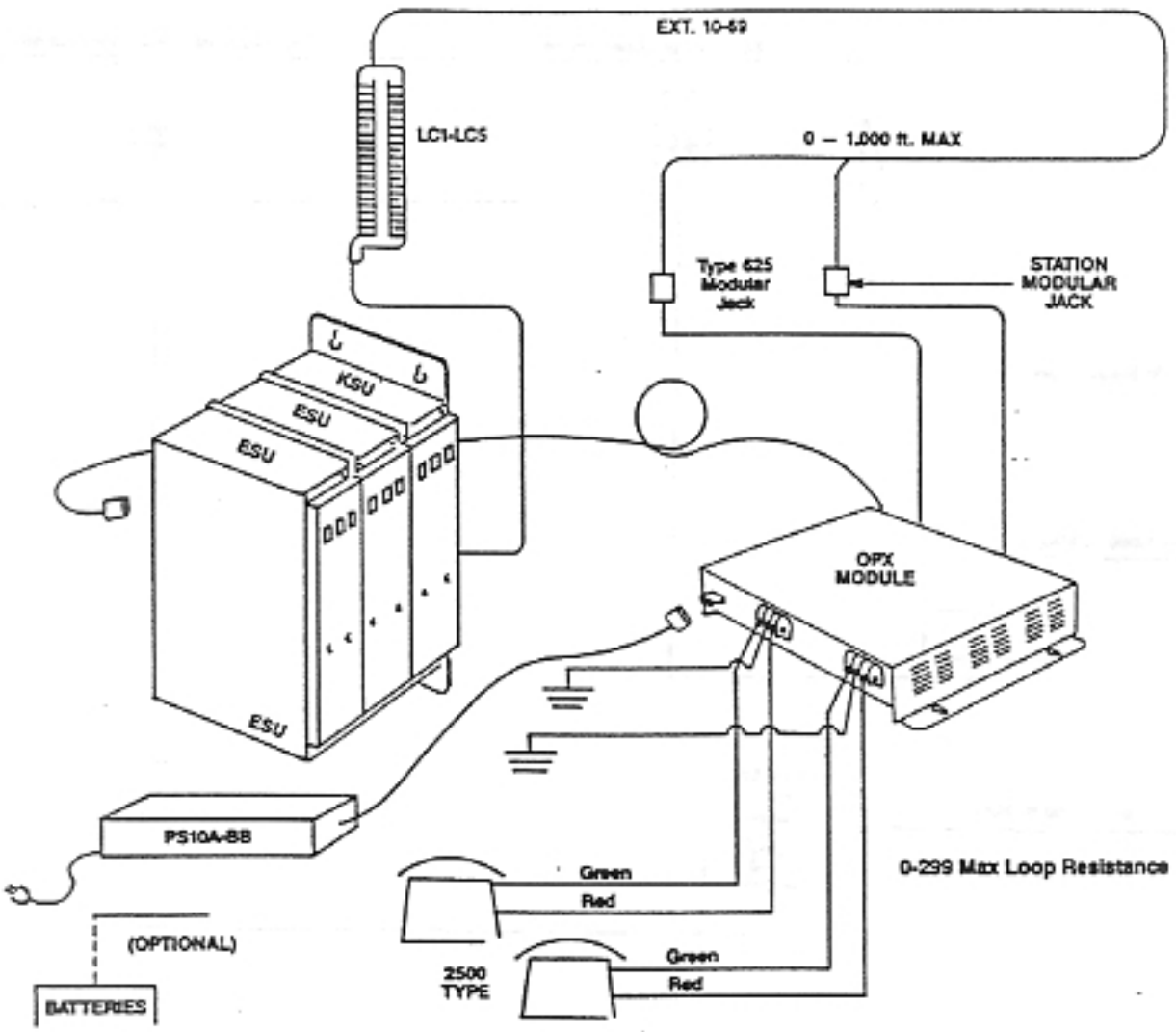

Figure 6-3 OPX Configuration

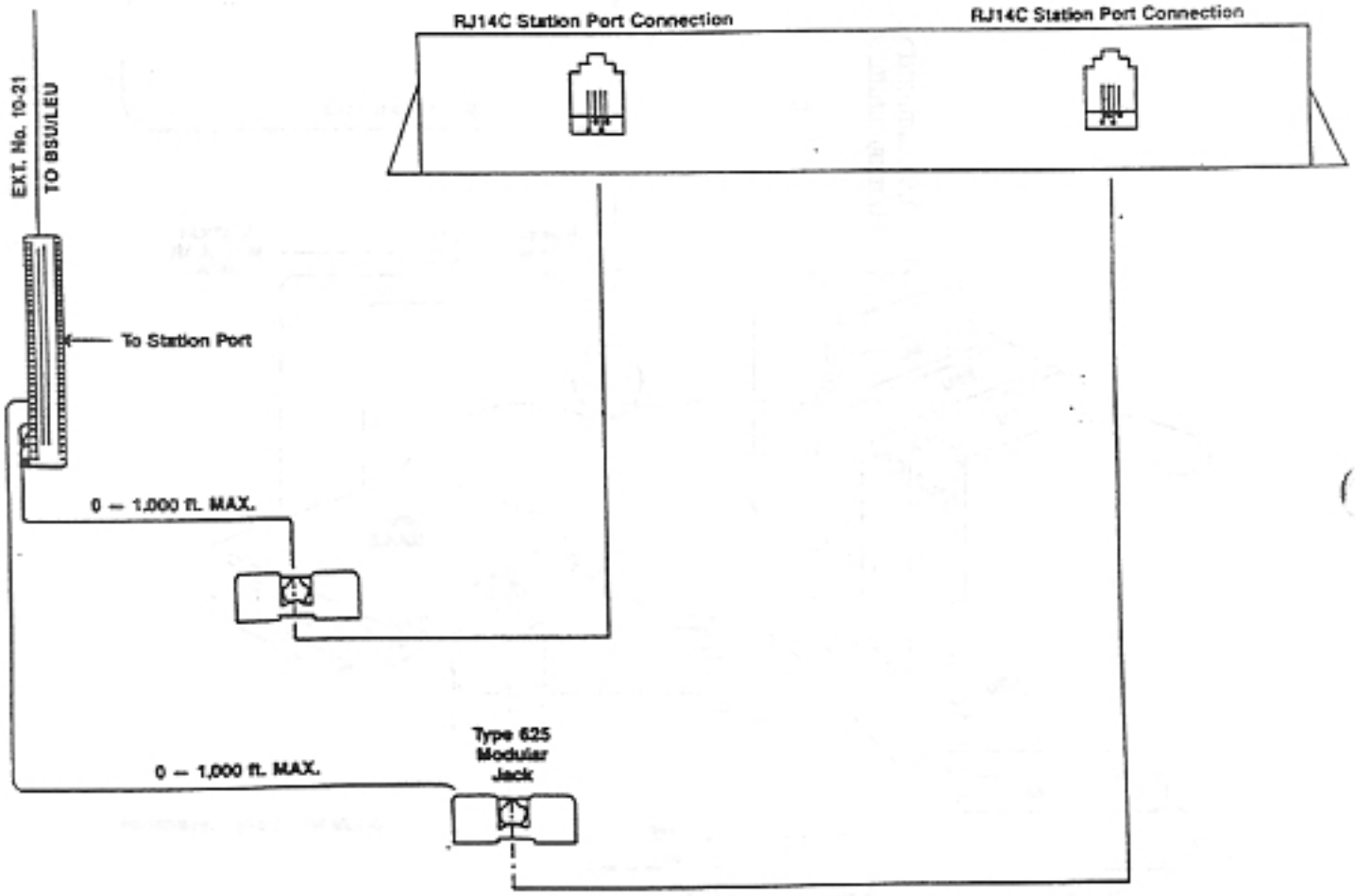

Figure 6-4 OPX Modular Station Port Connector

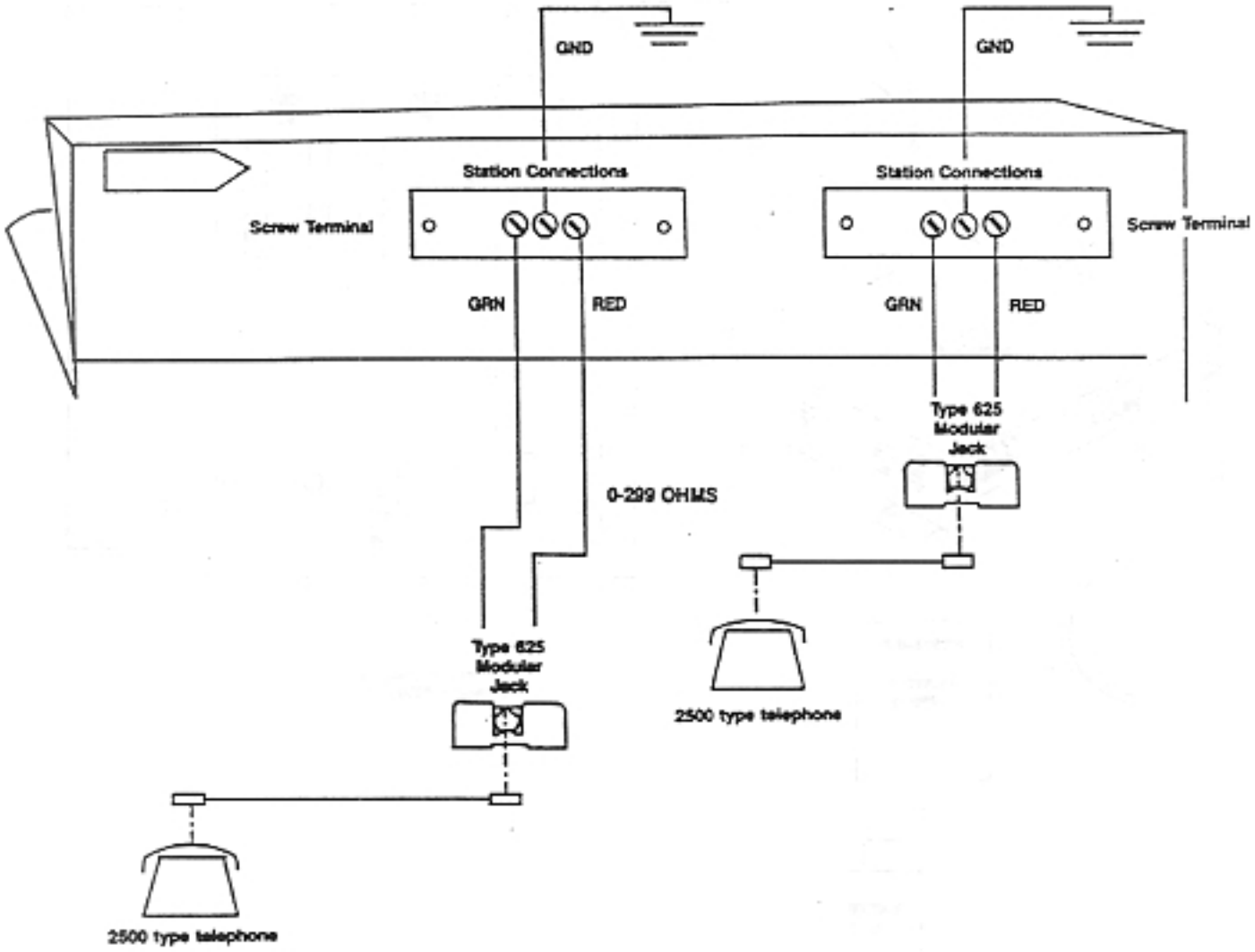

Figure 6-5 Telephone Station Wiring

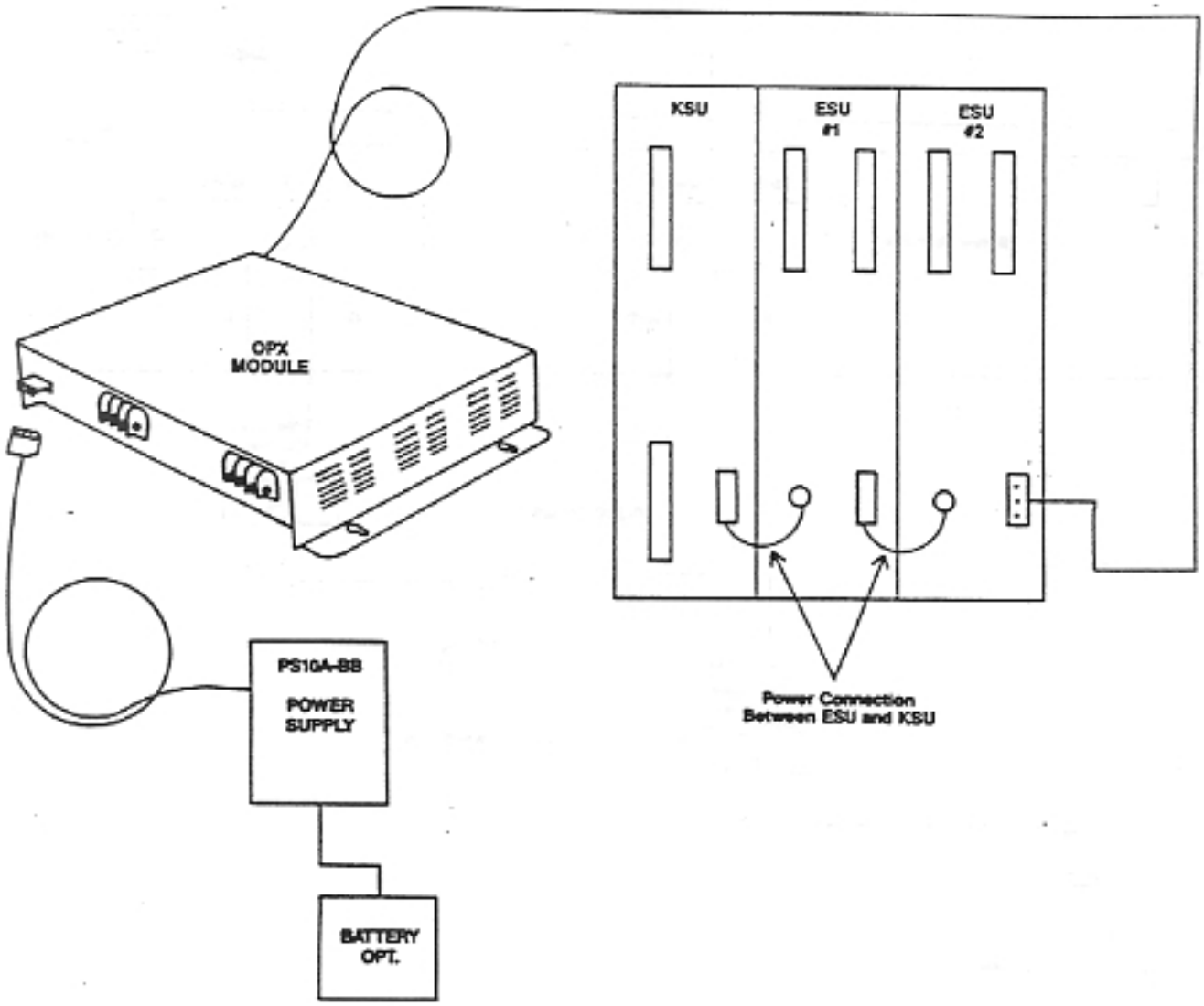

Figure 6-6 PS10A-BB Power Supply Connections

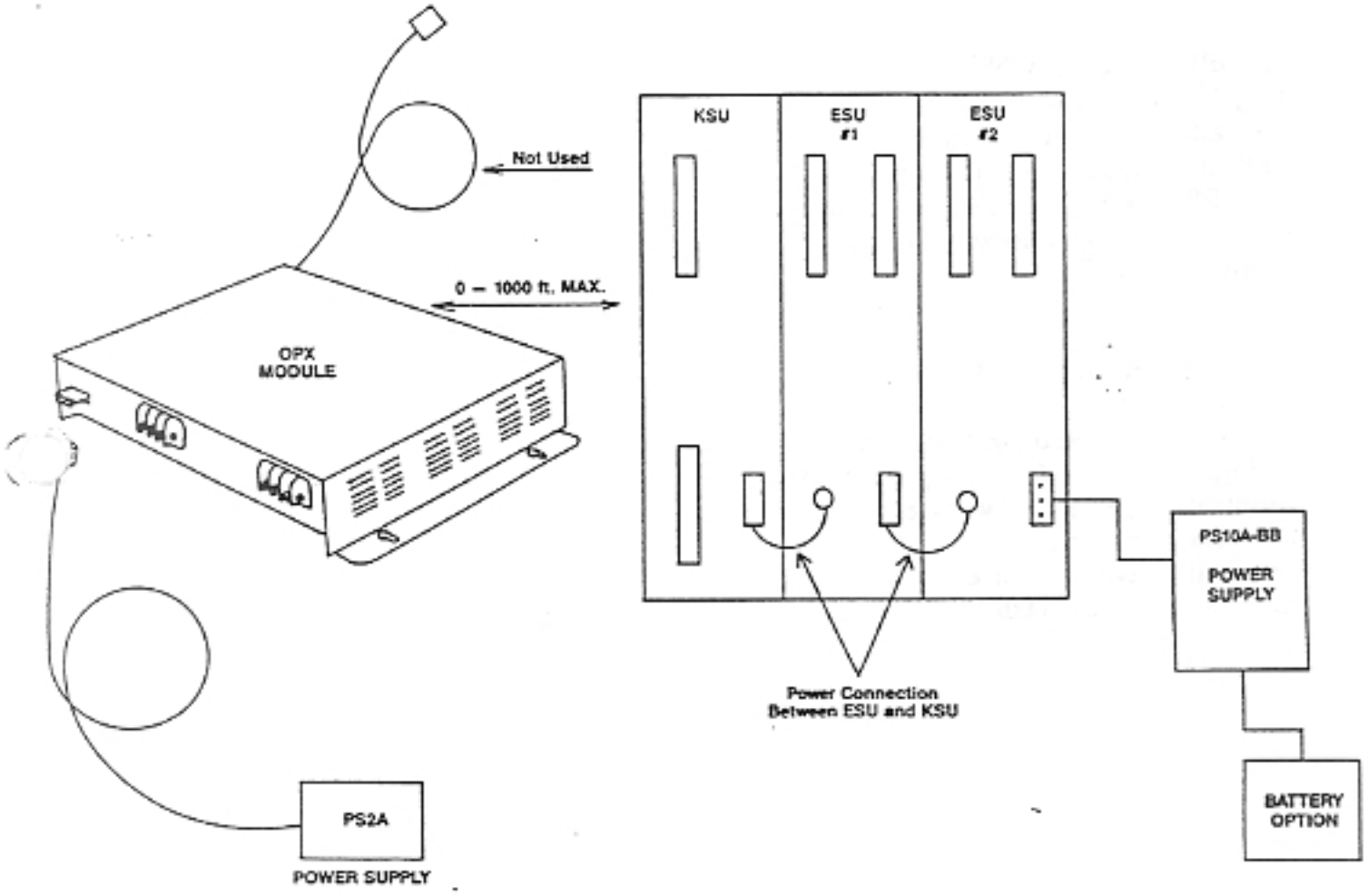

Figure 6-7 PS2A Power Supply Connections

SECTION 630
ELECTRICAL
SPECIFICATIONS

630.1 GENERAL

This section defines electrical specifications for the MARATHON OPX-L Unit.

630.2 SPECIFICATIONS

- Ring Voltage = 85 Volts RMS
- Max. allowable R.E.N. = 2.0A or 2.0B
- OPX unit max. cable distance from KSU/ESU = 1,000 ft. 24 gauge, 2 pair
- Max. OPX terminal loop resistance = 300 ohms DC
- Type terminal interface = loop start, 2 wire
- Power requirements = PS2A (if stand alone)
  PS10A BB (if used with KSU/ESU configuration) (refer to Figure 6-3)
- Terminal operating voltage = 24 VDC (talk battery)
- Terminal operating current = greater than 26 milliamps (talk battery)

SECTION 640
FEATURE OPERATION

640.1 GENERAL
The OPX-L feature offering and operation is specified in this section.

640.2 SELECTING AN OUTSIDE CO LINE
a) Dial "9" + "X", X= Trunk Group (i.e. 1-9)
b) The next available highest numbered trunk will automatically be selected from the specified trunk group. If all trunks in that group are in use, a busy-back tone will be received.

640.3 PLACING AN INTERCOM (ICM) CALL
a) Go off-hook; wait for ICM dial tone.
b) Dial 2 digit intercom station number
c) If called station is busy, you may camp-on to the station by depressing "#", or you may queue onto the called station by depressing "*".

640.4 TRANSFERRING A CALL
a) Depress the hook-switch momentarily (approximately 1 second).
b) Dial the 2 digit station number you wish to transfer the call to.
c) Follow normal transfer procedure (i.e. unscreened and screened).
d) If the called station is busy, you may camp-on or you may queue onto the called station.

640.5 HOLD (CO)
a) Depress the hook-switch momentarily.
b) Dial "*9" to put the call on system hold.
c) Hang up the handset
   or
   Remain off-hook

640.6 ANSWERING A CO CALL ON HOLD
a) Providing the call was placed on hold by you and the handset is in the cradle - Go off-hook and dial "*9".
b) If the handset is out of the cradle or off-hook, dial "*9".

640.7 SPEED DIALING FROM MEMORY
a) Go off-hook.
b) Dial 7 and trunk group number.
c) Dial 2 digit SPD location.

640.8 SPEED BANK PROGRAMMING (FOR CPU-B, CPU-B2 AND CPU-C)
a) Go off-hook.
b) Dial "#2".
c) Dial 2 digit speed bank location.
   Station = 60-87, 88, 89
   System = 00-49, 50-56 (If Sta. 10 only).
d) Dial desired telephone number - 20 digits max.
e) Return on-hook.

Note: To program a WAIT, dial "##".
To program a PAUSE, dial "**".

640.9 CHAIN DIALING SPEED BANKS.
a) Dial first speed bank (procedure 640.7).
b) Depress the Hook-Switch.

c) Dial "**".
d) Dial 2 digit SPD bank location.

640.10 INTERNAL PAGING

a) Go Off-Hook.
b) Dial 80 for all-page, 81-85 for zone page.
c) Announce page.
d) Return on-hook.

CHAPTER 7

DOORPHONE INTERFACE

SECTION 710
DPI OVERVIEW

710.1 GENERAL

The Door Phone Interface (DPI) is an optional ancillary unit which supports operation of a door phone. Included in the DPI unit is a common audible, solid relay closure for connection to an external ringing device such as a mechanical bell, valcom unit, etc. (Refer to Figure 7-1).

710.2 DPI CONNECTION

The DPI is equipped with a modular RJ14C jack for direct connection to an STU station port (reducing the system's total station capacity) via a 625A type connecting block (refer to Figure 7-1). Interface to the doorphone is achieved via 2 screw terminals (located on the main DPI circuit board) utilizing 1 pair standard 22 gauge cable for connection to the doorphone (refer to Figure 7-2).

SECTION 720
OPERATION

720.1 GENERAL

Operation of the doorphone is virtually automatic, therefore, the doorphone does not need to be assigned via programming.

720.2 DOORPHONE OPERATION

The DPI and doorphone (DP) are automatically associated in software with the primary port of the STU to which the doorphone's port is associated only. If the doorphone is connected to STU #2, Ext. #30, the associated station connected to STU #2 (primary) Ext #22 will be called when the doorphone user originates a call. If the doorphone is connected to STU #1, Ext #17 , Ext #10's (primary) station will be called. However, the doorphone may receive internal calls from any station in the system by dialing the appropriate extension number to which the DPI is connected (10-69).

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SECTION 730
ADDITIONAL APPLICATIONS

730.1 PAGE/RING TO EXTERNAL AMPLIFIER

The DPI can be used for additional purposes. For example, the DPI may be used to provide both paging and ringing to an external amplifier (600 OHM) input.

To accomplish this, short one leg of the doorphone terminal to one leg of the common audible terminal. The two remaining terminals will be connected to the amplifier.

To page; dial the extension number to which the DPI is connected.

For external ringing (day or night); ring assignment must be programmed in the system data. The same ringing normally heard over the telephone will be reproduced over the paging amplifier.

730.2 DRY CLOSURE

A non-interrupting dry closure will appear across the CAU terminals:

1. When a CO call is programmed to ring to a DPI.

2. When a station user calls the DPI via the ICM.

These terminals may be used to open an electric doorlock, activate an electromechanical bell for virtually any application requiring a dry contact closure. The following must not be exceeded:

120 VAC/6 milliamps
24 VDC/1 AMP

Note:
To provide an interrupted ring cycle, a self-interrupting type bell is required.

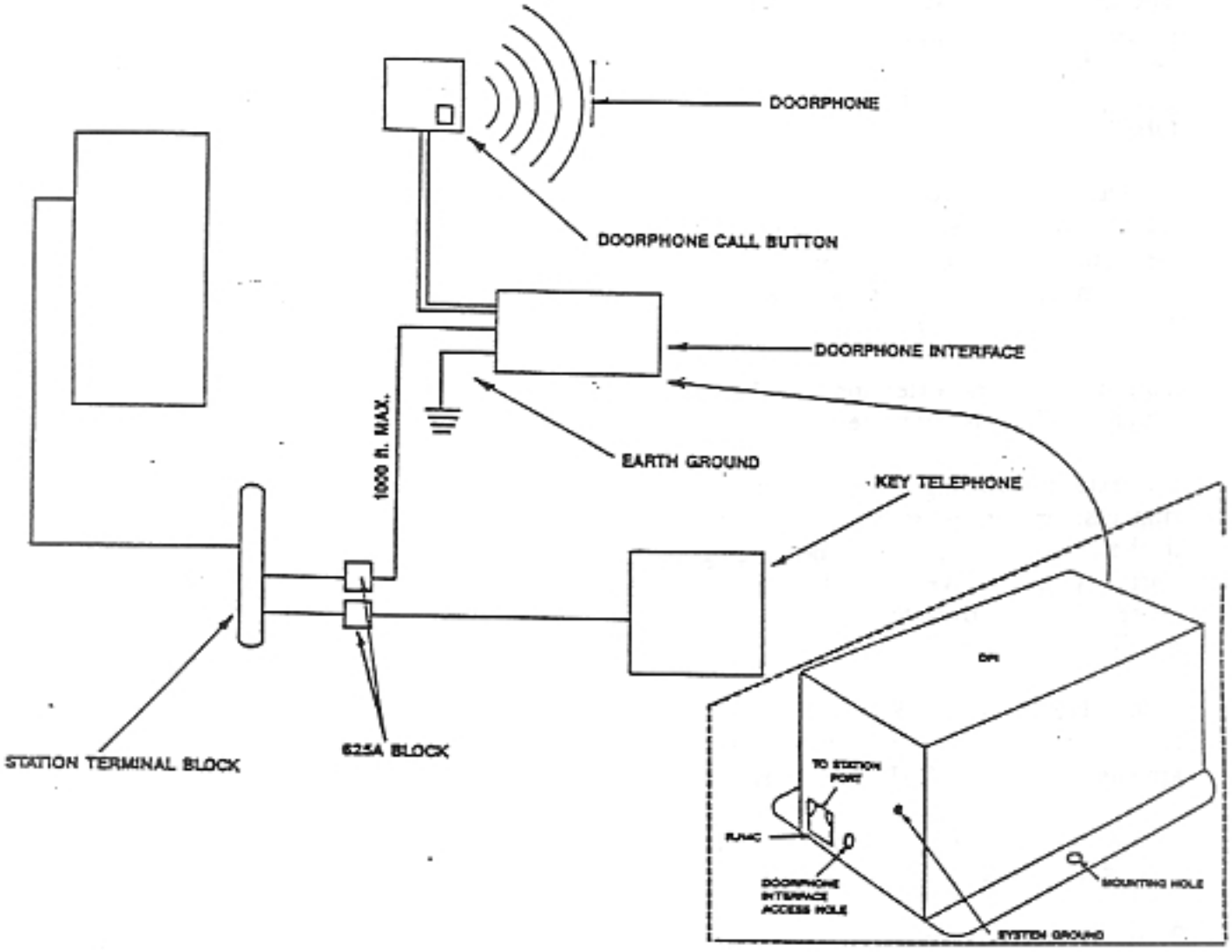


Figure 7-1 DPI/System Connection

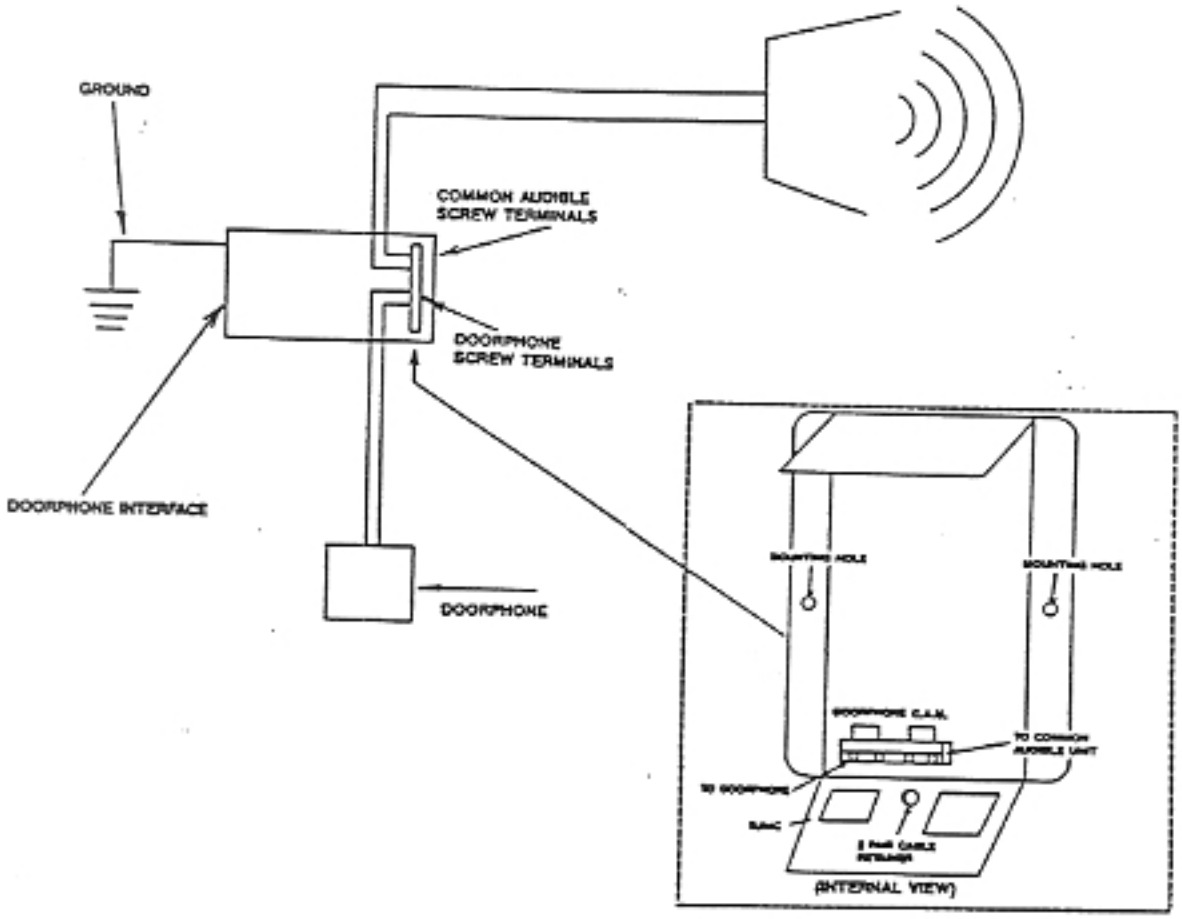


Figure 7-2 DPI/DP Connection

CHAPTER 8
STATION MESSAGE UNIT

SECTION 810
SMU OVERVIEW

810.0 GENERAL

The SMU is an optional circuit card (refer to **Figure 8-1**) which supports Station Message Detail Recording (SMDR). It is equipped with an EIA standard RS-232-C interface (refer to **Figure 8-2**) for connection to a standard serial RS-232 300 baud or 1200 baud printer, or call accounting system. The SMU is installed into the KSU card file in a card slot which is located beneath the CPU card (refer to **Figure 8-3**).

LED's are provided for indication of SMU status and as a trouble shooting aid. **Table 8-1** describes the specific LED functions.

Interfacing to the CPU and ECU is accomplished via ribbon cables provided (mounted) on the SMU. **Table 8-2** describes the cable connections.

Interfacing to the printer is accomplished via an RS-232 cabling assembly supplied for connection to a 15 pin plug (also supplied) mounted on the SMU (refer to **Figure 8-4**).

SECTION 820
INSTALLATION

820.1 GENERAL

This section provides the required information to install the SMU card.

820.2 INSTALLATION PROCEDURE

1. Before installation, check the SMU card for any visible signs of damage.
2. Power down the system.
3. Remove the KSU/ESU cabinet covers.
4. Insert the SMU into the KSU "SMU" card slot just below the CPU card as shown in **Figure 8-5.**
5. Connect the ribbon cables as indicated in **Table 8-2.**
6. Mount the RS-232 assembly (provided with the SMU) as shown in **Figure 8-2.** Connect the RS-232 cable to the SMU card as shown in **Figure 8-3.** Insure that the printer cable is wired as shown in **Table 8-3.** Note that a 15 pin plug is provided with the SMU.
7. Connect the printer to the SMU RS-232 interface assembly as shown in **Figure 8-4.** The printer must have a serial RS-232 interface and must be able to receive either 300 baud or 1200 baud data.
8. Power up the system and then power up the printer (make sure the printer has been loaded with paper before turning on power).

WIN Communications *Marathon* *8-1*

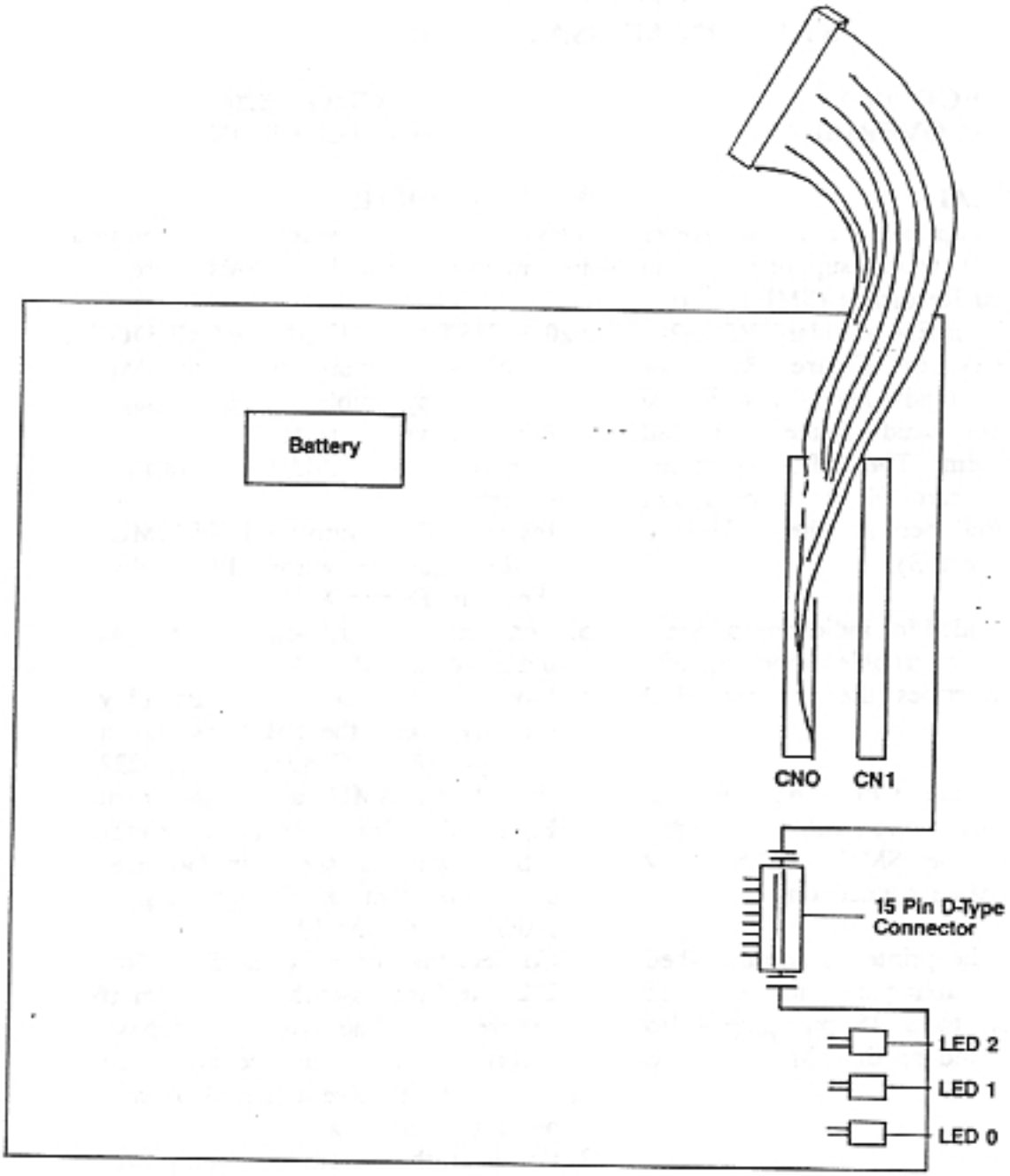


Figure 8-1 Station Message Unit Circuit Card

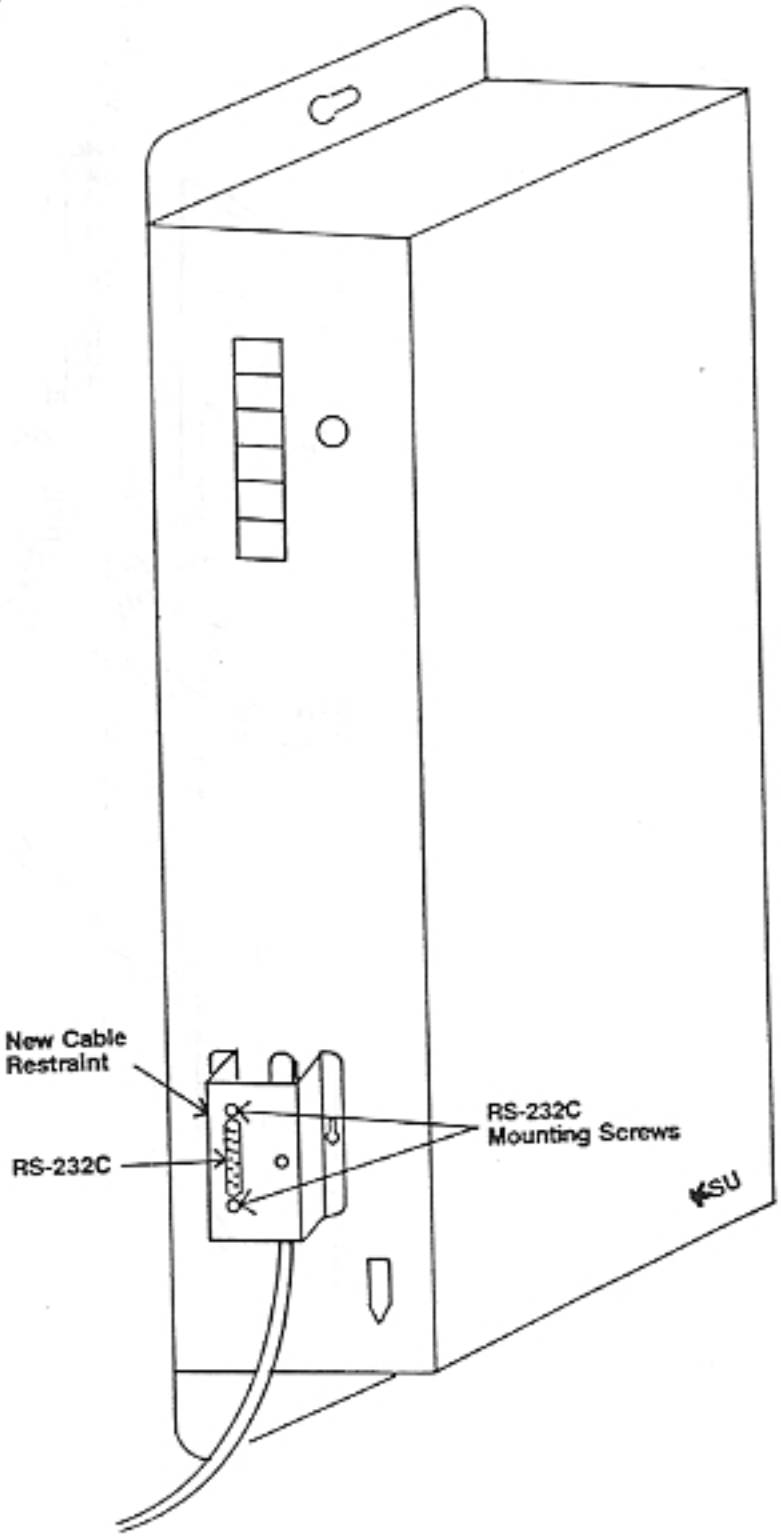


Figure 8-2 SMU Interface

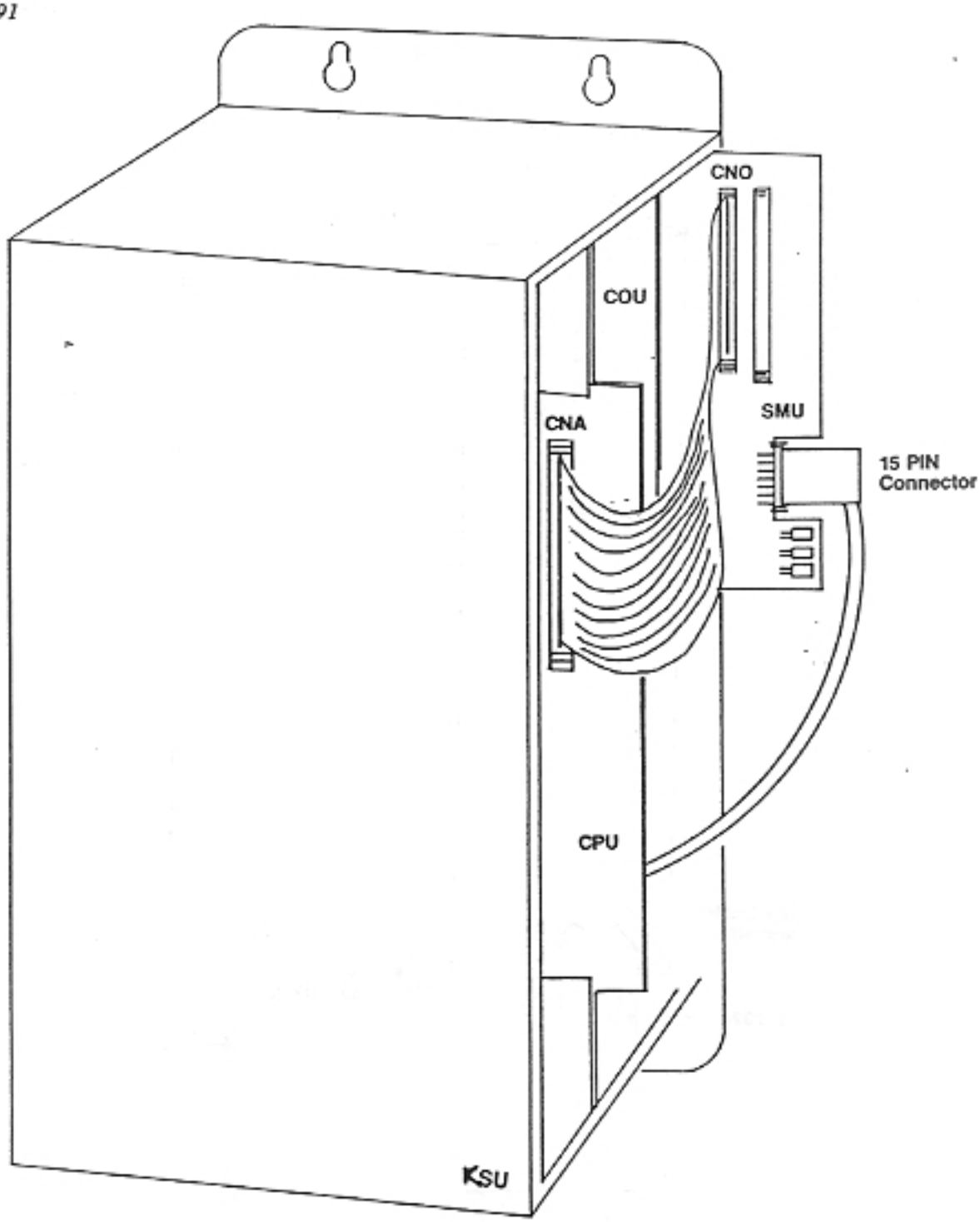


Figure 8-3 SMU Installation

TABLE 8-1
SMU LED FUNCTIONS

S.M.U. LED Descriptions		
LED NAME	NO. (#)	PURPOSE
CPU Status	0	This LED will flash to indicate a normally operating CPU. Depending on the nature of the problem, the CPU status LED will be off or on steadily to indicate a CPU trouble.
Communication Maintenance	1	Normally off - this LED will be on steady to indicate an input or output error (cabling).
*SMU Initial Status	2	Normally flashing - this LED will be off if initial program steps are not performed (prog. #40) or version III software is not present in the system CPU.

*The SMU will only work with version III software or later.

TABLE 8-2
SMU CABLE CONNECTIONS

Cable Connection (Flat Ribbon)	
From SMU	To CPU or ECU
CN 0	CNA on CPU
CN 1	CN 0 on ECU
CN 2	RS 232C Interface

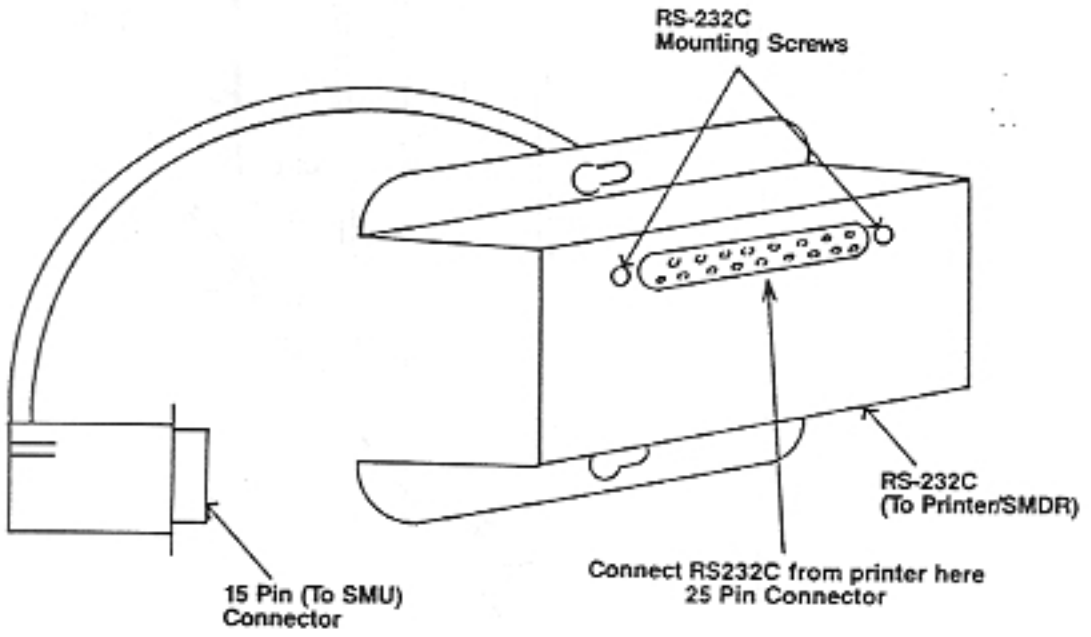


Figure 8-4 SMU Printer Interface

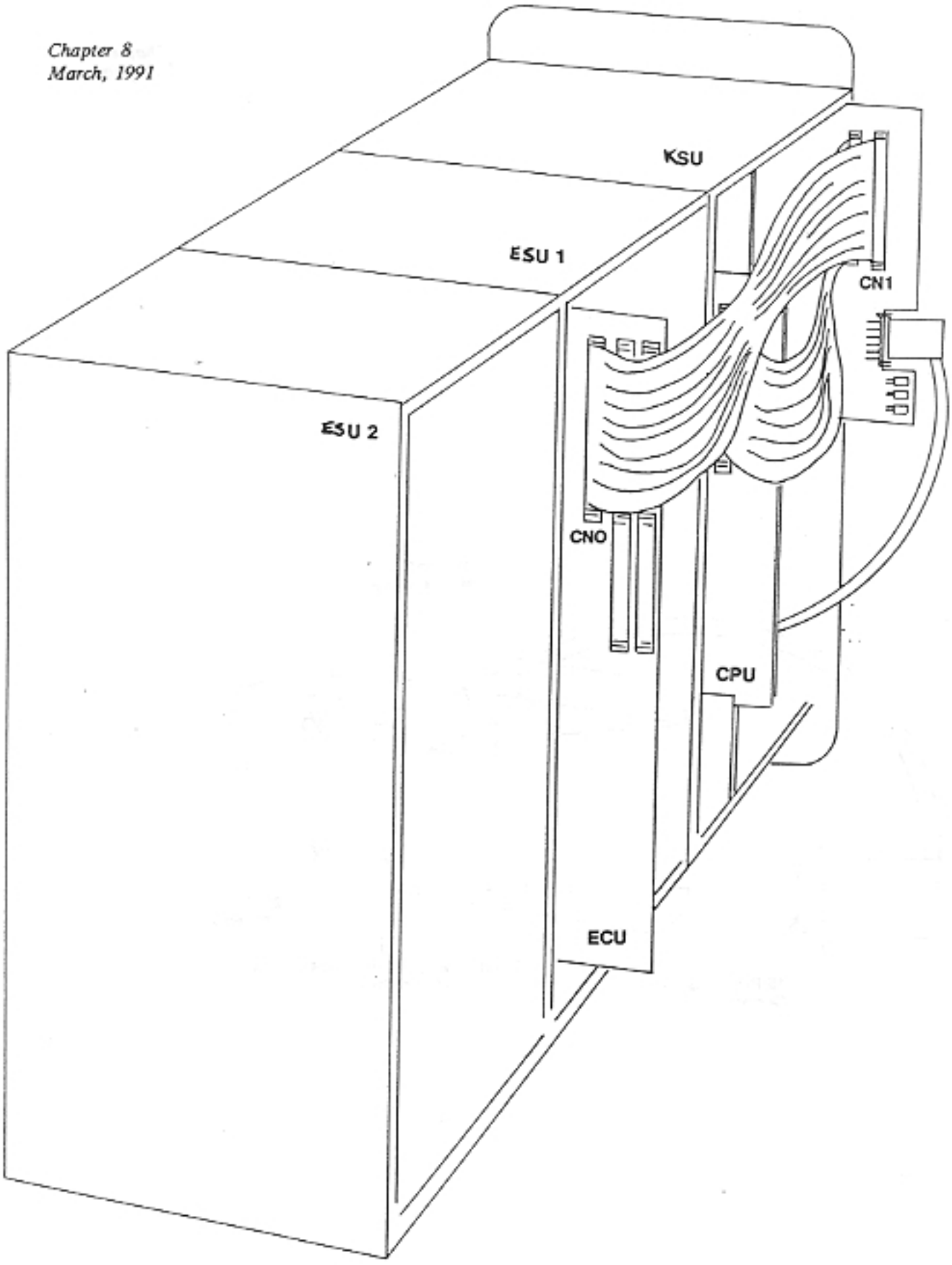


Figure 8-5 SMU Card Slot

TABLE 8-3
PRINTER CABLE WIRING

Pin No. RS232C Connector From SMU	Definition	Input or Output From or To SMU
1	Protective Ground	
3	Transmitting Data (TXD)	OUT
6	Data Terminal Ready	OUT
7	Signal Ground	
8	Data Terminal Ready	OUT
20	Data Set Ready (DSR)	IN

*All pins not shown not connected

SECTION 830
OPERATION AND PROGRAMMING

830.1 GENERAL

Operation of the SMU is virtually automatic. Initial programming is required to define certain operating parameters such as type of printer, baud rate, etc. (Refer to programming steps below). Programming may be performed while on-line from Station 10. The programming steps on the following pages are in their recommended order, and must be performed to initiate operation of the SMU.

830.2 ENTER PROGRAM MODE

1. Enter programming mode from Station 10 (while on-hook) using the following sequence:

KEY	NOTES
MON	
*	
0	
1	
#	End sequence
FEAT	End
FEAT	Exit

830.3 PROGRAM #40 SMU VERIFICATION

1. This program is used to notify the system that there is an SMU card installed.

2. Factory Program = 0 (No SMU card installed).

3. The program sequence takes the following form:

KEY	NOTES
*	
40	
X1	SMU Setting rate: 1 = with SMU 0 = without SMU
#	End Sequence
FEAT	End
FEAT	Exit

830.4 PROGRAM #41 BAUD RATE

1. This program sets the transmission speed of the data being sent from the SMU card to the serial device.

2. Factory Program = 0 (300 Baud)

3. The program sequence takes the following form:

KEY	NOTES
*	
41	
X1	Baud rate: 0 = 300 Baud 1 = 1200 Baud
#	End Sequence
FEAT	End
FEAT	Exit

830.5 PROGRAM #42 TERMINAL TYPE

1. This program is used to set the SMU card for a serial printer interface or a serial call accounting system interface.

2. Factory Program = 0 (Printer)

3. The program sequence takes the following form:

KEY	NOTES
*	
42	
X1	0 = Printer 1 = Call Accounting System
#	End Sequence
FEAT	End
FEAT	Exit

830.6 PROGRAM #43 To CLEAR ERROR INDICATOR P.P.C.

1. This program is used to clear and reset programming, printer and/or cable error indication (MON LED flashing). Refer to **Section 840.2,** Trouble Shooting for additional information)

2. The program sequence takes the following form:

KEY	NOTES
*	
43	
#	End Sequence
FEAT	End
FEAT	Exit

830.7 PROGRAM #44 CLEAR ALERTING (ERROR) TONE

1. This program is used to clear the alerting (error) tone. Refer to **Section 840.1,** Trouble Shooting for additional information.

2. The program sequence takes the following form:

KEY	NOTES
*	
44	
#	End Sequence
FEAT	End
FEAT	Exit

830.8 PROGRAM #45 SETTING SMU CLOCK

1. This program is used to set the SMU clock.

2. The program sequence takes the following form:

KEY	NOTES
*	
45	
#	
X1X2	Year (2 digits)
#	
X3X4	Month (01-12)
#	
X5X6	Date (01-31)
#	
X7X8	Hour (00-23)
#	
X9X10	Minute (00-59)
#	
FEAT	End
FEAT	Exit

SECTION 840
TROUBLE SHOOTING

840.1 ALERT TONES

The following conditions will result in continuous repetitive alerting tones (multiple beep tones) being generated from the primary station. In addition the "Communication Maintenance" LED (#1) will light steady, and the Station 10 (port #1) "MON" LED will begin to flash (C.M. LED is off under normal conditions).

1. Printer out of paper
2. Printer power turned off
3. Printer not in on-line mode
4. The RS-232 connector of the SMDR has been removed
5. Printer or SMDR power has been turned off

The warning tones may be disabled at the programming station (Station 10) by the following steps:

1. **MON * 0 1 # FEAT FEAT**
2. *** 44 # FEAT FEAT MON**

840.2 WARNING INDICATION

A warning indication-flashing "MON" LED on Station 10 will result when the following conditions exist:

1. Improper programming of the SMU
2. Improper programming of the system
3. Activity on line (station off-hook while programming the SMU)

The warming indication (Station 10 MON LED flashing) is provided simply to alert the user of inaccurate communication resulting in inaccurate output by the SMU. The warning does not represent malfunctioning hardware.

The programming, printer and/or cable error (P.P.C.) indication (flashing "MON" LED) may be reset at the programming station (Station 10), by the following method:

1. **MON * 0 1 # FEAT FEAT**
2. *** 43 # FEAT FEAT MON**

SECTION 850
ADDITIONAL FEATURES

850.1 ACCOUNT CODES

Six digit account codes may be entered by any station user by using the appropriate procedure:

1. **From a key telephone set:**
   Enter the following data at the station terminal:

KEY	NOTES
FEAT	
#	
X1—X6	6-digit access code
FEAT	
#	

2. **From a single line OPX station:**

KEY	NOTES
Hook Switch	
*	
7	
X1—X6	6-digit access code

SECTION 860
OUTPUT FORMAT

860.1 OUTPUT DATA FORMAT

Figure 8-6A illustrates the actual output data format as viewed from the printer output. Calls are recorded at the time of final disconnect (on-hook). The "Duration" of the call is recorded in one minute intervals, rounding off to the nearest minute. The length of the "Number Dialed" can be up to 16 digits long. An asterisk is used to indicate a transfer call (in the I/O column) as well as an O.C.C. call (in the O.C.C. column). In the case where an O.C.C. is dialed, the last 16 digits will appear in the "number dialed" column. Only a call with a duration of 20 seconds or more will be output by the SMU.

860.2 CALL ACCOUNTING SYSTEM DATA OUTPUT

Figure 8-6B illustrates the actual output data provided when the SMU is programmed (Program #42) for use with a call accounting system. In this case a "#" will be output in place of a asterisk "*" to represent an O.C.C. call ("*" for transferred call).

860.3 SMDR OUTPUT DATA

Figure 8-7 is provided as a detailed technical description of the raw SMDR output data by character. This information is required when interfacing with a call accounting system which has not been yet qualified by WIN Communications for compatibility; however, a complete list of qualified vendors will be supplied to you upon request. We do not recommend that you attempt to interface the SMU with equipment that has not been qualified by WIN for its compatibility with the SMU.

05/14/86

DATE	O/I	EXT	TRK	TIME	NUMBER DIALED	DURATION	ACC NO	OCC
05/14	O	32	09	PM 07:38	917184457999	00:01	123456	*
05/15	O	33	10	AM 09:49	9551212	00:01		
05/15	O	33	10	AM 09:50	98005228812	00:01		
05/15	O	33	19	AM 09:50	8005228812	00:01	765432	
05/15	O	33	19	AM 09:51	8005228812	00:01		
05/15	O	45	03	AM 09:52	8	00:01		*
05/15	I	16	05	AM 09:54		00:01	123	
05/15	O	33	19	AM 09:55	19143902841	00:01		*
05/15	O	33	19	AM 09:56	3286000	00:02		
05/15	I	27	07	AM 10:01		00:02	1035	
05/15	I	10	07	AM 10:08		00:01		*
05/15	O	14	03	AM 10:07	450	00:01		
05/15	I	29	16	AM 10:03		00:02		
05/15	*	24	16	AM 10:05		00:05	1527	
05/15	I	10	08	AM 10:08		00:01		
05/15	*	29	08	AM 10:08		00:04		
05/15	O	28	12	AM 10:06	912035687000	00:06		
05/15	I	10	07	AM 10:09		00:02	1370	
05/15	*	24	07	AM 10:10		00:02		
05/15	O	24	07	AM 10:12	416	00:01		
05/15	I	16	05	AM 10:12		00:02		
05/15	I	34	24	AM 10:14		00:01		
05/15	I	18	06	AM 10:14		00:01	14654	
05/15	I	34	24	AM 10:16		00:01		
05/15	I	15	04	AM 10:12		00:05		
05/15	I	18	06	AM 10:18		00:01	123456	
05/15	O	34	02	AM 10:19	62	00:01		
05/15	I	18	06	AM 10:20		00:01		

Figure 8-6A Output Data Format

```
 1    05101422320          123030002     2124432221
 2    05101422270    *     1234070001    2123315531
 3    05101423310    #*    31070001      2123315531
 4    05101424330          12345030001   4432221
 5    05101425320    #     12345030001   4432221
 6    05101426280    *     123456080001  3155123456
 7    0510142825 I         6010001
 8    0510143024 I         56010001
 9    0510143023 I   #     23010001
10    05101541280          080001
11    0510543310           31050001      611
↑
SAMPLE NO
```

Figure 8-6B Call Accounting System Data Output

FIELD NAME			CHARACTER START	CHARACTER STOP	CHARACTER LENGTH	NOTES
DATE & TIME OF CALL	MONTH	10s	1	1	1	0 1 - 1 2
		UNIT	2	2	1	
	DATE	10s	3	3	1	0 1 - 3 1
		UNIT	4	4	1	
	HOUR	10s	5	5	1	0 0 - 2 3
		UNIT	6	6	1	
	MIN.	10s	7	7	1	0 0 - 5 9
		UNIT	8	8	1	
STATION NUMBER		10s	9	9	1	0 0 - 6 9
		UNIT	10	10	1	
OUTGOING			11	11	1	O-4FH, OUTGOING, OTHERWISE SP-20H
INCOMING			12	12	1	I-49H, INCOMING, OTHERWISE SP-20H
SPACE			13	13	1	SP = 20H
TRANSFER CALL			14	14	1	/-23H IF TRANSFERRED, OTHERWISE SP-20H
OCC CALL			15	15	1	*-2AH IN CASE OF OCC, OTHERWISE SP-20
SPACE			16	18	3	SP = 20
ACCOUNT NUMBER		100k	19	19	1	0 - 9 IF NOT USED SP = 20H IN LEADING POSITIONS (SP: space)
		10k	20	20	1	
		1k	21	21	1	
		100s	22	22	1	
		10s	23	23	1	
		UNIT	24	24	1	
TRUNK USED		10s	25	25	1	0 1 - 9 9
		UNIT	26	26	1	
LENGTH OF CALL	HOUR	10s	27	27	1	0 0 - 2 3
		UNIT	28	28	1	
	MIN	10s	29	29	1	0 0 - 59
		UNIT	30	30	1	
NUMBER DIALED			31	46	16	IF NOT USED OR INCOMING CALL SP-20H
END OF TEXT			47	47	1	CR = O D H
			44	48	1	LF = OAH

START BIT 1
DATA BITS 8 (ASCII SEVEN, NO PARITY BIT)
STOP BIT 1

Figure 8-7 SMDR Output Data

CHAPTER 9
REMOTE MAINTENANCE UNIT

SECTION 910
OVERVIEW

910.1 GENERAL

The **MARATHON** Remote Maintenance Unit (RMU) is an optional circuit card which may be installed in the **MARATHON** Key Telephone System in the KSU cabinet slot marked RMU. The RMU circuit card provides on-line programming capability along with a description of system maintenance features from a remote location.

The features of an RMU circuit card are operated through the use of an internal modem over a standard loop start telephone line. Communication between the RMU circuit card and the remote location may be performed by using a standard ASCII type data terminal (Texas Instruments Silent 700™ or equivalent), along with a stand alone modem (Tandy DCM-7 or Hayes Smart Modem or equivalent), also an ASCII type terminal equipped with an internal modem (Texas Instruments Silent 703™) may be used.

910.2 RMU INTERFACE

The RMU circuit card also provides a serial data port in the form of an RS232C connector for on-site programming from a data terminal in the event that station number 10 is not available for programming purposes.

The RMU circuit card does not require additional power sources to be present in the system and may be easily interfaced with the existing CPU circuit card by using a Mother Board (MBD).

910.3 CPU REQUIREMENT

An RMU circuit card will only operate when used in conjunction with a CPU-B (or higher revision) circuit card.

Note: Silent 700 is a trademark of Texas Instruments.

SECTION 920
INSTALLATION

920.1 When adding an RMU circuit card or an LCU circuit card to a MARATHON Electronic Key Telephone System, it is necessary to install a motherboard (MBD) first.

920.2 When working on an existing system, be sure to power down before removing or installing any circuit cards or ribbon cables.

920.3 INSTALLATION SEQUENCE

1) Loosen the four screws that secure the front cover to the KSU cabinet and remove cover.
2) Remove four screws securing the cover plate to the back of the KSU cabinet, and remove cover plate.
3) Loosen screw that secures lockdown plate (refer to Figure 9-1). Slide lockdown plate to right, so that the card slots are clear.
4) Pull the CPU circuit card out of the KSU cabinet approximately one inch.
5) Put MBD in place and secure with four screws. A package of five screws and star washers are included with a new MBD if needed.

Note: It is very important to fully seat all circuit cards in the MBD before powering up the system.

6) Remove cutout plate from the back of the KSU cabinet marked RMUC (refer to Figure 9-2). Remove pin protector on RMU circuit card (refer to Figure 9-3). Install the RMU circuit card into the slot marked RMU, push in until it is firmly seated in the MBD. Connect ground wire to back of KSU cabinet (refer to Figure 9-2).
7) Push in CPU circuit card until it is firmly seated in the MBD.
8) If an LCU circuit card is utilized in the system, push in until it is firmly seated in the MBD.
9) Slide lockdown plate to left to cover circuit cards. Tighten lockdown plate screw.
10) Put front cover in place and tighten four screws.
11) Refer to Section 130 for additional installation procedures.
12) Refer to Section 180 for system programming and initialization. It is not necessary to initialize a MARATHON System when installing an RMU circuit card.
13) It is required to have a CO line from the telephone company in order to have Remote Maintenance. The CO line will plug into the four pin modular jack provided for on the MBD board.

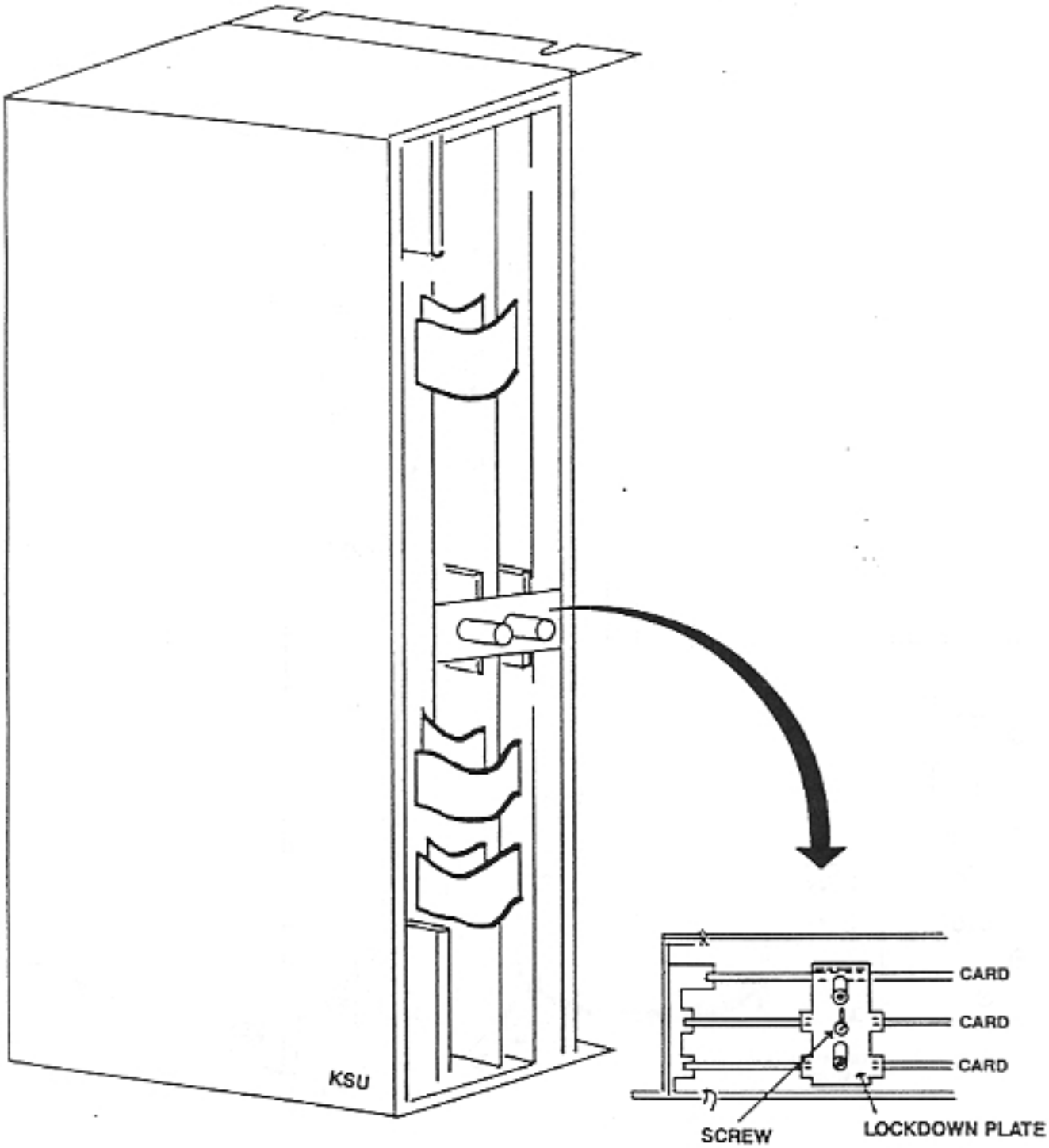


Figure 9-1 KSU Internal Construction

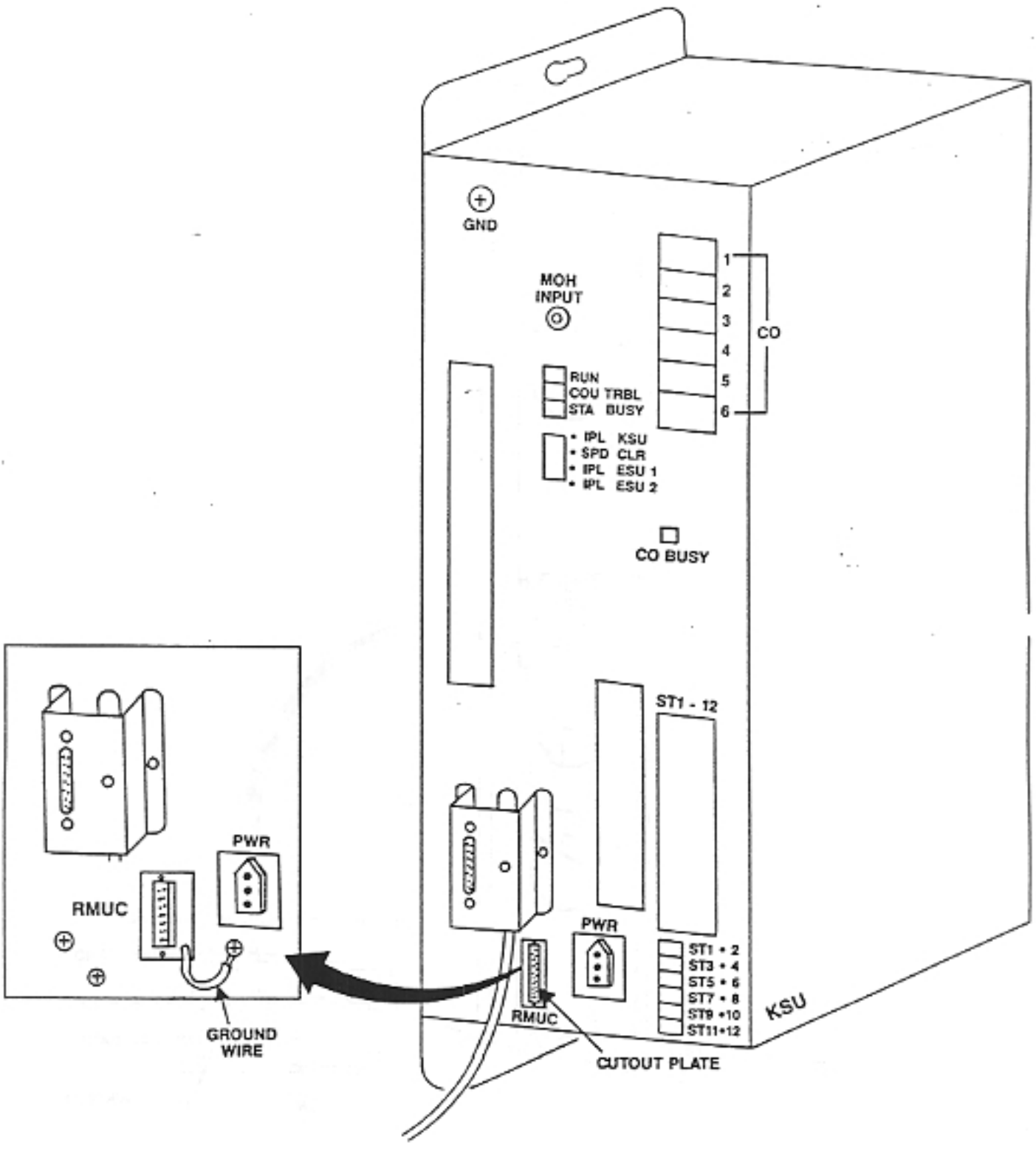


Figure 9-2 Rear View of KSU Cabinet

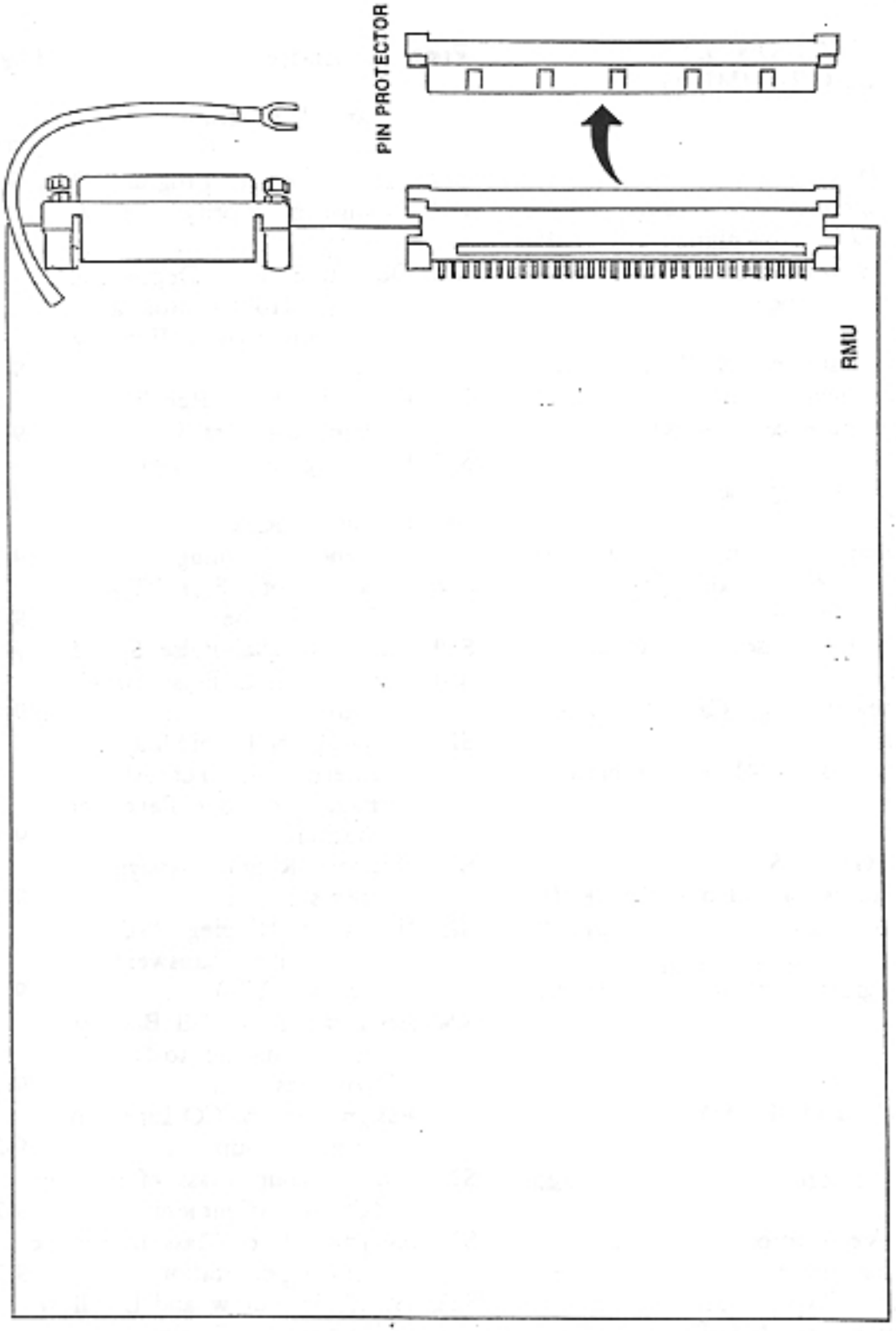


Figure 9-3 RMU Circuit Card

SECTION 930
PROGRAMMING

930.1 GENERAL

Certain programs are required to be performed when installing an RMU circuit card into the system. A sequence of programs have been prepared for the following:

1) when installing an RMU circuit card which will notify the system of the presence of an RMU circuit card
2) when choosing the baud rate to be used
3) whether programming will be done from a console (station no. 10) or a modem
4) to enter the user's identification number
5) to select the Carrier Detect Timing
6) to reset the RMU circuit card

930.2 PROGRAMS

Programs accessible from the RMU have been grouped according to functionality. The following sections provide programming instructions for each item.

930.3 RMU PROGRAMS

930.4 RMU PROGRAM MODE

Prior to accessing any system programming commands from the RMU; it is required to "set up" your RMU. Programs (60-65) are utilized to establish RMU parameters. This must be entered from Ext. 10 (port 1).

930.5 PROGRAM #60 RMU VERIFICATION

1. This program is used to notify the system that an RMU circuit card has been installed.

2. Factory program = 0 (No RMU card installed)

3. The program sequence takes the following form:

KEY	NOTES
*	
60	
X1	0 = NO
	1 = YES
#	
FEAT	
FEAT	

930.6 PROGRAM #61 TERMINAL TYPE

1. This program sets the transmission speed of the data being sent from the RMU card to the printer.

2. Factory program = 0 (300 Baud)

3. The program sequence takes the following form:

KEY	NOTES
*	
61	
X1	0 = 300 Baud
	1 = 1200 Baud
#	
FEAT	
FEAT	

930.7 PROGRAM #62 TERMINAL TYPE

1. This program is used to set the RMU circuit card for on-site programming with a terminal or remotely with a modem.

2. The program sequence takes the following form:

KEY	NOTES
*	
62	
X1	0 = Terminal 1 = Modem
#	
FEAT	
FEAT	

930.8 PROGRAM #63 TO ENTER USER IDENTIFICATION NUMBER

1. The user's identification number must be something other than four zeros.

2. Factory Program = 0000 (No User Identification Number).

KEY	NOTES
*	
63	
#	
X1X2X3X4	An example of X1X2X3X4 would be 1, 2, 3, 4
#	
FEAT	
FEAT	

930.9 PROGRAM #64 CARRIER DETECT TIMING

1. This program is used to detect a gap of time that has passed when communicating between the RMU circuit and the external modem at your terminal. When the determined time (01 to 99 seconds) has elapsed the RMU circuit card will drop the connection.

2. Factory Program = 10 seconds

KEYS	NOTES
•	
64	
X1X2	01 to 99 seconds
#	
FEAT	
FEAT	

930.10 PROGRAM #65 RMU RESET

1. This program is used to reset the RMU's circuit card.

KEYS

•
65
#
FEAT
FEAT

SECTION 940
RMU PROGRAMS

940.1 PROGRAM S11 CLEAR ALL PROGRAM DATA

1. This program step is used to clear the present system data, and replace it with factory (default) data.

2. Caution must be taken since this procedure completely erases all customer data and reloads factory data.

3. The program sequence takes the following form:

KEY	NOTES
S	
11	
,	
00	If "00" is not entered, the system will not perform the procedure
,	
RTN	

Note: This program is not a substitute for System Initialization.

940.2 PROGRAM S12 CLEAR SELECTED PROGRAM DATA

1. This program step is used to clear the data of specific programs. In some instances, factory (default) data is reloaded in place of the customer data. In other instances "00" is inputted in place of factory data . Refer to **Note** below.

2. Caution must be taken since this procedure completely erases selected customer data.

3. The Clear Selected Program Data code takes the following form:

KEY	NOTES
S	
12	
,	
X1X2	Program # to be cleared
,	
RTN	

Note: In some instances this program completely clears the selected program. The selected program must be re-entered after clearing it.

Only the following program may be completely cleared:

Program	Description
32	= Completely Cleared
All other Programs	= Factory data

940.3 PROGRAM S13 CHANGE IN PRIORITY OF ICM CALLS

1. This program allows changing ICM call priority system-wide from Voice to Tone or Tone to Voice.

2. The program sequence takes the following form:

KEY	NOTES
S	
13	
.	
X1	ICM ID
,	
RTN	

3. The system is factory programmed for Voice priority on all ICM calls (Handsfree Answerback).

Note: Origination of a handsfree ICM call must be performed by using the handset (off-hook).

4. ICM ID

X ID	DEFINITION
O	Voice Call
1	Tone Call

940.4 PROGRAM S14 DEFINITION OF FIRST DEPRESSION OF THE HOLD BUTTON AS SYSTEM HOLD OR EXCLUSIVE HOLD

1. This program defines the first depression of the HOLD button as System Hold or Exclusive Hold.

2. The program sequence takes the following form:

KEY	NOTES
S	
14	
,	
X1	HOLD ID
,	
RTN	

3. The system is factory programmed for the first depression of the HOLD Button to be System Hold.

4. HOLD ID

X ID	DEFINITION
O	E-hold
1	System-Hold

940.5 PROGRAM S15 CHANGING HOLD RECALL TIMEOUTS (1st & 2nd)

1. This program determines the length of the hold recall periods.

2. The first and second hold recall timers are programmed independently via this program.

3. It is possible to disable both of the hold recall features by entering "00" in the X1, X2 variable for first hold recall data.

4. Both first and second hold recall timers may be programmed independently for a maximum of 9.5 minutes and a minimum of 30 seconds in 30 second increments.

5. The program sequence takes the following form:

KEY	NOTES
S	
15	
,	Step
X1X2	00-9.5
,	Step to Second Hold Recall Timer
RTN	

6. Hold Recall Timing IDs

X1X2		Timing
00	=	No Recall
05	=	30 seconds
10	=	60 seconds
15	=	1.5 minutes
:	:	:
95	=	9.5 minutes

Note: Second hold recall does not begin until first recall is completed.

940.6 PROGRAM S16 CHANGING HOOK FLASH TIMING

1. This program allows changing the automatic Hook Flash Timing.

2. The program sequence takes the following form:

KEY	NOTES
S	
16	
,	
X1X2	Hook Flash ID
,	
RTN	

3. The system is factory programmed for three seconds. In many cases a shorter timing may be used: i.e. 500-700 milliseconds.

Note: Timing can be changed from 0.1 sec to 9.9 sec. in one tenth of a second increments.

Example:

KEY
S
16
,
10
,
RTN

With this program entry of "10", timing will be 1 second.

6. Hookflash ID

X1 X2 ID	TIMING
01	0.1 sec.
02	0.2 sec.
:	:
30	3.0 sec.
:	:
98	9.8 sec.
99	9.9 sec.

940.7 PROGRAM S17 CHANGING RINGING TIMEOUT TIMING

1. This program allows changing the abandon incoming call ringing timeout period. The purpose of the "Ring Timeout" is to prevent false ring detection; i.e. false ringing.

2. The program sequence takes the following form:

KEY	NOTES
S	
17	
,	
X1X2	Ring Timeout ID
,	
RTN	

3. Since most modern Central Offices have six second ring cycles (2 seconds on and 4 seconds off), the system is factory programmed for an eight second timeout.

4. Ring Timeout ID

X1X2 ID	TIMEOUT
05	5.0 sec.
08	8.0 sec.
11	11.0 sec.
14	14.0 sec.
17	17.0 sec.
20	20.0 sec.
23	23.0 sec.
26	26.0 sec.

940.8 PROGRAM S18 SELECTION OF DP OR DTMF PER CO LINE

1. This program allows selection of DP or DTMF signalling on a per CO line basis.

2. The program sequence takes the following form:

KEY	NOTES
S	
18	
,	
X1 X2	CO Line (01-30)
,	
X4	DP or DTMF
,	
RTN	

Note: After CO line number is entered, present signalling status of the CO line will be displayed in the first LCD position.

3. The system is factory programmed for DTMF signalling on all lines.

Example:

KEY	NOTES
S	
18	
,	
01	CO Line
,	
1	DP or DTMF
,	
RTN	

With this program entry of "1" CO Line "1" would be dial pulse.

4. DP or DTMF ID

X4 ID	DEFINITION
0	DTMF
1	DP

940.9 PROGRAM S19 CHANGING DIAL PULSE SPEED

1. This program allows changing the dial pulse speed from 10pps or 20pps.

2. The program sequence takes the following form:

KEY	NOTES
S	
19	
,	
X1X2	Pulse Speed Value
,	
RTN	

3. The system is factory programmed for 10pps.

4. Pulse Speed Value

X1 X2 Value	SPEED
10	10 pps
20	20 pps

940.10 PROGRAM S20 CHANGING DIAL PULSE BREAK RATIO

1. This program allows changing the dial pulse break ratio from 58 percent to 72 percent in one percent increments.

2. The program sequence takes the following form:

KEY	NOTES
S	
20	
,	
X1X2	Break Ratio Value
,	
RTN	

3. The system is factory programmed for 60 percent break.

4. Break Ratio Value

X1 X2 VALUE	BREAK RATIO
58	58%
59	59%
60	60%
:	:
:	:
:	:
70	70%
71	71%
72	72%

940.11 PROGRAM S21 ALLOWING OR FORBIDDING INTERNAL SPEAKER ALL PAGE AND ZONE PAGE PER STATION

1. This program allows each station to be programmed to allow or forbid internal all-page and zone-page.

2. The program sequence takes the following form:

KEY	NOTES
S	
21	
,	
X1X2	Ext. No.
,	
X5	0 = Allowed 1 = Forbidden
,	
RTN	

3. The system is factory programmed to allow internal all-page and zone-page at each station.
   0 = Internal Page Allowed
   1 = Internal Page Disallowed

Example:

KEY	NOTES
S	
21	
,	
13	Ext. No.
,	
1	Forbid
,	
RTN	

With this program entry station "13" would be disallowed internal page.

940.12 PROGRAM S22 DAYTIME RINGING ASSIGNMENTS

1. This program allows each station to be ring assigned to any or all of the CO/PBX lines. However, 10 stations may be ring assigned to any one CO/PBX line.

2. The program sequence takes the following form:

KEY	NOTES
S	
22	
,	
X1X2	CO No.(01-30)
,	
X3X4	Present Extension Displayed (10-69)
X5X6	New Station Data (10-69)
,	Step 10 Times
RTN	

3. All CO Lines may be ring assigned to any station, a maximum of ten stations may be assigned to ring each CO line.

4. The system is factory programmed for extensions 10, 21, 22, 34, 46, and 58 which are assigned to ring on all CO lines.

940.13 PROGRAM S23 NIGHTTIME RINGING ASSIGNMENT WITH UNANSWERED STATION "UN"

1. The purpose of this program is to assign night ringing stations as well as unanswered call "UN" stations on a per CO line basis.

2. A maximum of 5 night ringing stations may be assigned to ring on any incoming CO line when the system is placed in the night answer "NA" mode.

3. One "UN" call ringing station may also be assigned to ring on any incoming CO line in both the day and night modes. The unanswered call station assigned to a CO will ring only if the "UN" timer is programmed. (Refer to Program #37).

4. The program sequence takes the following form:

KEY	NOTES
S	
23	
,	
X1X2	CO (01-30)
,	
X3X4	Present Extension Displayed (10-69)
X5X6	New Station Data (10-69)
,	Step Repeat 5 times Last Time for "UN" Station
RTN	

5. The 6th (or last) station (X3X4) entry is designated as the "UN" station.

6. If "00" is inputted for "X3X4" in the first 5 positions then there will be no station assigned to ring in the night mode.

7. If "00" is inputted for "X3X4" in the last station position then there will be no "UN" station assigned to that corresponding CO line.

8. Factory (default) is as follows:

X1 X2 CO#	X3 X4 (repeat 6 times) Station#
01	10, 21, 00, 00, 00, 00 "UN" station
02	10, 21, 00, 00, 00, 00
03	10, 21, 00, 00, 00, 00
:	: : : : : :
:	: : : : : :
30	10, 21, 00, 00, 00, 00

** X1 and X2 represent any CO line 01-30.*
X3 and X4 represent any RA or "UN" station 10-69.

940.14 PROGRAM S24 ASSIGNMENT OF CALL BACKUP (CBU) STATION TO DSS CONSOLES

1. This program allows assignment of a call backup station to each DSS console.

2. The program sequence takes the following form:

KEY	NOTES
S	
24	
,	
X1X2	Call Backup Extension (10-69)
,	
RTN	

3. If there is no CBU station, "00" will be shown.

4. The system is factory programmed for no call backup stations assigned.

Example:

KEY	NOTES
S	
24	
,	
1	DSS 1
16	CBU Ext (10-69)
,	
2	DSS 2
00	CBU Ext (10-69)
,	
3	DSS 3
00	CBU Ext (10-69)
,	
RTN	

With this program entry DSS 1 would have station "16" assigned as its CBU. DSS #2 and #3 have no CBU stations assigned.

940.15 PROGRAM S25 ASSIGNMENT OF CO LINES TO TRUNK GROUP

1. This program allows assignment of CO lines to trunk groups.

2. Each CO line may be assigned to one of ten trunk groups. The first eight trunk groups may be assigned class of service restrictions. Trunk group nine is permanently non-restricted. Trunk group "0" is used for incoming trunks only.

3. The program sequence takes the following form:

KEY	NOTES
S	
25	
,	
X1	Trunk Group 0 - 9
,	Step to next CO line
RTN	

4. The system is factory programmed for all CO lines to be assigned to Trunk Group 1.

5. Trunk Group Numbers = 0-9.

940.16 PROGRAM S26 TRUNK GROUP CLASS OF SERVICE (COS) ASSIGNMENTS

1. This program allows COS configuration on a trunk group basis.

2. There can be 32 COS. Each COS is configured by assignment of one of 19 restriction designators to each of eight trunk groups. (Restrictions may not be assigned to Trunk Group 9.)

3. The restriction class designator defines the type of restriction to be featured.

4. There are 19 possible types of restrictions that can be assigned to each trunk group.

5. The programming sequence takes the following form:

KEY	NOTES
S	
26	
,	
X1X2	COS (01-32) Step 9 times
,	
X3X4	Toll Restriction (Refer to **Chapter 1, Table 1-18**)
,	
RTN	

6. The system is factory programmed for all trunk groups in all COS as non-restricted (restriction class designator 13).

940.17 PROGRAM S27 ASSIGNMENT OF CLASS OF SERVICE (COS) PER STATION

1. This program allows assignment of COS to stations.

2. Each station may be assigned 1 of 32 classes of service. Each station COS is associated with trunk group COS, and assigns the station access restrictions for eight trunk groups.

3. The program sequence takes the following form:

KEY	NOTES
S	
27	
,	
X1X2	Ext. No. (10-69)
,	
X5X6	Station COS (01-32)
,	
RTN	

4. The system is factory programmed for all stations to COS No. 1.

Example:

KEY	NOTES
S	
27	
,	
13	Ext. No.
02	Station COS
,	
RTN	

With this program entry, station 13 will be in station class of service 02.

940.18 PROGRAM S28, 29, 30, 31 ALLOW AND DISALLOW RESTRICTION TABLE CONFIGURATION

1. The purpose of this program is to configure semi-restrict, allow and disallow, tables for allowing or restricting certain numbers.

2. Each program number (28-31) corresponds directly to one of four tables, e.g.
   Program #28 = Allow Table 1
   Program #29 = Allow Table 2
   Program #30 = Disallow Table 1
   Program #31 = Disallow Table 2

3. There are 40 entries of four digits in each table (including Wild Card Digits "WCDs"). Each entry may be programmed for all tables.

4. Two WCDs are available for programming. They are "^" and "$ ". These digits may be programmed by depressing the "^" and "$" button, respectively.
   "^" = 2,3,4,5,6,7,8 and 9 = P
   "$" = 0,1,2,3,4,5,6,7,8,9,* and # = A

5. The purpose of the WCDs is to represent the decimal numbers "2-9" and "0-9". They may be used to represent a group of numbers with a single entry. For example, entering "^0^" will represent all area codes with middle digit "0".

6. The program sequence takes the following form:

KEY	NOTES
S	
X1X2	Program #(28,31)
,	
X5X6X7X8	Digits to be allowed or disallowed including " " and "$".
,	
RTN	

To clear data, press shift, then 8.

Example:

KEY
S
28
,
1800
,
911A
,
RTN

This program entry will allow only 1800 numbers and 911 to be dialed.

Example:

KEY
S
30
,
976A
,
411A
,
RTN

This program entry will disallow 976 numbers and 411 to be dialed.

940.19 PROGRAM S32 CENTRAL OFFICE, POOLED LINE, AND DSS/BLF KEY ASSIGNMENTS (NON-SQUARED)

1. This program defines the actual function of the telephone station's line keys as CO pick up keys, pooled line keys, or direct station (DSS) keys.

2. A maximum of nine P-keys may be assigned to any telephone. Pooled line keys allow the programmer to designate access to lines in a particular trunk group (1-9) by use of any single pick-up key on the telephone station. Since there are nine trunk groups allowed in the system, it is therefore conceivable to assign nine trunk groups to nine individual keys on the same telephone station. However, only the first eight trunk groups may be assigned class of service.

3. In addition, the telephone pick-up (line keys) may be defined (assigned) as Direct Station Select keys. In this case, any key defined as a DSS/BLF will assume a standard DSS/BLF type of operation complete with coordinated LED indications.

4. The line keys may also be assigned for normal CO line access, in a squared or nonsquared configuration.

5. The system is factory programmed for squared operation. Therefore, CO numbers "01-30" = CO line keys 01-30.

6. The program takes the following form:

KEY	NOTES
S	
32	
,	
X1X2	Station No. (10-69)
,	
,	
,	
X3	Type of Button 1 = CO 2 = DSS/BLF 3 = P-Key 0 = No Key
X4X5	Type of Key CO = (01-30) Sta. No. = (10-69) P = Key = 9 (1-9) No Key = 00
,	
RTN	

Note: A button programmed for no key assignment can be used as a feature key with software version B2 and C only.

i.e. If you were to select "1" for X3, you must then enter trunk #01-30. If you select "2" for X3, you must then enter the station number (10-69) to appear at that DSS/CO key. If you select "3" for X3, you must enter "9" and select a trunk group 1-9. If you select "0" for X3, you must then enter 00 to disable the key for a no-use condition.

7. The following program will reset the station CO buttons for no assignment:

KEY	NOTES
S	
32	
,	
X1X2	Station No. (10-69)
,	
*	Press shift, then 8
0	
,	
RTN	

8. The following program will return the station to factory default data:

KEY	NOTES
S	
32	
,	
X1X2	Station No. (10-69)
,	
*	Press shift, then 8
1	
,	
RTN	

940.20 PROGRAM S33 ALLOW OR DISALLOW DO NOT DISTURB

1. This program allows a station to use the Do Not Disturb feature.

2. This program sequence takes the following form:

KEY	NOTES
S	
33	
,	
X1X2	Ext. No. 10-69
,	
X3	DND 0 = Allowed 1 = Disallowed
,	
RTN	

940.21 PROGRAM S34 PRIMARY STATIONS' ASSIGNMENT OF 2ND HOLD RECALL AND/OR VOICE MAIL

1. The purpose of this program is to enable or disable the DSS 2nd hold recall. You may choose to enable a second hold recall or, disable a second hold recall on an individual basis at each of 5 DSS positions.

2. In addition, if the DSS port is used for interface with a **MARATHON** Voice Mail Processor, (MVP) you must define this function in programming.

3. The program sequence is as follows:

KEY	NOTES
S	
34	
,	Step 5 times
X1	1 = Yes 0 = No 2 = Voice Mail Step 5 Times
,	
RTN	

4. The system is factory programmed (default data) for the DSS associated with the no. 2 primary position (ICM 10) only to enable display (station number and CO number) of the second hold recall along with associated tones (short beeps).

5. By inputting "2" for voice mail, in "X1" the DSS port and primary port associated with that DSS will

function hand in hand with the MVP.

When a MSG waiting indication is activated by the attendant, "Call Attend xx" will appear in the associated E-EXEC and E-MSG phones LCD display. When a MSG waiting indication is activated by the MVP, "Call MVP" will appear in the E-EXEC and E-MSG LCD display.

Note:

First Step	*(,) is DSS No. 1*
Second Step	*(,) is DSS NO. 2*
:	:
Fifth Step	*(,) is DSS No. 5*

940.22 PROGRAM S35 ALLOW OR DISALLOW BROKERAGE SERVICE (NON-PRIVATE OPERATION)

1. This program will allow or disallow the use of the brokerage (non-private) feature on a station basis.

2. In order for a station user to have access to the brokerage feature his or her station must be defined in system programming as an allowed station.

3. The program sequence takes the following form:

KEY	NOTES
S	
35	
,	
X1X2	Ext. No. (10-69)
,	
X3	Allow = 1 Disallow = 0
,	Step
RTN	

4. The system is factory programmed for disallow, or NO access to the brokerage feature for all stations.

940.23 PROGRAM S36 ALLOW OR DISALLOW RINGING CO ANSWER PREFERENCE

1. The purpose of this program is to enable or disable ringing CO answer preference on a system wide basis.

2. If this feature is enabled in system programming, all telephone stations programmed to ring on incoming CO calls will provide the user with automatic access to incoming CO calls. By going off-hook on a telephone station programmed for incoming CO ringing (while a CO is ringing) your telephone will automatically seize the ringing line without any further action on the user's part.

3. The program sequence takes the following form:

KEY	NOTES
S	
36	
,	
X1	0 = Off 1 = On
,	Step
RTN	

4. The factory (default) data is "0" or off (disable this feature).

940.24 PROGRAM S37 UNANSWERED STATION TRANSFER TIMING

1. The purpose of this program is to specify the timing for the unanswered station recall from the ringing station.

2. The system may be programmed so that if a call ringing in at a particular station remained unanswered for a predetermined period of time, the call ringing would be diverted to the "UN" station position. This predetermined period of time is program selectable for between 00 seconds and 9.9. minutes.

Note: The system may also be programmed for no call diversion "00".

3. The factory (default) programmed timing is 05 or 15 seconds.

4. The program sequence takes the following form:

KEY	NOTES
S	
37	
,	
X1X2	00-99 (01-3 sec)
,	Step
RTN	

Note: CO = no timer/no "UN" function.

940.25 PROGRAM S38 EXTERNAL PAGING PORT ZONE ASSIGNMENTS

1. This program allows assignment of vacant station ports for use as external paging ports with the meet-me feature.

2. Three zones 86-88 are assigned to any three specific station ports 10-69.

3. Default data "00" is factory programmed for no allocation of station ports as paging ports.

4. The program sequence takes the following form:

KEY	NOTES
S	
38	
,	Step
X2X3	Vacant Station No.
,	Step 3 times for zones 86, 87, 88
RTN	

5. In this program there are three values for X1X2. By depressing the (,) key and entering three extension numbers the corresponding zones 86, 87, 88 are assigned.

   i.e.

X1X2	=	Zone 86
X1X2	=	Zone 87
X1X2	=	Zone 88

6. Dial access code 89 is solely for all call and is automatically assigned to three paging ports 86, 87, 88.

7. Dial *8 on the telephone dialpad will automatically connect you (meet-me) with the paging party no matter what zone has been selected by the paging party.

8. Refer to **Chapter 1, Section 130** for external paging connections.

940.26 PROGRAM S39 DIAL "976" RESTRICTION CONTROL

1. The purpose of this program is to allow or disallow "976" local, extended area and toll call restriction on a system wide basis.

2. Any station assigned a T/R or S/R class of restriction via a trunk group COS assignment (see Program #26 and #27) will either be allowed or disallowed "976" dial restriction depending on this data input.

3. The program sequence takes the following form:

KEY	NOTES
S 39	
, X1	Allow dialing of 976 calls =0 Disallow dialing of 976 calls =1
, RTN	Step

SECTION 950
SMU PROGRAMS

950.1 PROGRAM S40 SMU VERIFICATION (SMDR)

1. The purpose of this program is to notify the system that there is an SMU circuit card present in the hardware.

2. The system is factory programmed for no SMU, which means that the default data is 0. (No SMU circuit card installed.)

3. The program takes the following form:

KEY	NOTES
S 40	
, X1	1 = SMU circuit card installed 0 = NO SMU circuit card installed
, RTN	

950.2 PROGRAM S41 BAUD RATE

1. This program is used to set the transmission speed of the data being sent from the SMU card to the serial device.

2. The factory default data is set at 0, which is 300 baud.

3. The program takes the following form:

KEY	NOTES
S 41	
, X1	0 = 300 baud 1 = 1200 baud
, RTN	

950.3 PROGRAM S42 TERMINAL TYPE

1. This program is used to set the SMU card for serial printer interface or a serial call accounting system interface.

2. The factory default data is set at zero, which is for a serial printer interface.

3. The program takes the following form:

KEY	NOTES
S	
42	
,	
X1	0 = Serial Printer 1 = Call Accounting System
,	
RTN	

950.4 PROGRAM S43 TO CLEAR ERROR INDICATOR P.P.C.

1. This program is used to clear programming, printer and/or cable error indication Reset (MON LED will be flashing).

2. The program takes the following form:

KEY
S
43
,
RTN

950.5 PROGRAM S44 TO CLEAR ALERTING (ERROR) TONE

1. This program is used to clear the alerting tone when an error is inputted.

2. The program takes the following form:

KEY

S
44
,
RTN

950.6 PROGRAM S45 SETTING SMU CLOCK

1. This program is used to set the SMU clock.

2. The program takes the following form:

KEY	NOTES
S	
45	
,	
X1X2	year
,	
X3X4	month (01 to 12)
,	
X5X6	date (01 to 31)
,	
X7X8	hour (00 to 23)
,	
X9X10	minutes (00 to 59)
,	
RTN	

SECTION 960
SYSTEM MESSAGING PROGRAMS

960.1 PROGRAM S50 SYSTEM MESSAGE DATA CLEAR

1. This program allows the user to erase the data presently programmed in the station message memory area.

Note: This program does not erase data in the received message area or the system data message area.

2. The station message buffer (memory area) is comprised of message banks 02 through 09 (a total of 8 banks).

3. Once this program procedure is completed, all station message banks are completely cleared.

4. The program sequence takes the following form:

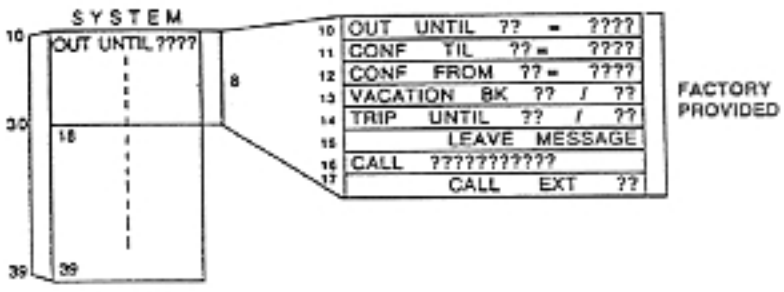
KEY	NOTES
S	
50	
,	Step (Erase)
RTN	

960.2 PROGRAM S51 SYSTEM MESSAGE EDIT

1. The purpose of this program is to delete, add or change the existing factory provided messages and/or create and input new and/or additional messages.

2. There are 30 message banks provided in the system message memory. The system message memory locations are designated by 2-digit codes numbered 10 through 39. The first eight locations, 10-17, are preprogrammed from the factory with standard type messages. Each message location is 16 characters in length.

3. The system message memory banks are configured as follows:



4. Additional information such as time, dates, extension numbers, and telephone numbers may be added to the existing messages at the time of actual use by the station user via the station dialpad.

5. System messages must be edited or created at the time of programming.

6. The program takes the following form:

KEY	NOTES
S 51	
, X1,X2	System MSG No. 10-39
, X3 to X18	Message to be edited, max 16 digits
, RTN	Step

960.3 PROGRAM S52 STATION USER NAME EDIT

1. The purpose of this program is to allow the system programmer to assign person's names to their associated stations or edit an existing name assigned to a station.

2. A person's name may be a total of 5 characters in length (so you may wish to abbreviate).

3. The program sequence takes the following form:

KEY	NOTES
S 52	
, X1X2	Station No. (10-69)
, X3X4X5X6X7	Station User's Name
, RTN	Step

SECTION 970
LCU PROGRAMS

970.1 PROGRAM S70 LCU VERIFICATION

1. The purpose of this program is to notify the system that there is an LCU circuit card present.

2. The system is factory programmed for no LCU, which means that the default data is 0 (no LCU circuit card installed).

3. The program sequence takes the following form:

KEY	NOTES
S	
70	
,	
X1	0 = No LCU circuit card present in the system 1 = LCU circuit card installed
RTN	

970.2 PROGRAM S71 SETTING LCU PAUSE TIMER

1. The purpose of this program is to determine the length of the pause needed. In some instances, it may be necessary to program a pause into a dialing sequence. An example of this would be in the case where OCC (i.e. MCI, Sprint) dialing takes place. When a pause is programmed into a dialing sequence, the length of the pause will be determined by the data input into Program S71.

2. This program takes the following form:

KEY
S
71
,
X1X2
,
RTN

3. Values for X1 and X2 are as follows:

Data		Definition
01	=	3 seconds
02	=	6 seconds
03	=	9 seconds
04	=	12 seconds (factory default)
:		: :
:		: :
20	=	60 seconds

Note: Factory provided data is "04" which means the timer is programmed for a duration of 12 seconds.

970.3 PROGRAM S72 ASSIGNMENT OF TENANT NUMBER

1. This program associates a particular tenant with each individual station class of service (COS).

2. In most system configurations, multiple stations will be assigned the same class of service. These common stations may be treated as groups or "Tenants" by the LCU circuit card for the purpose of simplifying the call routing procedures.

3. There are five tenants provided in the system. It is necessary to assign a tenant to each individual class of service. There are 32 classes of service.

4. The program takes the following form:

KEY	NOTES
S	
72	
,	
X1	Tenant number 1 to 5 may be entered 32 times for each COS
,	
RTN	

5. Factory default data is programmed for all classes of service (01 through 32) to be assigned to tenant group number "1".

The system programmer may assign any tenant to any class of service. An example of multiple tenant assignments would be:

Example:

COS		Tenant No.
01	=	1
02	=	2
03	=	3
04	=	4
05	=	5
06	=	1
07	=	2
08	=	4
:		:
:		:
:		:
32	=	5

Note: *This is not factory data represented. This is only an example configuration. Your system may be configured differently.*

970.4 PROGRAM S73 LCU RESET

1. The purpose of this program is to reset the LCU circuit card.

2. Resetting the LCU will interrupt any call processing taking place, restart the call processing procedure, and resume overall operation of the circuit card.

3. The program takes the following form:

KEY

S
73
,
RTN

970.5 PROGRAM S80 READ OR WRITE TENANT DATA

1. The purpose of this program is to read and write information into any tenant 1 to 5.

2. This program must be performed before inputting data into any of the Programs 81 to 90 for any given tenant 1 to 5.

3. A time of 40 seconds must be allowed before performing Programs 81 to 90.

4. After entering the necessary Programs 81 to 90, you must return back to Program 80 to write the information into the system.

5. Allow 40 seconds for the system to write the programmed data into the operating software.

6. The program takes the following form:

KEY	NOTES
S	
80	
,	
X	0 = Read 1 = Write
Y	Tenant Number 1 to 5
,	
RTN	

Example:
To read information from tenant number one:

KEY

S
80
0
1
,
RTN

Any of the LCU Programs from 81-90 can be performed at this time.

To write information into tenant number one:

KEY

S
80
1
1
,
RTN

970.6 PROGRAMS S81 TO 83 ASSIGNMENT OF ORPN DATA

1. The following programs are used to input allowable dialing digits on the LCU button. This sequence of programs will also assign a routing pattern to be taken. (Refer to Program S84).

2. Program S82 is used to input three digit area codes or three digit prefixes in states that do not require a "1" to be dialed first.

3. Program S82 is used in states that require a "1" plus a three digit prefix or a "1" plus the three digit area code.

   Note: *The system will automatically input the "1", do not enter the "1" before any prefixes or area codes.*

4. Program S83 is used for any number that requires a "0" plus the three digit prefix and a "0" plus the three digit area code. This program is mainly designed for international phone numbers.

   Note: *The system will automatically input the "0", do not enter the "0" before any prefixes.*

5. The program takes the following form:

KEY	NOTES
S	
NN	Program 81-83
,	
X1X2X3	Start No.
,	
Y1Y2Y3	End No.
,	
N	Change ORPN Table 1-7 (Refer to Program S84)
,	
RTN	

6. Factory default data there is no data in Programs S81, S82 and S83.

7. To clear all data tables S81 to S83 to factory default data, perform the following operations:

KEY

S
81
,
112
,
119
,
0
,
200
,
999
,
0
,
RTN

S
82
,
112
,
119
,
0
,
200
,
999
,
0
,
RTN

S
83
,
110
,
999
,
0
,
RTN

970.7 PROGRAM S84 ASSIGNMENT OF ORPN AND CALL CATEGORY TO TRUNK GROUP

1. This program is used to assign routing patterns (01 to 07) and its priorities using trunk groups.

2. There is a maximum of five priorities per ORPN.

3. Outgoing CO calls will be routed through the patterns according to the trunk group priorities programmed into the ORPN table (refer to Programs S81-S83).

4. If the preferred trunk group is busy then the next available trunk group will be assigned to the outgoing CO call. If all trunk groups are busy a busy tone will be received.

5. The program takes the following form:

KEY	NOTES
S	
84	
,	
X1X2	ORPN Numbers (01 to 07)
,	
X3X4X5X6	May be entered 5 times X3X4 = Call Category numbers (00 to 41) X5X6 = Trunk Groups (01 to 08)
,	
RTN	

Refer to Table 9-4 for call category assignments

970.8 PROGRAM S85 ASSIGNMENT OF AREA OFFICE CODE

1. The purpose of this program is to assign your own three digit area code from (000 to 999).

2. The program takes the following form:

KEY	NOTES
S	
85	
,	
X1X2X3	Area Code (000 to 999)
,	
RTN	

970.9 PROGRAM S86 NON-EQUAL ACCESS, ACCESS CODE, AUTHORIZATION CODE AND TELEPHONE NUMBER

1. The purpose of this program is to assign a long distance services number and authorization number to a call category (01 to 05).

2. The long distance services number and authorization number must be entered in two digit intervals with three SPD's put in between them. There is a maximum of nine entries.

3. The program takes the following form:

KEY	NOTES
S	
86	
,	
X1X2	Call Category (01 to 05) 01 = Call Category 37 02 = Call Category 38 03 = Call Category 39 04 = Call Category 40 05 = Call Category 41
,	
X3X4	
,	
X5X6	
,	
X7X8	
,	
X9X10	
,	
X11X12	
,	
X13X14	
,	
X15X16	
,	
X17X18	
,	
X19X20	
,	
RTN	

Example: When dialing 555-1212 12345 enter the following:

KEY
S
86
,
55
,
51
,
21
,
2SPD
,
SPD
SPD
,
12
,
34
,
5SPD
,
RTN

Note: X3 through X20 may be entered five times.

970.10 PROGRAM S87 EQUAL ACCESS, ACCESS CODE

1. The purpose of this program is to assign a three digit access code for Equal Access Codes.

2. Equal access codes will be found on the call category list (**Table 9-4**). Call category numbers 27 to 36 will be utilized for this program.

3. A maximum of 10 Equal Access Codes may be entered.

4. The program takes the following form:

KEY	NOTES
S	
87	
,	
X1X2X3	3 digit access code (up to 10 times)
,	
RTN	

970.11 PROGRAM S88 ASSIGNMENT OF OUTGOING WATS LINE BAND ACCESS CODE

1. The purpose of this program is to assign a two digit access code for outgoing WATS calls.

2. Access codes will be found on the call category list (**Table 9-4**). Call category numbers 10 to 15 will be utilized for this program.

3. A maximum of six access codes may be entered.

4. The program takes the following form:

KEY	NOTES
S	
88	
,	
X1X2	2 digit WATS Access Code
,	Step six times
RTN	

Note: The first access code refers to number 10 on the call category list. The second access code refers to number 11 on the call category list etc.

970.12 PROGRAM S89 DIAL "1" REQUIRED

1. The purpose of this program is to inform the system whether or not a "1" is required before an area code or prefix.

2. Factory default data is set for 0 which indicates a "1" before area code or prefix is not required.

3. The program takes the following form:

KEY	NOTES
S	
89	
,	
X1	0 = No (Factory) 1 = Yes
,	
RTN	

970.13 PROGRAM S90 ASSIGNMENT OF TYPE OF NON-EQUAL ACCESS CODES

1. The purpose of this program is to assign call categories (37 to 41) to a particular type of Non-equal Access Code (0-5).

Example:

Non-Equal Access Code	Call Categories
0	37 to 41 are MCI type
1	37 is ITT type, 28 to 41 are MCI type
2	38 is ITT type, 37, 39, 40 and 41 are MCI type
3	39 is ITT type, 37, 38, 40 and 41 are MCI type
4	40 is ITT type, 37, 38, 39 and 41 are MCI type
5	41 is ITT type, 27 to 49 are MCI type

2. The program takes the following form:

KEY	NOTES
S	
90	
,	
X1	Non-Equal Access Code (0 to 5)
,	
RTN	

Note: After all programs are preformed for a particular tenant, the information must be written back to the LCU circuit card via Program S80.

Table 9-1 COMMANDS

	COMMAND	NAME	MEANING	OPERATION	NOTE
	$\overline{O}$	OPEN COMMAND	Gets you into program mode	$\overline{O}$ $X_1X_2X_3X_4$ RTN	$X_1X_2X_3X_4$ User Identification Number 0000* ~ 9999 * (See Program No. 63)
	I	INITIAL PROGRAM LOADING (IPL) COMMAND	Provides Power reset for the System	I $X_1X_2X_3X_4$ RTN	User Identification Number. Used for momentary power reset.
	E	END COMMAND	Gets you out of program mode	E RTN	
	H	HELP COMMAND	Help command	H RTN	A list of system commands and programs will be printed (See table 3-1)
		BREAK COMMAND	Used to stop printing and cancel a program entry	ESC	If you want to stop Print Out.

Table 9-1 COMMANDS (cont.)

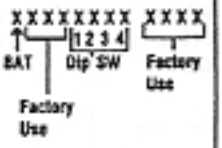
	COMMAND	NAME	MEANING	OPERATION	PRINT	NOTE
	C10	ROM VERSION	ROM Version Utilized in System	C10 RTN	X X	XX = 00 to 99 Displays ROM Version in System
	C11	DIP SWITCH POSITION	CPU Circuit Card Bit Switch setting and Lithium Battery Condition	C11 RTN		Battery Dip Switch: 0 = No Good 1 = Good Dip Switches 4,3,2,1 / 0 = On 1 = Off
	C12	RUNNING TIMER	CPU Run Time and Date since last power up	C12 RTN	DDDD HH MM	DDDD = DATE HH = HOUR MM = MINUTES
	C13	TROUBLE DATA	Hardware malfunctions	C13 RTN	KK DDDD HH MM SS VV	KK = KIND DDDD = DATE HH = HOUR MM = MINUTES SS = STACK NO. 1 to 5 VV = Version

Table 9-1 COMMANDS (cont.)

	COMMAND	NAME	MEANING	OPERATION	
	C14	SYSTEM CONSTRUCTION	This command will printout the system hardware, the quantity and version type of each circuit card in the system.	C14 RTN	
		EXAMPLE OF PRINTOUT: >C14 KSLV00 KSLV00 KSLV00 KSLV00 KSLCTT KSLCTT K = Kind of circuit card being utilized: 1 = STU 2 = COU 3 = ESU 4 = SMU 5 = LCU 6 = STATION SL = Stack location (1 to 5) V = Version Number C = Control Verification Number (6 = Marathon) TT = Type of Telephone (See table 3-2) 00 = Factory Use			

Table 9-1 COMMANDS (cont.)

	COMMAND	NAME	MEANING	OPERATION	PRINT	NOTE
	C15	CONTROL VERIFICATION NUMBER	Marathon System CPU Control Verification	C15 RTN	1 2 3 4 5 6 7 8 X X X X X X X [X] 0	Bit 8 = 1 = No control 0 = Marathon Control
	C16	RAM CHECK	Prints out the condition of the Systems RAM. Example: Broken RAM. If a Broken RAM is Found, Refer to Command C18.	C16 RTN	X	X = RAM CHECK: Good = 0 Bad = 1
	C17	TIME ADJUSTMENT	Time Adjustment For System Clock	C17,YY,MM,DD,HH,mm RTN		YY = Year MM = Month DD = Date HH = Hour mm = Minute
	C18	TROUBLE DATA CLEAR	Attempt to Clear Broken RAM, or Communication Break	C18 RTN		

Table 9-2

HELP COMMAND LIST

```
>H
   <SYSTEM COMMAND>
        O: OPEN COMMAND                    E:END COMMAND
        I:M-CPU IPL COMMAND                H:HELP PRINT COMMAND
        <ESC>:PRINT CANSEL COMMAND
   <SYSTEM STATUS PRINT COMMAND>
        C10:ROM VERSION                    C11:DIP SW
        C12:RUNNING TIME                   C13:FAULT INF.
        C14:SYSTEM INF.                    C15:TEL ID
        C16:RAM CHECK                      C17:UPDATE TIME
   <SYSTEM DATA MODIFY & PRINT COMMAND>
        S11(↑):USER DATA ALL CLR           S12(↑):USER DATA CLR
        S13(P):ICM CALLING                 S14(P):HOLD
        S15(P):HOLD ALARM TIME             S16(P):FLA TIME
        S17(P):CO CANSEL TIME              S18(P):DP LINE
        S19(P):DP SPEED                    S20(P):DP BREAK
        S21(P):FIP                         S22(P):RA ST
        S23(P):NA ST                       S24(P):CBU ST
        S25(P):CO TG                       S26(P):CLASS INDEX
        S27(P):ST CLASS                    S28(P)ALLOW (1)
        S29(P):ALLOW(2)                    S30(P):DISALLOW (1)
        S31(P):DISALLOW (2)                S32(P):NON SQUARE
        S33(P):DND                         S34(P):2ND RECALL
        S35(P):BRKG                        S36(P):AUTO ANSWER
        S37(P):UNA                         S40(P):SMDR INS/OUS
        S41(P):SMDR SPEED                  S42(P):SMDR UNIT
        S43(↑):OBSTRUCTION RESTORE         S44(↑):OBSTACLE TONE RES
        S45(↑):TIME ADJUST                 S50(↑):MSG RAM IPL
        S51(P):MSG EDIT                    S52(P):STNAME
        S70(P):LCU INS/OUS                 S71(P):LCU PAUSE TIME
        S72(P):LCU TENANT NO.              S80(↑):TENANT DATA READ
        S81(P):LCU NXX                     S82(P):LCU 1+NXX
        S83(P):LCU 0=NXX                   S84(P):LCU ORPN
        S85(P):LCU AREA CODE               S86(P):LCU N.E A/C
        S87(P):LCU E.Q A/C                 S88(P):LCU OUT WATS
        S89(P):LCU PREFIX                  S90(P):LCU SUFFIX
```

Table 9-3

MARATHON TELEPHONE DATA SHEET FOR RMU

12	Marathon	E-6 TEL	X	8	6F	
13		E-18 TEL	X	8	69	
14		E-30 TEL	X	8	6A	
15		E-6 TEL	O	8	67	
16		E-18 TEL	O	8	61	
17		E-30 TEL	O	8	62	
18		E-6 OA TEL	X	8	BF	
19		E-18 OA TEL	X	8	B9	
20		E-30 OA TEL	X	8	BA	
21		E-6 OA TEL	O	8	B7	
22		E-18 OA TEL	O	8	B1	
23		E-30 OA TEL	O	8	B2	
24		E-DSS		8		6D
25		E-EXPHONE		8	B3	
26		E-MSG PHONE	X	8	BC	
27		E-MSG PHONE	O	8	B4	
28						
29						
30						

Table 9-4

CALL CATEGORY LIST

No.		Description	No.		Description
01	STLC	Standard Local	22	FXTL1	FX Toll 1
02	HULC	High Use Local	23	FXTL2	FX Toll 2
03	FXLC1	FX Local 1	24	FXTL3	FX Toll 3
04	FXLC2	FX Local 2	25	FXTL4	FX Toll 4
05	FXLC3	FX Local 3	26	FXTL5	FX Toll 5
06	FXLC4	FX Local 4	27	EIC1	Equal Access 1
07	FXLC5	FX Local 5	28	EIC2	Equal Access 2
08	LCTL	Local Toll	29	EIC3	Equal Access 3
09	DDD	Direct Distance Dialing	30	EIC4	Equal Access 4
10	WATSC1	Wats Combined 1	31	EIC5	Equal Access 5
11	WATSC2	Wats Combined 2	32	EIC6	Equal Access 6
12	WATSC3	Wats Combined 3	33	EIC7	Equal Access 7
13	WATSC4	Wats Combined 4	34	EIC8	Equal Access 8
14	WATSC5	Wats Combined 5	35	EIC9	Equal Access 9
15	WATSC6	Wats Combined 6	36	EIC10	Equal Access 10
16	WATSD1	Wats Dedicated 1	37	NEIC1	No Equal Access 1
17	WATSD2	Wats Dedicated 2	38	NEIC2	No Equal Access 2
18	WATSD3	Wats Dedicated 3	39	NEIC3	No Equal Access 3
19	WATSD4	Wats Dedicated 4	40	NEIC4	No Equal Access 4
20	WATSD5	Wats Dedicated 5	41	NEIC5	No Equal Access 5
21	WATSD6	Wats Dedicated 6			

Table 9-5

MOTHER BOARD (MBD) LED INDICATORS

LED INDICATORS FOR THE RMU CIRCUIT CARD	
LED Name	**Description**
RMU Mode	This LED is used to indicate whether or not the system has been programmed for use with a modem **LED ON:** System is programmed for use with a modem **LED OFF:** System is not programmed for use with a modem
RMU Status	This LED is used to indicate the status of the RMU circuit card **LED ON:** RMU is on-line with terminal for programming **LED FLASHING:** The system has been programmed for RMU, but is not on-line with a terminal **LED OFF:** The system has not been programmed for RMU (perform program number 60)
CO Status	This LED is used to monitor the CO line used for remote programming **LED ON:** CO line to RMU circuit card is in use (on-line) **LED FLASHING:** There is an incoming call to the RMU circuit card **LED OFF:** CO line to RMU circuit card is idle

Table 9-6

RMU RS232 CABLE CONNECTIONS

On the RMU circuit card, there is a female 25-pin RS-232 connector used to interface the RMU circuit card with a terminal.

The ASCII code for the RMU circuit card is : Start Bit 1, Data Bit 3, Stop Bit 1. (ASCII Seven, No Parity Bit)

The pins of RMU circuit card are as follows:*

Pin 1	-	Frame Group (FG)
Pin 2	-	Transmitted Data (TXD)
Pin 3	-	Received Data (RXD)
Pin 4	-	Request to Send (RTS)
Pin 5	-	Clear to Send (CTS)
Pin 6	-	Data Set Read (DSR)
Pin 7	-	Signal Ground (SG)
Pin 8	-	Data Carrier Detect (DCD)
Pin 20	-	Data Terminal Ready (DTR)

Note: All pins are connected to a standard ASCII type data terminal (Texas Instrument Silent 700 or equivalent).

CHAPTER 10

TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
1. Erratic operation	1. System not initialized properly	1. Re-initialize in accordance with initialization instruction. Refer to **Chapter 1, Figure 1-42**
2. DSS operation same as if 30 button telephone (DSS buttons) operate as CO line keys or DSS LEDs erratic	1. DSS connected to wrong port *i.e.* can only be connected to port #2 and #3 of each STU	1. Re-connect DSS to ports #2 and #3
3. CPU run light/COU busy light flashing together. Station in continuous reset condition	1. Defective power supply *i.e.* incorrect voltage or fluctuating voltage	1. Connect line monitor to AC input to verify clean input
	2. Low AC voltage	2. Measure DC output voltage to power supply
4. CPU run light off or steady	1. Operational software (E-Proms U3-U6) not installed properly	1. Check installation of Eproms and PC board
	2. Bad DC/DC converter	2. Change CPU card to verify defective parts
	3. Damaged CPU *i.e.* cards plugged in with power on or cabling is short or wrong	3. Same as #2
	4. Power connector on CPU board is backwards	4. Re-connect internal power interface
	5. Power supply not connected to ESU #1, ESU #2, or internal power interface not connected to ECU	5. Re-confirm proper connection of all power interfaces

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
5. COU failure/TRBL light steady or flashing	1. COU malfunction	1. Swap-out for verification of malfunction
	2. COU communication error between CPU and COU	2. Same as #1
	3. System initialization required	3. Re-initialize system. Refer to Chapter 1, Figure 1-42
6. Lost Data: system assumed operation of factory data for specific programming instead of customized program.	1. Programming on-line while stations are in use (off-hook) requires you to re-enter data. See Programming Tips. There is no indication on DSS when customer data is not expected, only multiple beep-tones when pressing (#).	1. Review data for Ring Assignment Program #22 and #23
7. System Reset (Frequently/infreqently)	1. Improper system initialization	1. Re-initialize
	2. Power fluctuation initialization	2. Install Isolation transformer or power regulator. Relocate to dedicated power source.
	3. Defective power supply	3. Replace power supply
	4. AC line noise	4. AC line filter
	5. Power surges	5. Surge protector
	6. Lightning	6. Same as #4
	7. Electrical or mechanical interference	7. Consult WIN Technical Service Department
	8. Radio frequency interference	8. Install RFI filter
	9. System ground	9. Check star washer and ground

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
8. Erratic operation-system reset/ stations randomly accessing CO lines	1. Corrupted data in system RAM (Random Accessed Memory) due to system not initialized or initialized improperly	1. Re-initialize system
	2. Soft data due to defective software	2. Replace Software
	3. Defective CPU RAM or ECU RAM/- Defective CPU battery or ECU battery	3. Consult WIN Technical Service Department
9. 1KHZ (1000 cycle) continuous tone and all LEDs lit steadily on telephone station terminal (for E-6, E-18 and E-30)	1. Key short (out of box failure)	1. Consult WIN Technical Service Department for return and repair procedure
	2. Key depressed simultaneously while connecting the station line cord	2. Reset station by unplugging and replugging line cord
	3. Faulty station electronics	3. Swap out station to confirm trouble. Consult WIN Technical Service Department for return and repair procedure.
10. Cyclic repetition of station diagnostic sequence (resetting) LEDs sequencing, two beep tones after each cycle. LCD on Execs not functioning properly *i.e.* all 88888888 displayed	1. Key short (out of box failure)	1. Consult WIN Technical Service Department for return and repair procedure
	2. Keys depressed simultaneously while connecting the station line cord	2. Reset station by unplugging and replugging line cord
	3. Proper initialization procedure not followed	3. Refer to Chapter 1, Figure 1-42 for proper initialization
	4. ECU cabling to CPU improper or STU plugged in with power ON	4. Refer to Chapter 1, Section 130 for proper cabling procedure

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
10. (Continued)	5. Bad STU hardware	5. Swap-out STU with spare to verify , then return to **WIN** for repair
	6. Mis-communication between STU and CPU (possibly due to defective STU processor)	6. Same as #5
	7. Low DC Voltage at power input to KSU (from power supply)	7. Measure output voltage (DC) of power supply. Voltage should be approximately 29 volts unloaded
11. Station completes diagnostics and LED remain steady after two beep tones	1. Data pair reversed polarity	1. Correct data pair polarity
	2. STU lock up because of communication errors. STU unable to rectify problem internally	2. Swap-out STU with spare to verify, then consult **WIN Technical Service Department**
12. Executive station has no function	1. Data pair reversed polarity	1. Correct data pair polarity
	2. Data pair open (no connection)	2. Reconnect data pair
13. E-6 Tel, E-18 Tel, E-30 Tel, Exec and DSS are non-functioning	1. Data pair short circuit	1. Eliminate shorting cable and/or interface
14. No voice communication	1. Tip and Ring Short	1. Check for short location. Eliminate shorting cable and/or interface
	2. EMU not installed or installed incorrectly	2. Refer to Chapter 1, **Section 130** for correct installation and proper location of EMU cards

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
15. Station non-functional station trouble LED lights steady	1. DTA to T or R short	1. Locate short 2. Eliminate short from cabling and/or interface
16. Same as #7	1. DTB to T or R short	1. Same as #7 2. Same as #7
17. One-way communication to calling station from called station - low receive level	1. Tip or Ring disconnect at called station	1. Check cable for continuity
	2. Cable capacitance problem	2. Consult WIN Technical Service Department
	3. Bad transmitter or defective receiver or STU	3. Swap-out suspected part to verify defective operation
18. No LEDs flashing to indicate internal remote diagnostics	1. Station clock malfunction	1. Swap-out station to confirm, then consult WIN Technical Service Department for return/repair
19. Station busy light on	1. Steady - a station is busy	1. This is normal
	2. FLASHING - STU TRBL, Communication Error, STU CPU Failure, STU Hardware failure, Station or Terminal Communication Malfunction, No STU Communication between CPU	2. Check STU cabling, then change STU to verify malfunctioning part
20. Station TRBL light on	1. Cable short circuit	1. Verify proper cable connect
	2. Cross Connection	2. Check for cable continuity 3. Two stations must be unplugged to reset LED

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
21. BLF/Station CO LED's on steady	1. Damaged ECU card	1. Replace ECU
	2. ECU cabling incorrect	2. Check ECU cabling. Refer to Chapter 1, Section 150.
	3. System not re-initialized upon adding ESU	3. Re-initialize system. Refer to Chapter 1, Figure 1-42
		4. Swap-out ECU to verify part is malfunctioning
22. Improper or no access to COs	1. Line Key disabled	1. Re-program Line Key
	2. No COU card interfaced (in this case, busy tone heard)	2. Connect COU card
	3. COU incorrectly connected to ECU	3. Re-connect COU according to Installation Manual cabling diagram
	4. No EMU Card installed in ESU # 2 (In this case, busy tone heard)	4. Install EMU in ESU #2
23. Misdialing	1. Defective dial oscillator *i.e.* COU basis	1. Replace COU
	2. Defective dialpad	2. Replace station terminal
	3. DTMF tone burst duration too short	3. Consult WIN Technical Service Department for service information
24. No transmission on ICM card or oneway transmission	1. No EMU	1. Add EMU card to proper ECU
	2. EMU plugged into incorrect board	2. Unplug EMU and replug into proper ECU board
25. No LCD display (DSS/BLF)	1. Display control button off	1. Depress DISP CONT

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
26. No ring at attendant station	1. NA button on	1. Depress NA button
	2. CO not programmed to ring	2. Re-program ring assignment
	3. NA MODE activated primary station (Message light will be lit)	3. Go off-hook and depress "0"
27. Phantom Ringing	1. Station queue set and forgotten	1. Pick up handset and make connection, then hang up
	2. High off-hook voltage on trunks and voltage supervised lines	2. Consult **WIN Technical Service Department** for advice on how to verify with local operating company
	3. Ring timeout programmed for too long period of time	3. Shorten Ring-timeout period. Refer to **Chapter 1, Section 190.8**
	4. Radio Frequency Interference (RFI)	4. Consult **WIN Technical Service Department** for FCC requirements
	5. Electro Magnetic Interference due to electric motors, etc.	5. Consult **WIN Technical Service Department** for solution
	6. Peripheral equipment interfaced with trunks causing induced noise and false ringing due to surges (*i.e.* call diverters, call sequencers, call router, speed dialers, etc.)	6. Consult **WIN Technical Service Department** for information on equipment compatibility

TROUBLESHOOTING GUIDE (CONT.)

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
28. Cannot activate MSG Waiting function	1. No station connected to port - MSG LED extinguished	1. Connect station terminal
	2. When activating MSG, must depress station DSS within 5 seconds of MSG button	2. Depress MSG and try again
	3. Each MSG button associated with own DSS only *i.e.* must use 2 MSG buttons for 60 stations. Not true of NA and CBU	3. Depress correct MSG associated with that DSS only
29. Erratic ringing	1. Primary station accidentally put in night mode (even when DSS used)	1. Go off-hook on Ext. #10, then dial "0"
	2. Programming performed with stations in use without using proper procedure	2. Review and correct programmed data or re-enter program data
	3. Step by step Central Offices	3. Consult WIN Technical Service Department
30. Executive Telephone LCD "0000" (access to first 6 COs only)	1. Executive Telephone connection	1. Executive must be connected to Ports 1 through 8 only of each STU

APPENDIX A

PROGRAMMING TIPS

1. When programming station specific operation-related data such as:

   a. Line Key Assignments, Program # 32

   b. Ring Assignments (Day and Night) Programs #22 and #23

   c. P-Key Assignment, Program #32

When stations are off-hook, it is necessary to enter specific program data twice. The following are examples of hypothetical operation:

a. Suppose station #25 is off-hook (busy on a CO call).

b. You are presently programming Day-Ring Assignments and wish to program CO lines 1 through 6 to ring at station numbers #10 and #25.

c. Enter data "01" for CO line #1. The DSS LCD displays "01/10". This is correct since you wish to have CO line #1 ring at station #10.

d. Press "#" to step to next ring locations. The DSS LCD displays "01/21". If you do not want station 21 to ring, alter this data as follows:

e. Enter data "25" for next ring assigned station. The DSS LCD displays "01/25".

f. Enter "#" in order to step to next location. Notice that an error tone (Multiple beep-tones) is emitted from the programming station. This error tone is an indication that station #25 is in use. Therefore, the system requires verification that you wish to change the station's present operation. Notice the DSS display has not changed from "01/25". DO NOT press "#" again. This will only tell the system to pass this ring location and resume default data for this specific assignment.

g. Reenter the data "25" for ring assignment and press "#". Reentering the actual data a second time will tell the system to store this information for use when station #25 becomes idle (on-hook condition) again. At that time, the system will reload the newly stored

data into program #22 and assume the new operation for extension #25 with respect to its ring assignment.

2. Review programmed data upon completing programming. Many times information is entered incorrectly onto the dialpad due to human error. In addition, often stations are in use and proper programming procedures are not followed.

APPENDIX B

SPEAKERPHONE INSTALLATION

GENERAL

A MARATHON SPM (Speakerphone Module) may be installed in the MARATHON E-6, E-18 and E-30 telephones when CO handsfree calling is required.

INSTALLATION PROCEDURE

To install a MARATHON SPM:

1. Remove the modular line cord from the telephone.

2. Open the telephone by loosening two screws fastened at the base that secures the housing.

3. Place a MARATHON SPM into the card holder located on the upper middle of the base and plug a connector cable from the SPM into the connector CN40 located at the base as show in Figure B-1.

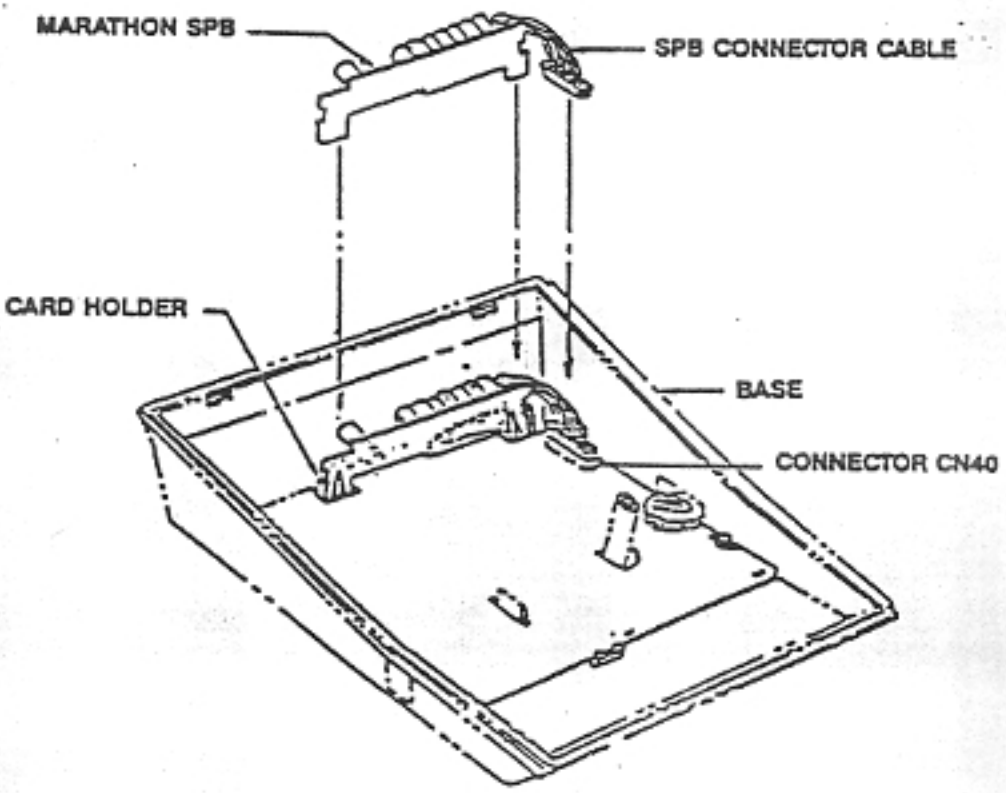


Figure B-1 Speakerphone Installation

APPENDIX C

WALL PHONE INSTALLATION

GENERAL

MARATHON E-6, E-18 and E-30 telephones may be wall mounted.

INSTALLATION PROCEDURE

To wall mount a MARATHON telephone, refer to Figure C-1.

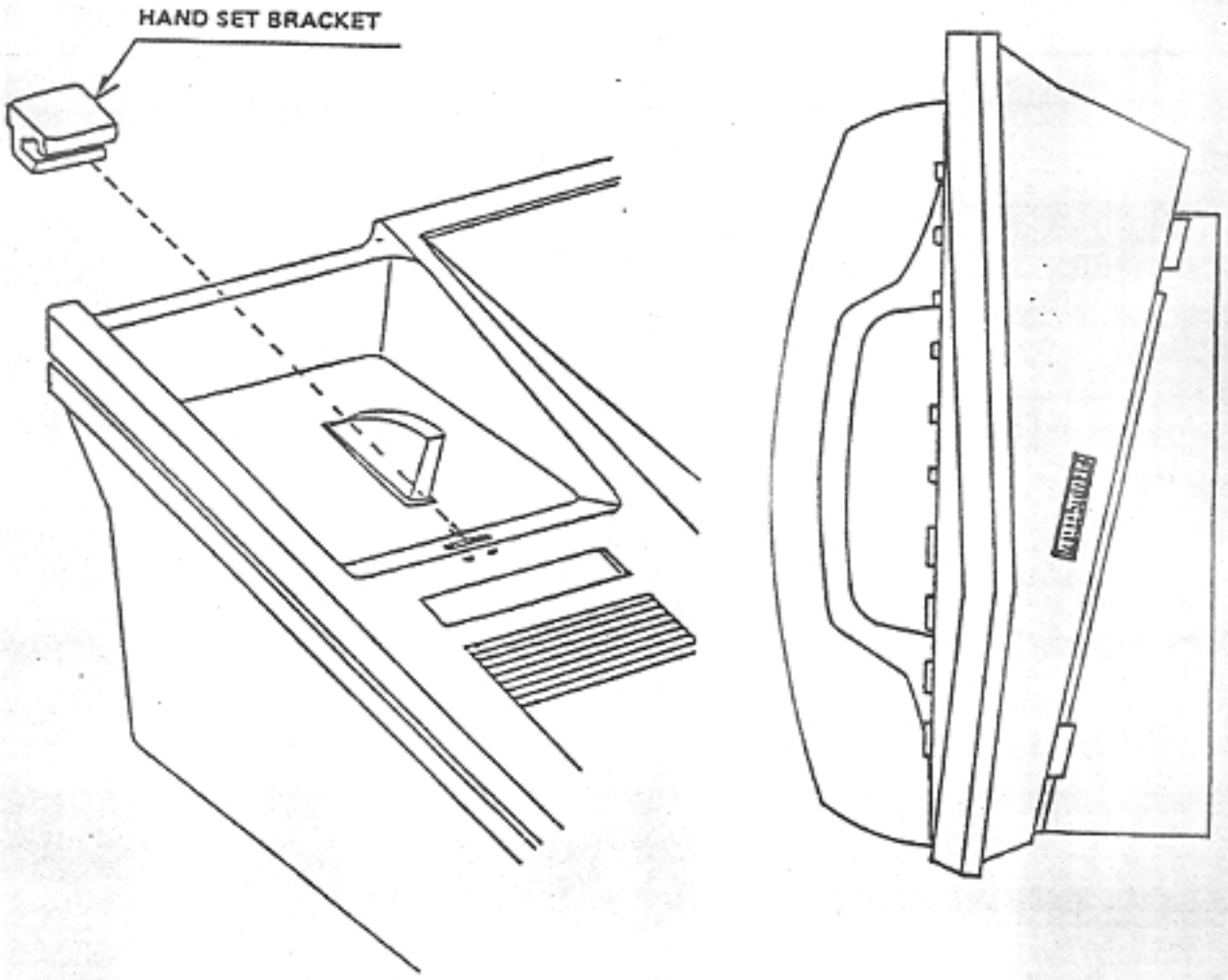


Figure C-1 Wall Phone Installation

APPENDIX D

GLOSSARY OF TERMS AND ACRONYMS

BLF - Busy Lamp Field

KSU - Key Service Unit

BTU - British Thermal Unit

C-MOS - Capacitive Metal Oxide Semiconductor

CO - Central Office

CONT DISP - Control Display

CO/PBX - Central Office/Private Branch Exchange

COS - Class of Service

COU - Central Office Line Unit

CPU - Central Processing Unit

Cradle - Handset rest (on-hook)

Dialpad - Keypad with digits 0-9, letters A-Z and characters * and #

Digital Key Pad - Same as Dialpad

DIP Switch - Dual Inline Package Switch

DP - Rotary Dial Pulse

DSS - Direct Station Select

DTMF - Dual Tone Multi Frequency

ECU - Expansion Control Unit

EMU - Expansion Matrix Unit

Enter - Depress appropriate key

Eprom - Electrically Programmable Read Only Memory

ESU - Expansion Service Unit

FCC - Federal Communications Commission

ICM - Intercom

Idle CO - Inactive Central Office Line

IPL - Initial Program Load

LCD - Liquid Crystal Display

LED - Light Emitting Diode

Line Key - Central Office Trunk Key

MDF - Main Distribution Frame

MOH - Music On Hold

ms - Millisecond

MSG - Message Key

Ohm - Value for (impedance) resistance to the flow of electrons

PBX - Private Branch Exchange

PGM - Program

PTC - Positive Temperature Coefficient Varistor

RAM - Random Access Memory

ROM - Read Only Memory

Semi Restrict - Modified Outgoing Dial Restriction

SPD - Speed Dial

SMU - Station Message Recording Unit

Splash Tone - Alerting Tone

STU - Station Terminal Unit

Tenants - Sharers of Service in the same Key System