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Electra **Elite** IPK II

System Hardware Manual

Empowered by Imagination

NEC

INT-1076 (IPK II)
Document Revision 1
(Release 1000)

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Technology Development

PREFACE

GENERAL INFORMATION

Congratulations! You have purchased the NEC Electra Elite IPK II System.

The feature-rich Electra Elite IPK II key system provides over 200 features including Computer Telephony Integration, Least Cost Routing, Automatic Call Distribution, T1, ISDN-BRI Voice Trunks, ISDN-PRI Voice Trunks, Voice over Internet Protocol, and many others.

The Electra Elite IPK II system provides what the customer needs today, and as business expands the system can be expanded to grow as well.

The Electra Elite IPK II system has a set of manuals that provide all the information necessary to install and support the system. This preface describes these manuals.

THIS MANUAL

This manual contains detailed instructions to install the Electra Elite IPK II KSUs, ETUs, Multiline Terminals, and optional equipment in the following chapters.

Chapter 1 – Regulatory Information

This chapter provides important regulatory information.

Chapter 2 – Introduction

This chapter provides an overview of the Electra Elite IPK II system.

Chapter 3– System Specifications

This chapter contains detailed specifications for the Electra Elite IPK II system and should be carefully reviewed by the technician ***before*** installing the system.

Chapter 4 – Hardware Requirements

This chapter contains the hardware requirements for the Electra Elite IPK II system and should be read by the technician ***before*** installing the system.

Chapter 5 – Installing KSUs

This chapter contains the information necessary for installing the basic and expansion KSUs. The technician should become familiar with this section **before** starting installation.

Chapter 6 – Installing ETUs (Circuit Cards)

This chapter contains instructions to install the Electronic Telephone Units (ETUs) in the Basic and Expansion KSUs.

Chapter 7 – Installing Electra Elite IPK II KSU Common Optional Equipment

This chapter provides information regarding Music on Hold, Station Background Music and external paging.

Chapter 8 – Installing Electra Elite IPK Multiline Terminals

This chapter describes the Electra Elite IPK Multiline Terminals that can be used with the Electra Elite IPK II system and provides installation instructions for each telephone.

Chapter 9 – Installing Electra Elite IPK II Optional Terminal Equipment

This chapter contains installation instructions for Electra Elite IPK II optional equipment that can be added to the system as a customer's business grows.

Chapter 10– Installing Electra Elite Multiline Terminals

This chapter describes the available Electra Elite Multiline Terminals that can be used with the Electra Elite IPK II system and provides installation instructions for each telephone.

Chapter 11 – Installing Electra Elite Optional Terminal Equipment

This chapter contains installation instructions for installing Electra Elite optional equipment that can be added to the Electra Elite IPK II as a customer's business grows.

Chapter 12 – Installing Single Line Telephones

This chapter describes the single line telephones that are compatible with the Electra Elite IPK II system. Installation instructions are provided where necessary.

Chapter 13 – Installing Cordless and Wireless Telephones

This chapter describes the cordless and wireless telephones that are compatible with the Electra Elite IPK II system and provides installation instructions where necessary.

Chapter 14 – System Maintenance

This chapter is a guide to help the technician troubleshoot and diagnose problems during and after system installation.

Appendix A – Glossary of Abbreviations

This chapter provides a list of commonly used abbreviations that are found throughout the manual.

SUPPORTING DOCUMENTS

Other manuals in the set are described below.

Electra Elite IPK II Features and Specifications Manual

This manual describes each available feature for the system.

Electra Elite IPK II General Description Manual

This manual contains general information about the system features, configuration and standards. This overview of the Electra Elite IPK II system is useful when presenting information to potential customers.

Electra Elite IPK II Programming Manual

This manual contains all programming instructions for the Electra Elite IPK II system.

Electra Elite IPK II PC Programming Manual

This manual describes the operation of the PCPro program for the Electra Elite IPK II key telephone system. This program is a user-friendly Windows application that allows the user to program and configure features of the Electra Elite IPK II KTS from the PC environment.

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TABLE OF CONTENTS
CHAPTER 1

Section 1	General Information	1-1
Section 2	Company Notification	1-1
Section 3	Incidence of Harm	1-2
Section 4	Radio Frequency Interference	1-3
Section 5	Hearing Aid Compatibility	1-3
Section 6	Direct Inward Dialing	1-3
Section 7	Voice Announcement/Monitoring Over DID Lines	1-4
Section 8	Music On Hold	1-4
Section 9	Service Requirements	1-4
Section 10	UL Regulatory Information	1-4
Section 11	Industry Canada Requirements	1-5
Section 12	Battery Disposal	1-6

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LIST OF TABLES
CHAPTER 1

Table 1-1 FIC, REN, SOC, and Jack Types for Electra Elite IPK II System ETUs 1-2

Table 1-2 Battery Types and Quantities for KSUs and ETUs 1-6

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Regulatory Information

CHAPTER 1

SECTION 1 GENERAL INFORMATION

Established Federal Communications Commission (FCC) rules permit this telephone system to be directly connected to the telephone network. A jack is provided by the telephone company. Jacks for this type of customer provided equipment are not provided on party lines or coin lines.

The telephone company may change technical operations and procedures. When such changes affect the compatibility or use of the Electra Elite IPK II system, the telephone company is required to give adequate notice of the changes.

SECTION 2 COMPANY NOTIFICATION

Before connecting this telephone system to the telephone network, the following information must be provided to the telephone company:

1. Your telephone Number.
2. FCC registration number:
   - When the system is to be installed as a Key Function system (no dial access to Trunk Groups/Route Advance Blocks), use the following number:

     NIFMUL-43074-KF-E
   - When the system is to be installed as a Multifunction system, use the following number:

     NIFMUL-43076-MF-E
   - When the system is to be installed as a PBX system, use the following number:

     NIFMUL-43075-PF-E
   - Ringer Equivalence Number (REN): **2.0B**
   - USOC jacks required: **RJ21X** and **RJ2GX**

The Facility Interface Code (FIC), Ringer Equivalent Number (REN), Service Order Code (SOC), and Jack for each interface ETU are listed in the following table:

Table 1-1 FIC, REN, SOC, and Jacks for Electra Elite IPK II System ETUs

Trunk/Station ETU Type	FIC	REN	SOC	Jack
BRT(4)-U( ) ETU	02IS5	N/A	6.0F	N/A
CAMA Trunk	02RV-O	0.7A	9.0F	RJ21X
COI(4)-U( ) ETU (Loop Start)	02LS2	0.7A	9.0F	RJ21X
COI(8)-U( ) ETU (Loop Start)	02LS2	0.7A	9.0F	RJ21X
COI(8)-U( ) ETU (Ground Start)	02GS2	0.7A	9.0F	RJ21X
COIB(4)-U(10) ETU for COI/COID Mode (Loop Start)	02LS2	0.7A	9.0F	RJ21X
COIB(4)-U(10) ETU for COI Mode (Ground Start)	02GS2	0.7A	9.0F	RJ21X
COIB(4)-U(20) ETU for COID/COI Mode (Loop Start)	02LS2	0.7A	9.0F	RJ21X
COIB(8)-U( ) ETU for COI/COID Mode (Loop Start)	02LS2	0.7A	9.0F	RJ21X
DID(4)-U( ) ETU	02RV2T	N/A	9.0F	RJ21X
DTI-U( ) ETU	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN	N/A	6.0P	N/A
OPX(2)-U( ) ETU	0L13C	N/A	9.0F	RJ21X
TLI(2)-U( ) ETU	TL31M	N/A	9.0F	RJ21X

SECTION 3 INCIDENCE OF HARM

When the system is malfunctioning, it could harm the telephone network. The telephone system should be disconnected until the problem can be determined and repair is made. When this is not done, the telephone company may temporarily disconnect service.

SECTION 4 RADIO FREQUENCY INTERFERENCE

In compliance with FCC Part 15 rules, the following statement is provided:

IMPORTANT NOTE

"This equipment generates, uses, and can radiate radio frequency energy and when not installed and used in accordance with the System Hardware Manual, may cause interference to radio communications. This equipment has been tested and approved for compliance with the limits for a Class B (except as noted below) computing device pursuant to Subpart J of Part 15 of FCC Rules, that provide reasonable protection against such interference when operated in a commercial environment. Operation of this telephone system in a residential area is likely to cause interference, in which case, the user, at his or her own expense, is required to take whatever measures may be required to correct the interference."

✎ *When equipped with the B64-U30 KSU and P64-U20 PSU, the Electra Elite IPK II can be operated as a Class B device except when using one of the ETUs in the following table. The system then becomes a Class A device that may not be used in a residential area.*

CCH(4)-U-10	CMS(2)/(4)-U30	FMS(2)/(4)/(8)-U30	HUB(8)-U( )
VMS(2)/(4)/(8)-U30			

SECTION 5 HEARING AID COMPATIBILITY

The NEC Multiline Terminals and NEC Single Line Telephones provided for this system are hearing aid compatible. The manufacturer of other Single Line Telephones for use with the system must provide notice of hearing aid compatibility to comply with FCC rules that prohibit the use of non-hearing aid compatible telephones.

SECTION 6 DIRECT INWARD DIALING

Operating this equipment without providing proper answer supervision is a violation of Part 68 of the FCC rules.

Proper Answer Supervision occurs when:

- This equipment returns answer supervision to the Public Switched Telephone Network (PSTN) when Direct Inward Dialing (DID) calls are:
  - Answered by the called station.
  - Answered by the Attendant.
  - Routed to a recorded announcement that can be administered by the Customer Premise Equipment (CPE) user.
  - Routed to a dial prompt.

- This equipment returns answer supervision on all DID calls forwarded to the Public Switched Telephone Network (PSTN). Permissible exceptions are:
  - A call is unanswered.
  - A busy tone is received.
  - A reorder tone is received.

SECTION 7 VOICE ANNOUNCEMENT/MONITORING OVER DID LINES

CAUTION

The use of monitoring, recording or listening devices to eavesdrop, monitor, retrieve or record telephone conversations or other sound activities, whether or not contemporaneous with its transmission, may be illegal in certain circumstances under federal or state laws. Legal advise should be sought prior to implementing any practice that monitors or records any telephone conversation. Some federal and state laws require some form of notification to all parties to the telephone conversation, such as using a beep tone or other notification methods, or require the consent of all parties to the telephone conversation, prior to monitoring or recording a telephone conversation. Some of these laws incorporate strict penalties.

SECTION 8 MUSIC ON HOLD

IMPORTANT NOTE

"In accordance with U.S. Copyright Law, a license may be required from the American Society of Composers, Authors and Publishers, or other similar organization, when radio or TV broadcasts are transmitted through the Music On Hold feature of this telecommunication system. NEC Unified Solutions, Inc., hereby disclaims any liability arising out of the failure to obtain such a license."

SECTION 9 SERVICE REQUIREMENTS

When equipment malfunctions, all repairs will be performed by NEC Unified Solutions, Inc. or by an authorized agent. The user must report the need for service to an NEC Unified Solutions, Inc. authorized agent or to NEC Unified Solutions, Inc.

SECTION 10 UL REGULATORY INFORMATION

This equipment has been listed by Underwriters Laboratories and complies with all applicable requirements of the standard for telephone equipment UL 1459.

SECTION 11 INDUSTRY CANADA REQUIREMENTS

Industry Canada has established rules that permit this telephone system to be directly connected to the telephone network. Prior to the connection or disconnection of this telephone system to or from the telephone network, the telephone company must be provided with the following information.

1. Your telephone number:

2. IC Certificate number: **140 7942 A**

3. Ringer Equivalence Number (REN) of the equipment: **2.1**

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the applicable Terminal Equipment Technical requirements document(s). The Department does not guarantee that equipment operates to user satisfaction.

Before installation, the user should ensure that it is permissible to connect this equipment to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, when present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

Users should not attempt to make such connections themselves, but should contact the applicable electric inspection authority, or electrician.

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalent Numbers of all the devices does not exceed 5.

This equipment is listed by the Canadian Standards Association and complies with all applicable requirements of the standard for telephone equipment C 22.2 No. 225.

This equipment meets IC requirements CS03.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as regulated by the radio interference regulations of Industry Canada.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte par Industrie Canada.

SECTION 12 BATTERY DISPOSAL

The Electra Elite IPK II system includes the batteries listed below. When disposing of these batteries, KSUs, and/or ETUs, you must comply with applicable federal and state regulations regarding proper disposal procedures.

Table 1-2 Battery Types and Quantities for KSUs and ETUs

Unit Name	Type of Battery	Quantity
B64-U20 KSU	Lead Acid	2
CPUII( )-U10 ETU	Lithium	1
CTI/VP(4)/(8)/(12)/(16)-U( ) ETU	Lithium	1
IVR(4)/(8)/(12)/(16)-U( )	Lithium	1
DTP-1HM-1 TEL DTP-1HM-2 TEL	Lithium	1
DTP-16HC-1 TEL	Nickel-Cadmium	1
DTR-1HM-1 TEL	Lithium	1
DTH-4R-1/2 TEL	Nickel-Cadmium	1
DTR-4R-1/2 TEL	Nickel-Cadmium	1
DTU-4R-1 TEL	Lead Acid	1
FMS(2)/(4)/(8)-U( ) ETU	Nickel-Cadmium	1
VMS(2)/(4)/(8)-U( ) ETU	Lithium	1

The Electra Elite IPK II CPUII( )-U10 ETU provides memory backup for approximately 21 days. The Lithium battery should be replaced about every two years.

IMPORTANT SAFEGUARDS FOR BATTERY DISPOSAL

DO NOT PLACE USED BATTERIES IN YOUR REGULAR TRASH! THE PRODUCT YOU PURCHASED CONTAINS A NICKEL-CADMIUM OR SEALED LEAD BATTERY. NICKEL-CADMIUM OR SEALED LEAD BATTERIES MUST BE COLLECTED, RECYCLED, OR DISPOSED OF IN AN ENVIRONMENTALLY SOUND MANNER.

The incineration, landfilling or mixing of nickel-cadmium or sealed lead batteries with the municipal solid waste stream is PROHIBITED BY LAW in most areas. Contact your local solid waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the battery.

Nickel-Cadmium (or sealed lead) batteries must be returned to a federal or state approved nickel-cadmium (or sealed lead) battery recycler. This may be where the batteries were originally sold or a local seller of automotive batteries. Contact your local waste management officials for other information regarding the environmentally sound collection, recycling and disposal of the battery contained in this product. For Ni-Cd batteries, you can also call 1-800-8-BATTERY^{SM} if further information is required.

The packaging for the Electra Elite IPK II system contains the following labels regarding proper disposal.

PRODUCT PACKAGE LABELING

Ni-Cd

CONTAINS NICKEL-CADMIUM BATTERY. BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY. MUST NOT BE DISPOSED OF IN MUNICIPAL WASTE.

Pb

CONTAINS SEALED LEAD BATTERY. BATTERY MUST BE RECYCLED. MUST NOT BE DISPOSED OF IN MUNICIPAL WASTE.

Ni-MH

CONTAINS NICKEL-METAL HYDRIDE BATTERY. BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY. MUST NOT BE DISPOSED OF IN MUNICIPAL WASTE.

TABLE OF CONTENTS
CHAPTER 2

Section 1 General Information 2-1

1.1 Unique Design 2-1

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LIST OF FIGURES
CHAPTER 2

Figure 2-1 System Configuration Example 2-3

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Introduction

CHAPTER 2

SECTION 1 GENERAL INFORMATION

1.1 Unique Design

The Electra Elite IPK II system is a powerful key system that meets the ever changing business communications demands of today. Unique compact design allows it to be easily and quickly installed.

The Electra Elite IPK II system can grow with your business. You can easily and economically increase port size when necessary. Two expansion units can be added when the CPUII( )-U10 ETU is installed in the basic cabinet. A full-blown system includes the basic and two expansion units.

Electra Elite IPK II is a feature-rich system that provides telephone functions and supports advanced features such as:

- ❑ Automatic Number Indication (ANI)/Caller ID
- ❑ Automatic Call Distribution (ACD)
- ❑ Automatic Route Selection
- ❑ Caller ID Call Return
- ❑ Centralized Voice Mail
- ❑ Computer Telephony Integration (CTI)
- ❑ Dialed Number Indication Service (DNIS)
- ❑ *D*^{term} Analog Cordless Terminal
- ❑ *D*^{term} Cordless II Terminal
- ❑ *D*^{term} Cordless Lite II Terminal
- ❑ *D*^{term} Handset Cordless
- ❑ *D*^{term} Headset Cordless
- ❑ Emergency 911 – Cut Through
- ❑ Enhanced 911
- ❑ Integrated Digital Voice Mail

- ISDN-BRI and ISDN-PRI Voice Trunks
- K-CCIS Common Channel Interoffice Signaling
- Least Cost Routing
- Live Monitoring
- Live Record
- Multiline Conference Bridge
- Multilingual LCD Indication
- Multiple Music on Hold Using CO Interface
- PC Attendant Console
- Unified Messaging
- Voice over Internet Protocol (VoIP)
- Wireless

The Electra Elite IPK II system offers a variety of compatible 8-line, 16-line, and 32-line Multiline Terminals with/without LCD. A 2-line non-LCD terminal and a 60-line Attendant Console are also available.

A customer with existing Electra Elite or Electric Elite IPK terminals can easily connect them to the Electra Elite IPK II system to provide inexpensive migration. Most Electra Elite IPK II system features are available with the Electra Elite or Electric Elite IPK Multiline Terminals.

The Electra Elite IPK II system supports a wide range of additional equipment such as Single Line Telephones, external speakers, facsimile machines, external microphones, and headsets that can be connected to the system to accommodate individual customer needs. The diagram in Figure 2-1 System Configuration Example shows an Electra Elite IPK II system with standard and optional equipment (some locally provided).

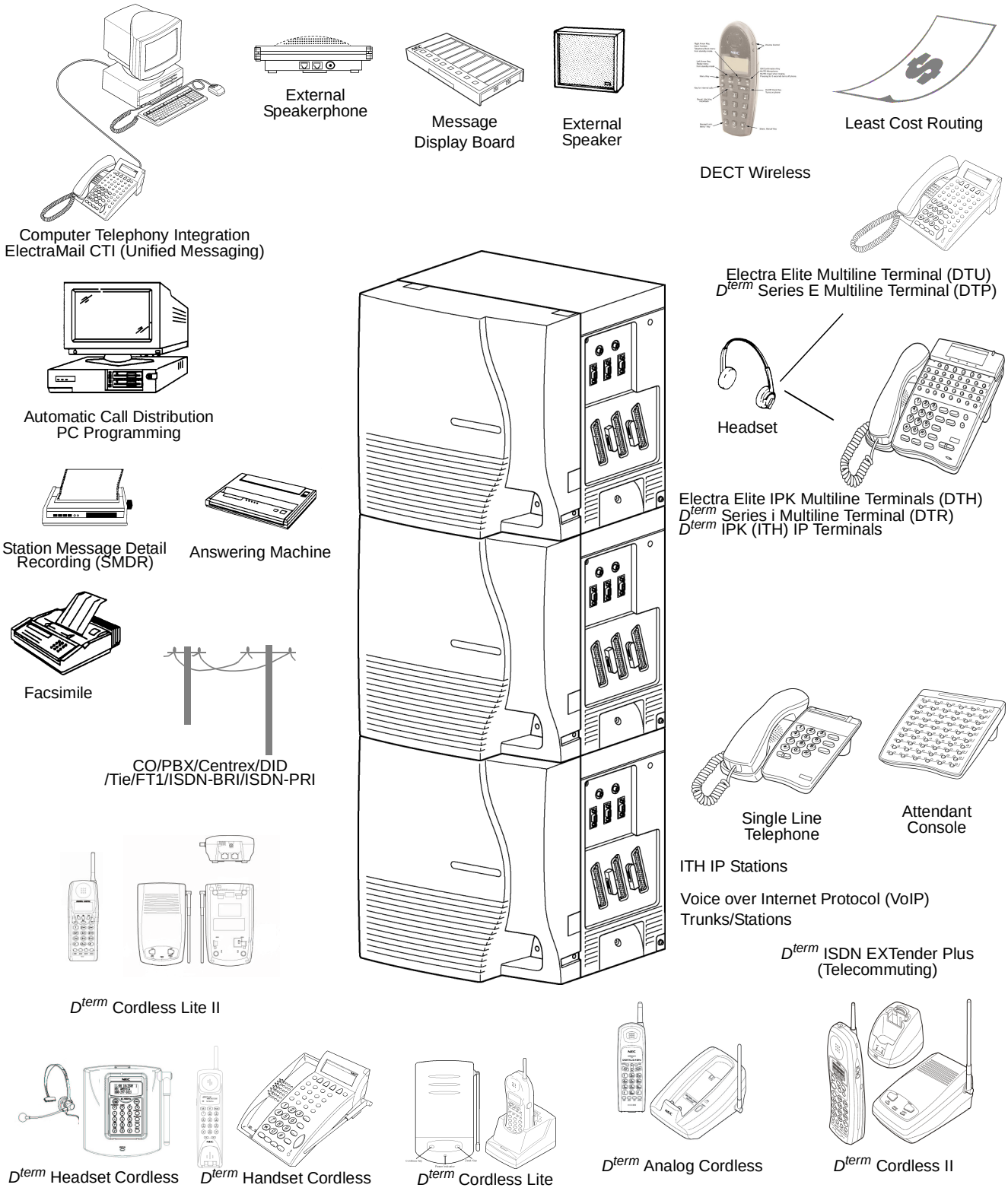

Figure 2-1 System Configuration Example

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TABLE OF CONTENTS
CHAPTER 3

Section 1 General Information 3-1

Section 2 System Block Diagram 3-1

Section 3 Maximum System Capacities 3-5

Section 4 KSU Power-Based Calculator Chart 3-17

Section 5 System Requirements and Specifications 3-21

5.1 Cabling Requirements and Specifications 3-21

5.2 Cabling Precautions 3-23

5.2.1 Cable Placement 3-23

5.2.2 Environmental Conditions 3-24

5.3 Power Requirements 3-24

5.3.1 Power Supply Inputs 3-24

5.3.2 Power Supply Consumption 3-24

5.4 Outside Line Types 3-25

5.5 Transmission, Network, and Control Specifications 3-25

5.5.1 Transmission 3-25

5.5.2 Network 3-26

5.5.3 Control 3-26

5.5.4 Electra Elite IPK Terminals and Equipment 3-26

5.5.5 Series i Terminals 3-27

5.6 Dialing Specifications 3-28

5.6.1 Dial Pulse Address Signaling 3-28

5.6.2 Dual-Tone Multifrequency (DTMF) Address Signaling 3-28

5.7 Battery Backup 3-29
5.7.1 System Backup 3-29
5.7.2 Memory Backup 3-29
5.8 Weights and Dimensions 3-29
5.9 External Equipment Interface 3-34
5.9.1 Music on Hold/Station Background Music 3-34
5.9.2 Music for Station BGM using Analog CO Trunk ETU (COI, COIB, or COID) 3-34
5.9.3 External Paging (Audio) 3-34
5.9.4 External Tone Ringer/Night Chime Output 3-34
5.9.5 SMDR Output 3-34
5.9.6 PC Connection 3-34
5.9.7 ACD/MIS Connector 3-34
5.9.8 Relay Contact 3-34
5.10 Audible and Visual Indications 3-35
5.10.1 Tone Patterns 3-35
5.10.2 LED Flash Patterns 3-35

LIST OF FIGURES AND TABLES
CHAPTER 3

Table 3-1 List of Abbreviations 3-1

Figure 3-1 System Block Diagram 3-4

Table 3-2 Maximum System Capacities for Station Interface ETUs 3-5

Table 3-3 Maximum System Capacities for Trunk Interface ETUs 3-11

Table 3-4 Maximum System Capacities for Application Interface ETUs 3-15

Table 3-5 KSU Power-Based Calculator Chart 3-18

Table 3-6 Electra Elite IPK/*D*^{term} Series i Multiline Terminal Loop Resistance and Cable Length 3-21

Table 3-7 Electra Elite/*D*^{term} Series E Multiline Terminal Loop Resistance and Cable Length 3-22

Figure 3-2 Connecting the ESI Using Twisted 2-Pair Cable 3-22

Table 3-8 Cable Connection Between the Analog Port and the Single Line Equipment 3-23

Table 3-9 Cabling Requirements 3-23

Table 3-10 Power Consumption 3-24

Table 3-11 Fuse Replacement 3-25

Table 3-12 Weights and Dimensions 3-29

Table 3-13 Tone Patterns 3-36

Table 3-14 Multiline Terminal LED Flash Patterns 3-37

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System Specifications

CHAPTER 3

SECTION 1 GENERAL INFORMATION

This chapter provides detailed specifications for the Electra Elite IPK II system technician. The technician should review this information carefully ***before*** installing the system.

SECTION 2 SYSTEM BLOCK DIAGRAM

Figure 3-1 System Block Diagram shows the ETUs that can be installed in the KSU and the number of channels supported when the ETU is installed. Table 3-1 List of Abbreviations lists abbreviations used in the diagram.

Table 3-1 List of Abbreviations

Abbreviation	Description
ACD	Automatic Call Distribution
BRT	Basic Rate Trunk Interface
BSU(2)/BSU(4M) BSU(2S)/BSU(6S)	Base Station Unit
CCH	Common Channel Handler (K-CCIS)
CF	Compact Flash
CNF(8)	Multiline Conference Bridge
CNF(16)	Multimedia Conference Bridge
COI	Central Office Interface
COIB	Central Office Interface (COI/COID mode)
COID	Central Office Interface with Caller ID
COM	Communication
CPU	Central Processing Unit
CTA	Computer Telephony Adapter

Table 3-1 List of Abbreviations (Continued)

Abbreviation	Description
CTI/VP, FMS, VMS, CMS, CTP, IVR, VMP	Voice Mail
DID	Direct Inward Dialing
DTI	Digital Trunk Interface
ESI/ESIB/ESIE	Electronic Station Interface
ETU	Electronic Telephone Unit
EXP	KSU Expansion Controller ETU
EXPT	System Expansion ETU for K-CCIS
FT1	Fractional T1
HDLC	High Level Data Link Control
HFU	Handsfree Unit
HUB	Optional Hub Ethernet Interface
IAD	Optional Integration Device
ISDN	Integrated Services Digital Network
LAN	Local Area Network
MDF	Main Distribution Frame
MG-16	Media Gateway
MIC	Microphone
MOH	Music On Hold
OPX	Off-Premise Extension
PC	Personal Computer
PCM	Pulse Code Modulation
PGD(2)-U10 ADP	Two circuit module for MOH, External Paging, and Doorphones
PKU	Port Key Unit
PRT	Primary Rate Trunk
PVA	Packet Voice Application
SLI/SLIB/SLIE	Single Line Interface
SLT	Single Line Telephone
SPK	Speaker

Table 3-1 List of Abbreviations (Continued)

Abbreviation	Description
TLI	Tie Line Interface
VM/VMP	Voice Mail
VoIP	Voice over Internet Protocol

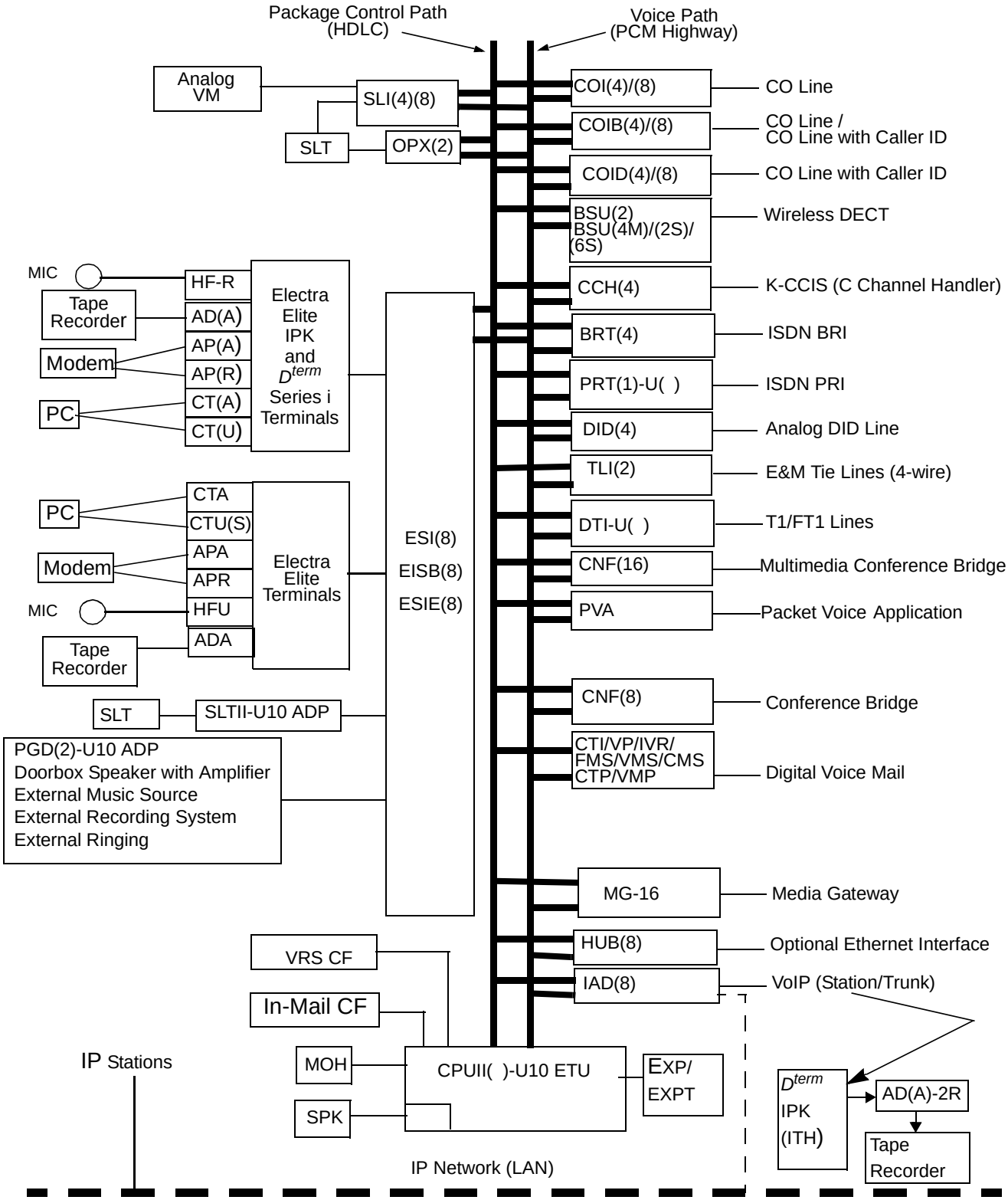


Figure 3-1 System Block Diagram

SECTION 3 MAXIMUM SYSTEM CAPACITIES

The maximum capacities available in the Electra Elite IPK II system are shown Table 3-2 Maximum System Capacities for Station Interface ETUs, Table 3-3 Maximum System Capacities for Trunk Interface ETUs and Table 3-4 Maximum System Capacities for Application Interface ETUs.

Table 3-2 Maximum System Capacities for Station Interface ETUs

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
CMS(2)/(4)-U( ) ETU	2- or 4-Port Digital Voice Mail System	1	1	Notes 1~4, 6
CNF(8)-U( ) ETU	8-Port Conference Unit. This Multiline Conference Bridge allows any intercom user or outside party calling to a port of the CNF(16)-U20 ETU to join or make a multiparty Conference Call. Each ETU supports one 8-party conference or two 4-party conferences regulated by a switch setting. This ETU is installed in slots S1~S8 in the B64-U20 KSU. The system recognizes this ETU as an SLI(8)-U( ) ETU. This ETU shares the total number of station ports in the system.	2	2	Notes 1, 4, 6
CNF(16)-U20 ETU	16-Port Multimedia Conference Unit. This Multiline Conference Bridge can support 8 or 16 ports. Each 8-port ETU supports one 8-party conference or two 4-party conferences. Each 16-port ETU supports one 16-party conference, two 8-party conferences, one 6-party and two 5-party conferences, or four 4-party conferences. This ETU is installed in slots S1~S8 in the B64-U20 KSU. The system recognizes this ETU as a CNF( )-U20 ETU. This ETU shares the total number of station ports in the system.	1	1	Notes 1, 4, 6

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
CTI(4)/(8)-U( ) (System) ETU	This ETU is a 4- or 8-Port Digital Voice Mail system with ports that support TeLANophy, inbound or outbound faxing, and Hospitality/ HVM applications. It is installed in an interface slot. This ETU shares the total number of station ports in the system.	1	1	Notes 1, 3, 4, 6
CTI(12)/(16)-U( ) (Daughter) ETU	This ETU and the 4- and 8-port ETU provide a 12- or 16-port is a 12- or 16-Port Digital CTI System Digital Voice Mail system with ports that support TeLANophy, inbound or outbound faxing, and Hospitality/ HVM applications. It is installed in any interface slot. This ETU shares the total number of station ports in the system.	1	1	Notes 1, 3~5, 6
CTP(4)/(8)-U( ) ETU CTP(12)/(16)-U( ) ETU	This ETU is a multiplatform system that supports a maximum of 16 ports. It is a PC platform that contains data storage for voice recording and application software. A digital signal processor/voice processing section handles the following functions: • DTMF detection and generation • General tone detection • FAX CNG tone detection • PCM compression for audio recording/playback • Automatic Gain Control (AGC) • Two USB 1.0 ports for USB keyboard and mouse support • One 15-pin VGA Connector for VGA monitor support One DSP8-U10 ETU is required for 8-ports. Two DSP8-U10 ETUs are required for 12- or 16-ports.	1	1	Notes 1, 3, 4, 6
DSPII-U10 Unit with In-Mail 2-port or In-Mail 4-port Compact Flash card installed.	This unit is a daughter board that is installed on the CPUII( )-U10 ETU and is used for the VRS or In-Mail Compact Flash	1	1	7
ESI(8)-U( ) ETU	8-Port Electronic Station Interface	7	23	

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
ESIB(8)-U( ) ETU	This 8-Port Electronic Station Interface ETU contains eight circuits. Each circuit can support any Attendant Console, Multiline Terminal, or Single Line Telephone adapter. This ETU is installed in slots S1~S8 in the basic or expansion B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of extension ports in the system	7	23	Notes 1, 6
ESIB(8)-U( ) ETU with ESIE(8)-U( ) ETU	These ETUs are a 16-Port Electronic Station Interface. The ESIE ETU is installed on ESIB ETU. This Electronic Station Interface ETU contains eight circuits. Each circuit can support any Attendant Console, Multiline Terminal, or Single Line Telephone adapter. This ETU is installed in slots S1~S8 in the basic or expansion B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of extension ports in the system.	3	15	Notes 1, 6
FMS(2)/(4)-U( ) ETU	This 2- or 4-Port Digital Voice Mail System is installed in any interface slot. It has eight channels of built-in Voice Mail. The system recognizes this ETU as a VMS(4)-U( ) ETU. This ETU shares the total number of station ports in the system.	1	1	Notes 1~4, 6
FMS(8)-U( ) ETU	This 8-Port Digital Voice Mail System is installed in any interface slot. It has two or four channels of built-in Voice Mail. The system recognizes this ETU as a VMS(8)-U( ) ETU. This ETU shares the total number of station ports in the system.	1	1	Notes 1, 3, 4, 6

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
IVR Application [VMP(4)/(8)-U( ) ETU with IVR HDD Kit]	This Interactive Voice Response ETU has four ports to support IVR applications. When the DSP-U( ) module is attached, eight ports are available. It is installed in any interface slot. This ETU shares the number of station ports in the system.	1	1	Notes 1, 3, 4, 6
OPX(2)-U( ) ETU	This 2-Port Off-Premise Extension Interface ETU provides termination and operation of two off-premise extensions. Each ETU has a built-in ringer signal generator (RSG). Up to 1600 ohms of resistance (including the Single Line instrument) is acceptable between the OPX ETU and the Single Line Telephone. This ETU is installed in slots S1~S8 in any B64-U20 KSU and shares the number of station ports in the system.	6	22	Note 1, 2, 6
SLI(4)-U( ) ETU	This 4-Port Single Line Interface ETU supports four Single Line Telephones and/or analog voice mail ports. Each ETU provides a built-in ringer signal generator (RSG) and Message Waiting (MW) LED voltage to Single Line Telephones. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of station ports in the system.	12	22	Notes 1, 6

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
SLI(8)-U( ) ETU	This 8-Port Single Line Interface ETU supports eight Single Line Telephones and/or analog voice mail ports. Each ETU provides a built-in ringer signal generator (RSG) and Message Waiting (MW) LED voltage to Single Line Telephones. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of station ports in the system.	6	22	Notes 1, 6
SLIB(4)-U( ) ETU	This 4-Port Single Line Interface ETU supports four Single Line Telephones. Each ETU provides a built-in ringer signal generator (RSG) and Message Waiting (MW) LED voltage to Single Line Telephones. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of station ports in the system.	12	22	Notes 1, 6
SLIB(4)-U( ) ETU with SLIE(4)-U( ) ETU installed	These ETUs are an 8-Port Single Line Interface. The SLIE ETU is installed on the SLIB ETU, and they support eight Single Line Telephones with built-in ringer signal generator (RSG) and Message Waiting (MW) LED voltage to Single Line Telephones. This combination ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other station ETUs installed. This ETU shares the total number of station ports in the system.	6	22	Notes 1, 6

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
VMS(2)/(4)-U( ) ETU	This 2- or 4-Port Digital Voice Mail System is installed in any Interface slot. It has two or four channels of built-in voice mail. The system recognizes this ETU as a VMS(4)-U( ) ETU. This ETU shares the total number of station ports in the system.	1	1	Notes 1~4, 6
VMS(8)-U( ) ETU/	This 8-Port Digital Voice Mail System is installed in any Interface slot. It has eight channels of built-in voice mail. The system recognizes this ETU as a VMS(8)-U( ) ETU. This ETU shares the total number of station ports in the system.	1	1	Notes 1, 3, 4, 6
VP(4)/(8)-U( ) (System) ETU	This 4- or 8-Port Digital Voice Mail System has ports that support TeLANophy, inbound/outbound faxing, and Hospitality/HVM applications. It is installed in any interface slot and shares the total number of station ports in the system.	1	1	Notes 1, 3, 4, 6
VP(12)/(16)-U( ) (Daughter) ETU	This 12- or 16-Port Digital Voice Mail System and the 4- or 8-port provide a 12- or 16-port Digital Voice Mail System with ports that support TeLANophy, inbound/outbound faxing, and Hospitality/HVM applications. It is installed in any interface slot and shares the total number of station ports in the system.	1	1	Notes 1,3~6,

Table 3-2 Maximum System Capacities for Station Interface ETUs (Continued)

Station Interface Units	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	

Note 1: Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Note 2: When 2-port Station Interface ETUs are installed, the system uses four ports from its maximum port capacity.

Note 3: Only one CMS, FMS, VMS, VP, CTI, CTP, IVR system can be installed in one Electra Elite IPK II system.

Note 4: A maximum of 32 Digital Voice Mail ports are available.

Note 5: Two physical Interface Slots are used for the EliteMail VP 12/16-port system and the EliteMail CTI 12/16-port system.

Note 6: Refer to the KSU Power-Based Calculator Chart.

Note 7: When the DSPII-U10 Unit with an In-Mail 2- or 4-port Compact Flash is installed on the CPUII( )-U( ) ETU, it uses four ports from the maximum station port capacity.

Table 3-3 Maximum System Capacities for Trunk Interface ETUs

Trunk Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
BRT(4)-U( ) ETU	This 4-Port Basic Rate Interface for 8 trunks provides four channels (eight voice channels) for an ISDN-Basic Rate Interface. Caller ID is supported. This ETU is installed in slots S1~S4 in the basic or first expansion B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU shares the total number of CO/PBX lines in the system.	7	23	Notes 1, 6
COI(4)-U( ) ETU	This 4-Port CO/PBX Line Interface has built-in fuses (posistors), supports four outside (CO/PBX) lines, and provides circuitry for ring detection, holding and dialing. The outside lines must be Loop Start DTMF trunks. This ETU is installed in slots S1~S8 in the basic or expansion B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU can provide an E911 CAMA trunk. This ETU shares the total number of CO/PBX lines in the system.	14	23	Note 1
COI(8)-U( ) ETU	This 8-Port CO/PBX Line Interface has built-in fuses (posistors), supports eight outside (CO/PBX) lines, and provides circuitry for ring detection, holding and dialing. The outside lines must be Ground Start DTMF trunks. This ETU is installed in slots S1~S8 in the basic or expansion B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU can provide an E911 CAMA trunk. This ETU shares the total number of CO/PBX lines in the system.	7	23	Note 1

Table 3-3 Maximum System Capacities for Trunk Interface ETUs (Continued)

Trunk Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
COIB(4)-U( ) ETU	This 4-Port CO/PBX Line Interface can function the same as the COI(4) or COID(4) ETU to provided a Central Office Interface. When set for COID mode, Loop Start DTMF trunks and/or Caller ID trunks are supported, and the ETU supports loop start only. When the ETU is set for COI mode, loop start or ground start DTMF trunks are supported, but Caller ID is not supported. Connections for ground start trunks are polarity sensitive. This ETU can provide an E911 CAMA trunk. For COID mode, Caller ID trunks must be installed in slots S1~S4. This ETU shares the total number of CO/PBX lines in the system. Tip and Ring electrical fuses are provided to comply with UL 1459 requirements.	14	23	Notes 1, 3
COIB(8)-U( ) ETU	8-Port CO/PBX Line Interface can function the same as the COI(4) or COID(4) ETU to provided a Central Office Interface. When set for COID mode, Loop Start DTMF trunks and/or Caller ID trunks are supported, and the ETU supports loop start only. When the ETU is set for COI mode, loop start or ground start DTMF trunks are supported, but Caller ID is not supported. Fax CO Branch is not supported. Connections for ground start trunks are polarity sensitive. Only DTMF signaling is supported. This ETU can provide an E911 CAMA trunk. For COID mode, Caller ID trunks must be installed in slots S1~S4. This ETU shares the total number of CO/PBX lines in the system. Tip and Ring electrical fuses are provided to comply with UL 1459 requirements.	7	23	Note 1

Table 3-3 Maximum System Capacities for Trunk Interface ETUs (Continued)

Trunk Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
DID(4)-U( ) ETU	This 4-Port Direct Inward Dialing Interface supports four DID or four two-way DID lines. Each ETU requires one interface slot in the KSU. Immediate, wink start, second dial tone, and delay dial signaling can be combined on this ETU. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU shares the total number of CO/PBX lines in the system.	14	23	Notes 1,4
DTI-U40 ETU for DTI Function DTI-U40 ETU for PRI Function	This T1/FT1 Trunk Interface or ISDN-Primary Rate digital trunk terminates Fractional T1 trunks (Up to 24 DS-0 channels). This ETU supports K-CCIS, ANI/DNIS trunks, and CSU less function on T1. A combination of ground start and loop start signaling can be used on the DTI-U40 ETU. Dial pulse dialing, DTMF, Tie Line (E&M), and DID are supported. This ETU has 24 built-in DTMF detectors. Trunks are assigned in groups of four. When channels are assigned to ANI, Feature Group D is supported. Feature Group D incoming MF/ outgoing DTMF signaling and K-CCIS signaling with point-to-point E&M Tie lines are also supported. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU shares the total number of CO/PBX lines in the system.	2	11	Notes 1, 5, 7.

Table 3-3 Maximum System Capacities for Trunk Interface ETUs (Continued)

Trunk Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
TLI (2)-U( ) ETU	This 2-Port Tie Line Interface ETU supports the termination and operation of two E&M tie lines (4-wire, type I and type V, and 10/20 pps Dial Pulse or DTMF). Immediate, wink start, second dial tone, and delay dial signaling can be combined on this ETU. This ETU is installed in slots S1~S8 in any B64-U20 KSU. The maximum number depends on other trunk ETUs installed. This ETU shares the total number of CO/PBX lines in the system.	14	23	Note 2

Note 1: Calculating maximum capacities are based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four Trunk ports.

Note 2: When 2-port Trunk Interface ETUs are installed, the system uses four ports from its maximum port capacity.

Note 3: With the Electra Elite IPK II Expanded Port Package, a maximum of 14 COIB(4)-U( ) ETUs can be installed as COID(4)-U( ) ETUs.

Note 4: Refer to the KSU Power-Based Calculator Chart .

Note 5: Firmware 5.0 or higher is required.

Note 6: Firmware 3.0 or higher is required.

Note 7: The first four DTI/PRI ETUs are assigned 24 Channels, the next 6 are assigned 16 Channels, and the 11th is assigned 8 channels.

Table 3-4 Maximum System Capacities for Application Interface ETUs

Application Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
BSU(4M)-U20 ETU	The Master 4-Base Station Unit for Wireless DECT provides connections for up to 16 Base Stations when using two BSU(6S) ETUs. This ETU is installed in slots S1~S8 (S2~S8 when using one slave ETU or S3~S8 when using two slave ETUs) in any B64-U20 KSU.	1	1	Notes 1, 2
BSU(2S)-U20 ETU	This Slave 2-Base Station Unit for Wireless DECT has connections for two Base Stations and must be used with the BSU(4M)-U20 ETU. This ETU is installed in the first or second slot to the left of the BSU(4)-U20 ETU	2	2	Notes 1, 2
BSU(6S)-U20 ETU	This Slave 6-Base Station Unit for Wireless DECT has connections for six Base Stations and must be used with the BSU(4M)-U20 ETU. This ETU is installed in the first or second slot to the left of the BSU(4)-U20 ETU	2	2	Notes 1, 2
CCH(4)-U( ) ETU	This 4-Channel - Common Channel Handler (CCH) for K-CCIS provides four K-CCIS routes to coordinate receiving common channel data from a distant system or to coordinate sending it to a distant system.	1	1	
HUB(8)-U( ) ETU	This 8-Port Switching HUB is an optional Ethernet interface that supports eight internet ports. Each port has two LEDs that indicate status and activity. One port can be a source port, and another port can be used to mirror source and monitor data traffic. One ETU can be installed in slots S1~S8 in each cabinet. This ETU cannot be installed in a KSU that contains EliteMail VP and IVR or CTI and IVR systems	1	1	Note 1
IAD(8)-U( ) ETU configured for ESI	For Megaco Station	3	14	

Table 3-4 Maximum System Capacities for Application Interface ETUs (Continued)

Application Interface ETUs	Description	Maximum Capacities		Notes
		Basic Port Package	Expanded Port Package	
IAD(8)-U( ) ETU configured for CCISoIP	For CCISoIP	6	22	Note 3
PVA( )-U10 ETU as an IP Station (MEGACO)–MG16	For MEgaco Station	2	13	
PVA( )-U ETU as K-CCIS – IP with PVA	For K-CCIS	2	11	

Note 1: Refer to the KSU Power-Based Calculator Chart .

Note 2: A maximum of three BSU(4M)/(2S)/(6S) DECT Wireless ETUs can be installed.

Note 3: The IAD(8)-U( ) ETU is assigned as a CCISoIP ETU and counts as 8 trunk ports when installed with the IP CCH ETU application loaded.

SECTION 4 KSU POWER-BASED CALCULATOR CHART

The Card Calculator on the next page allows you to determine the maximum power consumption for the Power supply in each cabinet under the following conditions:

- Each basic cabinet can contain a maximum of 10 cards.
- Each expansion cabinet can contain a maximum of nine cards.
- The total point value cannot exceed 1000 points for +5V.
- The total point value cannot exceed 1000 points for -24V.

To calculate the two values (+5V and -24V) for a card:

1. Pick the card type in the chart below.
2. Calculate the +5V total point value by multiplying the number of cards by the +5V value in the chart.
3. Calculate the -24V total point value by multiplying the number of cards by the -24V value in the chart.

An example is shown below:

- +5V

  Five ESIB(8)-U10 ETUs multiplied by a table value of 21 is 105 points toward a possible 1000 (895 points remaining).

- -24V

  Five ESIB(8)-U10 ETUs multiplied by a table value of 83 is 415 points toward a possible 1000 (585 points remaining).

Table 3-5 KSU Power-Based Calculator Chart

Package Name	Power Consumption		Number of ETUs	Equivalent Total Power Point	
	+5V	-24V		+5V	-24V
Common					
CPUII( )-U10 ETU	200	0			
CF ETU	7	0			
EXP-U10 ETU	6	0			
MOD-U10 Unit	25	0			
Trunk					
BRT(4)-U( ) ETU	67	0			
COI(4)-U10 ETU	48	5			
COI(8)-U10 ETU	82	9			
COID(8)-U( ) ETU	55	9			
COIB(4)-U20 ETU	29	5			
COIB(4)-U30 ETU	29	5			
COIB(8)-U30 ETU	54	9			
DID(4)-U( ) ETU	24	30			
DTI-U10/20/30 ETU	84	0			
DTI-U40 ETU	73	0			
IAD(8) ETU	31	110			
TLI(2)-U( ) ETU	15	10			
Station					
CNF(16)-U20 ETU	17	52			
ESI(8)-U( ) ETU	21	83			
ESIB(8)-U10 ETU	21	83			
ESIB(8) plus ESIE(8)-U10 ETU (16 Ports)	32	166			
OPX(2)-U( ) ETU	22	30			
SLI(4)-U( ) ETU	29	25			
SLI(8)-U( ) ETU	52	29			
SLIB(4)-U( ) ETU	30	17			
SLIE(4)-U( ) ETU	17	12			
Voice Mail					
CMS(2)-U10 ETU	62	54			
CMS(4)-U10 ETU	62	54			

Table 3-5 KSU Power-Based Calculator Chart (Continued)

Package Name	Power Consumption		Number of ETUs	Equivalent Total Power Point	
	+5V	-24V		+5V	-24V
FMS(2)-U10 ETU	62	54			
FMS(4)-U10 ETU	62	54			
VMS(2)/(4)-U10 ETU	60	57			
VMS(8)-U10 ETU	64	84			
FMS(2)/(4)-U20 ETU	75	97			
FMS(8)-U20 ETU	100	97			
VMS(2)-U20 ETU	74	100			
VMS(4)-U20 ETU	74	100			
VMS(8)-U20 ETU	99	101			
CMS(2)-U30 ETU	55	68			
CMS(4)-U30 ETU	55	68			
FMS(2)-U30 ETU	55	68			
FMS(4)-U30 ETU	55	68			
FMS(8)-U30 ETU	81	68			
VMS(4)-U30 ETU	55	96			
VMS(8)-U30 ETU	80	100			
VMS(4)-U40 ETU	55	96			
VMS(8)-U40 ETU	80	100			
FMS(2)-U40 ETU	55	68			
FMS(4)-U40 ETU	55	68			
FMS(8)-U40 ETU	81	68			
VP/CTI/IVR(8)-U10 ETU	155	193			
VP/CTI/IVR(16)-U10 ETU	274	193			
CTP( )-U10 ETU	120	288			
Optional					
BSU(4M)-U20 ETU	77	47			
BSU(2S)-U20 ETU	35	26			
BSU(6S)-U20 ETU	47	69			
CCH(4)-U( ) ETU	50	0			
HUB-U10 ETU	250	0			
VMP( )-U40 ETU	55	96			
Total Points			**XX**	**XXX**	**XXX**

An example of KTS Configuration with a Basic and Expansion Cabinet using the Calculator Chart is shown below.

SAMPLE CALCULATION USING KSU POWER-BASED CALCULATOR CHART			
Package	Quantity	Total Power Consumption +5V value from Chart	Total Power Consumption -24V value from Chart
Basic Cabinet			
CPUII( )-U10 ETU	1	200	0
ESIB/E(8)-U10 ETU	3	96	498
ESIB(8)-U10 ETU	1	21	83
SLIB(4)-U10 ETU	3	90	51
SLIE(4)-U( ) ETU	3	51	36
CTP(8)-U10 ETU	1	120	288
Totals	**10**	**578**	**956**
Expansion Cabinet			
EXP-U10 ETU	1	6	0
DTI-U30 ETU	1	84	0
DTI-U40 ETU	1	73	0
CCH(4)-U10 ETU	1	50	0
ESIB/E(8)-U10 ETU	4	128	664
COIB(4)-U30 ETU	1	29	5
Totals	**9**	**370**	**669**

SECTION 5 SYSTEM REQUIREMENTS AND SPECIFICATIONS

5.1 Cabling Requirements and Specifications

The KSU is connected with each Multiline Terminal and Single Line Telephone by a separate twisted 1-pair cable or 2-pair cable (only for Multiline Terminals). Refer to Figure 3-2 Connecting the ESI Using Twisted 2-Pair Cable.

Refer to Table 3-6 D^term Series i or D^term IP Terminal Loop Resistance and Cable Length.

Refer to Table 3-7 Electra Elite/D^term Series E Multiline Terminal Loop Resistance and Cable Length.

Refer to Table 3-8 Cable Connection Between the Analog Port and the Single Line Equipment.

Refer to Table 3-9 Cabling Requirements.

Table 3-6 *D^term* Series i or *D^term* IP Terminal Loop Resistance and Cable Length

Terminal or Adapter	Maximum Loop Resistance (without AC Adapter) (Ohms)	By Twisted 1-Pair Cable (without AC Adapter) 24 AWG	By Twisted 2-Pair Cable (without AC Adapter) 24 AWG	Maximum Loop Resistance (with AC Adapter) (Ohms)	By Twisted 1-Pair Cable (with AC Adapter) 24 AWG	By Twisted 2-Pair Cable (with AC Adapter) 24 AWG
DTH-8-1 TEL DTR-8-1 TEL	37	700	1400	107	2000	2000
DTH-8D-1 TEL DTR-8D-1 TEL ITH-8D-2/3 TEL	37	700	1400	107	2000	2000
DTH-16-1 TEL DTR-16-1 TEL	35	660	1320	107	2000	2000
DTH-16D-1 TEL DTR-16D-1 TEL ITH-16D-2/3 TEL	35	660	1320	107	2000	2000
DTH-32D-1 TEL DTR-32D-1 TEL	26	500	1000	107	2000	2000
DTH-16LD-1 TEL	37	700	1400	107	2000	2000
DCR-60-1 Console✱	—	—	—	107	2000	2000

✱ An AC Adapter is required.

Table 3-7 Electra Elite/*D*^{term} Series E Multiline Terminal Loop Resistance and Cable Length

Terminal or Adapter	Maximum Loop Resistance (Ohms)	Maximum Feet by Twisted 1-Pair Cable 24 AWG	Maximum Feet by Twisted 2-Pair Cable 24 AWG
DTU-8-1 TEL DTP-8-1 TEL	35	600	1000
DTU-8D-2 TEL DTP-8D-1 TEL	35	600	1000
DTU-16-1 TEL DTP-16-1 TEL	26	450	900
DTU-16D-2 TEL DTP-16D-1 TEL	26	450	900
DTP-16HC-1 TEL*	57	1083	
DTU-32-1 TEL DTP-32-1 TEL	21	360	720
DTU-32D-2 TEL DTP-32D-1 TEL	21	360	720
DTR-2DT-1 TEL	35	600	1000
DTR-4D-1 TEL	37	700	1400
DTR-4R-1/2 TEL	N/A	650	1000
DTH-4R-1/2 TEL	N/A	650	1000
SLTII(1)-U10 ADP**	35	600	1000
DP-D-1	20	410	820

* An AC Adapter is required for the DTP-16HC-1 TEL.

** The length for the specified SLTII(1)-U10 ADP is the length between the SLTII(1)-U10 ADP and the ESI.

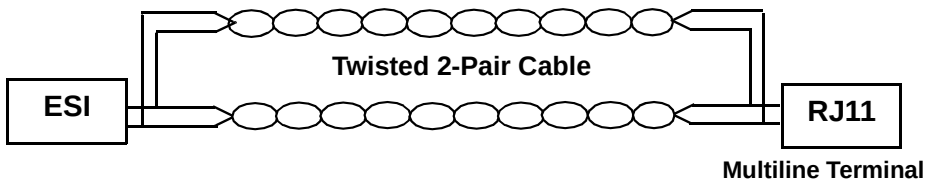


Figure 3-2 Connecting the ESI Using Twisted 2-Pair Cable

Table 3-8 Cable Connection Between the Analog Port and the Single Line Equipment

Connected Equipment	Cable	Maximum Distance or Impedance Between Equipment and Telephone
AD(A)-R/AD(A)-2R Unit	Twisted Pair	10 feet
ADA(2)-W Unit	Twisted Pair	10 feet
AP(A)-R or AP(R)-R Unit	Twisted Pair	50 feet
APA-U Unit or APR-U Unit	Twisted Pair	50 feet
OPX(2)-U( ) ETU	Twisted Pair	1,600 ohms
SLI(4)/(8)-U( ) ETU	Twisted Pair	300 ohms
SLIB(4)/SLIE(4)-U10 ETU	Twisted Pair	300 ohms
SLTII(1)-U10 ADP	Twisted Pair	50 feet

✎ Mixing digital and analog ports through the same 25-pair cable runs is not recommended.

Table 3-9 Cabling Requirements

Connected Equipment	Cable
External Amplifier	Hi-Fi Shielded Audio Cable
Music on Hold and Background Music Sources	Hi-Fi Shielded Audio Cable
ITH Cabling	Cat 5 Straight Data Network cable 100 meters maximum distance

5.2 Cabling Precautions

5.2.1 Cable Placement

When selecting cables and Main Distribution Frame (MDF), future expansion or assignment changes should be considered. Avoid running cables in the following places:

- A place exposed to wind or rain.
- A place near heat radiating equipment or where the quality of station cable covering could be affected by gases and chemicals.
- An unstable place subject to vibration.

5.2.2 Environmental Conditions

Temperature

- Operating: +32°F ~ +104°F (0°C ~ 40°C)
- Long Term: +50°F ~ +90°F (10°C ~ 32.2°C)

Humidity

- Operating: 10% ~ 90% noncondensing

5.3 Power Requirements

5.3.1 Power Supply Inputs

AC input requirements for the system are listed below.

AC Input [P64-U( ) PSU]

- 117 Vac ± 10%
- 60 Hz ± 10%
- Single Phase
- 7.5A circuit
- A dedicated outlet, separately fused and grounded

5.3.2 POWER Supply Consumption

The power consumption for the Electra Elite IPK II system is listed in Table 3-10 Power Consumption.

Table 3-10 Power Consumption

KSU	Maximum RMS Current	Watts Used (Idle)	Watts Used (Maximum)
Basic KSU – B64-U20 KSU	2.5 A	120	230
Basic KSU + Expansion KSU	5.0 A	240	460
Basic KSU + 2 Expansion KSUs	7.5 A	360	690

When replacing fuses, refer to the specifications in Table 3-11 Fuse Replacement.

Table 3-11 Fuse Replacement

Unit	Fuse Number	Specifications	Description	Dimensions
P64-U( ) PSU	F1	125V, 6.0A	AC Input	1/4” x 1 1/4”
P64-U( ) PSU	F101	250V, 10A	Battery Input	1/4” x 1 1/4”

✎ All fuses are normal blown glass tube.

Do not use slow blow fuses. Replace with a fuse of the same type and rating.

5.4 Outside Line Types

The following outside lines can be used with the Electra Elite IPK II system:

- ❑ 2-wire, Loop Start or Ground Start Trunks
- ❑ 2-wire, 2-way DID Lines (Dial Pulse or DTMF)
- ❑ 4-wire, E&M Tie Lines (Type I or V, Dial Pulse, or DTMF)
- ❑ Digital Trunk T1/FT1 (Loop Start, Ground Start, Tie Line (E&M), or DID Signaling)
- ❑ ISDN-BRI Trunks
- ❑ ISDN-PRI Trunks
- ❑ VoIP Trunks (Internet Protocols)

Refer to Table 1-1 FIC, REN, SOC, and Jack Types for Electra Elite IPK II System ETUs in the Regulatory Information section in this manual for a detailed list of Facility Interface Codes, Ringer Equivalence Numbers, Service Order Codes and Jack Types.

5.5 Transmission, Network, and Control Specifications

5.5.1 Transmission

- ❍ Data Length:

  From Multiline Terminal to ESI(8)-U( ) ETU: 23 bits

  From ESI(8)-U( ) ETU to Multiline Terminal: 23 bits

- Data Transmission Rates:

  Between ESI(8)-U( ) ETU and Multiline Terminal: 184K bps (voice and signaling)

- Scanning Time for each Multiline Terminal: 32 ms.

5.5.2 Network

Time Division Multiplexing (TDM) allows transmission of a number of separate data and voice simultaneously over one communications medium. The information below indicates the specifications the Electra Elite IPK II system uses for switching, clock, data bus, timeframe:

- TDM Switching: PCM (µ Law)
- TDM Clock: 2.048 MHz
- TDM Data Bus: 8 bit
- TDM Timeframe: 125 µs.

5.5.3 Control

This section indicates the speed or capacity:

- Control: Stored program with distributed processing
- Central Processor: 32-bit microprocessor
- Clock: 25 MHz
- Interface ETU: 8-bit or 16-bit microprocessor
- Optional ETUs: 16- or 32-bit microprocessor
- Multiline Terminal (TDM): 8-bit microprocessor
- Multiline Terminal (IP): 32-bit microprocessor
- IP Adapter: 32-bit microprocessor
- Attendant Console: 4-bit microprocessor
- SLT Adapter: 4-bit microprocessor

5.5.4 Electra Elite IPK Terminals and Equipment

The voltage, current, ring signal information for the Electra Elite IPK Multiline Terminals, Single Line Telephone equipment, and AP(A)-R/ AP(R)-R Units are listed below:

- Multiline Terminal

  Voltage: -11 ~ -26 Vdc

  Maximum Current: 250 mA

✎ Acoustical characteristics meet Electronic Industry Association (EIA) standard proposal SP-1286 and standard EIA RS-470.

- ❍ Single Line Telephone

  Standard 2500 Set: 500 type network

  Nominal Current: 35 mA

  Ring Signal: 56 Vac RMS @ 20 Hz

- ❍ SLTII(1)-U( ) ADP

  Standard 2500 Set: 500 type network

  Nominal Current: 30 mA

  Ring Signal: 56 Vac RMS @ 20 Hz

- ❍ AP(A)-R Unit

  Standard 2500 Set: 500 type network

  Nominal Current: 30 mA

- ❍ AP(R)-R Unit

  Standard 2500 Set: 500 type network

  Nominal Current: 30 mA

  Ring Signal: 56 Vac RMS @ 20 Hz

5.5.5 Series i Terminals

The voltage and current information for the *D*^{term} Series i Multiline Terminals are listed below:

- ❍ Multiline Terminal (Series i)

  Voltage: -11 ~ -48 Vdc

  Maximum Current: 250 mA

  ✎ Acoustical characteristics meet Electronic Industry Association (EIA) standard proposal SP-1286 and standard EIA RS-470.

- ❍ Voltage, current, and ring signal information for Single Line Telephone equipment, AP(A)-R Unit, and AP(R)-R Unit are the same as those listed in the previous paragraph.

5.6 Dialing Specifications

5.6.1 Dial Pulse Address Signaling

Dial Pulse address Signaling uses dial pulses (regular momentary interruptions) to signal the equipment. In the Electra Elite IPK II system, the following Dial Pulse specifications are used:

- Pulse Rate: 10 ± 0.5 pps/20 ± 1.0 pps
- Percent Break: 60 ± 1.5%
- Interdigit Interval: 0 pps/20 pps 500 ms. ~ 800 ms.

5.6.2 Dual-Tone Multifrequency (DTMF) Address Signaling

DTMF signaling describes push button or Touchtone dialing. When a key on a telephone is pushed, two tones (one high frequency and one low frequency) are provided. In the Electra Elite IPK II system, the following DTMF specifications are used:

- Frequencies

  Two sinusoidal frequencies are provided, one from the high frequency group and one from the low frequency group.
- Frequency Deviation: Less than ±1.0%
- Signal Level:

  Nominal level per frequency: -6 ~ -4 dBm

  Minimum level per frequency:

  Low Group: -10 dBm

  High Group: -8 dBm

  Maximum level per frequency: 0 dBm
- Rise Time: Within 5 ms.
- Duration of Dual Frequency Signal:

  110 ms. default/60 ms. minimum
- Interdigital Time: 80 ms. default/70 ms. minimum

Nominal **Low** Group Frequencies (Hz)	Nominal **High** Group Frequencies (Hz)		
	1209	**1336**	**1477**
697	1	2	3
770	4	5	6
852	7	8	9
941	*	0	#

5.7 Battery Backup

The Electra Elite IPK II system has battery backup functions for system backup and for memory backup.

5.7.1 System Backup

During power failure, the system is backed up using a rechargeable battery. This battery backup supports all of the system operations for approximately 30 minutes.

5.7.2 Memory Backup

The CPUII( )-U10 ETU has a battery installed to provide backup of system memory. When the battery is fully charged, system memory (customer data) is retained for approximately 21 days.

5.8 Weights and Dimensions

Table 3-12 Weights and Dimensions indicates the shipping weight, height, width, and depth of each Electra Elite IPK II KSU, ETU, Multiline Terminal, or adapter.

Table 3-12 Weights and Dimensions

Unit	Shipping Weight*	Height	Width	Depth
ACA-U Unit	22.5 oz (638 g)	3.4” (86 mm)	4.2” (107 mm)	5.2” (133 mm)
AD(A)-R Unit	4.0 oz (113 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137.5 mm)
AD(A)-2R Unit	4.0 oz (113 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137.5 mm)

Unit	Shipping Weight*	Height	Width	Depth
AP(A)-R Unit	5.6 oz (158 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137.5 mm)
AP(R)-R Unit	5.6 oz (158 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137.5 mm)
B64-U20 KSU	460.8 oz (13063 g)	13.0” (328.7 mm)	14.0” (354 mm)	10.25” (259 mm)
BRT(4)-U10 ETU	14.6 oz (414 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
BRT(4)-U20 ETU	11.3 oz (320 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
BSU(4M)-U20 ETU	14.8 oz (419 g)	1.97” (50mm)	8.27” (210 mm)	11,47” (290 mm)
BSU(2S)-U20 ETU	13.4 oz (381 g)	1.97” (50mm)	8.27” (210 mm)	11,47” (290 mm)
BSU(6S)-U20 ETU	15 oz (423 g)	1.97” (50mm)	8.27” (210 mm)	11,47” (290 mm)
CCH(4)-U( ) ETU	12.0 oz (340 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
CMS(2)/(4)-U( ) ETU	102.4 oz (2903 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
CMS/FMS/VMS-U30 ( ) ETU	102.4 oz (2903 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
CNF(8)-U( ) ETU	12.0 oz (340 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
CNF(16)-U20 ETU	12.3 oz (349 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COI(4)-U( ) ETU	13.6 oz (385 g	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COI(8)-U( ) ETU	16.6 oz (471 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COIB(4)-U( ) ETU	14.4 oz (408 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COIB(8)-U( ) ETU	16.6 oz (471 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COID(4)-U( ) ETU	14.4 oz (408 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
COID(8)-U( ) ETU	16.6 oz (471 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
CPUII( )-U10 ETU	13.4 oz (380 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)

Unit	Shipping Weight*	Height	Width	Depth
CT(A)-R Unit	4.0 oz (113 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137.5 mm)
CTA-U Unit	4.3 oz (122 g)	2.4” (60 mm)	2.3” (59 mm)	4.8” (121 mm)
CTI/VP(4)/(8)/(12)/(16)-U( ) ETU	192 oz [2] (5443 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
CTP-U10 ETU	20 oz [4] (580 g)	.8” (20 mm)	7.5” (190 mm)	7.5” (190 mm)
CTU(C)-U Unit	9.5 oz (270 g)	2.4” (60 mm)	4.3” (110 mm)	4.4” (112 mm)
CTU(S)-U Unit	9.5 oz (270 g)	2.4” (60 mm)	4.3” (110 mm)	4.4” (112 mm)
CT(U)-R Unit	8.4 oz (239 g)	2.25” (56.25 mm)	2.75” (68.75 mm)	5.5” (137 mm)
DCR-60-1 Console	53 oz (1503 g)	4.2” (107 mm)	12.8” (326 mm)	7.14” (182 mm)
DID(4)-U( ) ETU	15.5 oz (439 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
DP-D-1A Doorphone	8.4 oz (238 g)	1.5” (38 mm)	5.5” (140 mm)	4.6” (121 mm)
DTH-16D-1 TEL DTR-16D-1 TEL	43.5 oz (1233 g)	4.78” (122 mm)	10.2” (260 mm)	9.8” (250 mm)
DTH-8-1 TEL DTR-8-1 TEL	41.0 oz (1163 g)	4.78” (122 mm)	10.2” (260 mm)	9.8” (250 mm)
DTH-8D-1 TEL DTR-8D-1 TEL	43.5 oz (1233 g)	4.78” (122 mm)	10.2” (260 mm)	9.8” (250 mm)
DTH-32D-1 TEL DTR-32D-1 TEL	48 oz (1361 g)	4.78” (122 mm)	10.2” (260 mm)	9.8” (250 mm)
DTI-U( ) ETU	13.2 oz (374 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
DTI-U40 ETU	5.99 oz (170 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
DTP-1-1 TEL DTP-1-2 TEL DTP-1HM-1 TEL DTP-1HM-2 TEL	26.8 oz (760 g)	2.36” (60 mm)	6.22” (158 mm)	8.81” (224 mm)
DTU-16-1 TEL DTP-16-1 TEL	41 oz (1162 g)	4.8” (123 mm)	7.8” (197 mm)	9.3” (235 mm)
DTU-16D-2 TEL DTP-16D-1 TEL	43.5 oz (1233 g)	4.8” (123 mm)	7.8” (197 mm)	9.3” (235 mm)

Unit	Shipping Weight*	Height	Width	Depth
DTP-16HC-1 TEL	53 oz (1503 g)	6.00” (152 mm)	9.08” (230 mm)	8.04” (204 mm)
DTP-2DT-1 TEL	41 oz (1163 g)	4.8” (123 mm)	7.8” (197 mm	9.3” (235 mm)
DTU-32-1 TEL DTP-32-1 TEL	46 oz (1304 g)	4.8” (123 mm)	8.7” (220 mm)	9.3” (235 mm)
DTU-32D-2 TEL DTP-32D-1 TEL	48 oz (1361 g)	4.8” (123 mm)	8.7” (220 mm)	9.3” (235 mm)
DTU-8-1 TEL DTP-8-1 TEL	41.0 oz (1163 g)	4.8” (123 mm)	7.8” (197 mm)	9.3” (235 mm)
DTU-8D-2 TEL DTP-8D-1 TEL	43.5 oz (1233 g)	4.8” (123 mm)	7.8” (197 mm)	9.3” (235 mm)
DTR-1-1 TEL DTR-1HM-1 TEL	26.8 oz (760 g)	2.47” (100 mm)	7.65” (195 mm)	9.54” (243 mm)
DTR-1R-1 TEL	14.4oz (408 g)	4.5” (114 mm)	6.1” (153 mm)	8.62” (218 mm)
DTR-2DT-1 TEL	41 oz (1163 g)	2.47” (100 mm)	7.65” (195 mm)	9.54” (243 mm)
DTR-4D-1 TEL	44 oz (1250 g)	5.98” (152 g)	8.54” (217 g)	9.65” (245 mm)
DTR-4R-1 TEL	15.4 oz (437 g)	2.25” (57 mm)	4.25” (108 mm)	7.5” (191 mm)
DTU-4R-1 TEL	15.4 oz (437 g)	2.25” (57 mm)	4.25” (108 mm)	7.5” (191 mm)
D16(LD)-R ADM	27 oz (770 g)	4.33” (110 mm)	10.24” (260 mm)	7.09” (180 mm)
ESI(8)-U( ) ETU	14.5 oz (411 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
ESIB(8)-U( ) ETU	11.1 oz (315 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
ESIE(8)-U( ) ETU	9.9 oz (280 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
EXP-U( ) ETU	14.6 oz (414 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
FMS(2)/(4)/(8)-U( ) ETU	102.4 oz [2] (2903 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
HF-R Unit	9.9 oz (280 g)	2.9’ (74 mm)	4.2’ (106 mm)	5.6’ (141 mm)
HUB(8)-U( )ETU	10.4 oz (294 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)

Unit	Shipping Weight*	Height	Width	Depth
IAD(8)-U( ) ETU	8.11 oz (230 g)	7.5” (190 mm)	6.3” (160 mm)	0.87” (22 mm)
ITH-8D-2/3 TEL	50.92 oz (1445 g)	9.84” (250 mm)	10.31” (262 mm)	4.76” (121 mm)
ITH-16D-2/3 TEL	50.92 oz (1445 g)	9.84” (250 mm)	10.31” (262 mm)	4.76” (121 mm)
IVR Application VMP(4)/(8)-U( ) ETU with IVR HDD	14.6 oz (414 g)	1.75” (44 mm)	10.5” (266 mm)	8.62’ (219 mm)
OPX(2)-U( ) ETU	13.4 oz (380 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
PRT(1)-U( ) ETU	13.2 oz (374 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
RAK-U( ) Unit	320 0z (9072 g)	20” (507 mm)	15’ (380 mm)	8.5’ (216 mm)
SLI(4)-U( ) ETU	13.0 oz (370 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
SLI(8)-U( ) ETU	14.1 oz (400 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
SLIB(4)-U10 ETU	13.0 oz (370 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
SLIE(4)-U10 ETU	10.7 oz (303 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
SLTII(1)-U10 ADP	9 oz. (255 g)	1.8” (45 mm)	2.8” (70 mm)	4.8” (120 mm)
TLI(2)-U( ) ETU	13.8 oz (391 g)	1.97” (50 mm)	9.45” (240 mm)	7.68” (195 mm)
VMS(2)/(4)/(8)-U( ) ETU	102.4 oz [2] (2903 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)
VMP(2)/(4)/(8)-U( ) ETU	102.4 oz [2] (2903 g)	1.89” (48 mm)	11.47” (290 mm)	8.46” (214 mm)

1 Shipping weight includes the shipping carton.
2 Shipping weight includes the shipping carton and documentation.
3 Includes cable for connection of two KSUs.
4 Drive is shipped separately.

5.9 External Equipment Interface

Input signal levels, impedance, contact ratings, and connector types are listed for externally connected equipment.

5.9.1 Music on Hold/Station Background Music

- ❍ Auxiliary Input: 0.6V PPS Signal Level
- ❍ Input Impedance: 600 Ω

5.9.2 Music for Station BGM using Analog CO Trunk ETU (COI, COIB, or COID)

- ❍ Auxiliary input: 0.6 V PPS Signal Level
- ❍ Input Impedance: 600 Ω

5.9.3 External Paging (Audio)

- ❍ Output Power: -10 dBm Signal Level
- ❍ Output Impedance: 600 Ω
- ❍ Relay Contact Rating: 500 mA, 24 Vdc

5.9.4 External Tone Ringer/Night Chime Output

- ❍ Output Power: -10 dBm
- ❍ Output Impedance: 600 Ω
- ❍ Relay Contact Rating: 500 mA, 24 Vdc

5.9.5 SMDR Output

- ❍ Female Connector (System Output): Standard DB-9 (straight)

5.9.6 PC Connection

- ❍ Female Connector (System Input/Output): Standard DB-9 (straight)

5.9.7 ACD/MIS Connector

- ❍ Female Connector (System Output): Standard DB-9 (straight)

5.9.8 Relay Contact

- ❍ All Relay Contact Ratings: 500 mA, 24 Vdc

5.10 Audible and Visual Indications

The tables in this section provide the audible and visual indications used in the Electra Elite IPK II systems.

5.10.1 Tone Patterns

Tones are used in the Electra Elite IPK II systems to inform the station user of various system functions such as, dial tone, busy tone, or ringback tone. Table 3-13 Tone Patterns lists the frequency and the pattern for these tones.

5.10.2 LED Flash Patterns

The Electra Elite IPK II system has 2-color LEDs. Green is used primarily for I-Use conditions and for outside calls. Red is used primarily for Other Use conditions and internal calls. Refer to Table 3-14 Multiline Terminal LED Flash Patterns.

Table 3-13 Tone Patterns

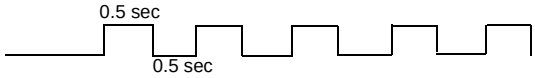
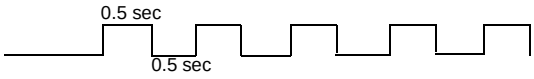
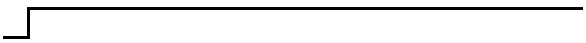
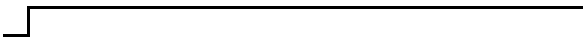
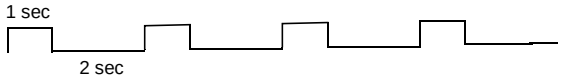
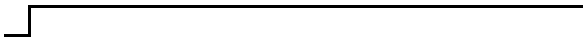
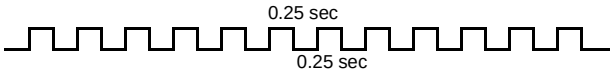
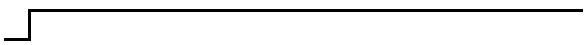
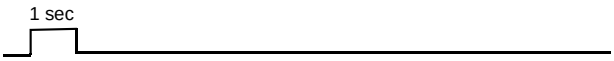
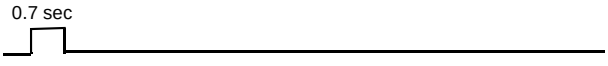
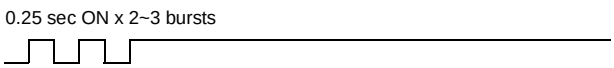
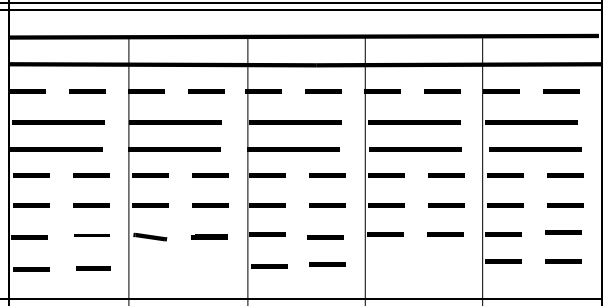
System Tone (Fixed)	Frequency (Hz) (Fixed)	Intermit (Default)	Cycle
Busy Tone	480/620	60 IPM	
Call Waiting Tone	440	60 IPM	
Second Dial Tone	350/440	120 IPM	
Howler Tone	2400 Modulation (16 Hz)	Continuous	
Internal Dial Tone	350/440	Continuous	
Internal Ringback Tone	440/480	1 sec On 2 sec Off	
LCR Dial Tone	440	Continuous	
Reorder Tone	480/620	120 IPM	
Service Set Tone	440	Continuous	
Special Dial Tone	440	240 IPM	
Tone Burst 1 Tone	440	Continuous	
Tone Burst 2 Tone	620	Continuous	
Tie/DID Ringback Tone	440/480	2 sec On 4 sec Off	
Camp-On Tone Call Alert Notification Attendant Tone Override	440	Continuous	
DIT Alert Tone	480/620	Continuous	
Call Forward Alert Tone Call Forward Configuration Tone	350/440	120 IPM	

Table 3-14 Multiline Terminal LED Flash Patterns

LED	Condition	Color	Flash Patterns
Line Key	I-Use	Green	
	Busy	Red	
	Incoming Call	Red	
	I-Hold	Green	
	Call Hold	Red	
	Hold Recall	Green	
	Transfer Recall	Green	
	Live Monitoring Mode	Green	
	Message Waiting on Line Key	Red	
Microphone	ON	Red	
Mic	ON (Series i)	Red	
ICM	I-Use	Red	
	ICM Incoming Call	Red	
	Voice Over Broker	Red	
Large LED	Incoming Internal Call	Red	
	Incoming Outside Call	Green	
	Message from Attendant	Green	
	Voice Mail Message	Red	
Speaker	ON	Red	
	System Data Entry	Red	
Conf	Conference in Progress/Barge In	Red	
	All Conference Circuits Used	Red	
	Hold Conference Call	Red	
	ICM Call Hold	Red	
	SPD Confirmation	Red	
Answer	Incoming Trunk	Red	
	Exclusive Hold	Green	
	User Ringing Line Preference	Red	
	Voice Over with Broker's Call	Green	
Feature	Callback Set	Red	
	Auto Repeat Set	Red	
	ON (to set function)	Red	
	Call FWD - All Calls Set	Red	
BLF or DSS Key	Use, Hold	Red	
	DND, Call FWD-All Calls Set	Red	
	Special Mode (while pressing Feature or going off-line)	Red	

0 0.5 1.0 1.5 2.0 sec.

TABLE OF CONTENTS
CHAPTER 4

Section 1 General Information 4-1

Section 2 Programming Stations 4-1

Section 3 Attendant Stations 4-1

Section 4 Programming from a PC 4-1

Section 5 Programming from a Multiline Terminal 4-2

Section 6 Electra Elite IPK II Remote PC Programming 4-2

6.1 Remote Programming 4-2

Section 7 Determining Required Equipment 4-2

7.1 Station Equipment 4-3

7.2 Interface ETUs 4-4

7.2.1 Determining Telephone and CO Port Numbers 4-5

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LIST OF FIGURES AND TABLES CHAPTER 4

Figure 4-1 Interface Slot and System Port Numbers for an Electra Elite IPK II System 4-4

Figure 4-2 Telephone and CO Port Numbering Example 4-5

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Hardware Requirements

CHAPTER 4

SECTION 1 GENERAL INFORMATION

The technician should be familiar with the Electra Elite IPK II system ***before*** trying to install it. Review this chapter carefully.

SECTION 2 PROGRAMMING STATIONS

Any multiline station can be a programming station in the Electra Elite IPK II system. Station equipment connected to any port of an ESI(8)-U( ) ETU can be a programming position, but requires a display multiline terminal.

SECTION 3 ATTENDANT STATIONS

Any display Multiline Terminal can be programmed as an Attendant position in the Electra Elite IPK II system. An Attendant Position can have up to four DCR-60-1( ) Consoles attached. Each Attendant Console must be supported by an ESI(8)-U( ) ETU. A maximum of ***four*** Attendant Consoles can be installed in each Electra Elite IPK II system.

SECTION 4 PROGRAMMING FROM A PC

Electra Elite IPK II systems can be programmed using a personal computer. The available Graphical User Interface allows the technician/end-user easy access to all information that can be programmed on the Electra Elite IPK II system. The PC must be a Pentium III 600 MHz or higher PC and have a Windows operating system compatible with the PC Programming (PCPro) application.

SECTION 5 PROGRAMMING FROM A MULTILINE TERMINAL

Programming can be accomplished using Multiline Terminals equipped with an LCD. Programming should be used after the system is installed and initial assignments are made. Using the Multiline Terminal is a quick way to access system data and make changes. To program from a Multiline Terminal one of the following terminals is required.

- ◇ DTH-8D-1( ) TEL
- ◇ DTH-16D-1( ) TEL
- ◇ DTH-16LD-1( ) TEL
- ◇ DTH-32D-1( ) TEL
- ◇ DTR-8D-1( ) TEL
- ◇ DTR-16D-1( ) TEL
- ◇ DTR-32D-1( ) TEL
- ◇ DTP-8D-1 TEL
- ◇ DTU-8D-2 TEL
- ◇ DTP-16D-1 TEL
- ◇ DTU-16D-2 TEL
- ◇ DTP-32D-1 TEL
- ◇ DTU-32D-2 TEL
- ◇ ITH-8D-2 TEL
- ◇ ITH-16D-2 TEL

SECTION 6 ELECTRA ELITE IPK II REMOTE PC PROGRAMMING

The Electra Elite IPK II system can be programmed from a remote location using a personal computer.

6.1 Remote Programming

To provide remote programming the following hardware is required:

- ❑ Internal Modem
  MDM-U-20 ETU installed on the CPUII( )-U10 ETU
  Available Trunk in the system
- ❑ LAN Programming
  CPUII( )-U10 ETU
  Available Network

SECTION 7 DETERMINING REQUIRED EQUIPMENT

To determine equipment type and quantity to be installed, the technician must be familiar with available station equipment and interface ETUs.

7.1 Station Equipment

The station equipment that can be installed with the Electra Elite IPK II system is listed below.

Equipment	Description
DCR-60-1 CONSOLE	Attendant Console with 60 programmable line keys
DTP-2DT-1 TEL DTR-2DT-1 TEL	2-line digital Multiline Terminal without LCD
DTU-8-1 TEL DTP-8-1 TEL DTH-8-1 TEL DTR-8-1 TEL	8-line digital Multiline Terminal without LCD
DTP-8D-1 TEL DTH-8D-1 TEL DTR-8D-1 TEL DTU-8D-2 TEL ITH-8D-2 TEL	8-line digital Multiline Terminal with LCD and softkeys
DTP-16-1 TEL DTU-16-1 TEL DTH-16-1 TEL	16-line digital Multiline Terminal without LCD
DTP-16D-1 TEL DTH-16D-1 TEL DTR-16D-1 TEL DTU-16D-2 TEL ITH-16D-2 TEL	16-line digital Multiline Terminal with LCD and softkeys
DTH-16LD-1 TEL	16-line digital Multiline Terminal with three LCDs (one for telephone information and two areas for recording line key information)
DTP-16HC-1 TEL	16-line digital Multiline Terminal with LCD, softkeys and a cordless handset
DTP-32-1 TEL DTU-32-1 TEL	32-line digital Multiline Terminal without LCD
DTP-32D-1 TEL DTH-32D-1 TEL DTR-32D-1 TEL DTU-32D-2 TEL	32-line digital Multiline Terminal with LCD and softkeys
DTR-1-1 TEL	Single Line Telephone with Message Waiting Indicator and data port

Equipment	Description
DTR-1(HM)-1 TEL	Single Line Telephone with Message Waiting Indicator and data port, eight programmable speed dial buttons, and Hold and Monitor keys
DTR-1R-1 TEL	*D*^{term} Multiline Cordless Telephone without LCD
DTR-4R-1/2 TEL	*D*^{term} Multiline Cordless Telephone with LCD
DTH-4R-1/2TEL	*D*^{term} Multiline Cordless Telephone with LCD
SLTII(1)-U10 ADP	Single Line Telephone interface Adapter

7.2 Interface ETUs

The slots in the Electra Elite IPK II KSU are flexible except for the CPU/EXP and AP slots in the first cabinet. The CPU/EXP slot is reserved for the CPUII( )-U10 ETU, and the AP slot is not used in the Electra Elite IPK II KSU. Figure 4-1 Interface Slot and System Port Numbers for an Electra Elite IPK II System shows the slot and port numbers.

Basic and Expansion KSUs for CPUII( )-U10 ETU

EXP (KSU2)	Not Used	272 thru 257	288 thru 273	314 thru 289	330 thru 315	346 thru 331	352 thru 347	368 thru 353	384 thru 369
		S1	S2	S3	S4	S5	S6	S7	S8
EXP (KSU1)	Not Used	144 thru 129	160 thru 145	176 thru 161	192 thru 177	208 thru 193	224 thru 209	240 thru 225	256 thru 240
		S1	S2	S3	S4	S5	S6	S7	S8
(BASIC KSU)	Not Used	16 thru 1	32 thru 17	48 thru 33	64 thru 49	80 thru 65	96 thru 81	112 thru 97	128 thru 113
		S1	S2	S3	S4	S5	S6	S7	S8

Figure 4-1 Interface Slot and System Port Numbers for an Electra Elite IPK II System

7.2.1 Determining Telephone and CO Port Numbers

Telephone and CO Ports numbers are provided with the Electra Elite IPK II system to count the station numbers and trunk numbers when programming System Data. The example below indicates how the CO and trunk numbers can be used.

The following ETUs are installed for the Figure 4-2 Telephone and CO Port Numbering Example.

Slot	ETU
S1	DTI-U( ) (All 24 channels count against the system maximum capacity, even when only 8 or 16 are used).
S2	ESIB(8)-U( ) ETU with ESIE(8)-U( ) ETU
S3	TLI(2)-U( )
S4	COI(8)-U( )
S5	SLI(8)-U( )
S6	DID(4)-U( )
S7	ESIB(8)-U( ) ETU
S8	Open

Trunk Ports 1 ~ 24	Telephone Ports 1 ~ 16	Trunk Ports 25 ~ 28 (See Note)	Trunk Ports 29 ~ 36	Telephone Ports 17 ~ 24	Trunk Ports 37~40	Telephone Ports 25~32	Open
S1	S2	S3	S4	S5	S6	S7	S8

✎ The TLI(2)-U( ) ETU has two E&M Tie lines, however, four of the system Trunk ports are used.

Figure 4-2 Telephone and CO Port Numbering Example

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TABLE OF CONTENTS
CHAPTER 5

Section 1 General Information 5-1

Section 2 Site Preparation and MDF/IDF Construction 5-1

2.1 Precautionary Information 5-1

2.2 Surveying the Customer Site 5-1

2.3 Selecting the Best Location for Proper Installation 5-2

2.3.1 Selecting the KSU Installation Site 5-2

2.3.2 Selecting a Permanent MDF Location 5-2

2.3.3 Selecting a Site for Installing the Telephones 5-3

2.4 Constructing the Main Distribution Frame (MDF) 5-3

2.5 Power Failure Transfer 5-8

2.6 Fax CO Branch Connection 5-9

Section 3 Installing Basic and Expansion KSUs 5-9

3.1 General Information 5-10

3.1.1 Basic KSU 5-10

3.1.2 Expansion KSUs 5-10

3.2 Removing the KSU Cover 5-10

3.3 Securing Cables Using the Velcro Strap 5-11

3.4 Wall Mounting the Basic KSU 5-12

3.5 Wall Mounting the Expansion KSU 5-15

3.6 Rack Mounting the Basic KSU 5-16

3.7 Rack Mounting the Expansion KSU 5-18

3.8 Floor Mounting the Basic KSU 5-19

3.9 Cable Routing 5-20
3.9.1 Connecting the Battery Expansion Cables on the KSU 5-20
3.9.2 Grounding Requirements 5-21
3.10 Replacing the Power Supply Unit in the KSU 5-23
3.10.1 Connecting the Power Supply Unit to the Basic KSU 5-23
3.10.2 Connecting Battery Expansion Cables to the Expansion KSU 5-25
3.10.3 Fuse Replacement 5-26
3.11 Installing Built-In and External Batteries in the KSU 5-27
3.11.1 Built-In Battery Installation 5-27
3.11.2 External Battery Installation 5-29
3.11.2.1 Basic KSU 5-29
3.11.2.2 Expansion KSU 5-32

LIST OF FIGURES AND TABLES
CHAPTER 5

Figure 5-1 Typical Full MDF Layout 5-4

Table 5-1 MDF Cable Connections 5-5

Figure 5-2 Power Failure Transfer Connections 5-8

Figure 5-3 Fax CO Branch Connection 5-9

Figure 5-4 Removing the Front Panel of the KSU 5-11

Figure 5-5 Threading the Velcro Strap to Secure Amphenol Cables 5-11

Figure 5-6 Threading the Velcro Strap to Secure Three Amphenol Cables 5-12

Figure 5-7 Attaching the Wall Mount Bracket 5-12

Figure 5-8 Attaching the Wall Mount Bracket with Spacer 5-13

Figure 5-9 Hanging the Basic KSU on the Bracket 5-13

Figure 5-10 Securing the Basic KSU to the Wall 5-14

Figure 5-11 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket 5-15

Figure 5-12 RAK-U( ) Unit and KSU 5-16

Figure 5-13 Hanging the KSU on the Bracket 5-17

Figure 5-14 Securing the KSU to the RAK-U( ) Unit 5-17

Figure 5-15 Location for Rack Mounting the KSUs 5-18

Figure 5-16 Floor Mounting the Basic KSU 5-19

Figure 5-17 Securing the KSU to the Floor Mounting Bracket 5-19

Figure 5-18 Connecting DC Expansion Cables 5-20

Figure 5-19 Attaching the Frame Ground Plate 5-21

Figure 5-20 KSU Grounding 5-22

Figure 5-21 Connecting Wires to the PSU 5-23

Figure 5-22 Mounting the PSU onto the KSU 5-24
Figure 5-23 Connecting the PSU Power Cable to the Basic KSU 5-24
Figure 5-24 Connecting Battery Expansion Cables to the Expansion KSU 5-25
Figure 5-25 Removing the PSU from the KSU 5-26
Figure 5-26 PSU Fuse Replacement 5-27
Figure 5-27 Connecting Built-In Batteries 5-27
Figure 5-28 Placing the Batteries into the KSU 5-28
Figure 5-29 Connecting the Batteries to the Power Supply Unit 5-28
Figure 5-30 Connecting Cables for External Batteries in the Basic KSU 5-29
Figure 5-31 Connecting the External Battery to the Basic KSU 5-30
Figure 5-32 Threading the Cables through the Clamps on the Basic KSU 5-31
Figure 5-33 Removing the Knockout on the Cover of the Basic KSU 5-31
Figure 5-34 Leading the Battery Cables out of the Basic KSU 5-32
Figure 5-35 External Battery Cable Installation 5-33
Figure 5-36 Threading the Cables through the Clamps on the Basic and Expansion KSUs 5-34
Figure 5-37 Removing the Knockouts on the Covers of Basic and Expansion KSUs 5-35
Figure 5-38 Leading the Battery Cables out of the Basic and Expansion KSUs 5-36

Installing KSUs

CHAPTER 5

SECTION 1 GENERAL INFORMATION

This chapter contains information to help the technician install the KSUs for the Electra Elite IPK II system. The technician should be familiar with this section before installing any equipment.

SECTION 2 SITE PREPARATION AND MDF/IDF CONSTRUCTION

Preinstallation planning is essential. Advanced planning minimizes installation time, cost, and disruption of the customer business activities.

2.1 Precautionary Information

Observe the following warnings during installation.

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

2.2 Surveying the Customer Site

In most cases, a survey of the customer site is necessary to determine the proper placement of the Main Distribution Frame (MDF), the exact dimensions of the area selected for the MDF, cabling requirements, and possible Intermediate Distribution Frame (IDF) locations.

The information obtained at the customer site can permit the installer to partially assemble the MDF before installation at the customer premise. This can reduce the time spent installing at the customer site and reduce downtime.

2.3 Selecting the Best Location for Proper Installation

2.3.1 Selecting the KSU Installation Site

When selecting an installation site for the KSU, consider the following conditions to ensure proper installation.

- KSUs are normally wall mounted to protect against accident or flooding.
- The KSU should not be located directly beneath pipes. Leaks or condensation could damage the Electra Elite IPK II system equipment.
- The area where the KSU is located must be free of corrosive and inflammable gases, excessive chemical or industrial dusts, and other materials that could cause a hazard to personnel or to the proper functioning of the equipment.
- The operating ambient temperature and humidity must be within the limits specified in 5.2.2 Environmental Conditions in Chapter 3 System Specifications.
- The operation of the system is virtually noiseless and allows wide selection of installation sites. Take care to ensure the KSUs do not present a hazard to office traffic. To minimize cabling costs, a centralized location must be chosen.
- Locate the KSU at a site where a dedicated AC power source can be easily accessed.
- Connect the KSU to a dedicated AC receptacle that is **not being used** for any other device such as a computer, copier, or facsimile machine.

2.3.2 Selecting a Permanent MDF Location

When selecting a permanent site for the MDF, the technician may encounter some of the following conditions.

- Limited space is available but must be used.
- The available space may pose one or more environmental hazards.
- The proposed location has limitations such as insufficient lighting or the lack of a suitable ground for the KSUs.
- The technician that encounters these conditions must provide the best possible solution for installing the equipment. This document cannot cover all possible situations, precautions, and actions.

2.3.3 Selecting a Site for Installing the Telephones

When a site is being selected for telephone installation, consider the following conditions to ensure proper installation.

- Ensure that the cable length and line resistance (loop), between the KSU and the telephones, comply with the specifications listed in Table 3-6 D^{term} Series i or D^{term} IP Terminal Loop Resistance and Cable Length on page 3-22 and Table 3-7 Electra Elite/D^{term} Series E Multiline Terminal Loop Resistance and Cable Length on page 3-23.
- Select a place where devices that require an external power supply can be easily connected to an AC outlet.

2.4 Constructing the Main Distribution Frame (MDF)

The Main Distribution Frame (MDF) has two different standard quick-connect terminal blocks that are mounted on a 3/4” plywood backboard. Mounting these blocks on standoffs for ease of access is recommended. The recommended blocks are 66B50 for termination of the MDF Cable Assembly and 66M50 for termination of the station cables.

The Intermediate Distribution Frame (IDF) requires the 66M50 blocks only.

Both the MDF and the IDF use standard bridging clips for each terminal block. The bridging clips mate the left half of the terminal block (terminated cable run) to the right half of the terminal block (crossconnection wire) to the terminal block (crossconnection wire). The bridging clips are also useful during troubleshooting to help isolate the cable runs and terminals/telephones from the central equipment and the Central Office Network from the system. Refer to Figure 5-1 Typical Full MDF Layout.

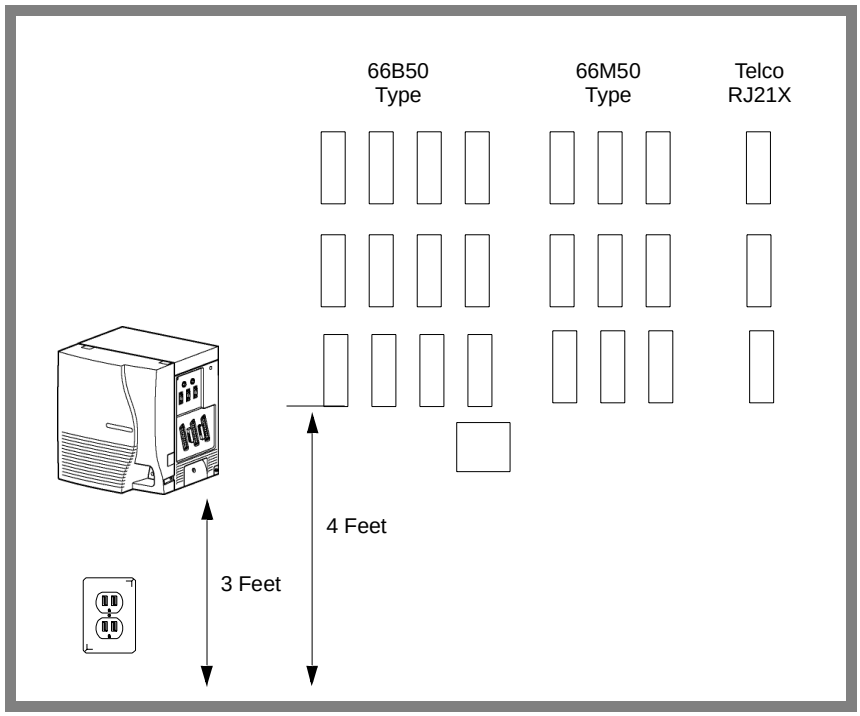

Figure 5-1 Typical Full MDF Layout

The Electra Elite IPK II KSU is connected to each of the Multiline Terminals, Single Line Telephones, optional equipment, CO/PBX, DID, ISDN, 4-wire E&M Tie lines (Types I and V), and FT1 digital trunks by separate twisted-pair cable through the MDF. The 4-wire E&M Tie lines, FT1 lines, and ISDN lines require multiple twisted-pair cabling. Table 5-1 MDF Cable Connections provides the necessary cabling information.

Table 5-1 MDF Cable Connections

MDF Pin N0.	Running Cable	Station Cable DTH	ESI	SLI (8)	SLI (4)	OPX	COI/ COIB/ (8)	COI/ COIB/ (4)	DID	TLI	DTI/ PRT	BRT
First ETU												
26	WH–BL	GN	T	T	T	T	T	T	T	GND	TA	TA-1
1	BL–WH	RD	R	R	R	R	R	R	R	—	TB	TB-1
27	WH–OR	GN	T	T	T	T	T	T	T	E-1	RA	RA-1
2	OR–WH	RD	R	R	R	R	R	R	R	M-1	RB	RB-1
28	WH–GN	GN	T	T	T	—	T	T	T	T-1	—	TA-2
3	GN–WH	RD	R	R	R	—	R	R	R	R-1	—	TB-2
29	WH–BR	GN	T	T	T	—	T	T	T	T1-1	—	RA-2
4	BR–WH	RD	R	R	R	—	R	R	R	R1-1	—	RB-2
30	WH–SL	GN	T	T	—	—	T	—	—	GND	—	TA-3
5	SL–WH	RD	R	R	—	—	R	—	—	—	—	TB-3
31	RD—BL	GN	T	T	—	—	T	—	—	E-2	—	RA-3
6	BL–RD	RD	R	R	—	—	R	—	—	M-2	—	RB-3
32	RD-OR	GN	T	T	—	—	T	—	—	T-2	—	TA-4
7	OR–RD	RD	R	R	—	—	R	—	—	R-2	—	TB-4
33	RD–GN	GN	T	T	—	—	T	Fax Brnch	—	T1-2	—	RA-4
8	GN–RD	RD	R	R	—	—	R		—	R1-2	—	RB-4
Second ETU												
34	RD–BR	GN	T	T	T	T	T	T	T	GND	TA	TA-1
9	BR–RD	RD	R	R	R	R	R	R	R	—	TB	TB-1
35	RD–SL	GN	T	T	T	T	T	T	T	E-1	RA	RA-1
10	SL–RD	RD	R	R	R	R	R	R	R	M-1	RB	RB-1
36	BK–BL	GN	T	T	T	—	T	T	T	T-1	—	TA-2
11	BL–BK	RD	R	R	R	—	R	R	R	R-1	—	TB-2
37	BK–OR	GN	T	T	T	—	T	T	T	T1-1	—	RA-2
12	OR–BK	RD	R	R	R	—	R	R	R	R1-1	—	RB-2
38	BK–GN	GN	T	T	—	—	T	—	—	GND	—	TA-3
13	GN–BK	RD	R	R	—	—	R	—	—	—	—	TB-3
39	BK–BR	GN	T	T	—	—	T	—	—	E-2	—	RA-3
14	BR–BK	RD	R	R	—	—	R	—	—	M-2	—	RB-3
40	BK–SL	GN	T	T	—	—	T	—	—	T-2	—	TA-4
15	SL–BK	RD	R	R	—	—	R	—	—	R-2	—	TB-4
41	YL–BL	GN	T	T	—	—	T	Fax Brnch	—	T1-2	—	RA-4
16	BL–YL	RD	R	R	—	—	R		—	R1-2	—	RB-4

Table 5-1 MDF Cable Connections (Continued)

MDF Pin N0.	Running Cable	Station Cable DTH	ESI	SLI (8)	SLI (4)	OPX	COI/ COIB/ (8)	COI/ COIB/ (4)	DID	TLI	DTI/ PRT	BRT
Third ETU												
42	YL–OR	GN	T	T	T	T	T	T	T	GND	TA	TA-1
17	OR–YL	RD	R	R	R	R	R	R	R	—	TB	TB-1
43	YL–GN	GN	T	T	T	T	T	T	T	E-1	RA	RA-1
18	GN–YL	RD	R	R	R	R	R	R	R	M-1	RB	RB-1
44	YL–BR	GN	T	T	T	—	T	T	T	T-1	—	TA-2
19	BR–YL	RD	R	R	R	—	R	R	R	R-1	—	TB-2
45	YL–SL	GN	T	T	T	—	T	T	T	T1-1	—	RA-2
20	SL–YL	RD	R	R	R	—	R	R	R	R1-1	—	RB-2
46	VI–BL	GN	T	T	—	—	T	—	—	GND	—	TA-3
21	BL–VI	RD	R	R	—	—	R	—	—	—	—	TB-3
47	VI–OR	GN	T	T	—	—	T	—	—	E-2	—	RA-3
22	OR–VI	RD	R	R	—	—	R	—	—	M-2	—	RB-3
48	VI–GN	GN	T	T	—	—	T	—	—	T-2	—	TA-4
23	GN–VI	RD	R	R	—	—	R	—	—	R-2	—	TB-4
49	VI–BR	GN	T	T	—	—	T	Fax Branch	—	T1-2	—	RA-4
24	BR–VI	RD	R	R	—	—	R		—	R1-2	—	RB-4
50	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—

- PFT circuits are only connected to AMP3.
- AMP1 is connected to S1, S2, and S3.
- AMP2 is connected to S4, S5, and S6.
- AMP3 is connected to S7 and S8.

MDF Pin Number	PFT Connection	
42	PFT1 – CO (Tip)	Power Failure Transfer Relay 1 (Amp 3 Connections Only)
17	PFT1 – CO (Ring)	
43	PFT1 – SLI (Tip)	
18	PFT1 – SLI (Ring)	
44	PFT1 – SLT (Tip)	
19	PFT1 – SLT (Ring)	
45	PFT2 – CO (Tip)	
20	PFT2 – CO (Ring)	
46	PFT2 – SLI (Tip)	
21	PFT2 – SLI (Ring)	
47	PFT2 – SLT (Tip)	
22	PFT2 – SLT (Ring)	
48	PFT3 – CO (Tip)	
23	PFT3 – CO (Ring)	
49	PFT3 – SLI (Tip)	
24	PFT3 – SLI (Ring)	
50	PFT3 – SLT (Tip)	
25	PFT3 – SLT (Ring)	

- PFT circuits are only connected to AMP3.
- AMP1 is connected to S1, S2, and S3.
- AMP2 is connected to S4, S5, and S6.
- AMP3 is connected to S7 and S8.

2.5 Power Failure Transfer

The Power Failure Transfer relay is located in the KSU. When selecting a Single Line Telephone for power failure transfer, make sure it matches the CO line dialing type (10 pps, 20 pps, or DTMF) where it is connected. A Single Line Telephone with a ground button must be used with Ground Start Trunks. Figure 5-2 Power Failure Transfer Connections is a relay diagram. The relay is shown with the power ON.

✎ There are three PFT Circuits for each B64-U( ) KTU.

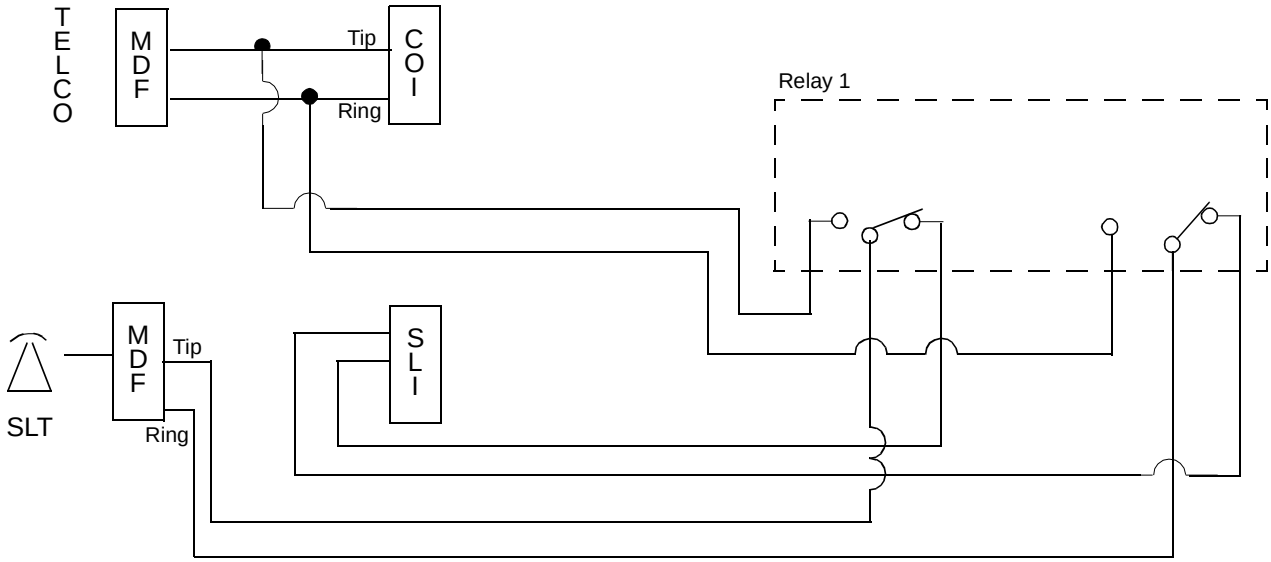

Figure 5-2 Power Failure Transfer Connections

2.6 Fax CO Branch Connection

This connection is made via the fourth port on any four port analog ETU (COI, COIB, or COID). Refer to Figure 5-3 Fax CO Branch Connection. The facsimile machine is connected to the eighth port for the specified slot where the Analog CO ETU is installed.

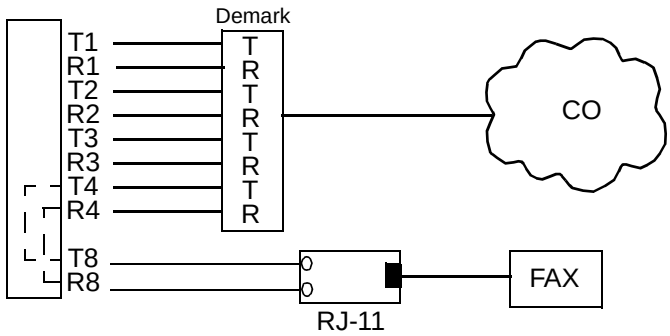

Figure 5-3 Fax CO Branch Connection

SECTION 3 INSTALLING BASIC AND EXPANSION KSUS

The compact design of the Electra Elite IPK II KSU provides easy installation. The KSUs can be floor mounted or rack mounted. Only the Basic KSU can be floor mounted. The floor mounting option is for demonstration purposes only. The information in this section provides detailed instructions for installing the KSU.

Before installing the system; observe the following precautions.

- ◇ Before beginning installation, ensure that the Power Supply Unit (PSU) is **OFF** and that the power cord is disconnected from the AC outlet.
- ◇ Do not touch the soldered surfaces of the ETUs.

3.1 General Information

3.1.1 Basic KSU

The B64-U20 KSU provides service for outside lines, Attendant Consoles, and interconnection of the station terminals. The B64-U20 KSU has two fixed and eight flexible slots. The first fixed slot is reserved for the CPUII( )-U10 in the basic KSU or for the EXP-U( ) ETU in expansion KSUs. The second fixed slot is not used in the Electra Elite IPK II KSU. The P64-U10 PSU (power supply unit), backup batteries, and three PFT relays are included with each KSU.

3.1.2 Expansion KSUs

The B64-U20 KSU is also used as the expansion unit that can be attached to the basic KSU to provide additional ports. Two expansion units can be added to the Electra Elite IPK II system. Each expansion KSU provides eight flexible slots and accommodates 8-, 16-, or 24-channel interface cards. The P64-U10 PSU (power supply unit), backup batteries, and three PFT relays are included with each KSU.

The installation instructions provided in this chapter apply to the basic B64-U20 KSU and the expansion B64-U20 KSUs unless otherwise specified.

3.2 Removing the KSU Cover

To access the battery, cables, and ETU slots, the front cover must be removed.

1. Loosen the screw that is located near the ON/OFF switch, on the right side of the KSU. Do not remove the screw from the unit.

2. To remove the front panel, slide it to the right and pull.

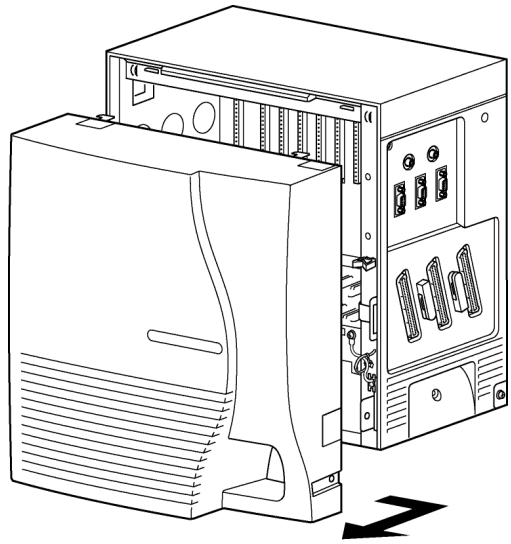

Figure 5-4 Removing the Front Panel of the KSU

3.3 Securing Cables Using the Velcro Strap

Amphenol cables attached to the side of the KSU can be secured using the provided velcro strap. When wall mounting, this should be done prior to attaching the KSU to the wall mount bracket.

1. When one or two amphenol cables are attached to the KSU, the velcro strap can be threaded around the cable and through the hooks to secure the cables.

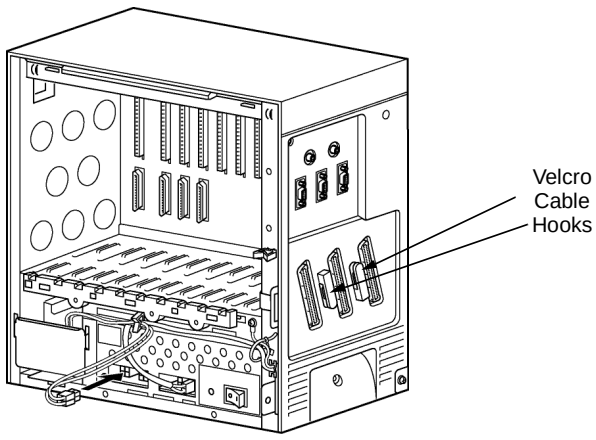

Figure 5-5 Threading the Velcro Strap to Secure Amphenol Cables

2. When all three amphenol cables are used, the velcro strap is threaded around the cables, instead of through the hooks, and attached to the KSU.

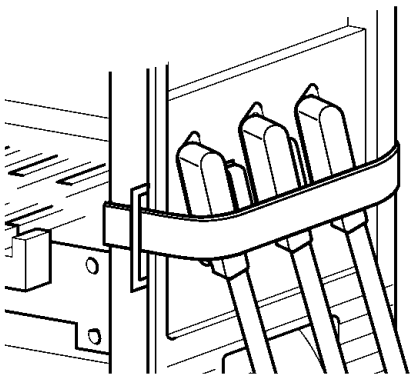

Figure 5-6 Threading the Velcro Strap to Secure Three Amphenol Cables

3.4 Wall Mounting the Basic KSU

1. Before wall mounting the KSU, Use the four (locally provided) screws to attach the wall mount bracket to the wall as shown in Figure 5-7 Attaching the Wall Mount Bracket.

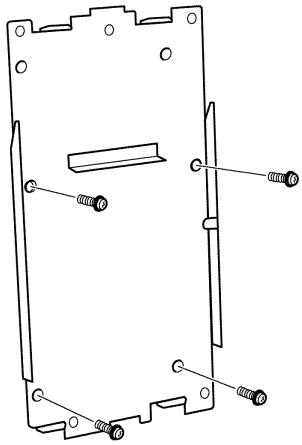

Figure 5-7 Attaching the Wall Mount Bracket

2. After the bracket is mounted to the wall, peel off the spacer backing. Place and adhere the spacer to the position shown in Figure 5-8 Attaching the Wall Mount Bracket with Spacer.

   ✎ All wall and rack mounted KSUs must have the Spacer Bracket added to the Wall Mount Bracket.

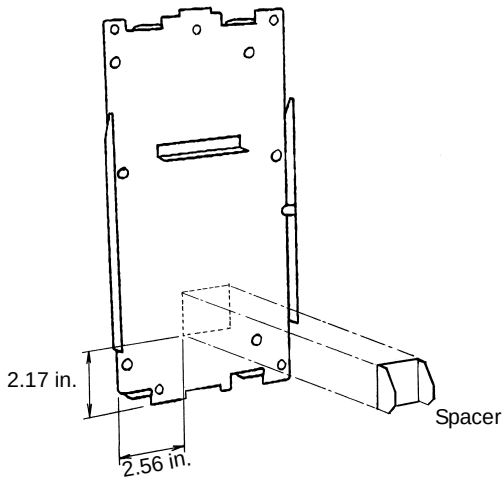

Figure 5-8 Attaching the Wall Mount Bracket with Spacer

3. Hang the KSU on the two hooks protruding from the wall mount bracket as shown in Figure 5-9 Hanging the Basic KSU on the Bracket.

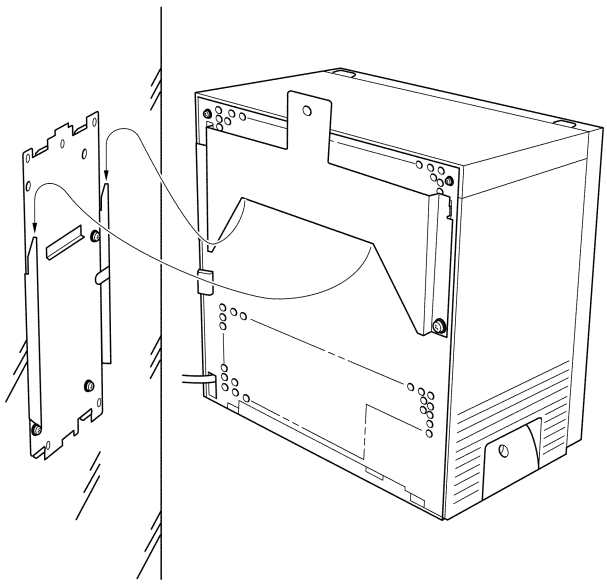

Figure 5-9 Hanging the Basic KSU on the Bracket

4. Secure the KSU to the wall by placing a locally provided screw and washer in the hole in the center of the wall mount bracket as shown in Figure 5-10 Securing the Basic KSU to the Wall.

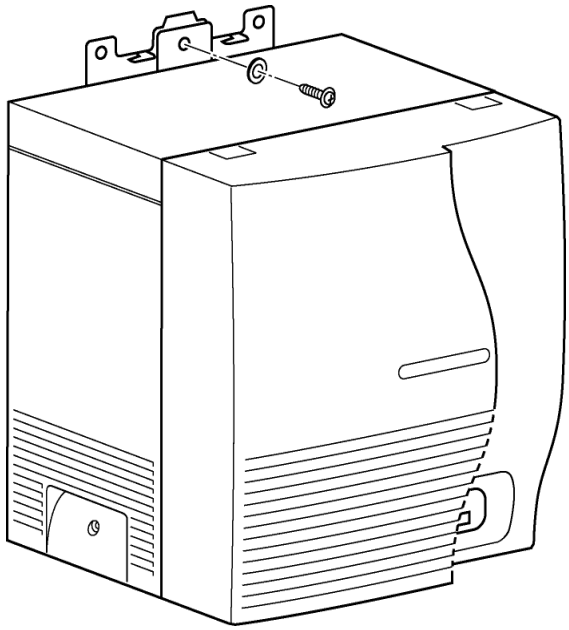

Figure 5-10 Securing the Basic KSU to the Wall

3.5 Wall Mounting the Expansion KSU

1. Fit the bottom of the Expansion Wall Mount Bracket to the top of the Basic Wall Mount Bracket. Refer to Figure 5-11 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket.

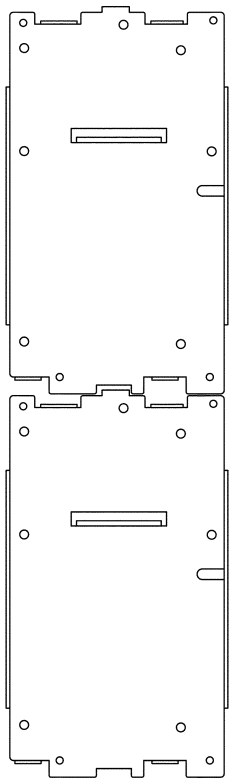

Figure 5-11 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket

2. Hang the KSU on the two hooks protruding from the expansion wall mount bracket as shown in Figure 5-9 Hanging the Basic KSU on the Bracket.

3. To secure the KSU to the wall, install a locally provided screw in the hole in the center of the wall mount bracket as shown in Figure 5-10 Securing the Basic KSU to the Wall on page 5-14.

3.6 Rack Mounting the Basic KSU

The RAK-U( ) Unit is a 19 inch unit used to simplify installation by rack mounting the Electra Elite IPK II system.

1. Mount the RAK-U( ) Unit to the equipment rack using the six provided screws. Refer to Figure 5-12 RAK-U( ) Unit and KSU. Use three screws on the right side (at 1, 2, and 3) and three screws on the left side.

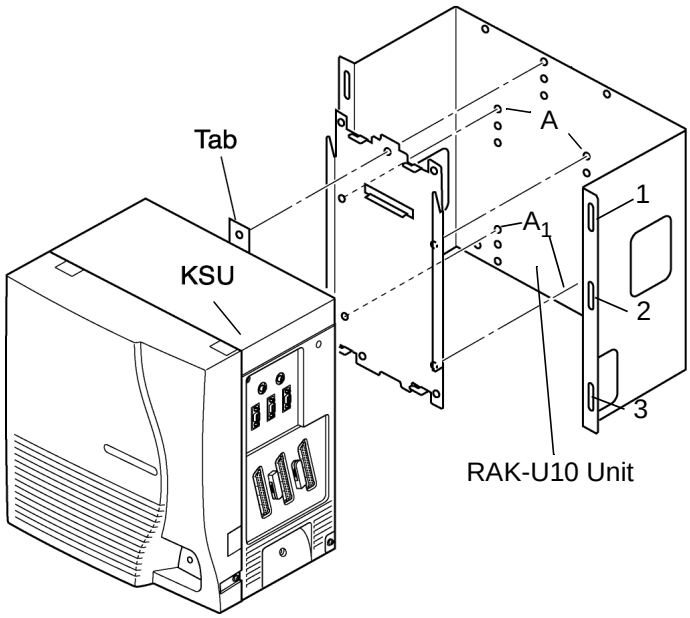

Figure 5-12 RAK-U( ) Unit and KSU

2. Mount the Wall Mount Bracket onto the RAK-U( ) Unit using the four provided screws. Install two screws in the upper holes (at **A**) and two screws in the lower holes (at $\mathbf{A_1}$).

3. After the bracket is mounted to the RAK-U( ) Unit, hang the KSU on the two hooks protruding from the Wall Mount Bracket, as shown in Figure 5-13 Hanging the KSU on the Bracket.

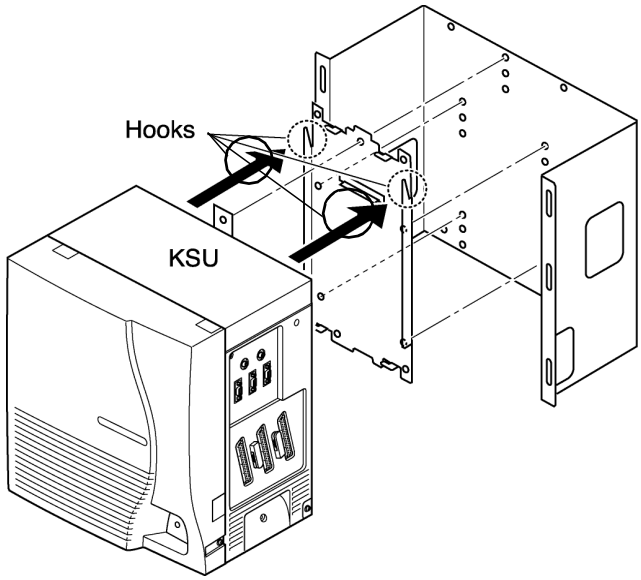

Figure 5-13 Hanging the KSU on the Bracket

4. Secure the KSU to the RAK-U( ) Unit by installing a provided screw into the KSU tab and bracket hole **A_2**. Refer to Figure 5-14 Securing the KSU to the RAK-U( ) Unit.

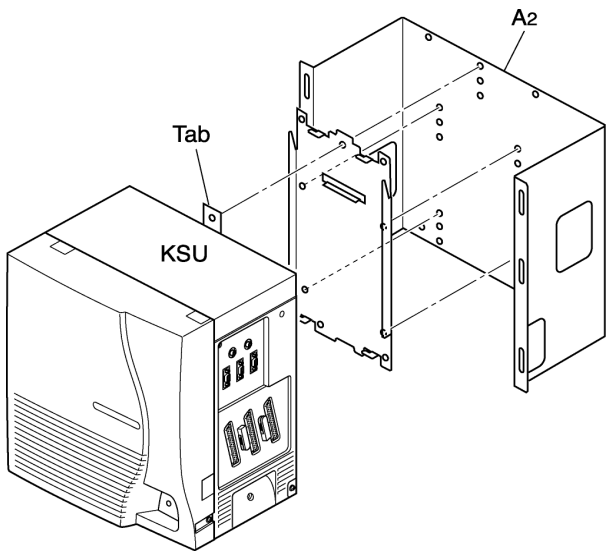

Figure 5-14 Securing the KSU to the RAK-U( ) Unit

3.7 Rack Mounting the Expansion KSU

1. Refer to Figure 5-15 Location for Rack Mounting the KSUs, for the proper location of rack mounting the Basic KSU and the Expansion KSUs.

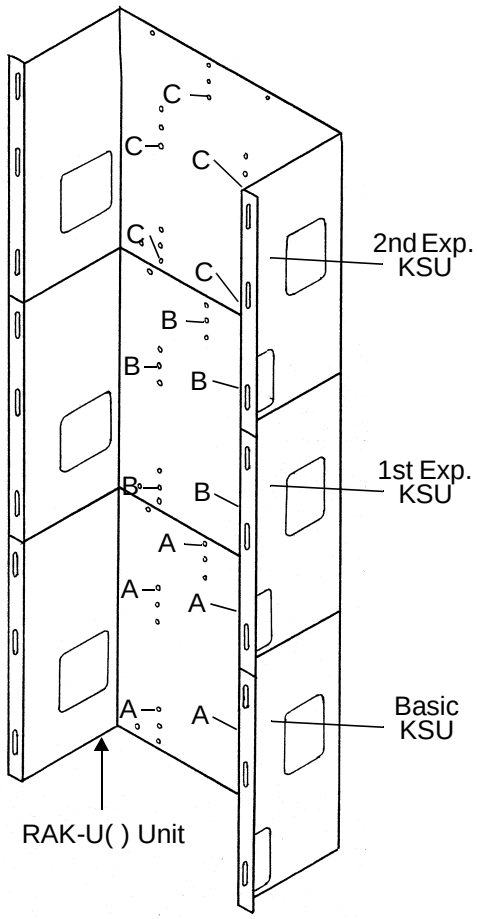

Figure 5-15 Location for Rack Mounting the KSUs

2. The Basic KSU is installed in the lower position of the rack mounting bracket. The Basic KSU is secured using the five threaded screw holes marked **A**.

3. The 1st Expansion KSU is installed in the center position and is secured using the five threaded screw holes marked **B**.

4. The 2nd Expansion KSU is installed in the upper position and is secured using the five threaded screw holes marked **C**.

3.8 Floor Mounting the Basic KSU

Only the B64-U( ) KSU with no expansion KSU can be floor mounted.

1. Use the four locally provided screws to attach the floor mount bracket to the floor.

2. Slide the KSU over the four hooks protruding from the floor mount bracket as shown in Figure 5-16 Floor Mounting the Basic KSU.

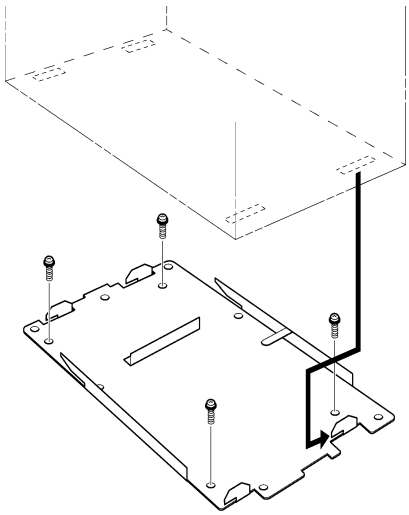

Figure 5-16 Floor Mounting the Basic KSU

3. To secure the KSU to the floor mounting bracket, install the two screws as indicated in Figure 5-17 Securing the KSU to the Floor Mounting Bracket.

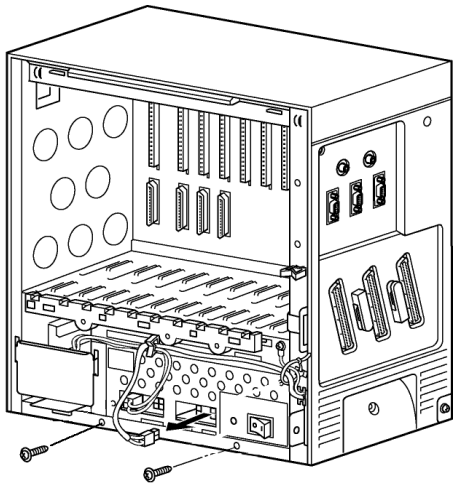

Figure 5-17 Securing the KSU to the Floor Mounting Bracket

3.9 Cable Routing

3.9.1 Connecting the Battery Expansion Cables on the KSU

1. Use the DC Expansion Cable (included with the EXP-U ETU) to connect the **BATTERY EXT** on the Basic KSU to the **BATTERY EXT** of the Expansion KSU.

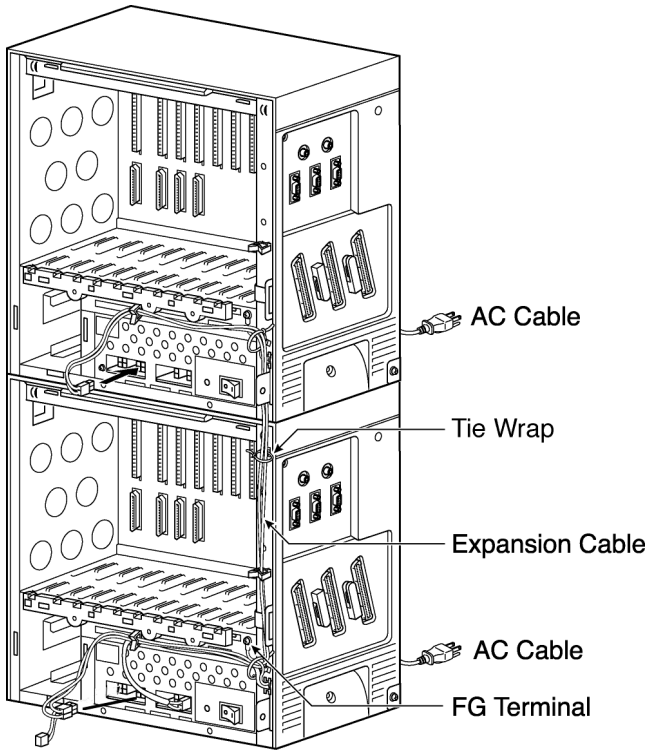

Figure 5-18 Connecting DC Expansion Cables

2. To connect an Expansion KSU, use the two screws to attach the FG plate to the Basic and Expansion KSUs. Refer to Figure 5-19 Attaching the Frame Ground Plate. (When installing a second Expansion KSU, another FG plate is required.)

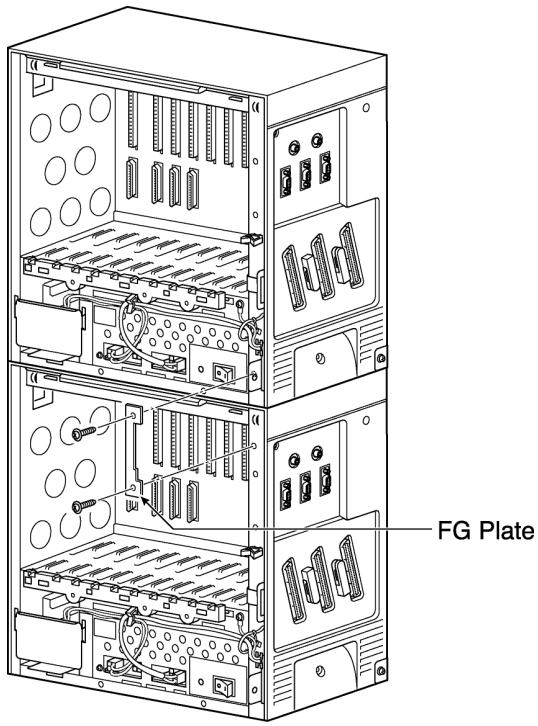

Figure 5-19 Attaching the Frame Ground Plate

3.9.2 Grounding Requirements

The KSUs must be properly grounded. The Electra Elite IPK II KSUs are provided with a typical AC third-wire ground. When this ground is questionable, an alternative ground must be provided.

1. Connect the grounding cable (green wire) to the ground terminal on the right side of the Basic KSU. *The locally provided grounding cable AWG must be greater than #16.*

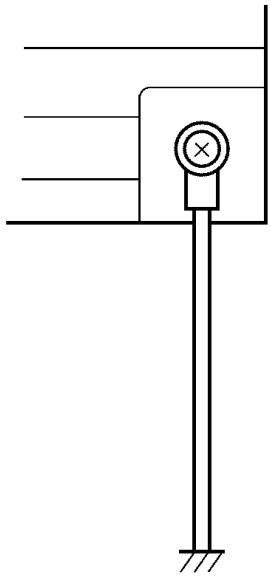

Figure 5-20 KSU Grounding

2. Provide a suitable ground inside of a building in accordance with local telephone company procedures.

3. When no suitable ground is available, a ground rod should be installed in accordance with the operating procedures of the local telephone company.

3.10 Replacing the Power Supply Unit in the KSU

The Electra Elite IPK II system has a P64-U( ) PSU for each KSU. The Power Supply Unit has a battery backup interface and accepts 117 Vac and outputs +5V and –24V to the system.

The Power Supply Unit is included with the B64-U20 KSU.

Before replacing the PSU, remove the defective PSU and verify that the power cord on the replacement PSU is unplugged.

3.10.1 Connecting the Power Supply Unit to the Basic KSU

1. Connect the 8-wire cable from the PSU to the connector on the backplane of the KSU.

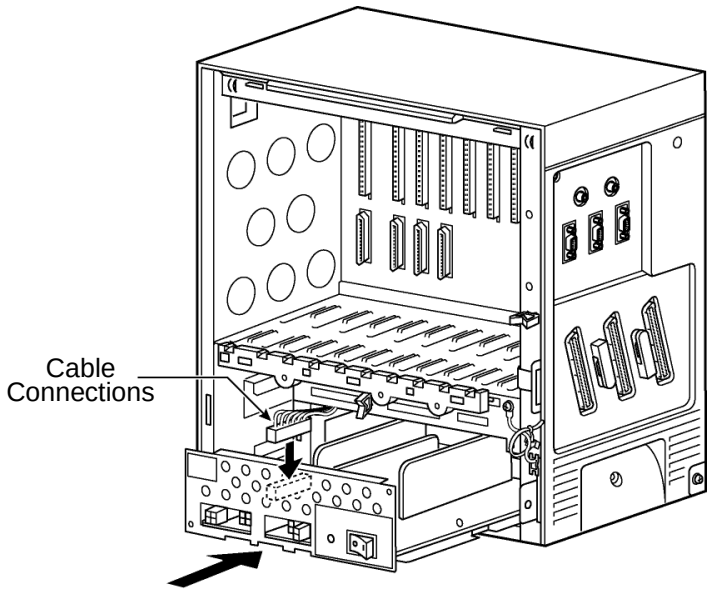

Figure 5-21 Connecting Wires to the PSU

2. Install the P64-U( ) PSU into the bottom space of the KSU and attach it to the KSU using the two provided screws.

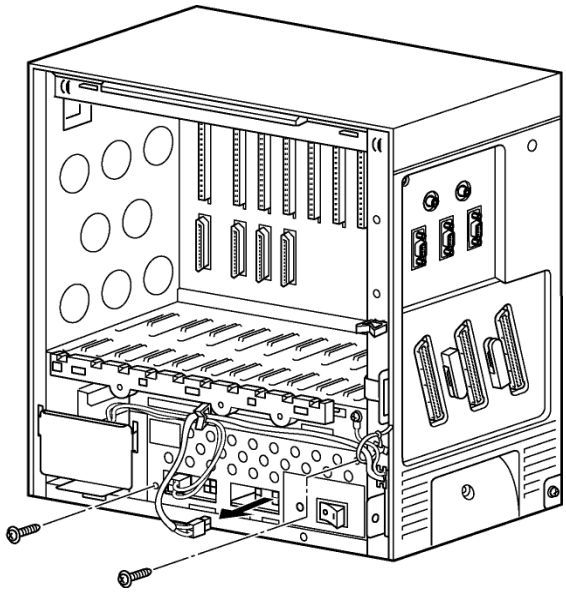

Figure 5-22 Mounting the PSU onto the KSU

3. Lead the KSU power cable through the clamp and connect the PSU as shown in Figure 5-23 Connecting the PSU Power Cable to the Basic KSU.

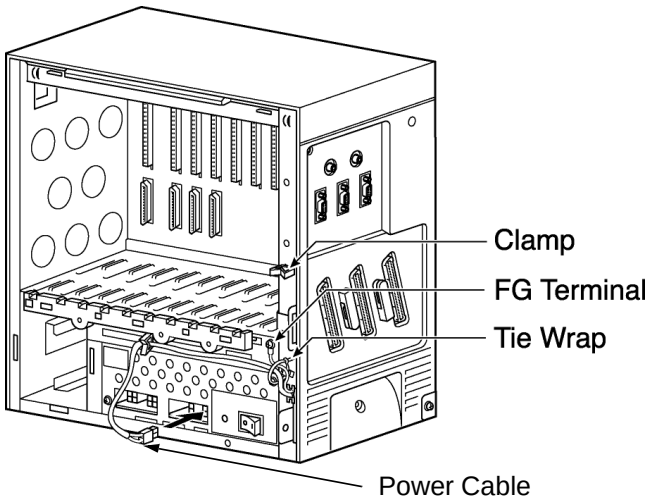

Figure 5-23 Connecting the PSU Power Cable to the Basic KSU

3.10.2 Connecting Battery Expansion Cables to the Expansion KSU

1. Lead the Battery Expansion Cables (included with the EXP-U( ) ETU) through the clamps and tie them to the KSU with a tie wrap on the expansion KSU.

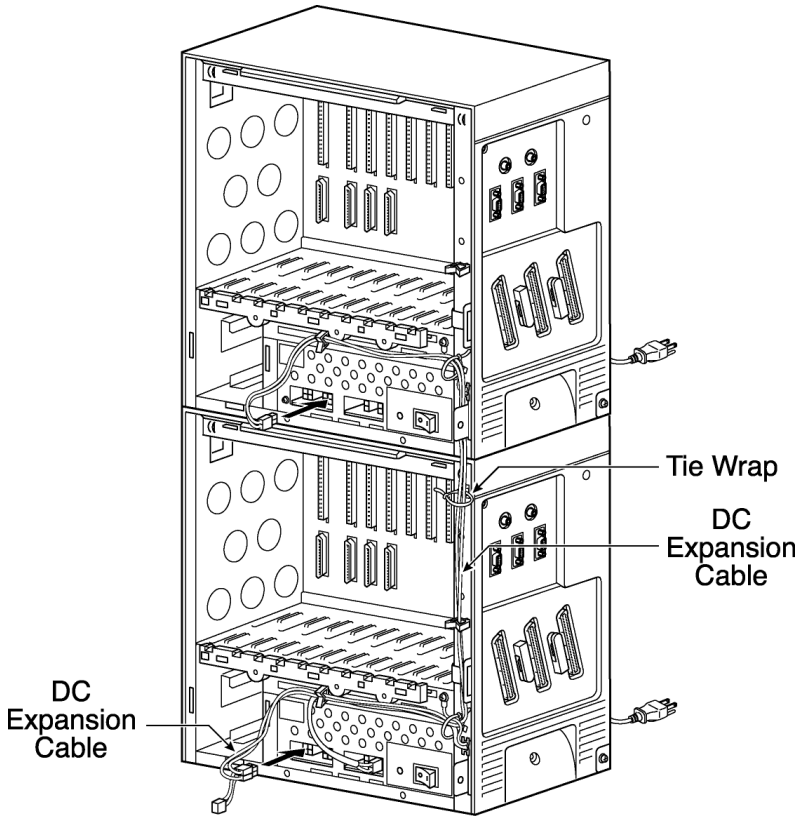

Figure 5-24 Connecting Battery Expansion Cables to the Expansion KSU

2. When using two expansion KSUs, connect the PSU of each expansion KSU with the Battery expansion cables, lead the cables through the clamps, and tie them with a tie wrap.

3.10.3 Fuse Replacement

For continued protection against risk of fire, replace fuses with the same type and rating originally installed.

1. Turn off the power switch and remove the front cover on the KSU. (Refer to Figure 5-4 Removing the Front Panel of the KSU.)

2. Pull out the drawer that holds the PSU and disconnect the cable as shown in Figure 5-25 Removing the PSU from the KSU.

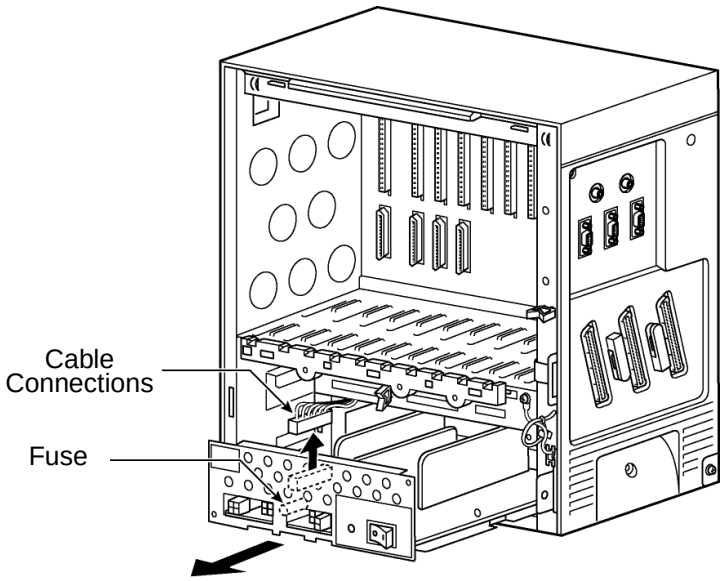

Figure 5-25 Removing the PSU from the KSU

3. Replace the fuses as necessary and return the PSU to the KSU. Fuse **F1** is a 125V, 6A fuse for AC input. Fuse **F101** is a 125V, 6.0A fuse for DC input.

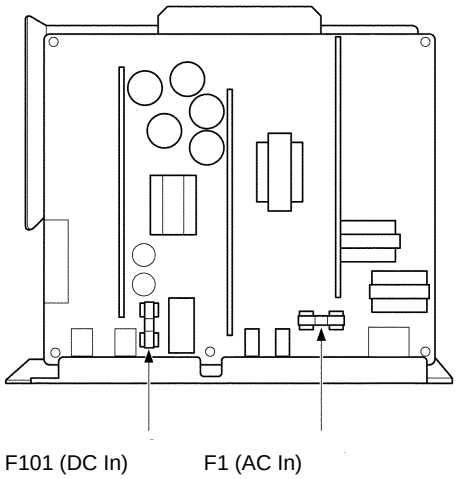

Figure 5-26 PSU Fuse Replacement

3.11 Installing Built-In and External Batteries in the KSU

3.11.1 Built-In Battery Installation

1. Connect the two batteries in series as shown in Figure 5-27 Connecting Built-In Batteries. The red cord attaches to the **red** terminal and the black cord attaches to the **black** terminal.

Be careful, and properly connect the terminals of the batteries.

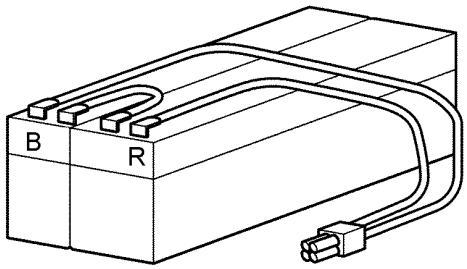

Figure 5-27 Connecting Built-In Batteries

2. Install the batteries into the bottom space at the left side the KSU. Refer to Figure 5-28 Placing the Batteries into the KSU.

3. Install the battery cover as illustrated in Figure 5-28 Placing the Batteries into the KSU.

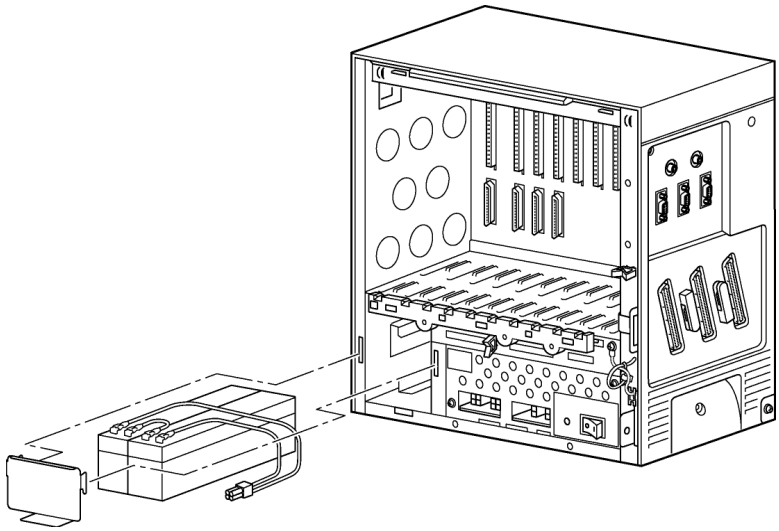

Figure 5-28 Placing the Batteries into the KSU

4. Connect the cable to the **BATTERY INT** connector of the PSU as shown in Figure 5-29 Connecting the Batteries to the Power Supply Unit.

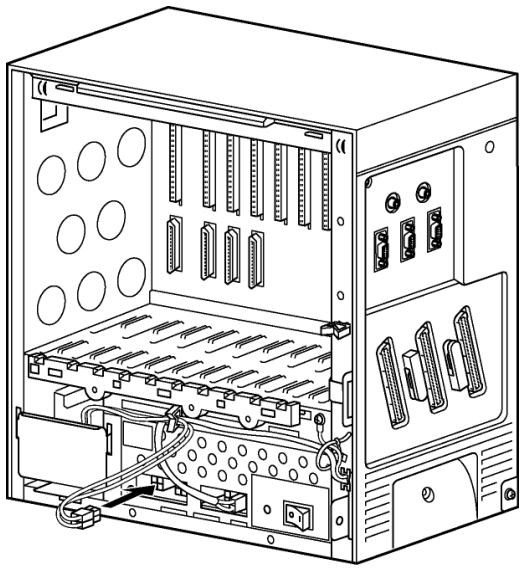

Figure 5-29 Connecting the Batteries to the Power Supply Unit

3.11.2 External Battery Installation

Batteries that are purchased locally can be connected to the system as external batteries.

When installing external batteries, disconnect the battery cable for the built-in batteries from the BATTERY INT connector of each KSU. When the built-in batteries are connected with the external batteries, a large charging current could flow from the external batteries to the built-in batteries and burn the battery cables.

3.11.2.1 Basic KSU

1. Connect cabling to the external batteries as shown in Figure 5-30 Connecting Cables for External Batteries in the Basic KSU.

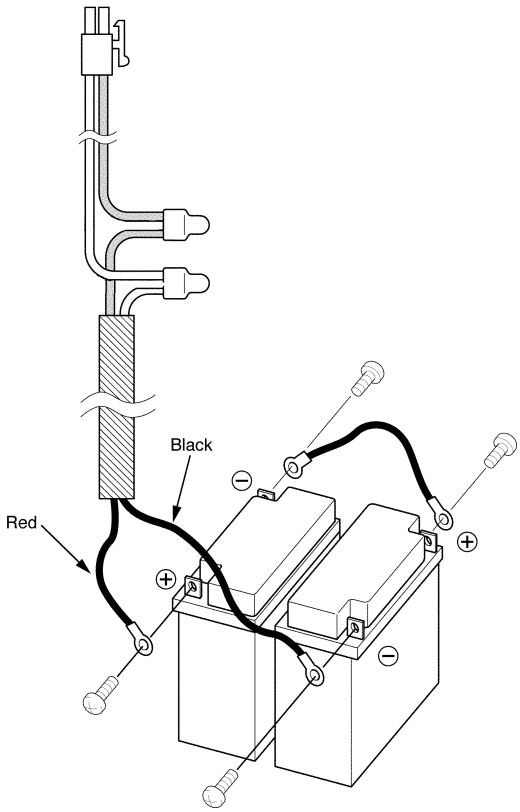

Figure 5-30 Connecting Cables for External Batteries in the Basic KSU

2. Connect the external batteries to the KSU in the location shown in Figure 5-31 Connecting the External Battery to the Basic KSU. Connect the external battery cable to the **EXT** connector on the PSU of the Basic KSU. Bundle any extra cabling together.

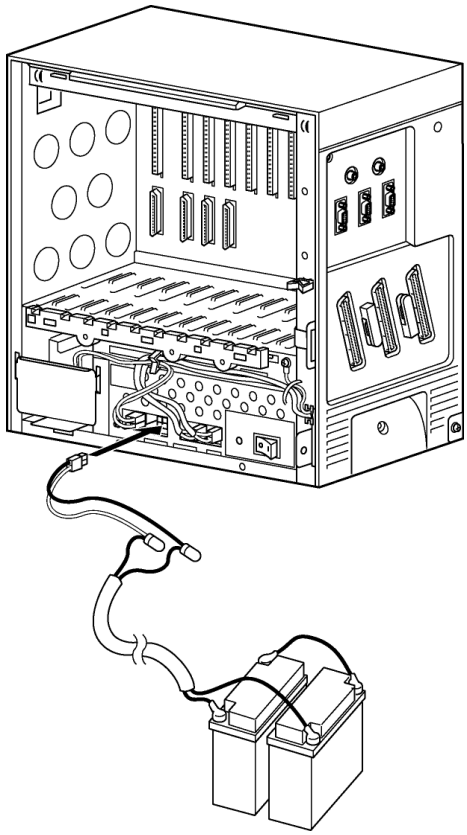

Figure 5-31 Connecting the External Battery to the Basic KSU

3. Route the cables through the clamps on the KSU as shown in Figure 5-32 Threading the Cables through the Clamps on the Basic KSU.

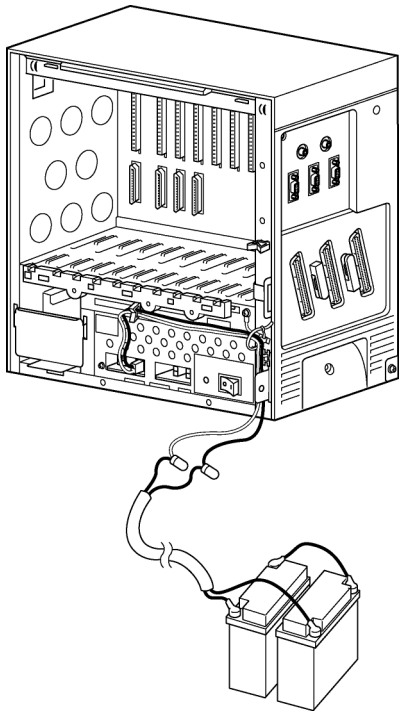

Figure 5-32 Threading the Cables through the Clamps on the Basic KSU

4. Before putting the cover on the Basic KSU, remove the knockout (indicated by the arrow). Refer to Figure 5-33 Removing the Knockout on the Cover of the Basic KSU.

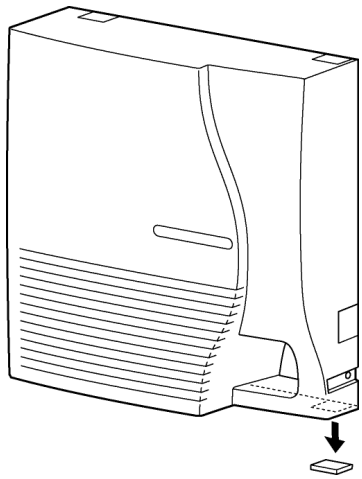

Figure 5-33 Removing the Knockout on the Cover of the Basic KSU

5. Lead the battery cables through the knockout and secure the front cover on the Basic KSU. Refer to Figure 5-34 Leading the Battery Cables out of the Basic KSU.

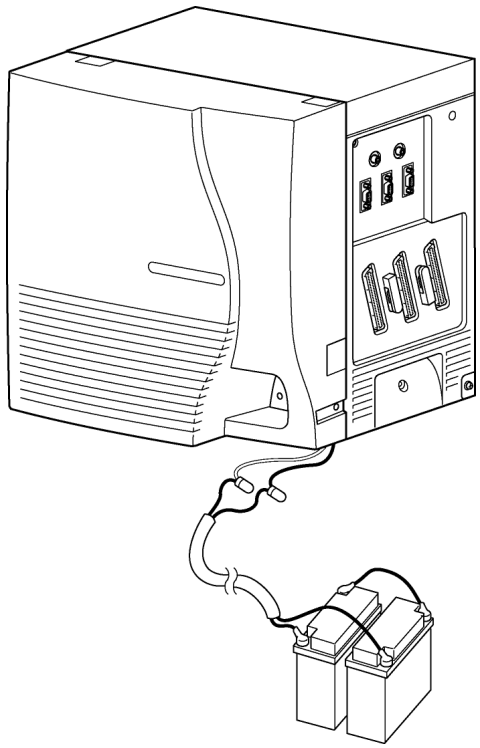

Figure 5-34 Leading the Battery Cables out of the Basic KSU

3.11.2.2 Expansion KSU

When connecting batteries to the Expansion KSUs, connections that must also be made to the Basic KSU are noted in the following instructions. Although a 3-cabinet drawing is not provided, the third KSU draws its external battery power by connecting a cable to the **EXT** connection of the second KSU. This provides a daisy-chain connection between all three KSUs.

1. Connect cabling provided by NEC to the external batteries as shown in Figure 5-30 Connecting Cables for External Batteries in the Basic KSU.

2. Connect the external battery cable to the **EXT** connector on the PSU of the Basic KSU and the Expansion KSUs as shown in Figure 5-35 External Battery Cable Installation. Bundle any extra cabling together.

Connecting this cable to PSU EXT connector solves voltage drop problems.

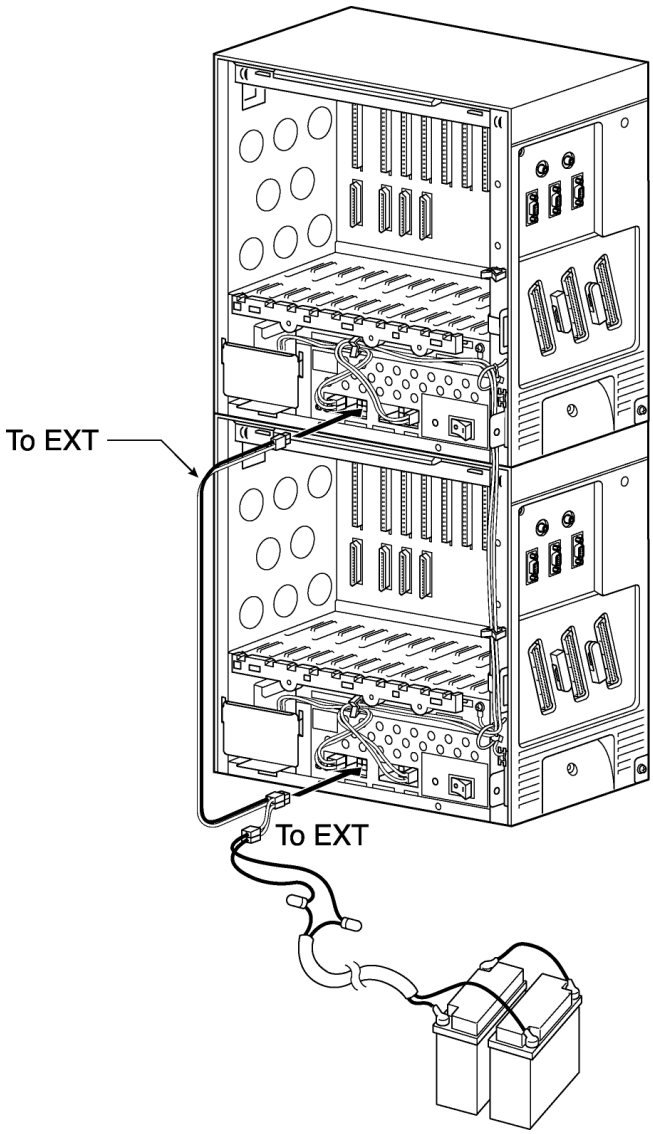

Figure 5-35 External Battery Cable Installation

3. Route the cables through the clamps on the Basic and Expansion KSUs as shown in Figure 5-36 Threading the Cables through the Clamps on the Basic and Expansion KSUs.

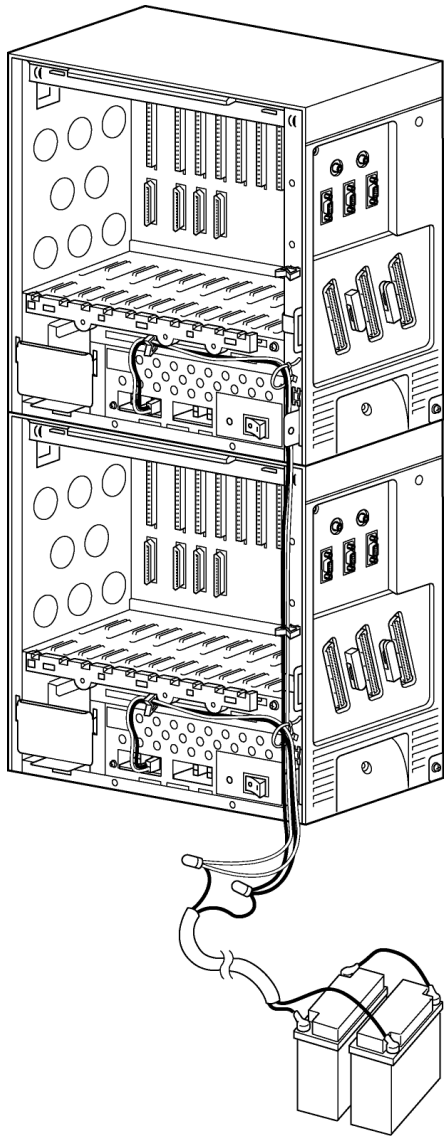

Figure 5-36 Threading the Cables through the Clamps on the Basic and Expansion KSUs

4. Before putting the covers on the Basic and Expansion KSUs, remove the knockouts (indicated by the arrows). On the Basic KSU, knockouts must be removed from the top and the bottom of the KSU cover. On the Expansion KSU, only the bottom knockout is removed. Refer to Figure 5-37 Removing the Knockouts on the Covers of Basic and Expansion KSUs.

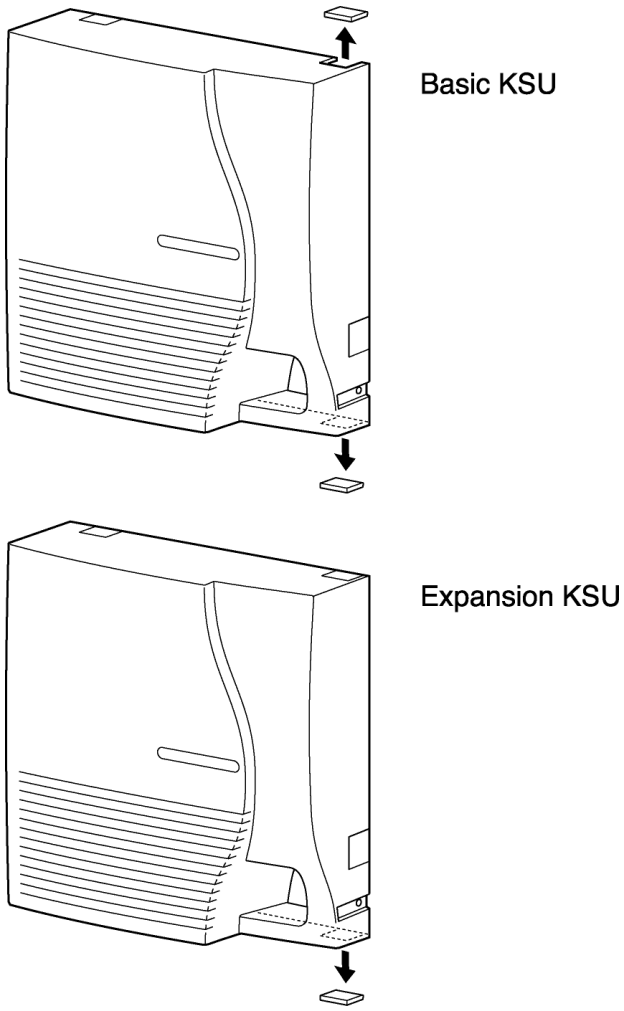

Figure 5-37 Removing the Knockouts on the Covers of Basic and Expansion KSUs

5. Lead the battery cables through the knockouts on the Basic and Expansion KSUs and secure the front covers on the KSUs. Refer to Figure 5-38 Leading the Battery Cables out of the Basic and Expansion KSUs.

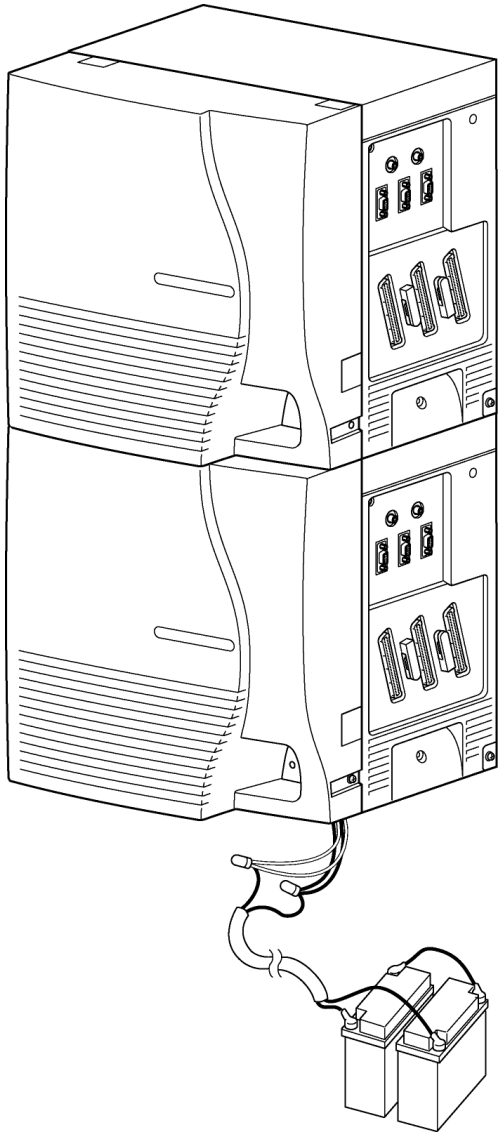

Figure 5-38 Leading the Battery Cables out of the Basic and Expansion KSUs

TABLE OF CONTENTS
CHAPTER 6

Section 1 General Information 6-1

Section 2 Installation 6-2

2.1 Installation Precautions 6-2

2.2 Inserting an ETU into the KSU Slots 6-4

2.3 Removing an ETU from the KSU 6-6

Section 3 Common Control ETUs 6-7

3.1 CPUII( )-U10 ETU 6-7

3.1.1 Description 6-7

3.1.2 Installation 6-7

3.1.3 Switch Settings 6-8

3.1.4 Connectors 6-9

3.1.5 LED Indications 6-10

3.1.6 Replacing Memory Backup 6-11

3.1.7 DSPII-U10 Daughter Board 6-11

3.1.8 MOD-U-(10) Unit 6-12

3.1.9 Connectors 6-12

3.1.10 Upgrading the CPUII( )-U10 ETU 6-12

3.2 PKUII-U (Port Key Unit) 6-17

3.3 EXP-U( ) ETU 6-18

3.3.1 Description 6-18

3.3.2 Installation 6-19

3.3.3 Connectors 6-19

3.3.4 MOD-U10 Unit 6-19

Section 4 Trunk ETUs 6-20

4.1 BRT(4)-U10 ETU 6-20

4.1.1 Description 6-20

4.1.2 Installation 6-21

4.1.3 Switch Settings 6-21

4.1.4 Jumpers 6-21

4.1.5 LED Indications 6-22

4.1.6 Connectors 6-23

4.1.7 Connections 6-23

4.2 BRT(4)-U20 ETU 6-24

4.2.1 Description 6-24

4.2.2 Installation 6-25

4.2.3 Switch Settings 6-25

4.2.4 Jumpers 6-25

4.2.5 LED Indications 6-26

4.2.6 Connectors 6-26

4.2.7 Connections 6-27

4.3 COI(4)/(8)-U( ) ETU 6-28

4.3.1 Description 6-28

4.3.2 Installation 6-29

4.3.3 Switch Settings 6-29

4.3.4 LED Indications 6-30

4.3.5 Connectors 6-30

4.3.6 Connections 6-31

4.4 COIB(4)-U10 ETU 6-32

4.4.1 Description 6-32

4.4.2 Installation 6-33

4.4.3 Switch Settings 6-33

4.4.4 LED Indications 6-34

4.4.5 Connectors 6-34

4.4.6 Connections 6-34
4.5 COIB(4)-U20/U30 ETU 6-35
4.5.1 Description 6-35
4.5.2 Installation 6-36
4.5.3 Switch Settings 6-36
4.5.4 LED Indications 6-37
4.5.5 Connectors 6-37
4.5.6 Connections 6-38
4.5.7 ETU Feature Chart 6-38
4.6 COIB(8)-U20/U30 ETU 6-39
4.6.1 Description 6-39
4.6.2 Installation 6-40
4.6.3 Switch Settings 6-40
4.6.4 LED Indications 6-41
4.6.5 Connectors 6-41
4.6.6 Connections 6-42
4.6.7 ETU Feature Chart 6-43
4.7 DID(4)-U( ) ETU 6-44
4.7.1 Description 6-44
4.7.2 Installation 6-45
4.7.3 LED Indications 6-45
4.7.4 Connectors 6-45
4.7.5 Connections 6-46
4.8 DTI-U40 ETU 6-47
4.8.1 Description 6-47
4.8.2 Installation 6-48
4.8.3 Switch Settings 6-49
4.8.4 LED Indications 6-52
4.8.5 Alarm Conditions 6-52
4.8.6 Connectors 6-53

4.8.7 Connections 6-53
4.9 TLI(2)-U( ) ETU 6-55
4.9.1 Description 6-55
4.9.2 Installation 6-56
4.9.3 Switch Settings 6-56
4.9.4 LED Indications 6-57
4.9.5 Connectors 6-57
4.9.6 Connections 6-57
Section 5 Station ETUs 6-58
5.1 ESI(8)-U( ) ETU 6-58
5.1.1 Description 6-58
5.1.2 Installation 6-59
5.1.3 Switch Settings 6-59
5.1.4 LED Indications 6-59
5.1.5 Connectors 6-59
5.1.6 Connections 6-60
5.2 ESIB(8)-U20 ETU 6-61
5.2.1 Description 6-61
5.2.2 Installation 6-62
5.2.3 Switch Settings 6-62
5.2.4 LED Indications 6-62
5.2.5 Connectors 6-63
5.2.6 Connections 6-63
5.3 ESIE(8)-U20 ETU 6-64
5.3.1 Description 6-64
5.3.2 Installation 6-65
5.3.3 Connectors 6-65
5.3.4 Connections 6-66
5.3.5 Pin Assignments 6-67

5.4 OPX(2)-U( ) ETU 6-68
5.4.1 Description 6-68
5.4.2 Installation 6-69
5.4.3 LED Indications 6-69
5.4.4 Connectors 6-69
5.4.5 Connections 6-70
5.5 SLI(4)/(8)-U( ) ETU 6-71
5.5.1 Description 6-71
5.5.2 Installation 6-72
5.5.3 LED Indications 6-72
5.5.4 Connectors 6-72
5.5.5 Connections 6-73
5.6 SLIB(4)-U10 ETU 6-74
5.6.1 Description 6-74
5.6.2 Installation 6-75
5.6.3 Switch Settings 6-75
5.6.4 LED Indications 6-76
5.6.5 Connectors 6-77
5.6.6 Connections 6-77
5.7 SLIE(4)-U10 ETU 6-78
5.7.1 Description 6-78
5.7.2 Installation 6-79
5.7.3 Connectors 6-79
5.7.4 Connections 6-80
Section 6 Voice Mail ETUs 6-81
6.1 CMS(2)/(4)-U( ) ETU 6-81
6.1.1 Description 6-81
6.1.2 Installation 6-83
6.1.3 Switch Settings 6-84
6.1.4 LED Indications 6-85

6.1.5 Connectors 6-87
6.1.6 Jumper Settings 6-87
6.1.7 Connectors 6-87
6.2 CTI/VP(4)/(8)/(12)/(16)-U( ) ETU 6-88
6.2.1 Description 6-88
6.2.1.1 System Board Components 6-90
6.2.1.2 Daughter Board Components 6-92
6.2.1.3 Port Expansion Board 6-93
6.2.2 Installation 6-93
6.2.3 LED Indications 6-93
6.3 CTP( )-U10 ETU 6-94
6.3.1 Description 6-94
6.3.2 Checklist of Components 6-94
6.3.3 Installation 6-96
6.3.4 Installing Drive on CTP( )-U10 ETU 6-97
6.3.5 Removing the Drive 6-99
6.3.6 Installing DSPs on the CTP( )-U10 ETU 6-100
6.3.7 Installing and Removing the CTP( )-U10 ETU 6-101
6.3.8 Switch Settings 6-102
6.3.9 LED Indications 6-102
6.3.10 Connectors 6-102
6.4 FMS(2)/(4)/(8)- U( ) 6-103
6.4.1 Description 6-103
6.4.2 Installation 6-106
6.4.3 Switch Settings 6-107
6.4.4 LED Indications 6-108
6.4.5 FMS(2)/(4)/(8)-U( ) ETU Connectors 6-111
6.4.6 FMS-U30 ETU Jumper Settings 6-111
6.4.7 FMS-U30 ETU Connectors 6-111

6.5 VMS(2)/(4)/(8)-U( ) ETU 6-112
6.5.1 Description 6-112
6.5.2 Installation 6-115
6.5.3 Switch Settings 6-115
6.5.4 LED Indications 6-117
6.5.5 VMS(2)/(4)/(8)-U( ) ETU Connectors 6-119
6.5.6 VMS-U30 ETU Jumper Settings 6-119
6.5.7 VMS-U30 ETU Connectors 6-119

Section 7 Optional ETUs 6-120

7.1 BSU(4M)-U20 ETU 6-120
7.1.1 Description 6-120
7.1.2 Installation 6-121
7.1.3 LED Indications 6-122
7.1.4 Connectors 6-123
7.2 BSU(2S)-U20 ETU 6-125
7.2.1 Description 6-125
7.2.2 Installation 6-125
7.2.3 LED Indications 6-127
7.2.4 Connectors 6-128
7.3 BSU(6S)-U20 ETU 6-129
7.3.1 Description 6-129
7.3.2 Installation 6-130
7.3.3 LED Indications 6-131
7.3.4 Connectors 6-132
7.4 CCH(4)-U( ) ETU 6-133
7.4.1 Description 6-133
7.4.2 Installation 6-134
7.4.3 Switch Settings 6-134
7.4.4 LED Indications 6-134
7.4.5 Connectors 6-135

7.4.6 Connections 6-135
7.5 CNF(8)-U( ) ETU 6-136
7.5.1 Description 6-136
7.5.2 Installation 6-137
7.5.3 Switch Settings 6-137
7.5.4 LED Indications 6-138
7.5.5 Connectors 6-139
7.6 CNF(16)-U20 ETU 6-140
7.6.1 Description 6-140
7.6.2 Installation 6-141
7.6.3 Configuring 6-142
7.6.4 Switch Settings 6-142
7.6.5 LED Indications 6-144
7.6.6 Connectors 6-144
7.7 HUB(8)-U( ) ETU 6-146
7.7.1 Description 6-146
7.7.2 Installation 6-147
7.7.3 Switch Settings 6-147
7.7.4 LED Indications 6-147
7.7.5 Connectors 6-147
7.8 IAD(8)-U( ) 6-148
7.8.1 Description 6-148
7.8.2 Boot Up Sequence Status Identification 6-149
7.8.3 Installation 6-149
7.8.4 Switch Settings 6-150
7.8.5 Ethernet Status 6-150
7.8.6 Connectors 6-150
7.9 IVR Application 6-151
7.9.1 Description 6-151
7.9.2 Installation 6-152

7.9.3 Switch Settings 6-152
7.9.4 LED Indications 6-153
7.9.5 Jumper Settings 6-154
7.9.6 Connectors 6-155
7.10 PVA( )-U10 ETU 6-156
7.10.1 Description 6-156
7.10.2 Installation 6-157
7.10.3 Applications 6-157
7.10.4 Removal Procedure 6-157
7.10.5 Configuring 6-157
7.10.6 LED Indications 6-158
7.10.7 Connectors 6-160
7.11 VMP( )-U40 ETU 6-161
7.11.1 Description 6-161
7.11.2 Installation 6-162
7.11.3 Installing Flash Drive on the VMP( )-U40 ETU 6-163
7.11.4 Installing Hard Drive on the VMP( )-U40 ETU 6-165
7.11.5 Installing DSP( )-U30 on VMP( )-U40 ETU 6-169
7.11.6 Switch Settings 6-172
7.11.7 Jumper Settings 6-173
7.11.8 VMP( )-U40 LED Indications 6-173
7.11.9 Connectors 6-174

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LIST OF FIGURES
CHAPTER 6

Figure 6-1 Inserting the ETU into the KSU 6-2
Figure 6-2 Inserting or Removing ETUs from the KSU 6-3
Figure 6-3 Handling an ETU 6-3
Figure 6-4 Safety Precautions when Setting Switches on an ETU 6-4
Figure 6-5 Sliding the ETU into the KSU Slot 6-5
Figure 6-6 Lifting the Ejector Tabs on the ETU 6-6
Figure 6-7 CPUII( )-U10 ETU 6-8
Figure 6-8 EXP-U( ) ETU 6-18
Figure 6-9 MOD-U10 Unit 6-19
Figure 6-10 BRT(4)-U10 ETU 6-20
Figure 6-11 BRT(4)-U10 Connections 6-23
Figure 6-12 BRT(4)-U( ) ETU 6-24
Figure 6-13 BRT(4)-U20 Connections 6-27
Figure 6-14 COI(8)-U( ) ETU 6-28
Figure 6-15 COI(4)/(8)-U( ) ETU Connections 6-31
Figure 6-16 COIB(4)-U10 ETU 6-32
Figure 6-17 COIB(4)-U10 ETU Connections 6-34
Figure 6-18 COIB(4)-U20/U30 ETU 6-35
Figure 6-19 COIB(4)-U20/U30 ETU Connections 6-38
Figure 6-20 COIB(8)-U20/U30 ETU 6-39
Figure 6-21 COIB(8)-U20/U30 ETU Connections 6-42
Figure 6-22 DID(4)-U( ) ETU 6-44

Figure 6-23 DID(4)-U( ) ETU Connections 6-46
Figure 6-24 DTI-U40 ETU 6-48
Figure 6-25 DTI-U40 ETU Connectors 6-54
Figure 6-26 ISDN PRI Connectors 6-54
Figure 6-27 TLI(2)-U( ) ETU 6-55
Figure 6-28 TLI(2)-U( ) ETU Connections 6-57
Figure 6-29 ESI(8)-U( ) ETU 6-58
Figure 6-30 ESI(8)-U( ) ETU Connection 6-60
Figure 6-31 ESIB(8)-U20 ETU 6-61
Figure 6-32 ESIB(8)-U20 ETU Connection 6-63
Figure 6-33 ESIE(8)-U20 ETU 6-64
Figure 6-34 ESIE(8)-U20 ETU Connection 6-66
Figure 6-35 OPX(2)-U( ) ETU 6-68
Figure 6-36 OPX(2)-U( ) ETU CN1 Connection 6-70
Figure 6-37 SLI(4)/(8)-U( ) ETU 6-71
Figure 6-38 SLI(4)/(8)-U( ) ETU Connections 6-73
Figure 6-39 SLIB(4)-U10 ETU 6-74
Figure 6-40 SLIB(4)-U10 ETU Connections 6-77
Figure 6-41 SLIE(4)-U10 ETU 6-78
Figure 6-42 SLIB(4)-U10 ETU Connections 6-80
Figure 6-43 CMS(2)/(4)-U( ) ETU 6-82
Figure 6-44 CMS-U30 ETU 6-83
Figure 6-45 EliteMail CTI System Board 6-89
Figure 6-46 EliteMail CTI Daughter Board 6-91
Figure 6-47 EliteMail CTI Port Expansion Board 6-92
Figure 6-48 CTP( )-U10 ETU (Front View) 6-95
Figure 6-49 CTP( )-U10 ETU (Back View) 6-96
Figure 6-50 Before Installing the Drive 6-97

Figure 6-51 Line up Four Screws 6-98
Figure 6-52 Slide Drive Toward Connector 6-98
Figure 6-53 Loosen the Four Screws 6-99
Figure 6-54 Push Drive Toward Backplane 6-99
Figure 6-55 Lift up and Remove Drive from ETU 6-100
Figure 6-56 Insert Brass Connector End 6-100
Figure 6-57 Push Other End Down Until it Locks 6-101
Figure 6-58 FMS(2)/(4)-U( ) ETU 6-104
Figure 6-59 FMS(8)-U( ) ETU 6-105
Figure 6-60 FMS-U30 ETU 6-106
Figure 6-61 VMS(2)/(4)/(8)-U( ) ETU 6-113
Figure 6-62 VMS-U30 ETU 6-114
Figure 6-63 BSU(4M)-U20 ETU 6-120
Figure 6-64 Busy LED Flash Pattern 6-123
Figure 6-65 BSU(2S)-U20 ETU 6-125
Figure 6-66 Busy LED Flash Pattern 6-127
Figure 6-67 BSU(6S)-U20 ETU 6-129
Figure 6-68 Busy LED Flash Pattern 6-132
Figure 6-69 CCH(4)-U( ) ETU 6-133
Figure 6-70 CNF(8)-U( ) ETU 6-136
Figure 6-71 CNF(16)-U20 ETU 6-141
Figure 6-72 HUB(8)-U( ) ETU 6-146
Figure 6-73 IAD(8)-U( ) ETU 6-148
Figure 6-74 VMP(4)-U( ) ETU With IVR Compact Flash 6-151
Figure 6-75 PVA( )-U10 ETU 6-156
Figure 6-76 VMP( )-U40 ETU 6-162
Figure 6-77 Installing the Flash Drive on the VMP( )-U40 ETU 6-163
Figure 6-78 Flash Drive Seated on VMP( )-U40 ETU 6-164

Figure 6-79 Connecting the Hard Drive 6-165
Figure 6-80 Plus Sign on Battery Displayed Up 6-166
Figure 6-81 Connecting the Ribbon Cable 6-167
Figure 6-82 Leaving Four Pins Unconnected 6-168
Figure 6-83 Placing the Hard Drive on the ETU 6-168
Figure 6-84 Placing the Four Mounting Screws 6-169
Figure 6-85 Installing the DSP-U30 on the VMP( )-U40 ETU 6-171

LIST OF TABLES
CHAPTER 6

Table 6-1 CPUII( )-U10 ETU Default Switch Settings 6-9
Table 6-2 CPUII( )-U10 LED Indications 6-10
Table 6-3 CPUII( )-U10 Status 6-10
Table 6-4 PKUII-U Unit Configuration 6-17
Table 6-5 BRT(4)-U10 ETU LED Indications 6-22
Table 6-6 BRT(4)-U20 LED Indications 6-26
Table 6-7 COI(8)-U( ) ETU Default Switch Settings 6-29
Table 6-8 COI(8)-U( ) ETU LED Indications 6-30
Table 6-9 COIB(4)-U10 ETU Default Switch Settings 6-33
Table 6-10 COIB(4)-U10 ETU LED Indications 6-34
Table 6-11 COIB(4)-U20/U30 ETU Default Switch/Jumper Settings 6-36
Table 6-12 COIB(4)-U20/U30 ETU LED Indications 6-37
Table 6-13 COIB(4)-U20/U30 ETU Feature Chart 6-38
Table 6-14 COIB(8)-U20/U30 ETU Default Switch/Jumper Settings 6-40
Table 6-15 COIB(8)-U20/30 ETU LED Indications 6-41
Table 6-16 COIB(8)-U20/U30 ETU Feature Chart 6-43
Table 6-17 DID(4)-U( ) ETU LED Indications 6-45
Table 6-18 DTI-U40 Default Switch Settings 6-49
Table 6-19 DTI-U40 ETU LED Indications 6-52
Table 6-20 TLI(2)-U( ) ETU Default Switch Settings 6-56
Table 6-21 TLI(2)-U( ) ETU LED Indications 6-57
Table 6-22 ESIE(8)-U( ) ETU MJ1 Pin Assignments 6-67

Table 6-23 ESIE(8)-U( ) ETU MJ2 Pin Assignments 6-67
Table 6-24 SLIB(4)-U10 ETU SW2 Switch Settings 6-75
Table 6-25 SW2-2/SW2-3 Details 6-76
Table 6-26 SLIB(4)-U10 ETU SW3 Switch Settings 6-76
Table 6-27 Configuration Support Table 6-81
Table 6-28 CMS(2)/(4)-U( ) ETU DIP Switch Functions 6-84
Table 6-29 CMS(2)/(4)-U( ) ETU LED Indicators 6-85
Table 6-30 CMS-U30 ETU LED Indications 6-86
Table 6-31 Configuration Support 6-89
Table 6-32 System Board Components 6-90
Table 6-33 Daughter Board Components 6-92
Table 6-34 Port Expansion Board Components 6-93
Table 6-35 Configuration Support Table 6-103
Table 6-36 FMS(2)/(4)/(8)-U( ) ETU Switch Settings 6-107
Table 6-37 FMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions 6-108
Table 6-38 FMS(2)/(4)/(8)-U( ) ETU LED Indications 6-108
Table 6-39 FMS-U30 ETU LED Indications 6-109
Table 6-40 Configuration Support Table 6-112
Table 6-41 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Settings 6-115
Table 6-42 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions 6-116
Table 6-43 VMS(2)/(4)/(8)-U( ) ETU LED Indications 6-117
Table 6-44 VMS-U30 ETU LED Indications 6-118
Table 6-45 CCH(4)-U( ) ETU Default Switch Settings 6-134
Table 6-46 CCH(4)-U( ) ETU LED Indications 6-134
Table 6-47 CNF(8)-U( ) ETU Reset Switch 6-137
Table 6-48 CNF(8)-U( ) ETU Maximum Conference Time Switch 6-138
Table 6-49 CNF(8)-U( ) ETU Party Size Switch 6-138
Table 6-50 CNF(8)-U( ) ETU LED Indications 6-138

Table 6-51 Default Network Settings for TCP/IP Addressing 6-142
Table 6-52 CNF(16)-U20 ETU Dip Switch SW1 6-143
Table 6-53 CNF(16)-U20 ETU Rotary Switch SW3 6-143
Table 6-54 CNF(16)-U20 ETU LED Indications 6-144
Table 6-55 HUB(8)-U( ) LEDS 6-147
Table 6-56 IAD(8)-U( ) Configurations 6-149
Table 6-57 IAD(8)-U( ) ETU LED Boot Sequence Indications 6-149
Table 6-58 IAD(8)-U( ) ETU Switches 6-150
Table 6-59 Switch Settings for VMP(4)/(8)-U( ) ETU 6-152
Table 6-60 VMP(4)/(8)-U( ) ETU LED Indications 6-153
Table 6-61 VMP(4)/(8)-U( ) ETU Ready LED Indications 6-154
Table 6-62 PVA( )-U10 ETU Configurations 6-157
Table 6-63 Default Network Settings for TCP/IP Addressing 6-157
Table 6-64 PVI(16)-U10 ETU Rotary Switch SW3 6-158
Table 6-65 Default Boot Sequence: In Active PVA( )-U10 ETU without IP Application Loaded 6-159
Table 6-66 Active PVA( )-U10 ETU with IP Application Loaded 6-159
Table 6-67 VMP( )-U40 ETU Switch Settings 6-172
Table 6-68 VMP( )-U40 ETU Jumper Settings 6-173
Table 6-69 VMP( )-U40 ETU LED Indications (on back of ETU) 6-173
Table 6-70 VMP( )-U40 ETU Connectors 6-174

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Installing ETUs (Circuit Cards) CHAPTER 6

SECTION 1 GENERAL INFORMATION

Each Electronic Telephone Unit (ETU) is installed in a slot in the Basic or Expansion KSU.

The B64-U20 KSU has 10 slots that are divided into three categories:

- ◇ CPU/EXP Slot
- ◇ AP Slot (Not Used)
- ◇ Interface (IF) Slot

CPU/EXP Slot

This is the first slot from the left in the KSU. A CPUII( )-U10 ETU must be installed in this slot in the Basic KSU and an EXP-U10 ETU must be installed in this slot in the Expansion KSU.

The CPUII( )-U10 ETU is damaged when installed in slots S1~S8!

AP Slot

The second slot from the left in the KSU, is not used in the Electra Elite IPK II KSU.

Do not install a CPU or EXP ETU in this slot in the Expansion KSU!

Interface Slots (S1~S8)

Any interface ETU can be installed in these slots.

The remainder of this chapter describes installation procedures for each ETU.

SECTION 2 INSTALLATION

2.1 Installation Precautions

Observe the following precautions when installing the ETUs to avoid static electricity damage to hardware or exposure to hazardous voltages.

- ❑ CMOS technology that is very susceptible to static is extensively used in the ETUs in this system; therefore, extreme care must be taken to **avoid static discharge** when handling ETUs.
- ❑ Make all switch setting changes on the ETU before inserting it in the KSU.
- ❑ When installed, the component side of all ETUs must face the left side of the KSU. Ejector tabs are always on top. Refer to Figure 6-1 Inserting the ETU into the KSU.

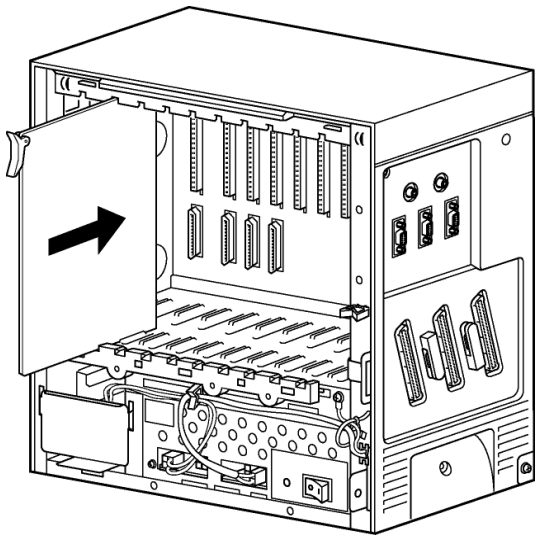


Figure 6-1 Inserting the ETU into the KSU

- ❑ Carry an ETU in a conductive polyethylene bag to prevent static electricity.
- ❑ The ETU installer must wear a grounded wrist strap to protect the ETU from static electricity.

- When you insert or remove an ETU, be sure the wrist strap is connected to the Frame Ground Terminal on the KSU.

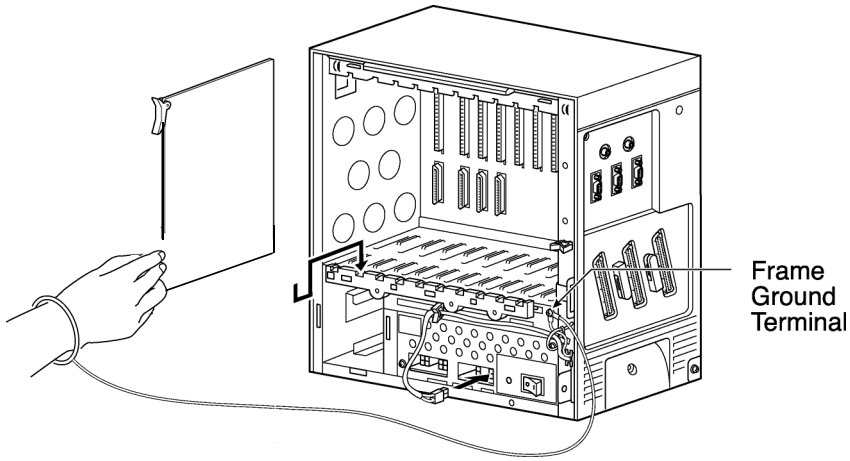


Figure 6-2 Inserting or Removing ETUs from the KSU

- When you hold an ETU, do not touch the components or the soldered surfaces with bare hands. Place one hand under the bottom corner of the ETU and with the other hand hold the ejector tab (located in the top corner of the ETU).

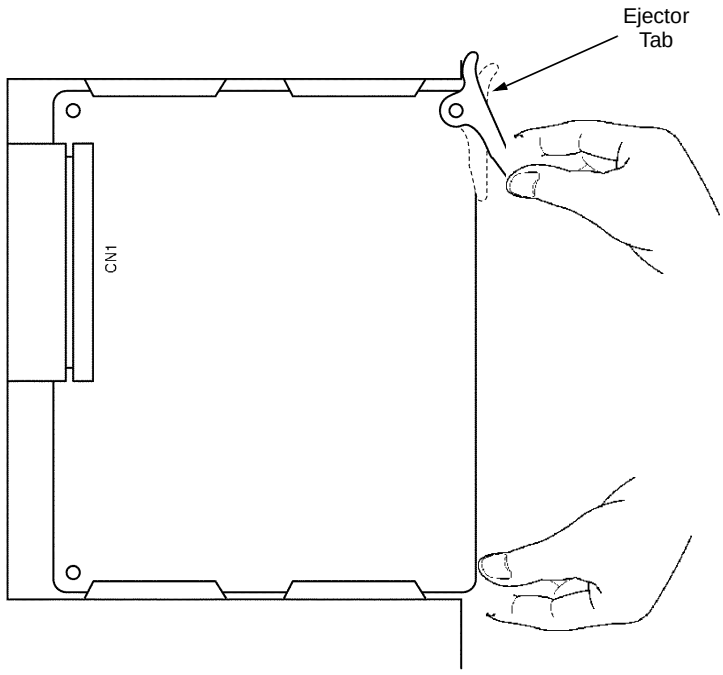


Figure 6-3 Handling an ETU

- ❑ When you set switches on the ETU, wear a wrist strap and stand on a grounded conductive work surface to avoid static electricity.

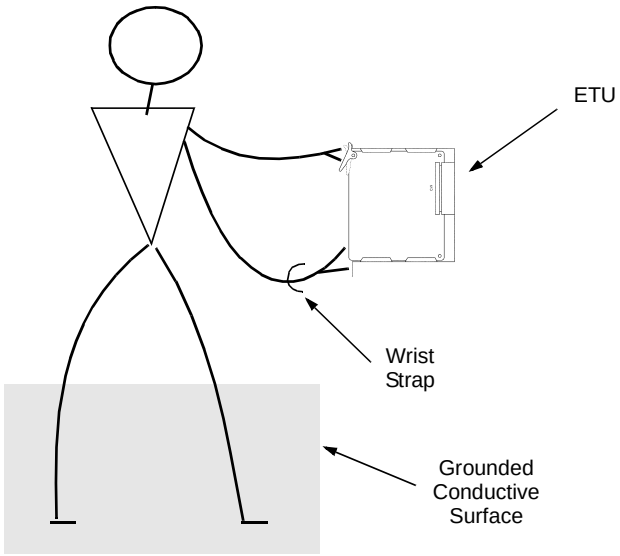


Figure 6-4 Safety Precautions when Setting Switches on an ETU

- ❑ Do not touch the surface of the ETU. A small screw driver can be used to change the switch settings when the installer follows the recommended safety precautions.

2.2 Inserting an ETU into the KSU Slots

1. To unlock the ETUs slots, move the slide bar to the left.
2. Slide the ETU into the proper slot in the KSU.
3. After the ETU is pushed all the way to the back of the KSU, move the slide bar to the right to lock the ETU slots.

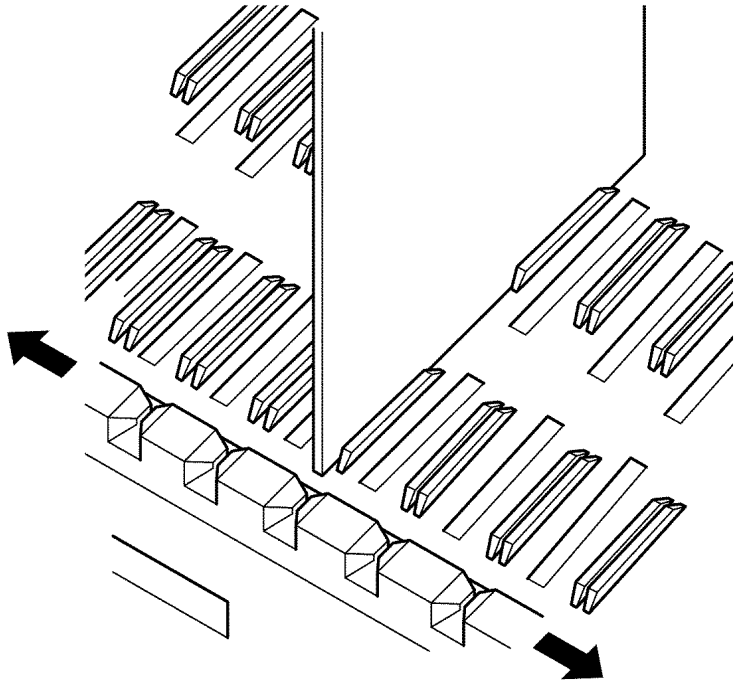


Figure 6-5 Sliding the ETU into the KSU Slot

2.3 Removing an ETU from the KSU

1. To unlock the ETUs, move the slide bar to the left.
2. Lift the ejector tab on the ETU and pull the ETU out of the slot.

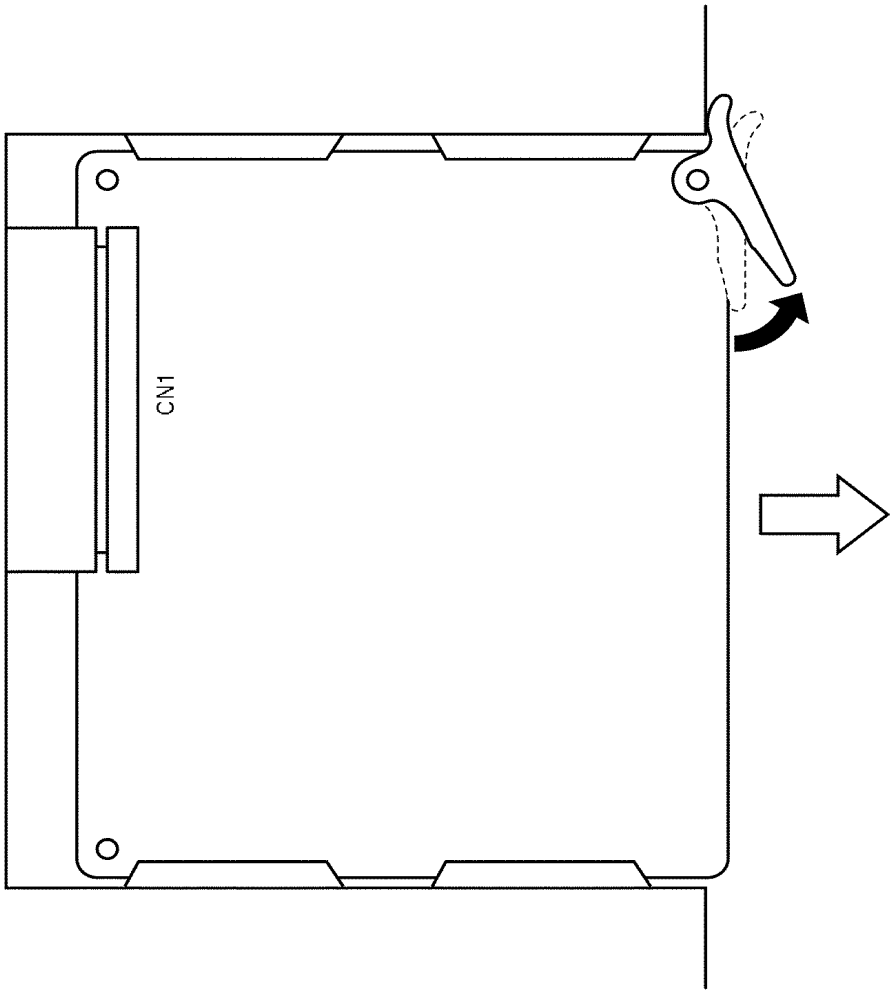


Figure 6-6 Lifting the Ejector Tabs on the ETU

3. To secure remaining ETUs, move slide bar to the right.

SECTION 3 COMMON CONTROL ETUS

The Electronic Telephone units described in this section control the common functions of the KSU.

3.1 CPUII( )-U10 ETU

3.1.1 Description

The CPUII( )-U10 ETU is the Central Processing Unit for the system. This ETU has a Central Processing Unit and a Microprocessing Unit (MPU).

A 32-bit microprocessor executes the programs stored on the Flash ROM ICs of the MPU unit. This controls the entire system when data is transferred to and from other ETUs.

This ETU provides the following items:

- Time Switch Control 512 CH
- Digital Phase Lock Loop (DPLL)
- Static Random Access Memory (SRAM)
- DSPII-U10 (Daughter Board)
- 32-bit Processor
- 25 MHz Clock
- 64-channel DTMF Push Button Receiver (PBR)
- 2 blocks of 32 Conference Circuits with any number of parties as long as the block limit is not exceeded.
- External Music-on-Hold input (also used for station background music)
- Flash ROM (FROM)
- Call Progress and DTMF Tone Generator
- Memory Backup Battery (Retains memory for approximately 21 days)
- Key Function (KF)/Multifunction (MF) Registration
- Compact Flash Memory – 128MB maximum, Compact Flash Type 1 only (must be FAT 16 format)

3.1.2 Installation

Each system must have this ETU in the CPU/EXP slot of the basic B64-U20 KSU. Each system has one CPUII( )-U10 ETU. Refer to Figure 6-7 CPUII( )-U10 ETU.

The CPUII( )-U10 ETU is severely damaged when installed in slots S1~S8.

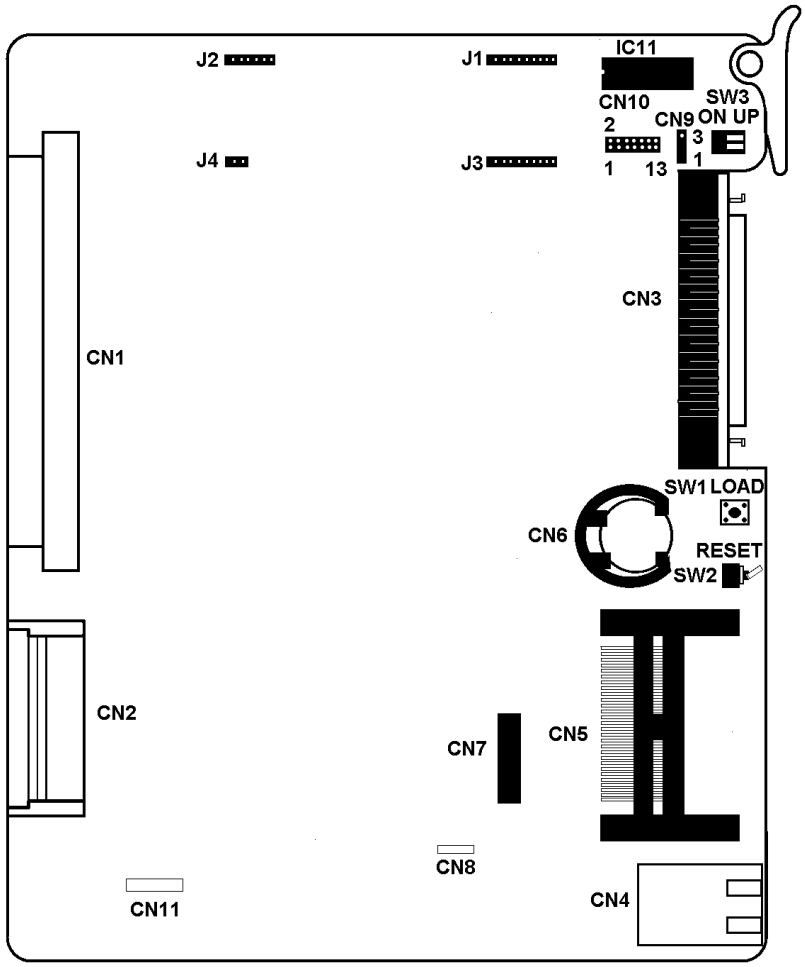


Figure 6-7 CPUII( )-U10 ETU

3.1.3 Switch Settings

Refer to Table 6-1 CPUII( )-U10 ETU Default Switch Settings.

Table 6-1 CPUII( )-U10 ETU Default Switch Settings

SW1	Description
Momentary Switch	Load

SW2	Description
Up	Default/Normal State
Down	System Reset

SW3-1	Description	SW3-2	Description
On (Up)	RS-232C Monitor On	On (Up)	Not Used
Off	RS-232C Monitor Off	Off	Not Used

3.1.4 Connectors

Before programming System Data, the battery must be installed in **CN6** to allow memory retention when a power failure or brownout occurs. When a brownout or power failure occurs, and the battery backup circuit is not activated, Time and Date, Terminal status (e.g., MIC), and SMDR Data reset. System data is not lost due to the battery backup circuit.

When a CPUII( )-U10 ETU is installed and the system or battery backup fails for any reason, the clock/calendar must be set. The fully charged battery retains memory for approximately 7 days.

3.1.5 LED Indications

✎ Refer to Table 6-2 CPUII( )-U10 LED Indications.

Table 6-2 CPUII( )-U10 LED Indications

LED	Description
LED1	On indicates that Compact Flash is installed
LED2	Indicates system alarms – Refer to Table 6-3 CPUII( )-U10 Status
LED3	Indicates system alarms – Refer to Table 6-3 CPUII( )-U10 Status
LED4	Indicates system alarms – Refer to Table 6-3 CPUII( )-U10 Status
LED5 (LIVE)	On indicates the PKG is operating.

✎ The LEDs are on the back of the ETU in the following order top to bottom:
LED5 (LIVE)
LED4
LED3
LED2
LED1

Table 6-3 CPUII( )-U10 Status

LED Indication					Status
LED5	LED4	LED3	LED2	LED1	
On	Off	Off	Off	On	System starting up
Off	Off	Off	Off	On	System initializing
Off	On	Off	Access blink	On	Initializing disk or formatting
Off	Off	On	On	On	Boot program initializing in flash memory
Off	On	On	Access blink	On	Reading system software
On	Blinking	Blinking	Blinking	On	Upgrading system software
On	Blinking	Off	Off	On	Upgrading boot software

Table 6-3 CPUII( )-U10 Status

LED Indication					Status
LED5	LED4	LED3	LED2	LED1	
On	Blinking	Blinking	Off	On	Finish format (SRAM, Flash)
Blinking	Off	Off	Off	On	DRAM error
Blinking	Off	Off	On	On	FPGA version error
Blinking	Off	On	Off	On	SRAM error
Blinking	Off	On	On	On	Flash memory boot error
Blinking	On	On	On	On	Flash memory data error
Blinking	Blinking	Blinking	Blinking	On	System Program reading error
Blinking	Off	Off	Off	On	System starting up

3.1.6 Replacing Memory Backup

The CPUII( )-U10 ETU provides memory backup for approximately 21 days. The Lithium battery should be replaced with a CR2032 type battery every two years.

1. Turn off the KSU power.
2. Remove the CPUII( )-U10 ETU from the KSU.
3. Remove the battery from connector CN6.
4. Install new CR2032 battery in CN6.
5. Install the CPUII( )-U10 ETU in the KSU.
6. Turn on the KSU power.

3.1.7 DSPII-U10 Daughter Board

Systems that use VRS or In-Mail require the daughter board. VRS and In-Mail are provided on a Compact Flash card that plugs into the daughter board. The DSPDBU plugs into the CN7 connector on the CPUII( )-U10 ETU.

3.1.8 MOD-U-(10) Unit

The MOD-U(10) Unit provides a Modem and is installed on the CPUII( )-U10 ETU using connectors J1~J4. The pins of the MOD-U(10) Unit and the sockets on the CPUII( )-U10 ETU are numbered the same. Line up MOD connector J1 with socket J1 on the CPUII and carefully plug in the unit.

3.1.9 Connectors

The CPUII( )-U10 ETU has the following connectors:

- CN1 Connects to the backplane.
- CN2 Connects to the AP bus
- CN3 Connects to CN2 on the EXP-U( ) ETU using an expansion cable
- CN4 LAN connector.
- CN5 Compact Flash connector.
- CN6 Holds the Lithium (CR2032) Battery
- CN7 DSPII-U10 (Daughter Board) connector
- CN8 Used for FPGA Programming
- CN9 Normal Operation: Pins 1 and 2 shorted.
  CPU DEbug: Pins 2 and 3 shorted
- CN10 Used for CPU Debug
- CN11 Used for DSP Debug
- J1~J4 Socket Modem connectors

3.1.10 Upgrading the CPUII( )-U10 ETU

You should backup the database before upgrading the CPUII( )-U10 ETU. This can be done with a download from PCPro and saving the file. Refer to the Electra Elite IPK II PC Programming Manual for more information.

Upgrading from Compact Flash

1. Insert the Compact Flash that has the new firmware files in the CN5 connector on front of the CPUII( )-U10 ETU.

2. Press and hold the SW1 load switch.

3. While continuing to hold the SW1 load switch, toggle the SW2 reset switch, and hold the SW1 switch down for 5 seconds.

4. When the firmware has finished copying, LED 1 is on solid, and LEDs 2~4 blink in unison. You can now remove the Compact Flash Card, and toggle the SW2 reset switch.

5. After the system boots, check that the firmware was upgraded by pressing the Feature key +3.

Remote Upgrade of the CPUII( )-U10 ETU Using PCPro

1. Before starting, make certain a Compact Flash is installed in the CPU CN5 connector. Refer to the Installing a Compact Flash section for more information.

2. Launch PCPro by selecting Start → Programs → Electra Elite IPK II PCPro → Electra Elite IPK II PCPro.

3. Login to PCPro. The default login is **tech** with a password of **12345678**.

4. Connect to IPK II by selecting **Connect** from the toolbar or selecting Connect from the Communications Menu.

5. Define the connection information and click **Connect**.

6. From the Communications Menu, select **Firmware Update**. The Firmware Update window displays.

7. In the Firmware File field, browse out to the location where you stored the Firmware Package file provided by NEC.

8. Select the time when you want the update to be applied. After PCPro uploads the Firmware Package file the system can reset and switch to the new version immediately or at a scheduled date and time.

   ✎ The time specified is relative to the time on the KTS, not the PC that PCPro was run from. Technicians must take time zones into consideration when scheduling updates.

9. Click Start to begin uploading the Firmware Package file. the progress bar indicates the progress of the upload.

10. When the upload is complete, the progress bar indicates Operation Complete.

11. If you selected immediately after upload, the system resets and switches to the new firmware version after one minute. If you selected a time and date, the system resets and switches to the new firmware on the time and date you specified.

12. Click Close to close the firmware window.

13. After a remote upgrade, the Compact Flash must remain in the system. The CPUII( )-U10 ETU now boots from the Compact Flash, not the onboard flash. If the Compact Flash is removed, the system boots off the older version that is in the onboard flash.

    ✎ Up to two versions of firmware are kept on the CF card. One version is the current version that the CPU used to boot from. the other version is the new version that is used on the next boot up. If boot up fails, The CPU can revert back to the older version.

14. To verify if the system was upgraded to the new firmware version, reconnect with PCPro and check the version number of the KTS in the lower right corner. The on site technician can press the Feature Key +3 from any Multiline Terminal.

Remote Upgrade of the CPUII( )-U10 ETU Using WebPro

1. Prior to starting, make sure a Compact Flash is installed in the CPU CN5 connector. Refer to Compact Flash section for more information.

2. Select Start → Programs → Internet Explorer to launch WebPro.

3. From the File Menu, select Open and enter HTTP:// xxx.xxx.xxx.xxx where xxx.xxx.xxx.xxx is the IP address of the CPUII( )-U10 ETU.

4. From the logon page, log into WebPro. The default login is **tech** with a password of **12345678**.

5. From the Administration section of the Home Page, Click the Firmware Update icon.

6. In the Firmware File field, browse to the location where the Firmware Package file provided by NEC is stored.

7. Select the time to apply the update. After WebPRo uploads the Firmware Package file, the system can reset and switch to the new version immediately or at a scheduled time and date.

   ✎ The time specified is relative to the time on the KTS instead of the PC that WebPro was run from. The technician must take time zone differences into account when scheduling updates.

8. Click Start to begin uploading the Firmware Package file. The progress bar indicates the progress of the upload.

9. Click OK when asked if you are sure you want to proceed.

10. The update procedure may take a few minutes to complete. **Do not interact** with the browser window until the update is complete. Do not reset the CPU until the update is complete.

11. After the upload is complete, a complete message is displayed in the WebPro browser window.

    ✎ When immediately is selected for the Schedule Update section, reset and switching versions takes place at the beginning of the next minute (e.g., if upload completes at 4:36:29 PM, reset takes place at 4:37:00 PM).

12. After a remote upgrade, the Compact Flash must remain in the system. The CPUII( )-U10 ETU now boots up from the Compact Flash, not the onboard Flash memory. If the Compact Flash is removed, the system boots from the old version in the onboard Flash.

    ✎ Two versions of firmware are kept on the CF card. One version is the current version that the CPU booted from. The other version is the new version to be used at the next bootup. If bootup fails, the system can revert to the older version.

13. Connect with WebPro again and go to the System Configuration section of the Home Page to verify that the system upgraded to the new version.

14. The Firmware version underneath Cabinet 1 should look like the following: CPU: xx.xx(America). The on site technician can press FEATURE +3 from any multiline terminal.

Writing new Software from Compact Flash to Onboard FLash

As stated above the new software is on the CF after a remote upgrade. If the CF is removed from the system, the next reset boots from the old version. The following procedure describes how to write the new version to the onboard permanent flash.

1. Remove the Compact Flash and use a Compact Flash reader to view the contents of the drive.

2. Find the BATCH64.UP file.

3. Rename this file to BATCH64.TXT.

4. Perform the Upgrading from Compact Flash procedure.

3.2 PKUII-U (Port Key Unit)

When the Port Key Unit is installed, the system is configured as an Expanded Port Package. When the PKUII-U Unit is not installed, the system is configured as a Basic Port Package.

The PKUII-U Unit is installed in the IC11 socket of the CPUII( )-U10 ETU.

Table 6-4 PKUII-U Unit Configuration

Description	Basic Port Package	Expanded Port Package
Basic Terminals (Telephones)	64	256*
Dedicated CAR/VE	256	256
Basic Terminals + CAR/VE	320*	512
Basic Trunks	64*	200
Universal Slots	24	24
Basic Terminals + Trunks	64*	416*

* Sixteen port slots X 24 Universal slots (384) plus 32 common ports shared by all three cabinets equals 416 ports.

✎ The PKUII-U Unit cannot be removed after it is installed and the system has been initialized. If it is removed, the CPUII( )-U10 ETU cannot boot up.

3.3 EXP-U( ) ETU

3.3.1 Description

The EXP-U( ) ETU is the Expansion KSU Controller. This ETU controls transmission between the CPUII( )-U10 ETU and the other ETUs installed in the expansion KSU when it is installed.

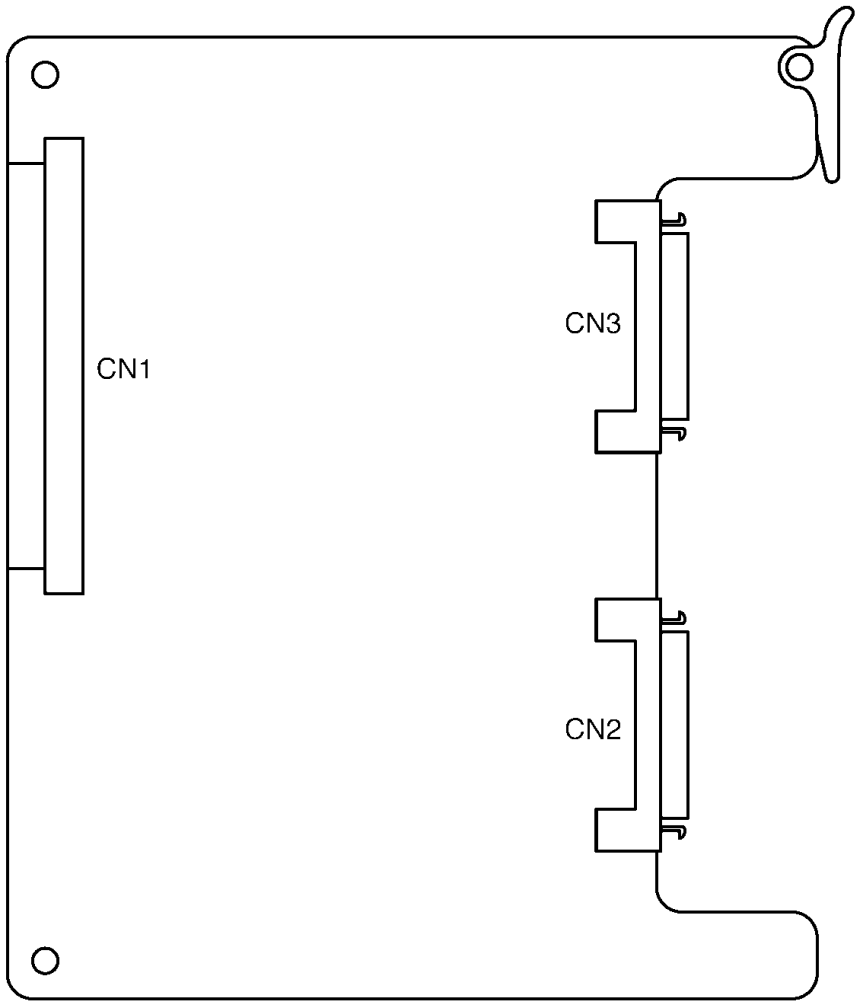


Figure 6-8 EXP-U( ) ETU

3.3.2 Installation

Turn system power off, and install the EXP-U( ) ETU in the CPU/EXP slot of the expansion KSU.

3.3.3 Connectors

The following connectors are included:

- ❍ CN1 Connects to the backplane.
- ❍ CN2 Connected to CN3 on the CPUII( )-U10 ETU or CN3 on EXP-U( ) ETU (installed in the first expansion cabinet) using an expansion cable.
- ❍ CN3 Connected to CN2 on the EXP-U( ) ETU installed in the third expansion cabinet using the expansion cable.

  ✎ Not used when the EXP-U( ) ETU is installed in the last Expansion KSU.

3.3.4 MOD-U10 Unit

This unit is installed on the CPUII( )-U( ) ETU to provide a modem and must be installed in connectors J1, J2, J3, and J4.

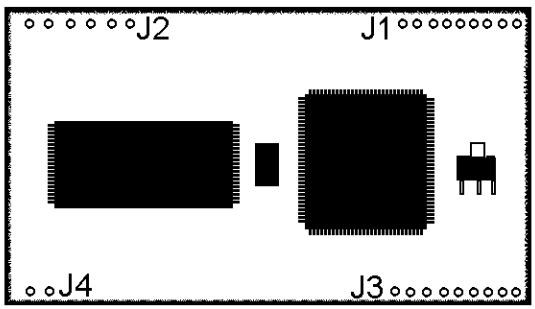


Figure 6-9 MOD-U10 Unit

The MOD-U10 Unit pins and the sockets of the CPUII( )-U( ) ETU are labeled. Line up MOD unit connector J1 with CPUII ETU J1 and MOD unit J2 with CPUII ETU J2, and carefully plug in the unit.

SECTION 4 TRUNK ETUS

The Electronic Telephone Units described in this section provide a link between trunks in the Electra Elite IPK II system and outside equipment. All ETUs are installed in the interface slots of the KSU.

4.1 BRT(4)-U10 ETU

4.1.1 Description

The Basic Rate Trunk (BRT) Interface ETU terminates ISDN Basic Rate Trunk lines and supports four ISDN-BRI circuits. Each trunk supports two B channels. These eight B channels can be used for CO trunks with DTMF signaling. Tip and Ring electrical fuses are provided to comply with UL 1459 requirements.

This ETU uses an S/T-type interface. When connecting to a CO, a locally provided Network Termination unit (NT1) is required. Caller ID is supported.

One BRT ETU provides a maximum of four ISDN circuits that provide eight B channels to be used as trunks.

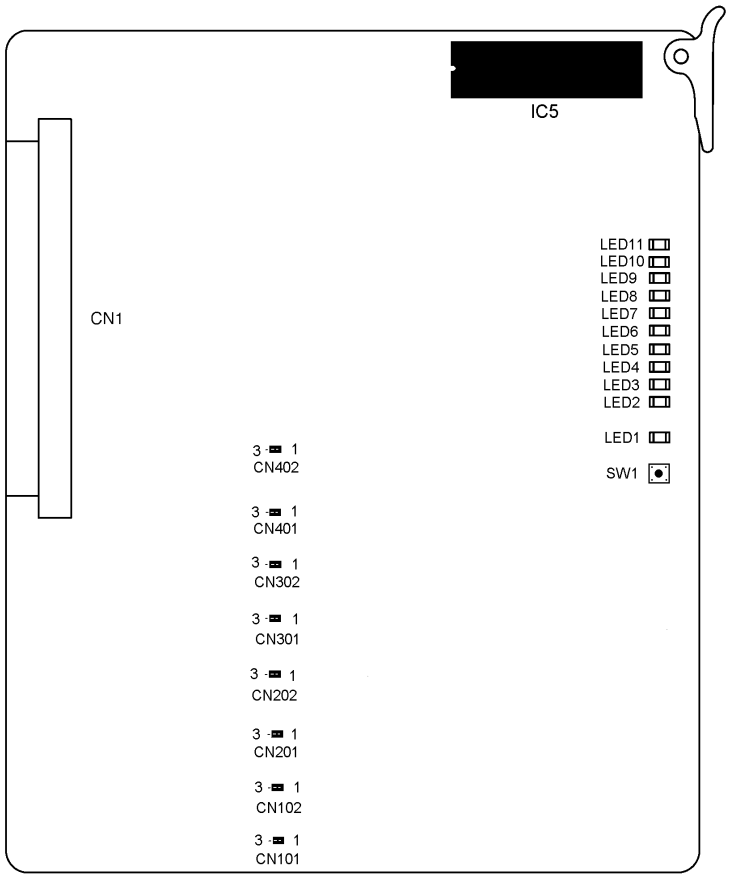


Figure 6-10 BRT(4)-U10 ETU

4.1.2 Installation

Basic Port Package

A maximum of seven BRT(4)-U10 ETUs can be installed in any interface slot in the system. The system limitation is 64 trunks and station ports combined.

The maximum number of BRT(4)-U10 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 BRT(4)-U10 ETUs can be installed in any interface slot in the system. The system limitation is 200 trunks.

The maximum number of BRT(4)-U10 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.1.3 Switch Settings

SW1 is the reset switch.

4.1.4 Jumpers

CN101 and CN102

- Set the 100Ω termination to On or Off for Circuit 1. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN201 and CN202

- Set the 100Ω termination to On or Off for Circuit 2. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN301 and CN302

- Set the 100Ω termination to On or Off for Circuit 3. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN401 and CN402

- Set the 100Ω termination to On or Off for Circuit 4. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

4.1.5 LED Indications

Refer to Table 6-5 BRT(4)-U10 ETU LED Indications.

Table 6-5 BRT(4)-U10 ETU LED Indications

LED	Description	On	Flashing	Off
LED 1	ETU status	Operation stopped (Power On)	Normal Operation	No Power
LED 2	L1 status - BRI CKT1	L1 working	Not Used	L1 idle
LED 3	L1 status - BRI CKT2	L1 working	Not Used	L1 idle
LED 4	L1 status - BRI CKT3	L1 working	Not Used	L1 idle
LED 5	L1 status - BRI CKT4	L1 working	Not Used	L1 idle
LED 6	B1 or B2 status CKT 1	Busy	Not Used	Idle
LED 7	B1 or B2 status CKT 2	Busy	Not Used	Idle
LED 8	B1 or B2 status CKT 3	Busy	Not Used	Idle
LED 9	B1 or B2 status CKT 4	Busy	Not Used	Idle
LED 10	Communication or self-diagnostics	Communication error or Self-diagnostics in progress	Not Used	Normal
LED 11	Communication or self-diagnostics	Communication error or Self-diagnostics in progress	Not Used	Normal

4.1.6 Connectors

The following connector is included:

CN1 Connects to the backplane.

4.1.7 Connections

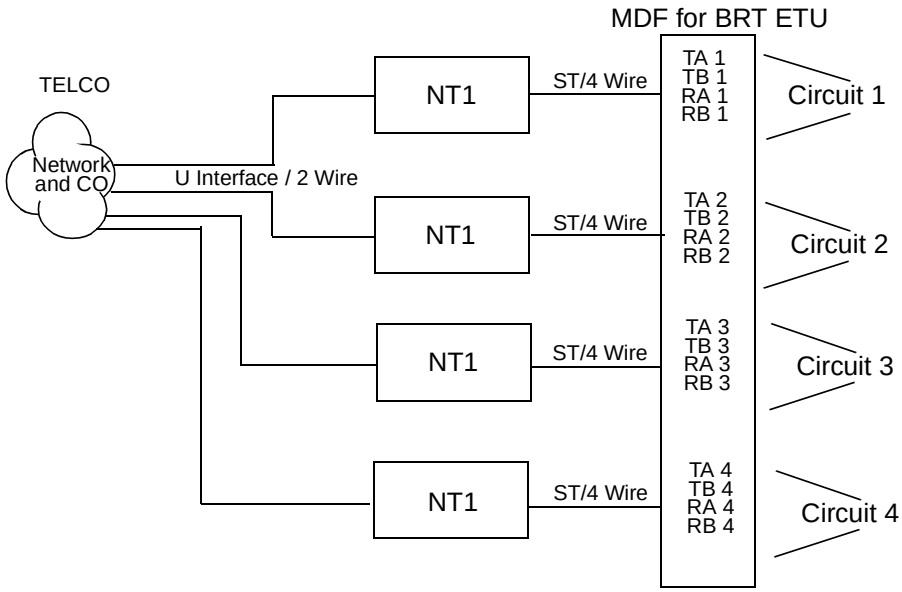


Figure 6-11 BRT(4)-U10 Connections

4.2 BRT(4)-U20 ETU

4.2.1 Description

The Basic Rate Trunk (BRT) Interface ETU terminates ISDN Basic Rate Trunk lines and supports four ISDN-BRI circuits. Each trunk supports two B channels. These eight B channels can be used for CO trunks with DTMF signaling.

This ETU uses an S/T-type interface. When connecting to a CO, a locally provided Network Termination unit (NT1) is required. Caller ID is supported.

One BRT ETU provides a maximum of four ISDN circuits that provide eight B channels to be used as trunks.

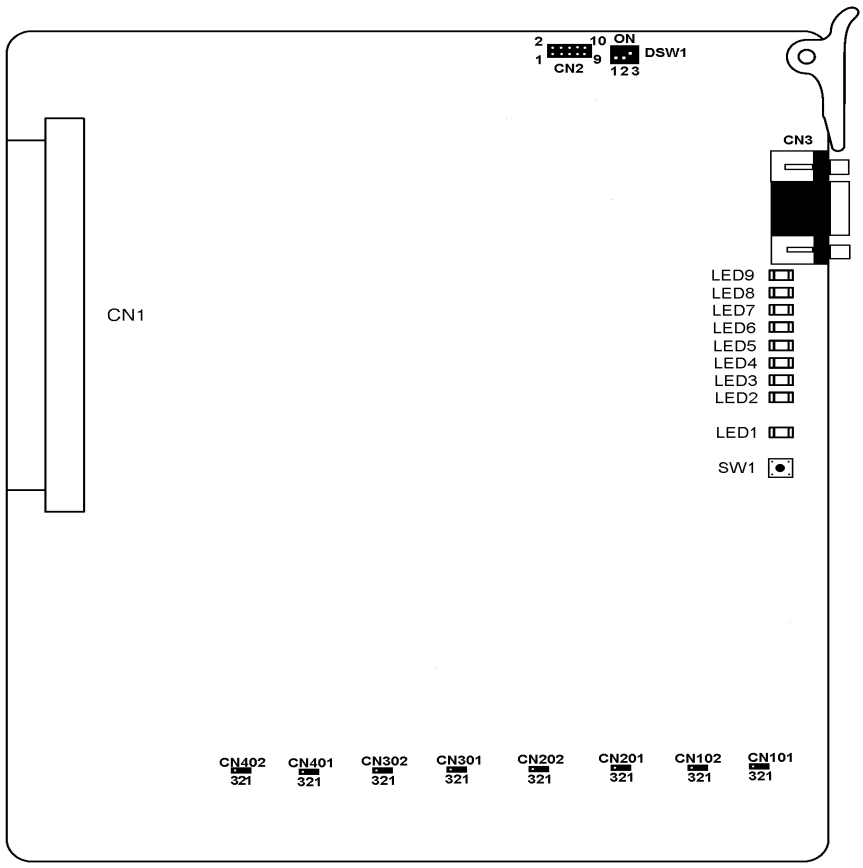


Figure 6-12 BRT(4)-U( ) ETU

4.2.2 Installation

Basic Port Package

A maximum of seven BRT(4)-U20 ETUs can be installed in any interface slot in the system. The system limitation is 64 trunk and station ports combined.

The maximum number of BRT(4)-U20 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 BRT(4)-U20 ETUs can be installed in any interface slot in the system. The system limitation is 200 trunks.

The maximum number of BRT(4)-U20 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.2.3 Switch Settings

SW1 is the reset switch.

DSW1 is used for maintenance. Normal operation is all 3 Off.

Switches DSW1~3	ON: IPK II BRT Mode	OFF: IPK BRT Mode

4.2.4 Jumpers

CN101 and CN102

Set the 100Ω termination to On or Off for Circuit 1. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN201 and CN202

Set the 100Ω termination to On or Off for Circuit 2. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN301 and CN302

Set the 100Ω termination to On or Off for Circuit 3. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

CN401 and CN402

Set the 100Ω termination to On or Off for Circuit 4. Jumper Pins 1 and 2 are shorted together at the factory to turn on the 100Ω terminal.

4.2.5 LED Indications

Refer to Table 6-6 BRT(4)-U20 LED Indications.

Table 6-6 BRT(4)-U20 LED Indications

LED	Description	On	Flashing	Off
LED 1	ETU status	Operation stopped (Power On)	Normal Operation	No Power
LED 2	L1 status - BRI CKT1	L1 working	Not Used	L1 idle
LED 3	L1 status - BRI CKT2	L1 working	Not Used	L1 idle
LED 4	L1 status - BRI CKT3	L1 working	Not Used	L1 idle
LED 5	L1 status - BRI CKT4	L1 working	Not Used	L1 idle
LED 6	B1 or B2 status Circuit 1	Busy	Not Used	Idle
LED 7	B1 or B2 status Circuit 2	Busy	Not Used	Idle
LED 8	B1 or B2 status Circuit 3	Busy	Not Used	Idle
LED 9	B1 or B2 status Circuit 4	Busy	Not Used	Idle

4.2.6 Connectors

The following connectors are included:

- ❍ CN1 Connects to the backplane.
- ❍ CN3 DB9 Pin Male connector used for maintenance

4.2.7 Connections

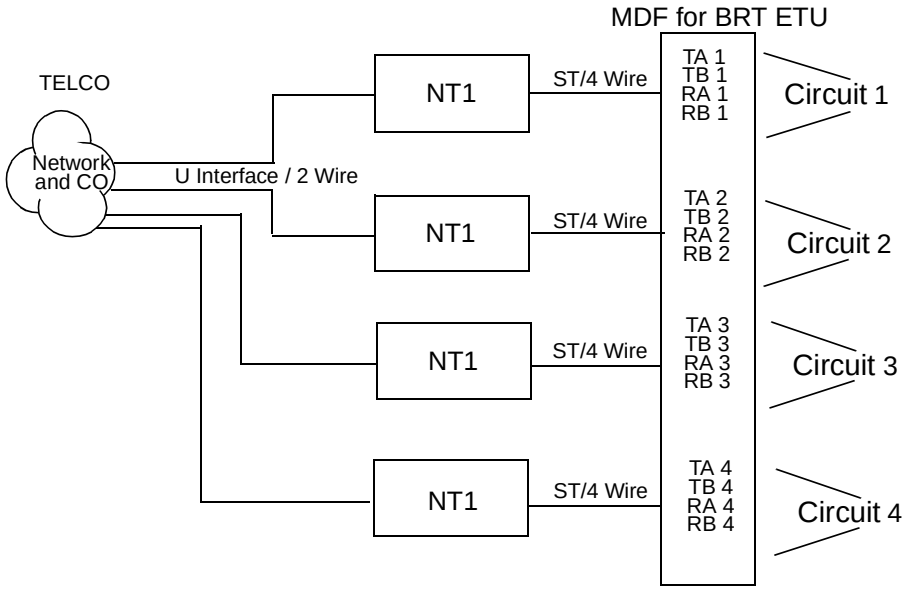


Figure 6-13 BRT(4)-U20 Connections

4.3 COI(4)/(8)-U( ) ETU

4.3.1 Description

The COI(4)/(8)-U( ) ETU is the Central Office interface. The COI ETU contains circuitry for outside ring detection, holding, dialing, and control functions.

This ETU can provide a CAMA trunk for Enhanced E911.

The COI(8)-U( ) ETU has identical circuits to serve up to eight CO trunks that can be any combination of Loop Start or Ground Start with DTMF signaling. The COI(4)-U( ) ETU is for Loop Start trunks with DTMF signaling only. ETU Tip and Ring electrical fuses are provided to comply with UL 1459 requirements.

Refer to Figure 6-14 COI(8)-U( ) ETU.

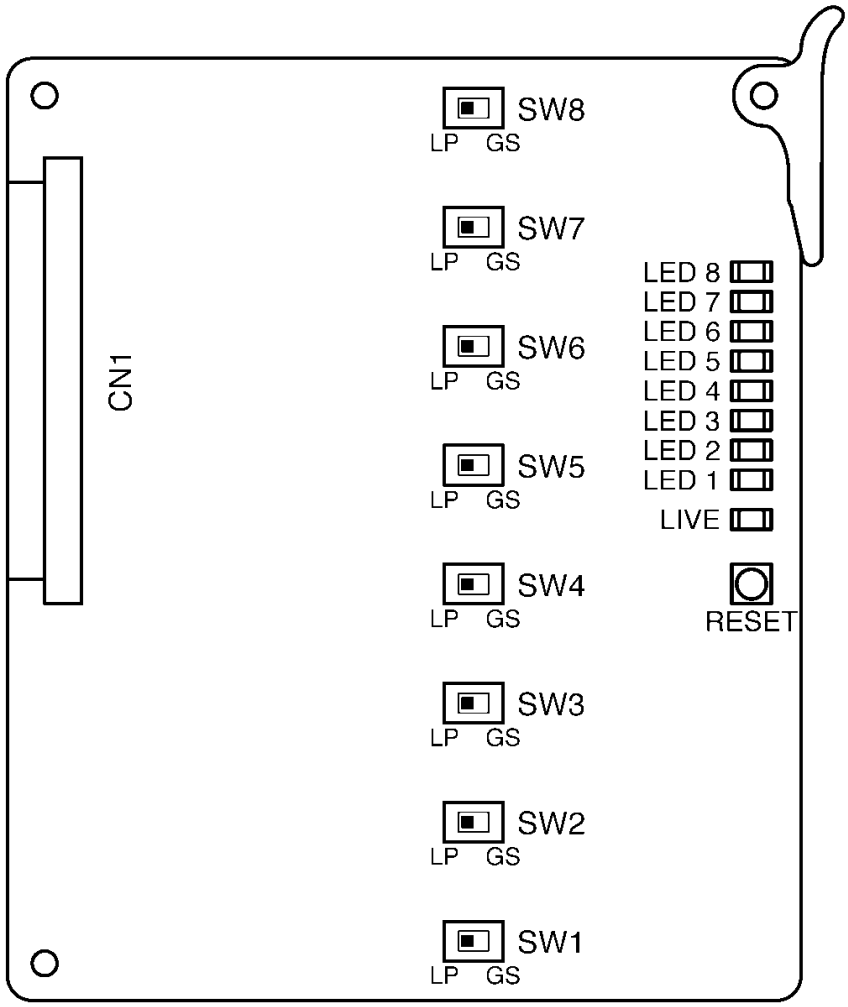


Figure 6-14 COI(8)-U( ) ETU

4.3.2 Installation

Basic Port Package

A maximum of 14 COI(4)-U( ) ETUs or seven COI(8)-U( ) ETUs can be installed in any interface slot. The system limitation is 64 trunk or station ports combined.

The maximum number COI(4)/(8)-U( ) ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 COI(4)-U( ) ETUs or 23 COI(8)-U( ) ETUs can be installed in any interface slot. The system limitation is 200 trunks.

The maximum number COI(4)/(8)-U( ) ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.3.3 Switch Settings

Refer to Table 6-7 COI(8)-U( ) ETU Default Switch Settings.

Table 6-7 COI(8)-U( ) ETU Default Switch Settings

Switch	Setting	Description
SW1~8	Set according to the line type. Default Setting: LP	Switches between Loop Start (LP) or Ground Start (GS) Trunks on Lines 1~8 of COI(8)-U10 ETU.
Reset	N/A	Resets the COI ETU

4.3.4 LED Indications

Refer to Table 6-8 COI(8)-U( ) ETU LED Indications.

Table 6-8 COI(8)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Operation stopped (Power On)	Normal Operation	No Power
LED 1	Line 1 status COI(4)/COI(8)	Busy	Not Used	Idle
LED 2	Line 2 status COI(4)/COI(8)	Busy	Not Used	Idle
LED 3	Line 3 status COI(4)/COI(8)	Busy	Not Used	Idle
LED 4	Line 4 status COI(4)/COI(8)	Busy	Not Used	Idle
LED 5	Line 5 status COI(8)	Busy	Not Used	Idle
LED 6	Line 6 status COI(8)	Busy	Not Used	Idle
LED 7	Line 7 status COI(8)	Busy	Not Used	Idle
LED 8	Line 8 status COI(8)	Busy	Not Used	Idle

4.3.5 Connectors

The following connector is included:

- CN1 Connects to the backplane.

4.3.6 Connections

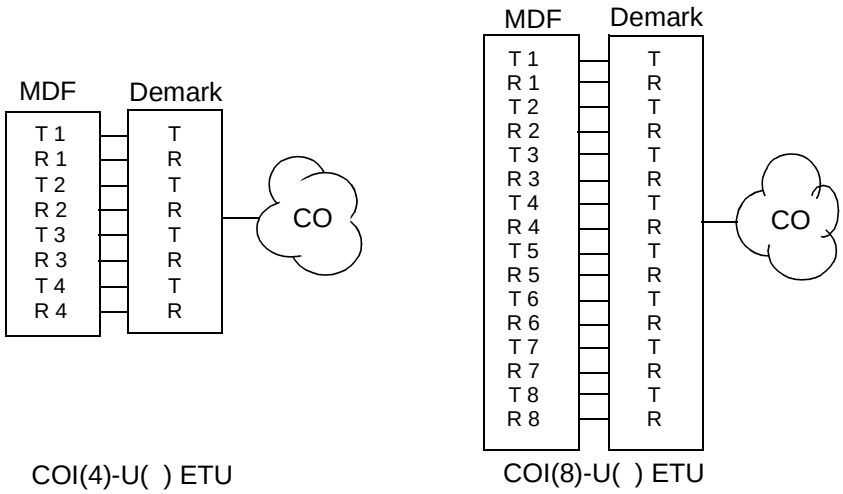


Figure 6-15 COI(4)/(8)-U( ) ETU Connections

4.4 COIB(4)-U10 ETU

4.4.1 Description

This ETU can function the same as the COI(4)-U( ) ETU or COID(4)-U( ) ETU to provide a Central Office interface. When the ETU is set for COID mode, Loop Start trunks and /or Caller ID trunks are supported. When the ETU is set for COI mode, Loop Start or Ground Start is supported. Caller ID is **not** supported in COI mode. Connections for Ground Start trunks are polarity sensitive.

Fax CO Branch Support is provided on Port 4 only.

Only DTMF signaling is supported.

This ETU can provide an E911 CAMA trunk.

Tip and Ring electrical fuses are provided to comply with UL 1459 requirements.

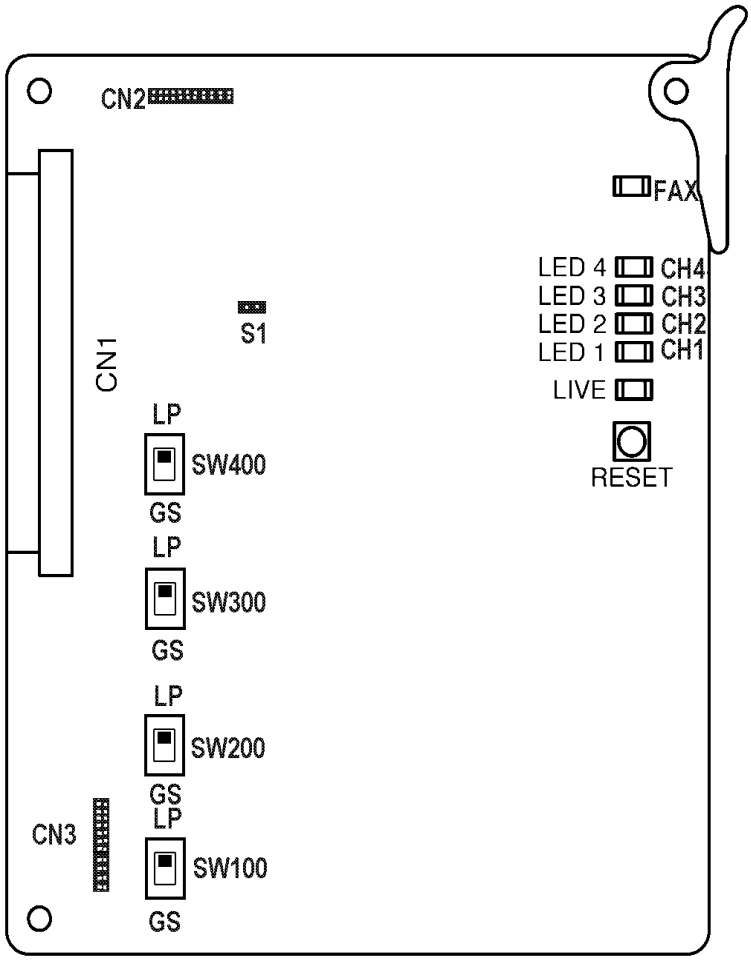


Figure 6-16 COIB(4)-U10 ETU

4.4.2 Installation

Basic Port Package

A maximum of 14 COIB(4)-U10 ETUs can be installed in any interface slot. The system is limited by 64 trunk and station ports combined.

The maximum number of COIB(4)-U10 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 COIB(4)-U10 ETUs can be installed in any interface slot when configured as either a COI/COID ETU. The system is limited by 200 trunks.

The maximum number of COIB(4)-U10 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.4.3 Switch Settings

Refer to Table 6-9 COIB(4)-U10 ETU Default Switch Settings.

Table 6-9 COIB(4)-U10 ETU Default Switch Settings

Switch	Setting	Description
SW100~400	Set for line type. Default Setting: LP	Switches between Loop Start (LP) or Ground Start (GS) Trunks.
S1	Open for COI Shorted (default) for COID	Selects the function for COIB(4)-U10 ETU between COI or COID mode
Reset	N/A	Resets the COIB(4)-U10 ETU

4.4.4 LED Indications

Refer to Table 6-10 COIB(4)-U10 ETU LED Indications.

Table 6-10 COIB(4)-U10 ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Operation stopped (Power On)	Normal Operation	No Power
LED 1/ CH1	Channel 1 Status	Busy	Not Used	Idle
LED 2/ CH2	Channel 2 Status	Busy	Not Used	Idle
LED 3/ CH3	Channel 3 Status	Busy	Not Used	Idle
LED 4/ CH4	Channel 4 Status	Busy	Not Used	Idle
FAX	FAX Status	Busy	Not Used	Idle

➢ Switch SW400 must be set to Loop Start for FAX CO function to work.

4.4.5 Connectors

The following connectors are included:

- ❍ CN1 Connects to the backplane.
- ❍ CN2 Future
- ❍ CN3 Future

4.4.6 Connections

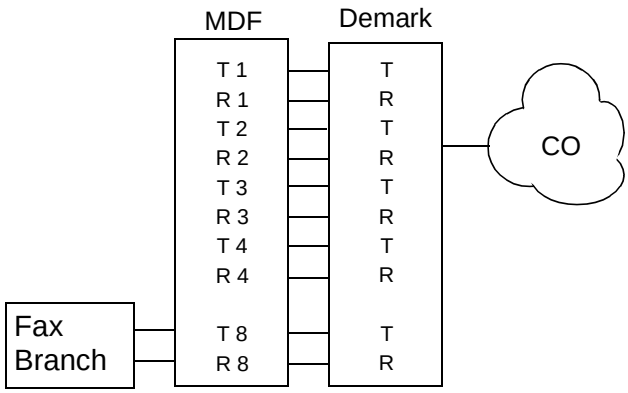


Figure 6-17 COIB(4)-U10 ETU Connections

4.5 COIB(4)-U20/U30 ETU

4.5.1 Description

These ETUs functions are similar to the COI(4)-U( ) or COID(4)-U( ) ETU to provide a Central Office interface. Only the COIB(4)-U30 can support the CO Message Waiting Indication feature. These ETUs have transmit and receive pad controls. When the ETU is set for COID mode, Loop Start trunks and Caller ID trunks are supported. When the ETU is set for COI mode, Loop Start is supported. *Ground Start Trunks are not supported*. Caller ID is *not* supported in COI mode. Fax CO Branch support is provided on port 4 only.

Only DTMF signaling is supported.

This ETU can provide an E911 CAMA trunk on port 3 only.

Tip and RIng electrical fuses are provided to comply with UL 60950 requirements.

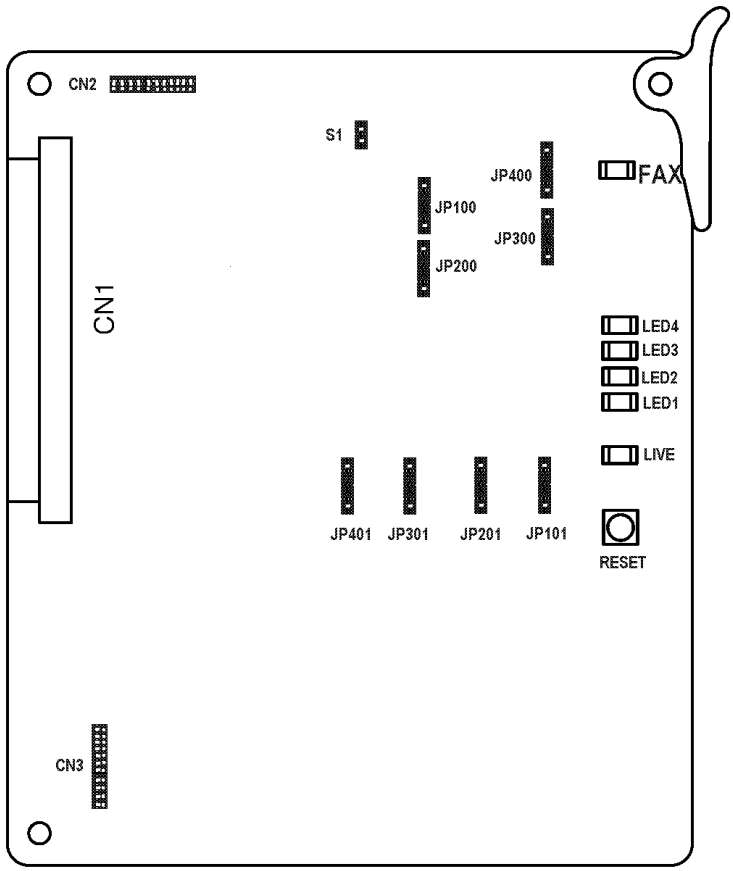


Figure 6-18 COIB(4)-U20/U30 ETU

4.5.2 Installation

Basic Port Package

A maximum of 14 COIB(4)-U20/U30 ETUs can be installed in any interface slot. The system is limited by 64 trunk and station ports combined.

The maximum number of COIB(4)-U20/U30 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 COIB(4)-U20/U30 ETUs can be installed in any interface slot when configured as either a COI/COID ETU. The system is limited by 200 trunks.

The maximum number of COIB(4)-U20/U30 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.5.3 Switch Settings

Refer to Table 6-11 COIB(4)-U20/U30 ETU Default Switch/Jumper Settings.

Table 6-11 COIB(4)-U20/U30 ETU Default Switch/Jumper Settings

Switch/ Jumper	Setting	Description
JP100~400	Jumpers 1-2 shorted 6dB increase Jumpers 2-3 shorted (default) No Gain Jumpers 3-4 shorted 6dB decrease	Receive pad for related channel
JP101~401	Jumpers 1-2 shorted 6dB increase Jumpers 2-3 shorted (default) No Gain Jumpers 3-4 shorted 6dB decrease	Transmit pad for related channel

Table 6-11 COIB(4)-U20/U30 ETU Default Switch/Jumper Settings

Switch/ Jumper	Setting	Description
S1	Open for COI Shorted (default) for COID	Selects the function for COIB(4)-U20 ETU between COI or COID mode.
Reset	N/A	Resets the COIB(4)-U20 ETU.

4.5.4 LED Indications

Refer to Table 6-12 COIB(4)-U20/U30 ETU LED Indications.

Table 6-12 COIB(4)-U20/U30 ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Operation Stopped (Power On)	Normal Operation	No Power
LED 1	Channel 1 status	Busy	Not Used	Idle
LED 2	Channel 2 status	Busy	Not Used	Idle
LED 3	Channel 3 status	Busy	Not Used	Idle
LED 4	Channel 4 status	Busy	Not Used	Idle
FAX	FAX status	Busy	Not Used	Idle

4.5.5 Connectors

The following connectors are included:

- CN1 Connects to the backplane.
- CN2 Future
- CN3 Future

4.5.6 Connections

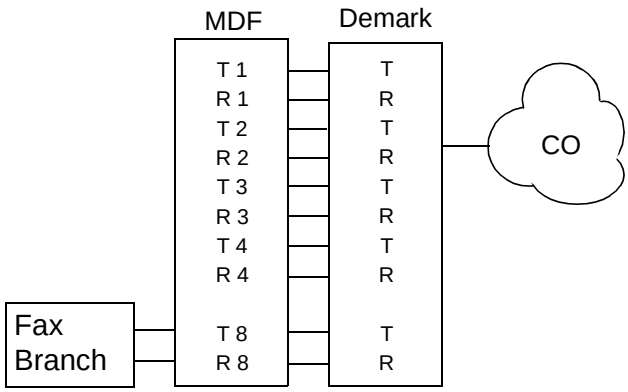


Figure 6-19 COIB(4)-U20/U30 ETU Connections

4.5.7 ETU Feature Chart

Refer to Table 6-13 COIB(4)-U20/U30 ETU Feature Chart.

Table 6-13 COIB(4)-U20/U30 ETU Feature Chart

ETU	Caller ID (See Note)	CO Message Waiting Indicate	Pad Control	Loop Start	Ground Start	Fax Branch	CAMA Trunk
COI(4)-U( )				X		X	X
COI(8)-U( )				X	X		X
COID(4)-U( )	X			X		X	X
COID(8)-U( )	X			X			X
COIB(4)-U10	X			X	X	X	X
COIB(4)-U20	X		X	X		X	X
COIB(4)-U30	X	X	X	X		X	X
COIB(8)-U( )	X		X	X			X
COIB(8)-U30	X	X	X	X		X	

- Caller ID is not supported for Ground Start trunks.
- The COIB(4)-U20/U30 ETU supports CAMA trunks on port 3 and the COIB(8)-U20/U30 ETU supports CAMA trunks on ports 3 and 7. Other ETUs listed in this table (with the exception of COIB(8)-U( ), support CAMA trunks on all ports.

4.6 COIB(8)-U20/U30 ETU

4.6.1 Description

These ETU functions are similar to the COI(8)-U( ) or COID(8)-U( ) ETU to provide Central Office Interface. Only the COIB(8)-U30 ETU can support the CO Message Waiting Indication Feature. Transmit and receive pad controls have been added to the COIB(8)-U20/U30 ETU. When the ETU is set for COID mode, Loop Start trunks and Caller ID trunks are supported. When the ETU is set for COI mode, Loop Start is supported. *Ground Start Trunks are not supported*. Caller ID is *not* supported in COI mode. Fax CO Branch support is provided on port 4 only. Only DTMF signaling is supported.

This ETU can provide a CAMA trunk for E911.

CAMA trunk support is provided on COIB(8)-U20/U30 ports 3 or 7 only.

Tip and Ring electrical fuses are provided to comply with UL 60950 requirements. Refer to Figure 6-20 COIB(8)-U20/U30 ETU.

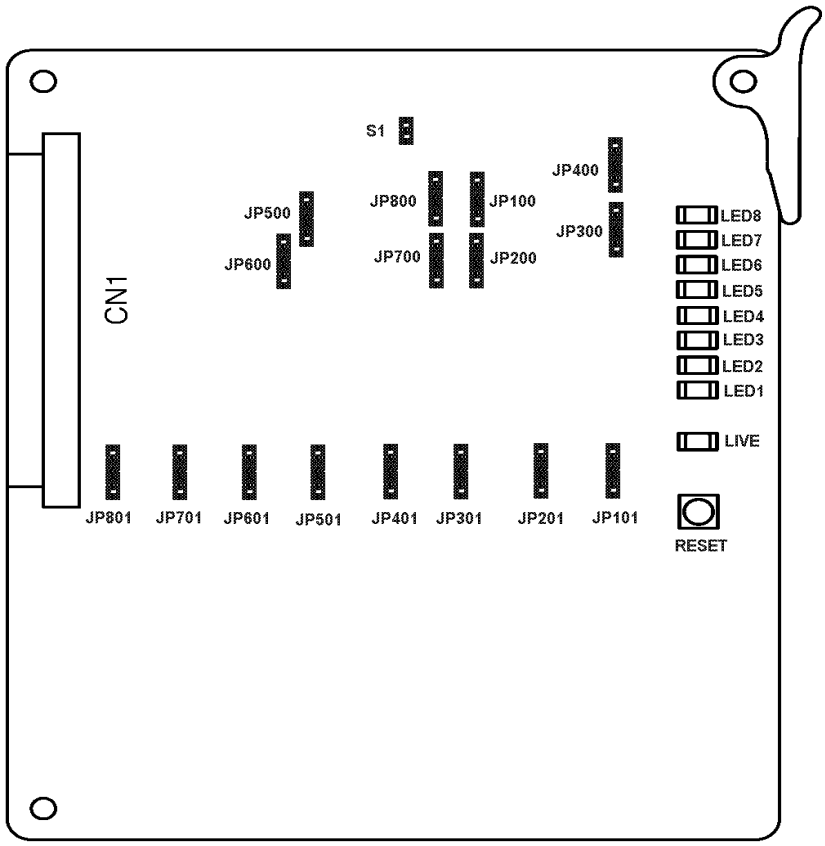


Figure 6-20 COIB(8)-U20/U30 ETU

4.6.2 Installation

Basic Port Package

A maximum of seven COIB(8)-U20/U30 ETUs can be installed in any interface slot. The system is limited by 64 trunk and station ports combined.

The maximum number of COIB(8)-U20/U30 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 COIB(8)-U20/U30 ETUs can be installed in any interface slot. A maximum of 23 COIB(8)-U20/U30 ETUs can be installed in any interface slot when configured as COI ETUs. The system is limited by 200 trunks.

The maximum number of COIB(8)-U20/U30 ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.6.3 Switch Settings

Refer to Table 6-14 COIB(8)-U20/U30 ETU Default Switch/Jumper Settings.

Table 6-14 COIB(8)-U20/U30 ETU Default Switch/Jumper Settings

Switch/ Jumper	Setting	Description
JP100~800	Jumpers 1-2 shorted 6dB increase Jumpers 2-3 shorted (default) No Gain Jumpers 3-4 shorted 6dB decrease	Receive pad for related channel
JP101~801	Jumpers 1-2 shorted 6dB increase Jumpers 2-3 shorted (default) No Gain Jumpers 3-4 shorted 6dB decrease	Transmit pad for related channel
S1	Open for COI Shorted (default) for COID	Selects the function for the COIB(8)-U20/ U30 ETU between COI or COID mode.

Table 6-14 COIB(8)-U20/U30 ETU Default Switch/Jumper Settings

Switch/ Jumper	Setting	Description
Reset	N/A	Resets the COIB(8)-U20/U30 ETU.

4.6.4 LED Indications

Refer to Table 6-15 COIB(8)-U20/30 ETU LED Indications.

Table 6-15 COIB(8)-U20/30 ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Operation Stopped (Power On)	Normal Operation	No Power
LED 1	Channel 1 status	Busy	Not Used	Idle
LED 2	Channel 2 status	Busy	Not Used	Idle
LED 3	Channel 3 status	Busy	Not Used	Idle
LED 4	Channel 4 status	Busy	Not Used	Idle
LED 5	Channel 5 status	Busy	Not Used	Idle
LED 6	Channel 6 status	Busy	Not Used	Idle
LED 7	Channel 7 status	Busy	Not Used	Idle
LED 8	Channel 8 status	Busy	Not Used	Idle

4.6.5 Connectors

The following connector is included:

- CN1 Connects to the backplane.

4.6.6 Connections

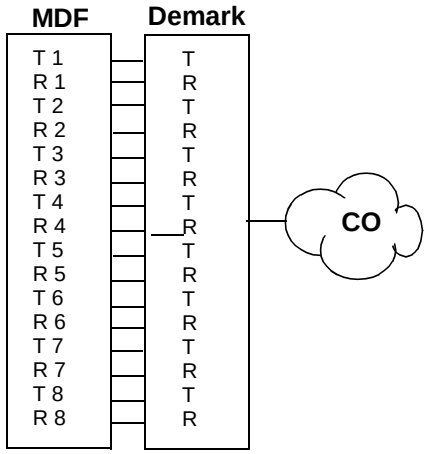


Figure 6-21 COIB(8)-U20/U30 ETU Connections

4.6.7 ETU Feature Chart

Refer to Table 6-16 COIB(8)-U20/U30 ETU Feature Chart.

Table 6-16 COIB(8)-U20/U30 ETU Feature Chart

ETU	Caller ID (See Note)	CO Message Waiting Indicate	Pad Control	Loop Start	Ground Start	Fax Branch	CAMA Trunk
COI(4)-U( )				X		X	X
COI(8)-U( )				X	X		X
COID(4)-U( )	X			X		X	X
COID(8)-U( )	X			X			X
COIB(4)-U10	X			X	X	X	X
COIB(4)-U20	X		X	X		X	X
COIB(4)-U30	X	X	X	X		X	X
COIB(8)-U( )	X		X	X			X
COIB(8)-U30	X	X	X	X		X	

- Caller ID is not supported for Ground Start trunks.
- The COIB(4)-U20/U30 ETU supports CAMA trunks on port 3 and the COIB(8)-U20/U30 ETU supports CAMA trunks on ports 3 and 7. Other ETUs listed in this table (with the exception of COIB(8)-U( ), support CAMA trunks on all ports.

4.7 DID(4)-U( ) ETU

4.7.1 Description

The Direct Inward Dialing Interface Unit supports up to four DID or four 2-way DID lines. Each DID(4)-U( ) ETU requires one interface slot position in the KSU.

Immediate, wink start, second dial tone, and delay dial signaling can be combined on this ETU.

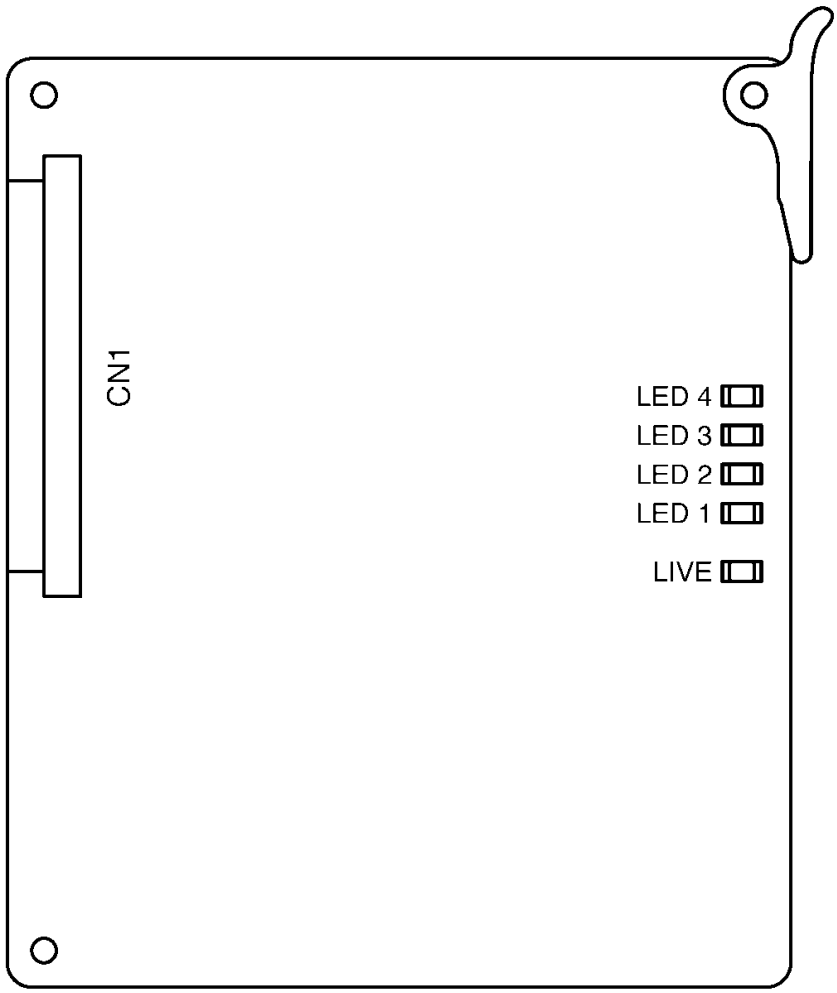


Figure 6-22 DID(4)-U( ) ETU

4.7.2 Installation

Basic Port Package

A maximum of 14 DID(4)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of DID(4)-U( ) ETU depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 DID(4)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of DID(4)-U( ) ETUs depends on other trunk cards installed. This ETU shares the total number of CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

4.7.3 LED Indications

Refer to Table 6-17 DID(4)-U( ) ETU LED Indications.

Table 6-17 DID(4)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Operation Stopped (Power On)	Normal Operation	No Power
LED 1	Line 1 status	Busy	Not Used	Idle
LED 2	Line 2 status	Busy	Not Used	Idle
LED 3	Line 3 status	Busy	Not Used	Idle
LED 4	Line 4 status	Busy	Not Used	Idle

4.7.4 Connectors

The following connector is included:

- CN1 Connects to the backplane.

4.7.5 Connections

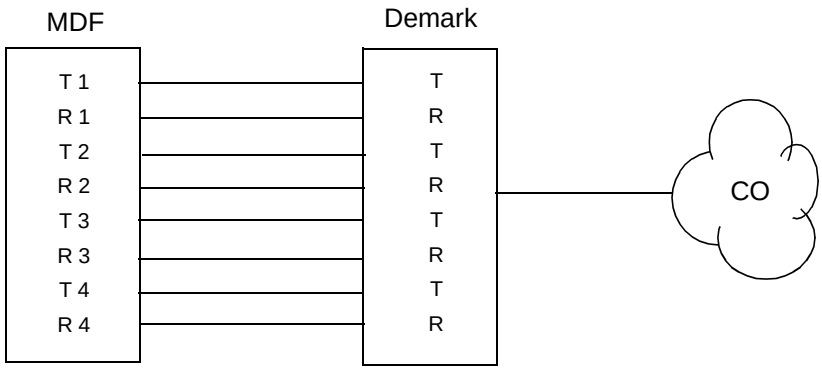


Figure 6-23 DID(4)-U( ) ETU Connections

4.8 DTI-U40 ETU

4.8.1 Description

The DTI-U40 ETU is a Digital Trunk ETU that terminates FT1 trunks (up to 24 DS-0 channels). This ETU supports K-CCIS, ANI/DNIS trunks, and CSU Less Function on T1. On-site firmware upgrade is supported.

A combination of Loop Start and Ground Start signaling can be used on the DTI-U40 ETU. Dial Pulse dialing, DTMF, Tie line (E&M) and DID are supported. The DTI-U40 ETU has 24 built-in DTMF detectors. Each trunk is assigned in groups of four.

When channels are assigned to ANI, the DTI-U40 ETU supports Feature Group D. The DTI-U40 ETU also supports Feature Group D incoming MF/outgoing DTMF signaling.

The DTI-U40 ETU supports the K-CCIS common channel signaling feature with point-to-point E&M Tie lines.

The Integrated Service Digital Network (ISDN) – Primary Rate Interface (PRI) is a public switched Telephone Network (PSTN) service that provides 23 B channels and one D (23+D) channel for voice call trunking. The B channels provide 23 CO/DID connections.

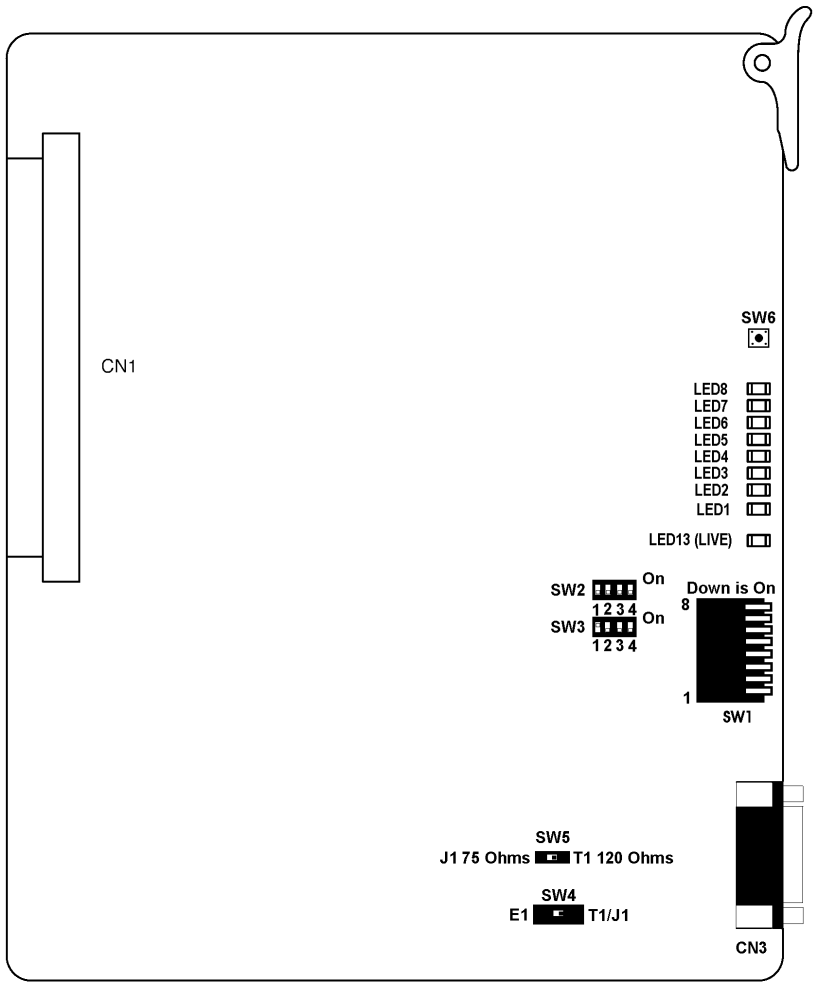


Figure 6-24 DTI-U40 ETU

4.8.2 Installation

Basic Port Package

A maximum of two DTI-U40 ETUs, configured as either DTI or PRT, can be installed in any slot. The system is limited by 64 trunk and system ports combined.

The maximum number of DTI-U40 ETUs depends on other trunk cards installed. This ETU shares the CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 11 DTI-U40 ETUs, configured as either DTI or PRT, can be installed in any slot. The system is limited by 200 trunks.

The maximum number of DTI-U40 ETUs depends on other trunk cards installed. This ETU shares the CO/PBX lines in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

The maximum number of DTI-U40 ETUs and PRT(1)-U( ) ETUs that can be installed is 11 per system.

4.8.3 Switch Settings

Refer to Table 6-18 DTI-U40 Default Switch Settings.

Table 6-18 DTI-U40 Default Switch Settings

Switch	Setting	Description
SW1–1	ON: Use channel indication by LEDs 1~8 OFF: Line State indication by LEDs 1~8 (**Default**)	Used to assign LED Indications
SW1–2 SW1–3	When SW1-1 is ON: SW1-2 SW1-3	
	ON ON	Not Applicable
	OFF OFF	CH1~ CH8 indication (**Default**) ON Used
	ON OFF	CH9~ CH16 indication ON Used
	OFF ON	CH17~ CH24 indication ON Used

Table 6-18 DTI-U40 Default Switch Settings (Continued)

Switch	Setting		Description
SW1-4	ON: DS-1 Mode (T1 with CSU Function; external CSU not required) OFF: DSX-1 Mode (T1 without CSU Function; external CSU required) When the system is connected behind an external Channel Service Unit (CSU), this switch must be ON. ➢ DSX-1 interfaces T1 between the PBX and CSU. Digital Signal Crossconnect Level 1 (DS-1) interfaces T1 between the PBX and network with no CSU (CSU less). Both are standard interfaces accepted by Telco. Both have the same electrical characteristics recommended by EIA/TIA 464, but DSX-1 is preferred because most PBXs have a CSU/DSU (DSX-1 interface) installed at the customer site for T1 line protection and ease of measurements and troubleshooting.		
SW1-5 SW1-6	When SW1-4 is ON SW1-5 SW1-6		
	OFF	OFF	When LBO = 0dB
	ON	OFF	When LBO = -7.5dB
	OFF	ON	When LBO= -15dB
	ON	ON	When LBO = -22.5dB
	➢ LBO (Line Build Out) adds a combination of induction, capacitance, and resistance to a cable pair so its electrical length may be increased by a desired level of impedance and loss characteristics.		
SW1-7 SW18	When SW1-4 is ON SW1-7 SW1-8		
	OFF	OFF	Normal Mode (Default)
	ON	OFF	Line Loop Back Mode
	OFF	ON	DTE Loop Back Mode
	ON	ON	Local Loop Back Mode
	➢ In Local Loop Back, data goes through the entire transmit and receive process. Line Loop Back allows user to check transmission line continuity.		

Table 6-18 DTI-U40 Default Switch Settings (Continued)

Switch	Setting		Description
SW2-1 SW2-2	Select Running Mode SW2-1 SW2-2		
	ON	ON	Test program mode
	ON	OFF	Not Used
	OFF	ON	F/W upgrade mode (on-site upgrade)
	OFF	OFF	Normal operation (Default)
SW2-3	ON: To be determined OFF: Normal operation (Default)		
SW2-4	ON: Watch Timer OFF OFF: Watch Timer ON (Default)		
SW3-1	ON: T1 mode (Default)		Firmware Version 5.00
	OFF: PRT Mode		Firmware Version 1.00
SW3-2	ON: To be determined OFF: No operation (Default)		
SW3-3	ON: To be determined OFF: No operation (Default)		
SW3-4	ON: To be determined OFF: No operation (Default)		
	➢ The DTI-U40 works only with the SW3-2~SW3-4 Default settings.		
SW4/5	SW4	SW5	Termination mode
	T1/J1	T1 120Ω	T1 mode (Default)
	T1/J1	J1 75Ω	J1 mode
	E1	T1 120Ω	E1 mode (120Ω termination)
	E1	J1 75Ω	E1 mode (75Ω termination)
	➢ E1 Services are not supported		

Table 6-18 DTI-U40 Default Switch Settings (Continued)

Switch	Setting	Description
SW6		Reset Switch

4.8.4 LED Indications

Refer to Table 6-19 DTI-U40 ETU LED Indications.

Table 6-19 DTI-U40 ETU LED Indications

LED	SW1-1 OFF	With SW1-1 ON
LED 1	Link Indication ON = Activated	CH1 or CH9 or CH17 Indication ON = Used
LED 2	LSA Error Indication ON = Error	CH2 or CH10 or CH18 Indication ON = Used
LED 3	AIS Error Indication ON = Error	CH3 or CH11 or CH19 Indication ON = Used
LED 4	OOF Error Indication ON = Error	CH4 or CH12 or CH20 Indication ON = Used
LED 5	RAI Error Indication ON = Error	CH5 or CH13 or CH21 Indication ON = Used
LED 6	Loop Back Indication ON = Loop Back mode	CH6 or CH14 or CH22 Indication ON = Used
LED 7	Self-Test Indication ON = Testing	CH7 or CH15 or CH23 Indication ON = Used
LED 8	Used CH Indication ON = Using a channel	CH8 or CH16 or CH24 Indication ON = Used
LED 9	LIVE Indication ON = Activate	

4.8.5 Alarm Conditions

A brief description of each alarm condition is given below.

- Alarm Indication Signal (AIS) Detection

  On red when the system is receiving an Alarm Indication Signal from an FT1 trunk.

- Controlled Slip Event Detection (SLIP)

On red when the timing difference between a synchronous receiving terminal and the received signal exceeds the buffering ability of the terminal.

- Cyclic Redundancy Check (CRC) Error Event Detection

  On red when a CRC Error occurs.

- Excessive Bipolar Violation (BPV) Detection

  On red when excessive BPV is detected.

- Line Synchronization Alarm (LSA) Detection

  On red when an FT1 trunk loses frame synchronization.

- Out-of-Frame (OOF) Condition Detection

  On red when two of the four or five framing data bits received are in error.

- Remote Alarm Indication (RAI) Detection

  On red when RAl is received.

4.8.6 Connectors

The following connector is included:

- CN1 Connects to the backplane.
- CN3 Serial Port DB-9

4.8.7 Connections

Although the DTI-U40 ETU can connect directly to the Telco TI Smart Jack, your Telco may require you to purchase and install a separate Channel Service Unit (CSU) between the Smart Jack and the DTI-U40 ETU.

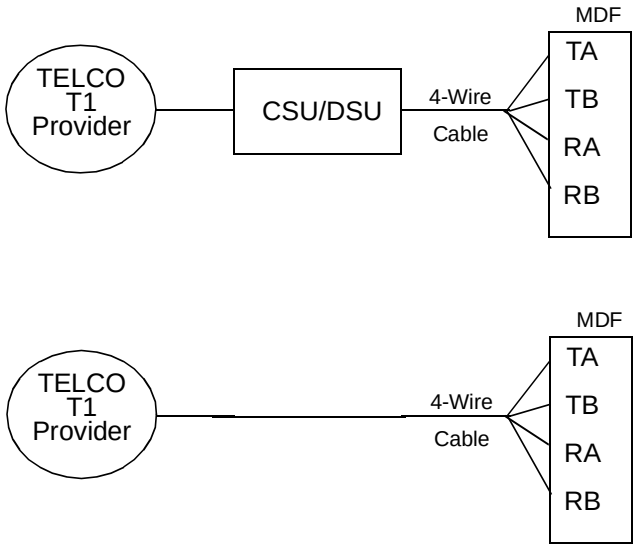
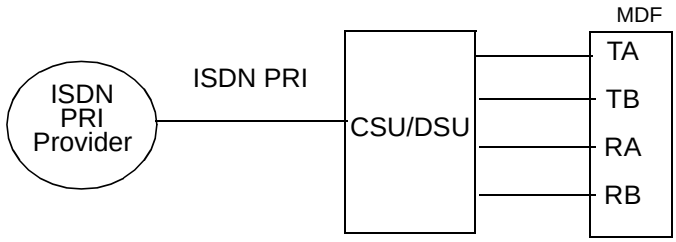


Figure 6-25 DTI-U40 ETU Connectors



The CSU may not always be required

Figure 6-26 ISDN PRI Connectors

4.9 TLI(2)-U( ) ETU

4.9.1 Description

The Tie Line Interface ETU supports the termination and operation of up to two E&M Tie lines (4-wire, type I and type V, and 10/20 pps Dial Pulse or DTMF).

✎ Immediate, wink start, second dial tone, and delay dial signaling can be combined on this ETU.

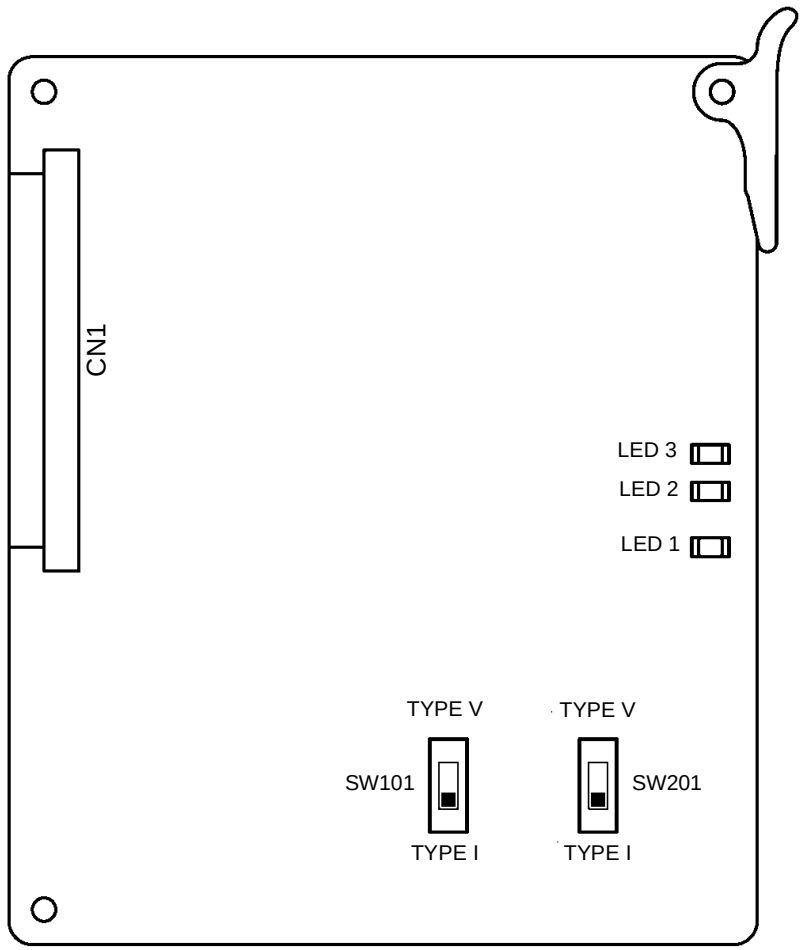


Figure 6-27 TLI(2)-U( ) ETU

4.9.2 Installation

Basic Port Package

A maximum of 14 TLI(2)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of TLI(2)-U( ) ETUs that can be installed for the depends on other trunk cards installed. The system is limited by 64 trunk and station ports combined.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports. When 2-port trunk interface ETUs are installed the system uses four ports from its maximum port capacity.

Expanded Port Package

A maximum of 23 TLI(2)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of TLI(2)-U( ) ETUs that can be installed for the depends on other trunk cards installed. The system is limited by 200 trunks.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports. When 2-port trunk interface ETUs are installed the stem uses four ports from its maximum port capacity.

4.9.3 Switch Settings

Refer to Table 6-20 TLI(2)-U( ) ETU Default Switch Settings.

Table 6-20 TLI(2)-U( ) ETU Default Switch Settings

Switch	Setting	Description
SW101	When lines provided by this unit are used for back-to-back connections, set to Type V. When connection is to a Central Office, set to Type I. Default: Type V	Switch Type I or Type V for Line 1
SW201	When lines provided by this unit are used for back-to-back connections, set to Type V. When connection is to a Central Office, set to Type I. Default: Type V	Switch Type I or Type V for Line 2

4.9.4 LED Indications

Refer to Table 6-21 TLI(2)-U( ) ETU LED Indications.

Table 6-21 TLI(2)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LED 1	ETU status	Operation Stopped (Power On)	Normal Operation	No Power
LED 2	Line 1 status	Busy	Not Used	Idle
LED 3	Line 2 status	Busy	Not Used	Idle

4.9.5 Connectors

The following connector is included:

- CN1 Connects to the backplane.

4.9.6 Connections

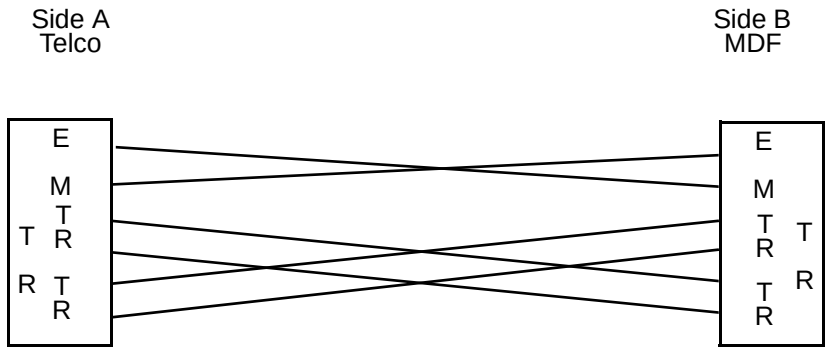


Figure 6-28 TLI(2)-U( ) ETU Connections

SECTION 5 STATION ETUS

The station Electronic Telephone Units are installed in the interface slots of the KSU.

5.1 ESI(8)-U( ) ETU

5.1.1 Description

The Electronic Station Interface ETU contains eight circuits. Each circuit can support any Attendant Console, Multiline Terminal, or Single Line Telephone adapter.

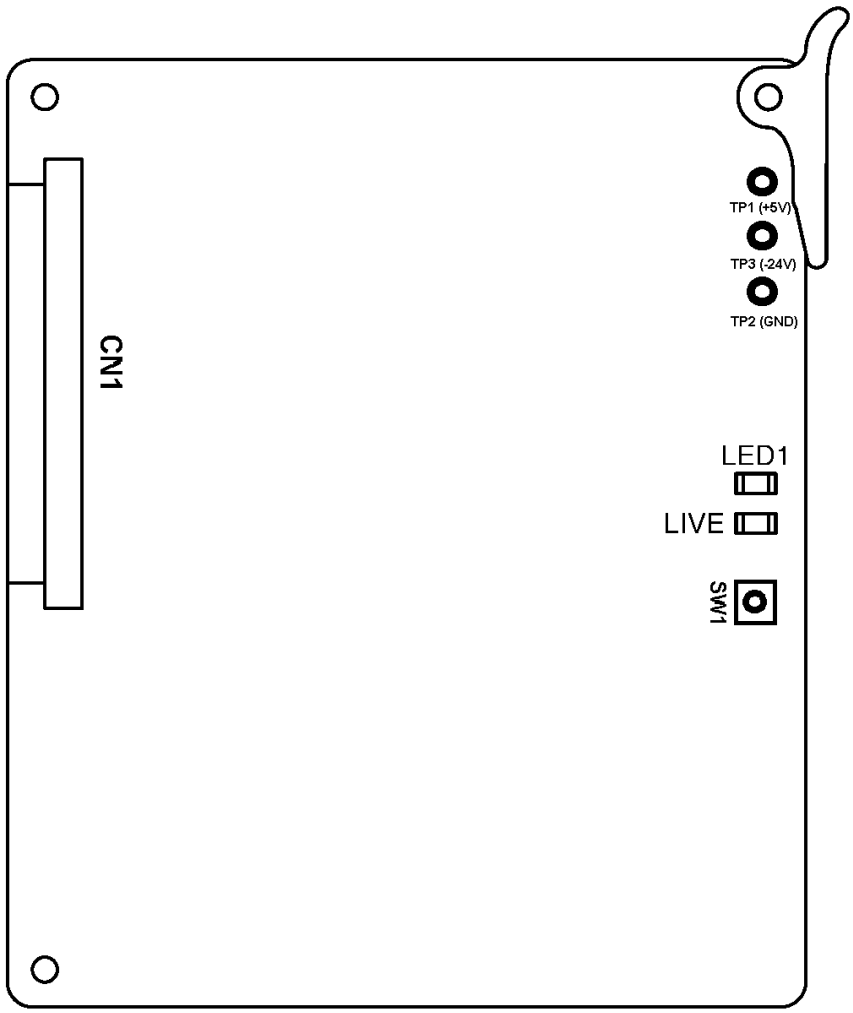


Figure 6-29 ESI(8)-U( ) ETU

5.1.2 Installation

Basic Port Package

A maximum of seven ESI(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of ESI(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 ESI(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of ESI(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

5.1.3 Switch Settings

SW1 resets the ETU.

5.1.4 LED Indications

Live LED indications are listed below.

- ❍ Blinking Red Normal Operation
- ❍ Steady Red Operation Stopped (power On)
- ❍ Off No Power

LED1 indications are listed below.

- ❍ Steady Red Some port(s) busy
- ❍ Off All ports idle

5.1.5 Connectors

The following connector is included:

- ❍ CN1 Connects to the backplane.

5.1.6 Connections

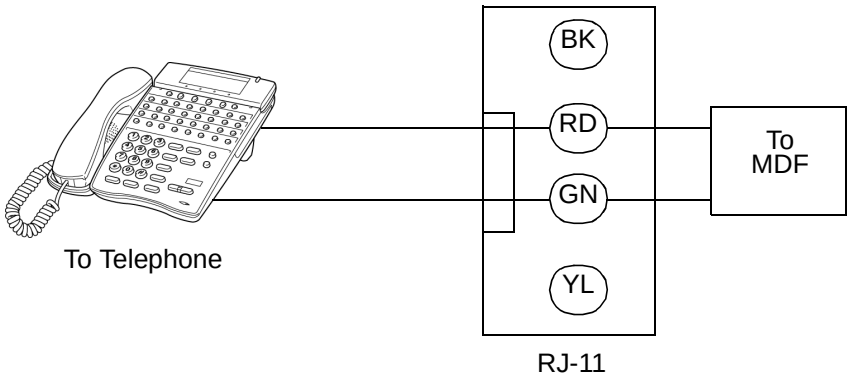


Figure 6-30 ESI(8)-U( ) ETU Connection

5.2 ESIB(8)-U20 ETU

5.2.1 Description

The ESIB(8)-U20 ETU is the basic Electronic Station Interface ETU that provides an 8-channel interface for Multiline Terminals, Attendant Consoles, Single Line Telephone Adapter SLTII(1)-U10 ADP. This ETU can be expanded to 16 channels by installing the ESIE(8)-U20 ETU.

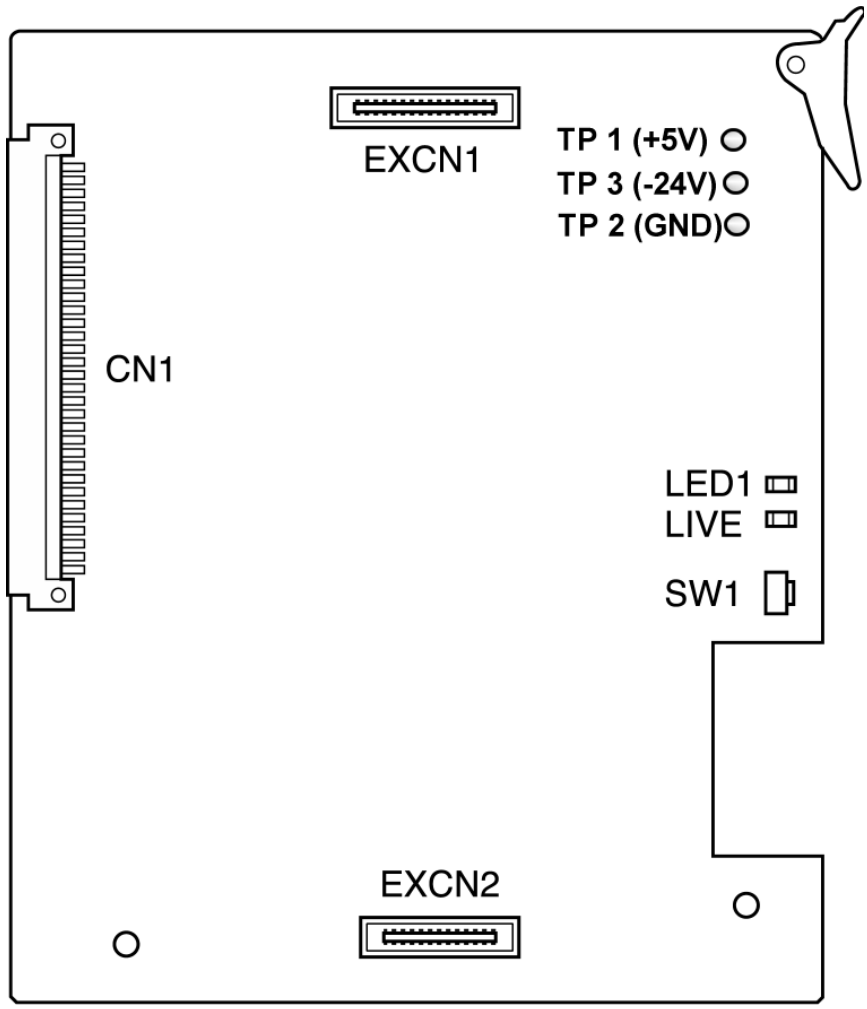


Figure 6-31 ESIB(8)-U20 ETU

5.2.2 Installation

Basic Port Package

A maximum of seven ESIB(8)-U20 ETUs can be installed in slots S1~S8.

The maximum number of ESIB(8)-U20 ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of Station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 23 ESIB(8)-U20 ETUs can be installed in slots S1~S8.

The maximum number of ESIB(8)-U20 ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of Station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Refer to Chapter 3 System Specifications, Section 4 KSU Power-Based Calculator Chart for Universal Slots.

5.2.3 Switch Settings

SW1 resets the ETU.

5.2.4 LED Indications

Live LED indications are listed below.

- ❍ Blinking Red Normal Operation
- ❍ Steady Red Operation Stopped (power On)
- ❍ Off No Power

LED1 indications are listed below.

- ❍ Steady Red Some port(s) busy
- ❍ Off All ports idle

5.2.5 Connectors

The following connectors are included:

- ❍ CN1 Connects to the backplane.
- ❍ EXCN1 Connects to EXCN1 on the ESIE(8)-U20 ETU.
- ❍ EXCN2 Connects to EXCN2 on the ESIE(8)-U20 ETU.

5.2.6 Connections

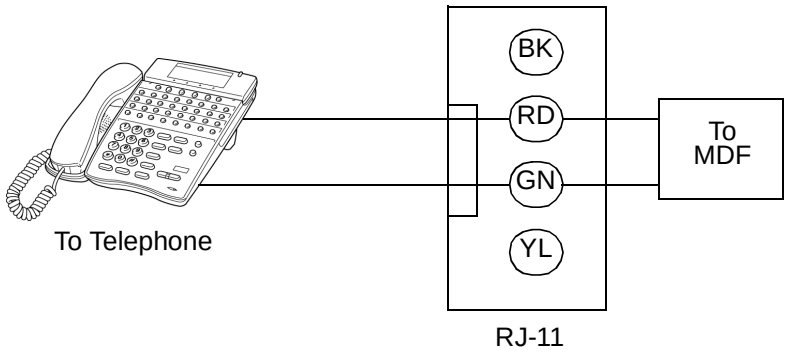


Figure 6-32 ESIB(8)-U20 ETU Connection

5.3 ESIE(8)-U20 ETU

5.3.1 Description

The ESIE(8)-U20 ETU is the expansion Electronic Station Interface ETU that provides an additional 8-channel interface for Multiline Terminals, Attendant Consoles, Single Line Telephone Adapter SLTII(1)-U10 ADP. This expansion ESI ETU is piggybacked on the ESIB(8)-U20 ETU.

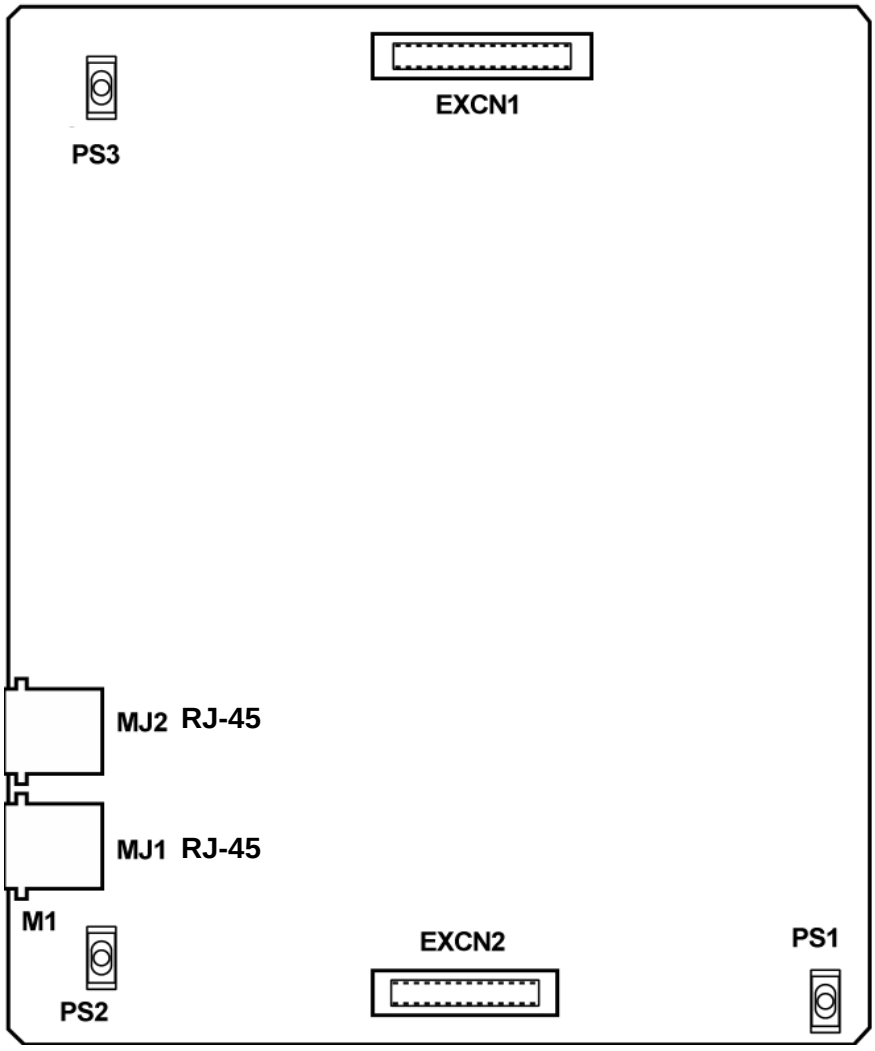


Figure 6-33 ESIE(8)-U20 ETU

5.3.2 Installation

Basic Port Package

A maximum of three ESIE(8)-U20 ETUs , piggybacked on an ESIB(8), can be installed in slots S1~S8. The system is limited by 64 trunk and station ports combined.

The maximum number of ESIE(8)-U20 ETUs that can be installed depends on other station cards installed. This ETU shares the total number of stations in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 15 ESIE(8)-U20 ETUs, piggybacked on an ESIB(8), can be installed in slots S1~S8. The system is limited by 256 stations.

The maximum number of ESIE(8)-U20 ETUs that can be installed depends on other station cards installed. This ETU shares the total number of stations in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Refer to Chapter 3 System Specifications,Section 4 KSU Power-Based Calculator Chart for Universal Slots.

5.3.3 Connectors

The following connectors are included:

- EXCN1 Connects to EXCN1 on the ESIB(8)-U20 ETU.
- EXCN2 Connects to EXCN2 on the ESIB(8)-U20 ETU.
- MJ1 Connects to MDF RJ-61 (four ESI ports 1~4).
- MJ2 Connects to MDF RJ-61 (four ESI ports 5~8).

5.3.4 Connections

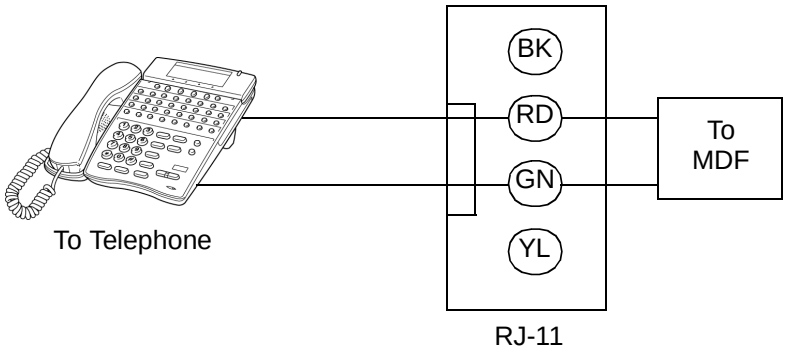


Figure 6-34 ESIE(8)-U20 ETU Connection

5.3.5 Pin Assignments

The pin assignments are for connecting eight Multiline Terminals to the ESIE(8)-U20 ETU. Refer to Table 6-22 ESIE(8)-U( ) ETU MJ1 Pin Assignments and Table 6-23 ESIE(8)-U( ) ETU MJ2 Pin Assignments.

Table 6-22 ESIE(8)-U( ) ETU MJ1 Pin Assignments

MJ1 Pin (RJ-61)	Signal	Signal Name	Pin Color
1	T4	CH3–Tip	WHT–BRN
2	T3	CH2–Tip	WHT–GRN
3	T2	CH1–Tip	WHT–ORN
4	R1	CH0–Ring	BLU–WHT
5	T1	CH0–Tip	WHT–BLU
6	R2	CH1–Ring	ORN–WHT
7	R3	CH2–Ring	GRN–WHT
8	R4	CH3–Ring	BRN–WHT

Table 6-23 ESIE(8)-U( ) ETU MJ2 Pin Assignments

MJ2 Pin (RJ-61)	Signal	Signal Name	Pin Color
1	T8	CH7–Tip	WHT–BRN
2	T7	CH6–Tip	WHT–GRN
3	T6	CH5–Tip	WHT–ORN
4	R5	CH4–Ring	BLU–WHT
5	T5	CH4–Tip	WHT–BLU
6	R6	CH5–Ring	ORN–WHT
7	R7	CH6–Ring	GRN–WHT
8	R8	CH7–Ring	BRN–WHT

5.4 OPX(2)-U( ) ETU

5.4.1 Description

The OPX(2)-U( ) ETU is the interface for two off-premise extensions. This ETU has a built-in ringing signal generator (RSG). A maximum of 1600Ω of loop resistance (including the Single Line Telephone) is acceptable between the OPX(2)-U( ) ETU and a Single Line Telephone.

This ETU also provides circuitry for loop status detection, talk battery, sending ringing signals from the RSG unit to the Single Line Telephones, and dial pulse detection.

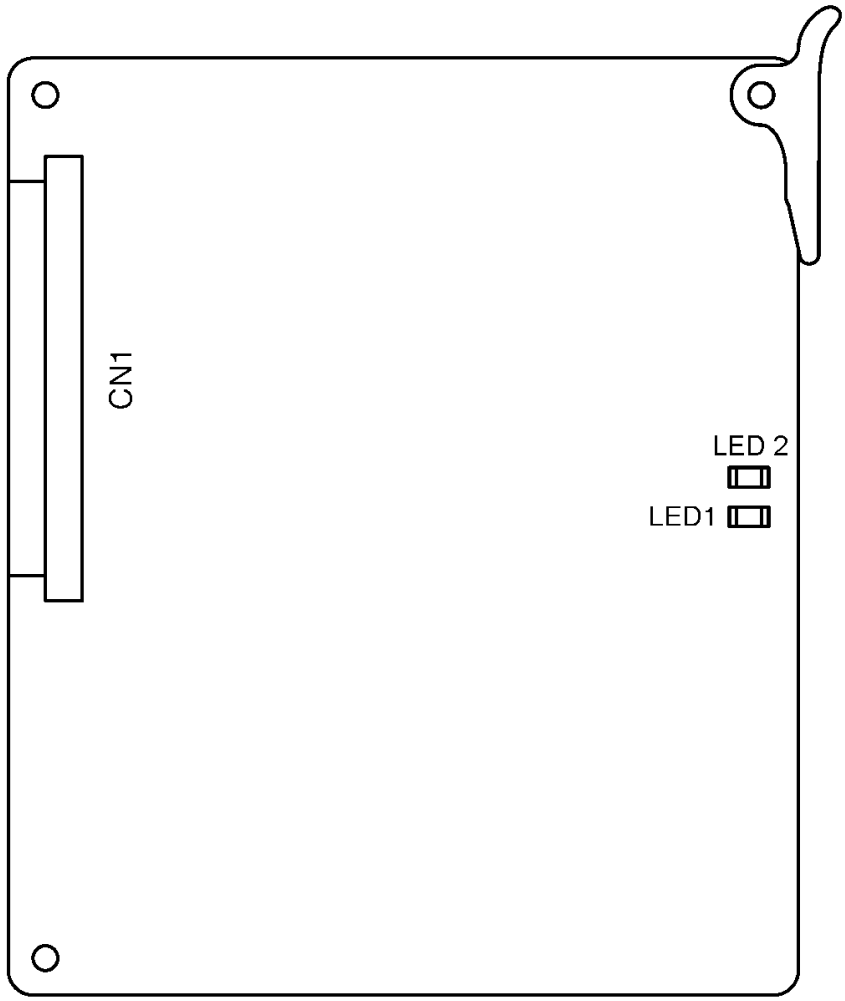


Figure 6-35 OPX(2)-U( ) ETU

5.4.2 Installation

The extension can be run up to approximately three miles (5 km) using 24 AWG wiring.

Basic Port Package

A maximum of 6 OPX(2)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of OPX(2)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports. When 2-port trunk interface ETUs are installed the system uses four ports from its maximum port capacity.

Expanded Port Package

A maximum of 22 OPX(2)-U ETUs can be installed in slots S1~S8.

The maximum number of OPX(2)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports. When 2-port trunk interface ETUs are installed the system uses four ports from its maximum port capacity.

5.4.3 LED Indications

Live LED indications are listed below.

- ❍ Blinking Red Normal Operation
- ❍ Steady Red Operation Stopped (power On).
- ❍ Off No Power

LED1 indications are listed below.

- ❍ Steady Red One port busy
- ❍ Off All ports idle

5.4.4 Connectors

The following connector is included:

- ❍ CN1 Connects to the backplane.

5.4.5 Connections

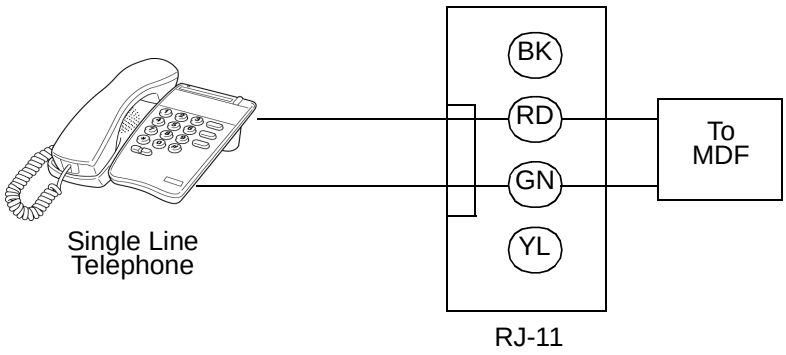


Figure 6-36 OPX(2)-U( ) ETU CN1 Connection

5.5 SLI(4)/(8)-U( ) ETU

5.5.1 Description

SLI(4)-U( ) ETU

The Single Line Interface ETU supports a maximum of four Single Line Telephones and/or analog voice mail ports. This ETU provides Ringing Signal Generator (RSG), and Message Waiting (MW) LED voltage to Single Line Telephones.

SLI(8)-U( ) ETU

The Single Line Interface ETU supports a maximum of eight Single Line Telephones and/or voice mail ports. This ETU provides Ringing Signal Generator (RSG), and Message Waiting (MW) LED voltage to Single Line Telephones.

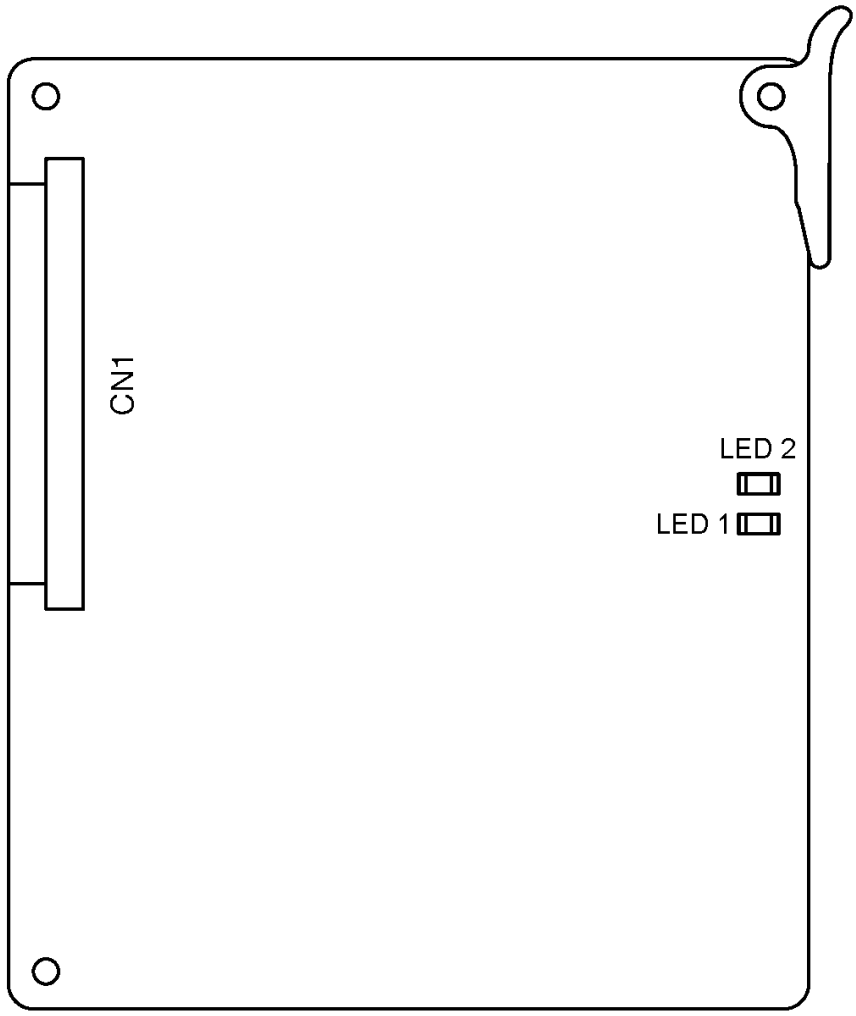


Figure 6-37 SLI(4)/(8)-U( ) ETU

5.5.2 Installation

Basic Port Package

A maximum of 12 SLI(4)-U( ) ETUs can be installed in slots S1~S8.

A maximum of six SLI(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of SLI(4)/(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 22 SLI(4)-U( ) ETUs can be installed in slots S1~S8.

A maximum of 22 SLI(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of SLI(4)/(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

5.5.3 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power On).
- Off No Power

BUSY indications are listed below.

- Steady Red Some port(s) busy
- Off All ports idle

5.5.4 Connectors

The following connector is included:

- CN1 Connects to the backplane.

5.5.5 Connections

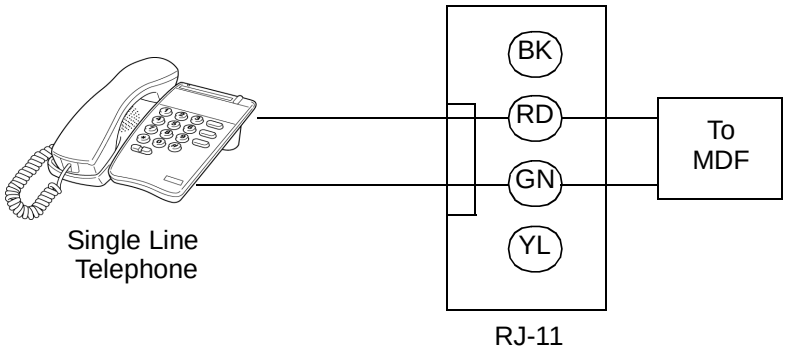


Figure 6-38 SLI(4)/(8)-U( ) ETU Connections

5.6 SLIB(4)-U10 ETU

5.6.1 Description

The SLIB(4)-U( ) ETU is the basic Single Line Interface ETU that provides a 4-channel interface for a Single Line Telephone, and also provides Ringing Signal Generator (RSG), Message Waiting (MW) LED voltage, and Caller ID to Single Line Telephones.

This ETU can be expanded to eight channels by installing the SLIE(4)-U10 ETU.

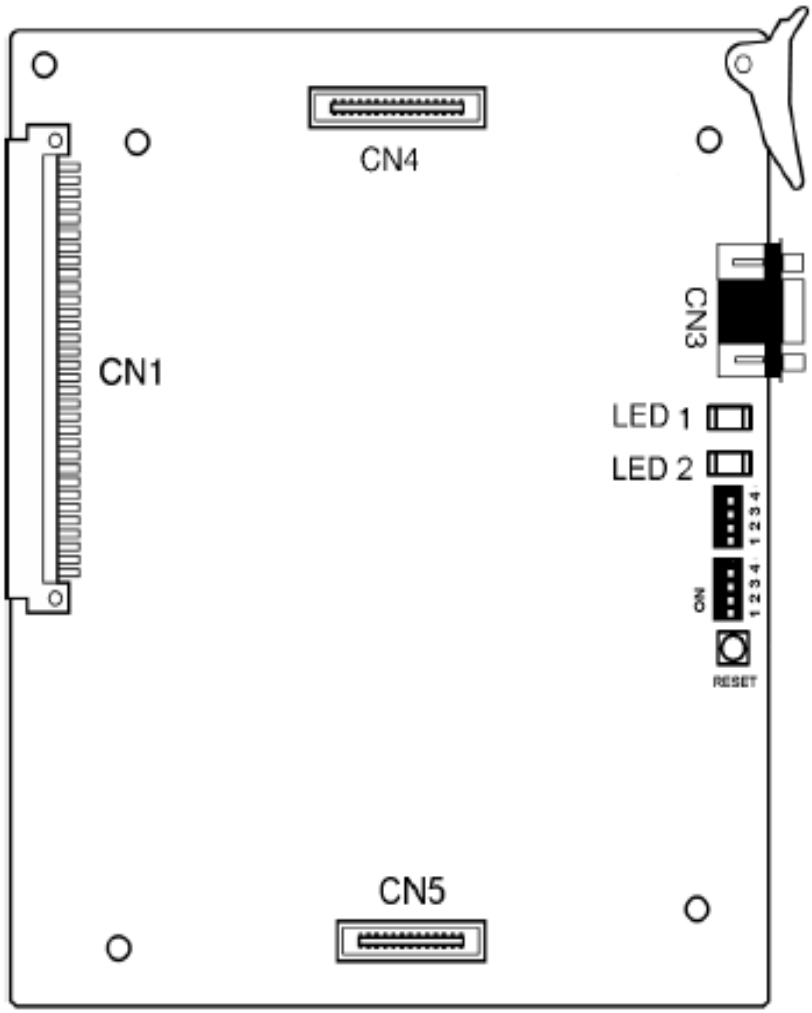


Figure 6-39 SLIB(4)-U10 ETU

5.6.2 Installation

Basic Port Package

A maximum of 12 SLIB(4)-U10 ETUs can be installed in slots S1~S8.

The maximum number of SLIB(4)-U10 ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 22 SLIB(4)-U10 ETUs can be installed in slots S1~S8 in any KSU.

The maximum number of SLIB(4)-U10 ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations of which 8 would be ESI ports. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

✎ When initially installing the SLIB(4)-U10 ETU, it may be necessary to press the RESET switch for the ETU to boot up properly.

5.6.3 Switch Settings

Table 6-24 SLIB(4)-U10 ETU SW2 Switch Settings

Switch		Setting	Purpose
SW2	1	ON	4 Channels (**Default)**
		OFF	8 Channels
	2	ON	See Table below for SW2-2 and SW2-3 details
		OFF	
	3	ON	
		OFF	
	4	ON	SLI(4)/(8) -U10 Mode (Caller-ID Disable) (**Default)**
		OFF	SLIB/SLIE(4)-U( ) Mode (Caller-ID Enable)

Table 6-25 SW2-2/SW2-3 Details

SW 2-2	SW 2-3	Function
ON	ON	Factory Test
OFF	ON	Firmware Upgrade
ON	OFF	Not Used
OFF	OFF	Normal Operation **(Default)**

Table 6-26 SLIB(4)-U10 ETU SW3 Switch Settings

SW 3-1	SW 3-2	SW 3-3	SW 3-4	Country Selection
ON	ON	ON	ON	**North America (Default)**
ON	OFF	OFF	ON	**Multiple SLT Devices** (One Single Line Telephone and one External Loud Ringer)

➢ Firmware Version 1.72 or higher is required for the Multiple SLT Devices setting.

5.6.4 LED Indications

LED 1 (LIVE) indications are:

- ❍ Flashing Red (Normal Operation)
- ❍ Steady Red (Operation Stopped, Power On)
- ❍ Off (No Power)

LED 2 (BUSY) indications are:

- ❍ Steady Red (Some ports Busy)
- ❍ Off (All ports idle)

5.6.5 Connectors

The following connectors are included:

- CN1 Connects to the backplane.
- CN4 Connects to CN4 on the SLIE(4)-U( ) ETU.
- CN5 Connects to CN5 on the SLIE(4)-U( ) ETU.

5.6.6 Connections

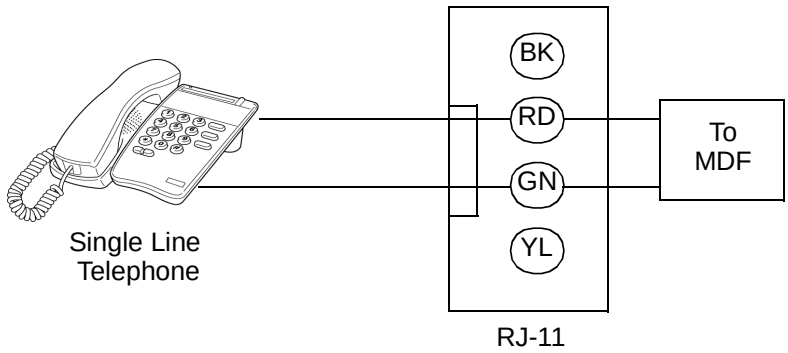


Figure 6-40 SLIB(4)-U10 ETU Connections

5.7 SLIE(4)-U10 ETU

5.7.1 Description

The SLIE(4)-U10 ETU is the expansion Single Line Interface ETU That plugs into the SLIB(4)-U10 ETU to provide an additional 4-channel interface for a Single Line Telephone, and also provides Ringing Signal Generator (RSG) and Message Waiting (MW) LED voltage to Single Line Telephones.

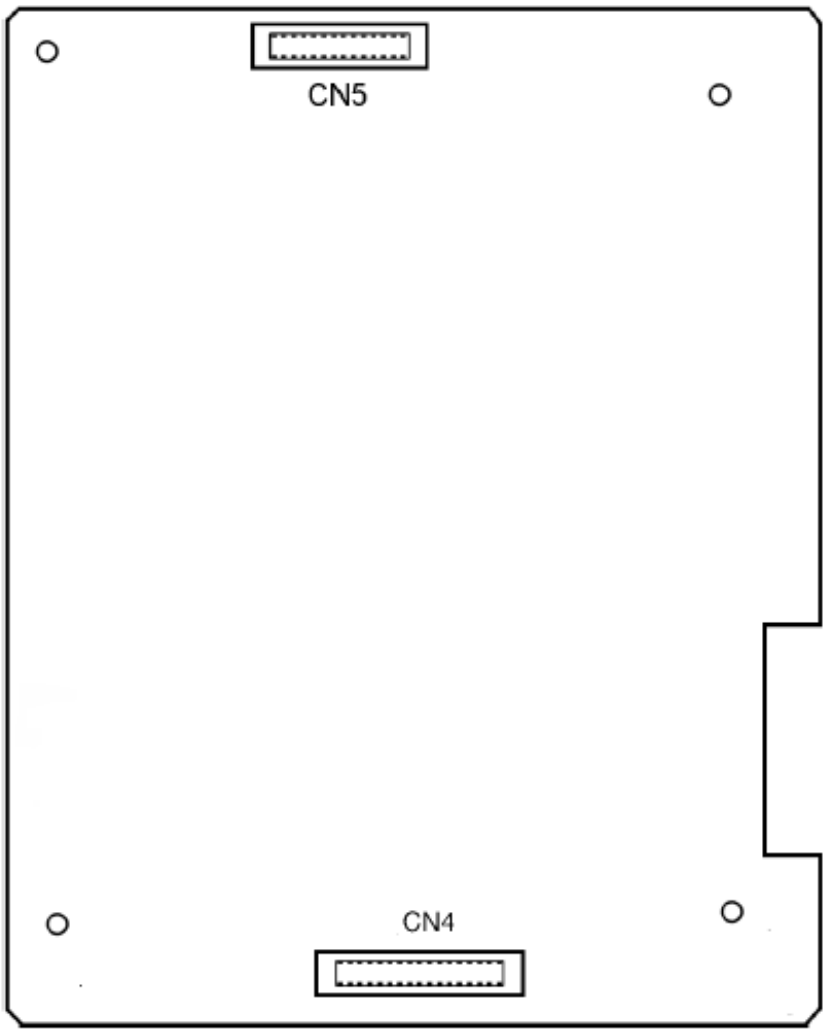


Figure 6-41 SLIE(4)-U10 ETU

5.7.2 Installation

Basic Port Package

A maximum of six SLIB(4)-U10 ETUs with the SLIE(4)-U10 ETU installed can be installed in slots S1~S8.

The maximum number of SLIB(4)-U10 ETUs with the SLIE(4)-U10 ETU installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of 22 SLIB(4)-U10 ETUs with the SLIE(4)-U10 ETU installed can be installed in slots S1~S8 in any KSU.

The maximum number of SLIB(4)-U10 ETUs with the SLIE(4)-U10 ETU installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

5.7.3 Connectors

The following connectors are included:

- CN4 Connects to CN4 on the SLIB(4)-U( ) ETU.
- CN5 Connects to CN5 on the SLIB(4)-U( ) ETU.

5.7.4 Connections

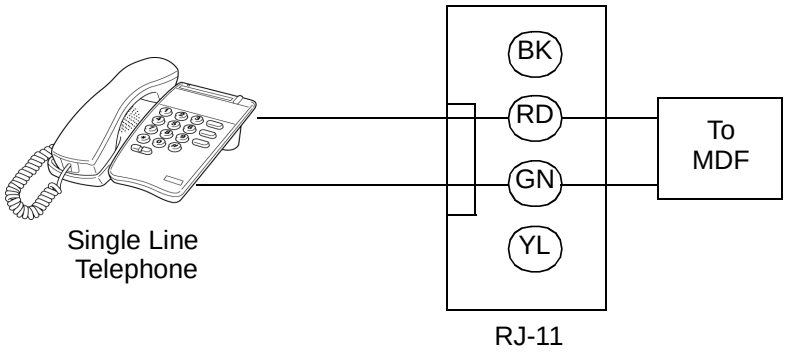


Figure 6-42 SLIB(4)-U10 ETU Connections

SECTION 6 VOICE MAIL ETUS

6.1 CMS(2)/(4)-U( ) ETU

6.1.1 Description

The CMS(2)/(4)-U( ) ETU is a Digital Voice Mail system that supports a maximum of four ports.

This ETU is a PC platform installed in the Electra Elite IPK II that contains Flash ROM data storage for voice recording and application software. A digital signal processor/voice processing section handles the following functions:

- DTMF detection
- DTMF generation
- General tone detection
- FAX CNG tone detection
- PCM compression for audio recording/playback
- Automatic gain control (AGC)
- A serial port (direct connect speeds up to 19.2 Kbps)

This ETU provides two or four ports for digital voice mail. Refer to Table 6-27 Configuration Support Table.

Table 6-27 Configuration Support Table

Function	Configuration Support
Applications	Automated Attendant/Voice Mail with call forwarding (release transfer) Automated Attendant/Voice Mail without call forwarding (await answer transfer) Voice Mail only (No transfer)
Call Forwarding	Supported
Connections	Connects to backplane connector of the KSU.
Hardware	One CMS(2)/(4)-U( ) ETU
Message Notification	Through message waiting lamp.
Operator Console	100 (default) Positive disconnect: Digital Signal
MDM-F-20 Unit	Used for remote connection.

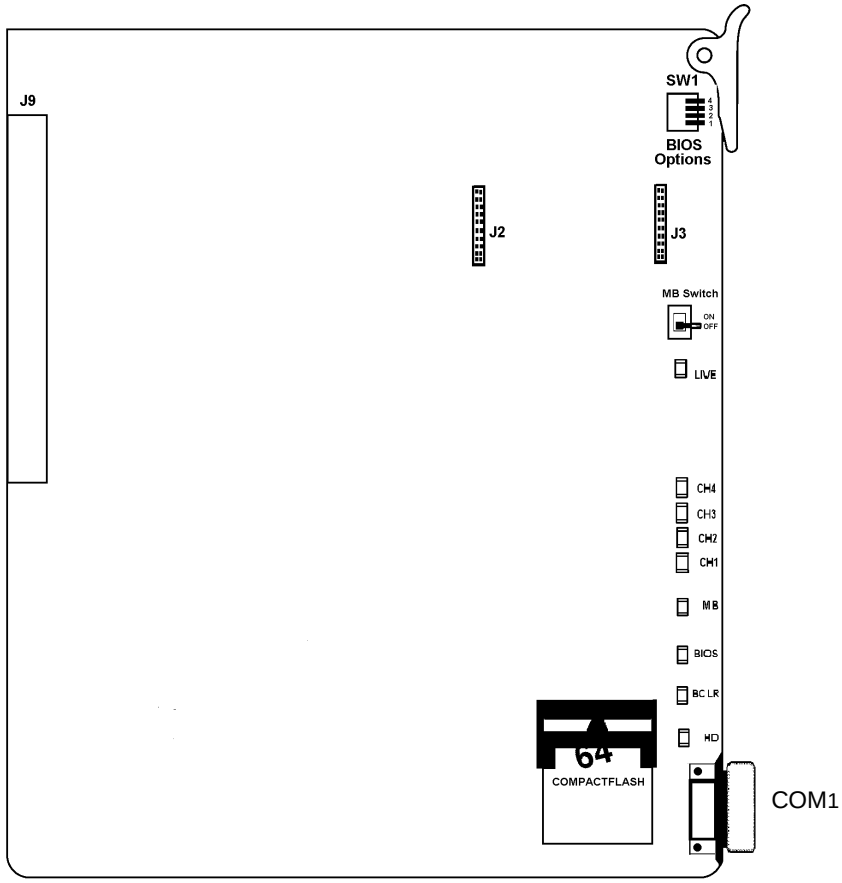


Figure 6-43 CMS(2)/(4)-U( ) ETU

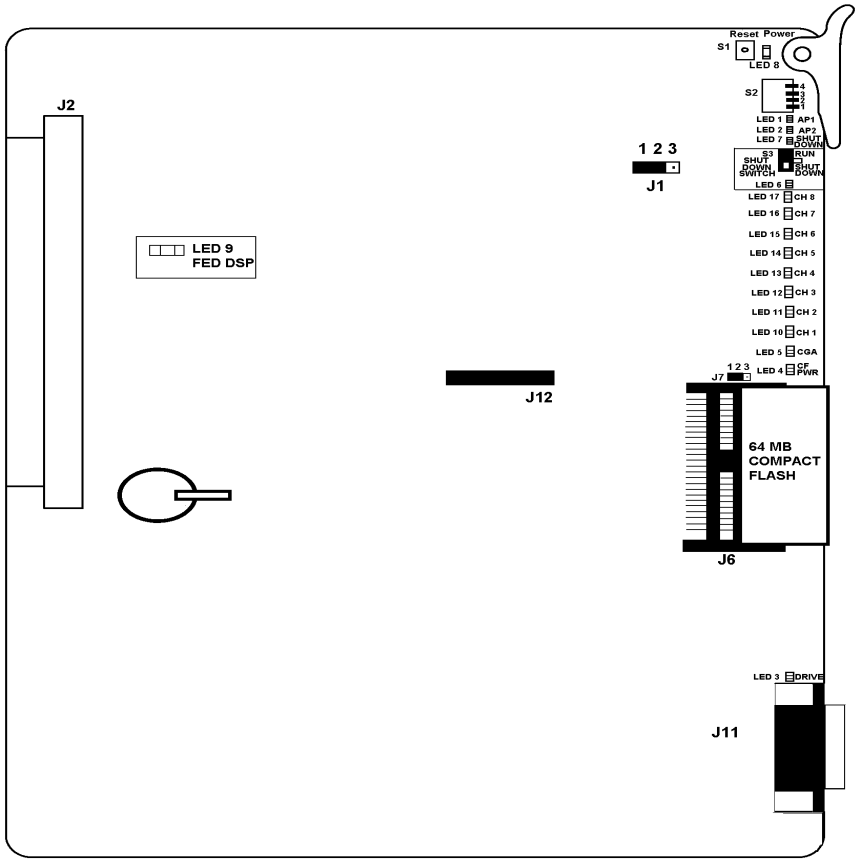


Figure 6-44 CMS-U30 ETU

6.1.2 Installation

Basic Port Package

Only one CMS(2)/(4)-U( ) ETU or one CMS-U30 ETU can be installed in slots S1~S8.

Expanded Port Package

Only one CMS(2)/(4)-U( ) ETU or one CMS-U30 ETU can be installed in slots S1~S8.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that KSU is off.

6.1.3 Switch Settings

For Revision Q00431 v 6.68 or higher, refer toTable 6-28 CMS(2)/(4)-U( ) ETU DIP Switch Functions.

Table 6-28 CMS(2)/(4)-U( ) ETU DIP Switch Functions

DIP 1	DIP 2	DIP 3	DIP 4	Description
ON				To enable HostKey and run Manufacturing Test (NEC Production only)
ON	ON			To enable HostKey with floppy disk redirection and run Manufacturing Test (NEC Production only)
		ON		To connect to CoSession using modem instead of direct cable connection
			ON	To start BRU Host with direct cable connection
		ON	ON	To start BRU Host with modem connection
	ON		ON	To connect to CoSession using direct cable connection but not start voice mail software (Troubleshooting or Maintenance Mode)

➢ Used for Revision Q00431 v 6.68 or higher.

6.1.4 LED Indications

Refer to Table 6-29 CMS(2)/(4)-U( ) ETU LED Indicators.

Table 6-29 CMS(2)/(4)-U( ) ETU LED Indicators

LED	Description	On	Flashing	Off
LIVE	ETU status	Receiving Power	Not Used	No Power
CH1	Port Status	Busy	Not Used	Idle/Not Used
CH2	Port Status	Busy	Not Used	Idle/Not Used
CH3	Port Status	Busy	Not Used	Idle/Not Used
CH4	Port Status	Busy	Not Used	Idle/Not Used
MB	MB Switch Status	ON	Not Used	OFF
BIOS	DOS Status	BIOS Error	Not Used	No error
BCLR	Application Status	**Red:** DOS started (VM Not Ready) **Green:** VM Running **Orange:** Error	Not Used	Idle

➢ *If BCLR LED is orange, check error type on console screen. After error is corrected, LED automatically changes to green. Do Not connect link between console and ETU until BCLR turns green during booting.*

HD	Flash Status	Not Used	Compact Flash Disk Active	Flash Inactive

➢ *Do not reset the ETU while the HD LED is flashing.*

Table 6-30 CMS-U30 ETU LED Indications

LED	Name	Description
LED 1	APP1	Indicates status of voice mail application software Green Application running without errors Amber Application running with errors Red Application not running
LED 2	APP 2	Not Used
LED 3	Drive	HDD active light is red when the hard drive is accessed ➢ Do not reset the ETU while this switch is on.
LED 4	CF Power	On when shutdown switch in Run to indicate power on the ETU
LED 5	ICGA	Live LED flashes every 125 ms during normal operation
LED 6	Shut Down Switch	Indicates that the switch has no software control. On red only when SHUTDOWN switch is in Run
LED 7	Shutdown	On red when Switch S3 is in SHUT DOWN to indicate that voice mail can be safely removed form the KSU
LED 8	Power	On red when ETU is receiving power from the KSU
LED 9	FED DSP	Used only for development purposes
LED 10	CH 1	On red when voice channel 1 is Off-Hook
LED 11	CH 2	On red when voice channel 2 is Off-Hook
LED 12	CH 3	On red when voice channel 3 is Off-Hook
LED 13	CH 4	On red when voice channel 4 is Off-Hook
LED 14	CH 5	On red when voice channel 5 is Off-Hook
LED 15	CH 6	On red when voice channel 6 is Off-Hook
LED 16	CH 7	On red when voice channel 7 is Off-Hook
LED 17	CH 8	On red when voice channel 8 is Off-Hook

➢ The first four channel LEDs are also used during startup to show that the BICOM driver is loaded (LED 1), Scan disk successfully completed (LED 2), CoSession Host successfully Loaded (LED 3), and voice mail started successfully (LED 4). After the system is up and running and all channels are ready to receive calls, these LEDs are Off. When voice mail does not start successfully, all eight channel LEDs and LED 1 are On.

6.1.5 Connectors

The following connectors are included:

- J2 and J3

  Used to install the MDM-F-20 Unit.

- J9

  Connects to the backplane.

- 9-pin RS-232 (COM2)

  Connector is not used (MDM-F-20 Unit).

- RJ-11 modem port (COM2)

  Remote connector on serial interface (MDM-F-20 Unit).

- 9-pin RS-232 (COM1)

  Local serial connector on main ETU for direct connection.

6.1.6 Jumper Settings

J1	Used only on FMS/CMS
Pin 1 to Pin 2	No external modem connected (default)
Pin 2 to Pin 3	External modem connected

6.1.7 Connectors

The following connectors are included:

- J2 Connects to the backplane.
- J6 Used for Compact flash drive on FMS.
- J10 Not used.
- J11) COM port for console programming connection
- J12 Port expansion connector for DSP-U30

6.2 CTI/VP(4)/(8)/(12)/(16)-U( ) ETU

6.2.1 Description

The CTI/VP(4)/(8)/(12)/(16)-U( ) ETU is a 4-, 8-, 12-, or 16-port Digital Voice Mail system that can support TeLANophy, inbound or outbound faxing and Hospitality/HVM applications.

The EliteMail VP cannot support TeLANophy or faxing and Hospitality/HVM applications, but it can be upgraded to EliteMail CTI when these features are required.

For a 4- or 8-port system, only the System Board and one slot are required. For the 12- or 16-port system, the Daughter Board that attaches to the System board, and the Port Expansion Board that requires another slot are also required.

This ETU is a PC platform, installed in the Electra Elite IPK II system, that contains hard disk space for voice recording storage and application software. A digital signal processor/voice processing section handles the following functions:

- DTMF detection/generation
- General tone detection
- FAX CNG tone detection
- PCM compression for audio recording/playback
- Automatic gain control
- A serial port (direct connect speeds up to 115,200 bps) used for direct connection console programming and backup/restore
- A LAN port with an RJ-45 connector (activated only with CTI)
- Up to two fax ports (activated only with CTI)
- A built-in modem for remote console programming that supports up to 19.2 Kbps

Table 6-31 Configuration Support

Function	Support
Applications	Automated Attendant/Voice Mail with call forwarding (release transfer) Automated Attendant/Voice Mail without call forwarding (await answer transfer) Voice Mail only (no transfer)
Call Forwarding	Supported
Connections	KSU backplane connection RJ-45 LAN connection RJ-11 Modem connection VGA connection for monitor support PS2 Keyboard and Mouse connections
Hardware	One CTI/VP(4)/(8)/(12)/(16)-U( ) ETU
Message Notification	Uses message waiting lamp
Operator Console	100 (default) Positive connect: Digital signal

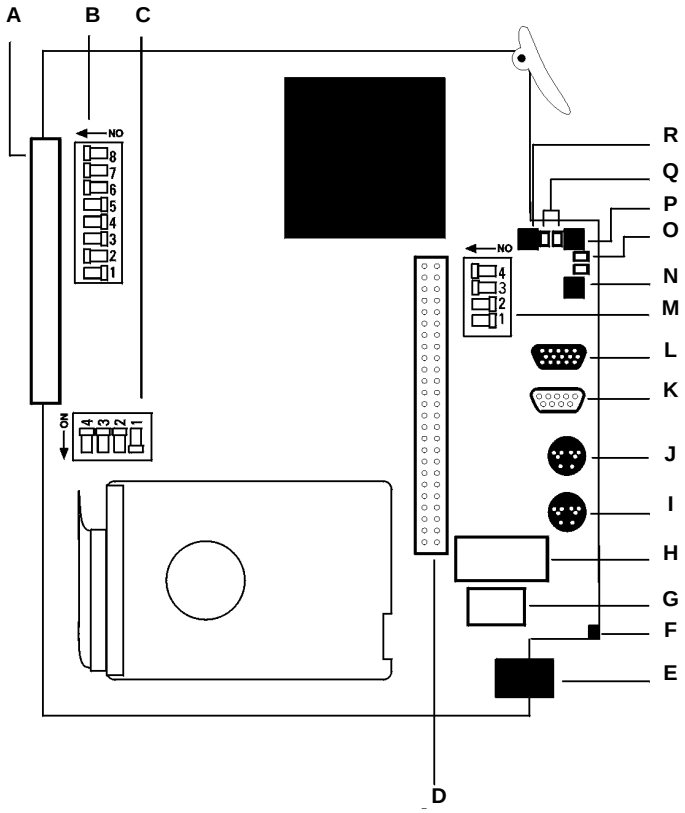


Figure 6-45 EliteMail CTI System Board

6.2.1.1 System Board Components

The components identified in Figure 6-45 EliteMail CTI System Board are listed and described in Table 6-32 System Board Components.

Table 6-32 System Board Components

Item	Description
A	Backplane connector
B	Switch SW2 Not used. Keep indicated default settings.
C	Switch SW1 Not used. Keep indicated default settings.
D	Port Expansion Board (PEB) cable
E	Modem connector
F	Hard Drive (HD) LED
G	Universal Serial Bus (USB) connector
H	Local Area Network (LAN) connector
I	Keyboard connector
J	Mouse connector
K	COM Serial Port connector
L	VGA Monitor connector
M	Switch SW3 DIP switch 1 default is Off so the voice messaging application starts when the board is turned On. Set this switch On to start OS/2 software only. DIP switch 2 default is Off for direct serial remote access connections. Set this switch On for modem connections. DIP switches 3 and 4 are not used and should be left On.
N	The power button cuts the power to the board from the PC and the hard drive and should not be used.
O	Voice messaging software LED Green when software is active Amber when active with possible application problem Red when inactive or shut down

Table 6-32 System Board Components (Continued)

Item	Description
P	Shutdown switch Default is On. Place Off to shut down the software and system board properly before turning off the telephone system and disconnecting the system board. Place On before restarting – The board restarts only when the switch is On.
Q	Shutdown LED Red when switch is On. Green when switch is Off. After the LED goes off, turn off power to the KSU and disconnect the board.
R	Make Busy switch and LED Do not use. Must always be On with a red LED.

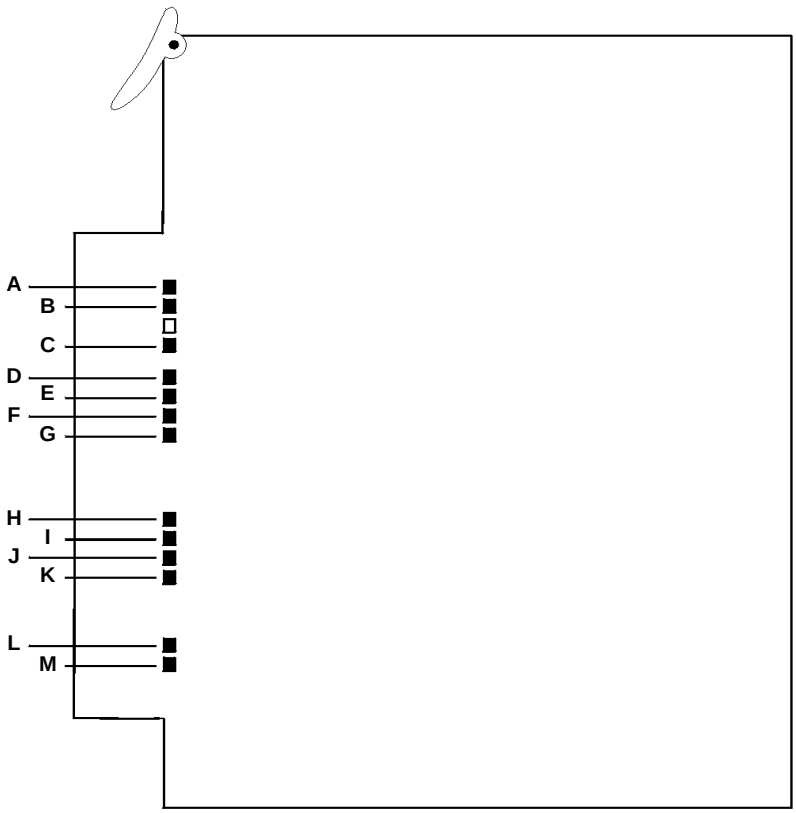


Figure 6-46 EliteMail CTI Daughter Board

6.2.1.2 Daughter Board Components

The components identified in Figure 6-47 EliteMail CTI Port Expansion Board are listed and described inTable 6-33 Daughter Board Components.

Table 6-33 Daughter Board Components

Item	Description
A	F206 LED
B	CGA LED
C	Application LED
D~K	VM Channel LEDs 1~8 respectively
L, M	Fax Channel LEDs Channel 1, Channel 2

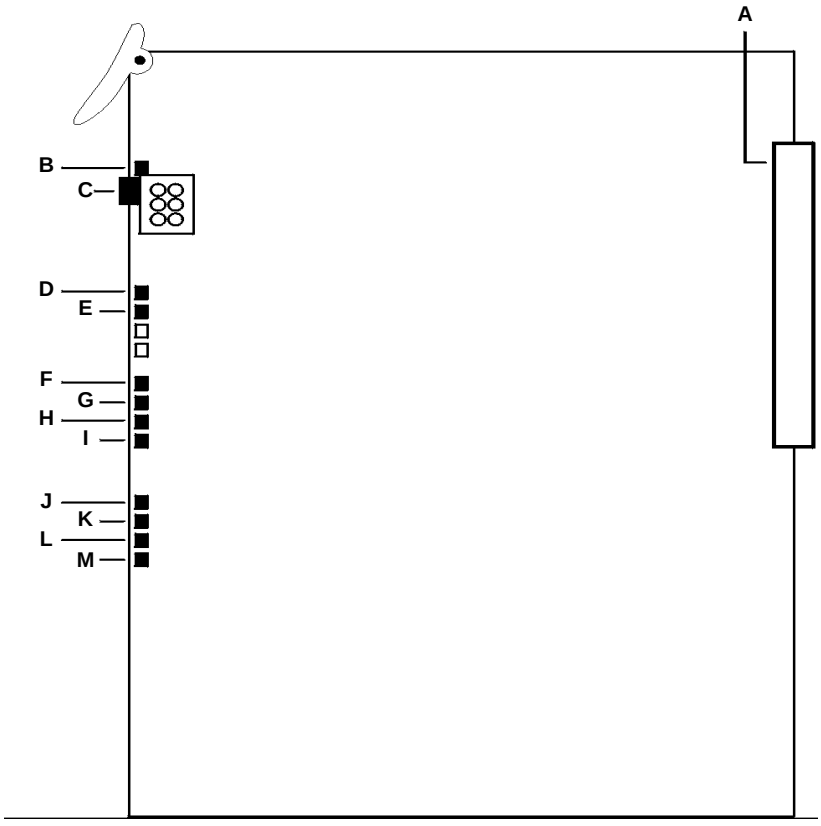


Figure 6-47 EliteMail CTI Port Expansion Board

6.2.1.3 Port Expansion Board

The components identified in Figure 6-47 EliteMail CTI Port Expansion Board are listed and described in Table 6-34 Port Expansion Board Components.

Table 6-34 Port Expansion Board Components

Item	Description
A	Backplane connector
B	MB LED – Always On when board is installed
C	MB switch – Do not use, leave On
D	F206 LED
E	CGA Live LED
F~M	VM Channels 9~16, respectively

6.2.2 Installation

Basic Port Package

Only one CTI/VP(4)/(8)/(12)/(16)-U( ) ETU can be installed in a system.

This ETU shares the total number of station ports in the system.

Expanded Port Package

Only one CTI/VP(4)/(8)/(12)/(16)-U( ) ETU can be installed in a system.

This ETU shares the total number of station ports in the system.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that KSU is off.

6.2.3 LED Indications

The HD LED flashes red when the hard drive is active.

✎ *Do not reset the ETU when the HD LED is flashing.*

6.3 CTP( )-U10 ETU

6.3.1 Description

This ETU is a multiplatform system that supports a maximum of 16 ports.

This ETU is a PC platform installed in the Electra Elite IPK II that contains data storage for voice recording and application software. A digital signal processor/voice processing section handles the following functions:

- DTMF detection
- DTMF generation
- General tone detection
- FAX CNG tone detection
- PCM compression for audio recording/playback
- Automatic gain control (AGC)
- Two USB 1.0 ports for USB Keyboard and Mouse support
- One 15-pin VGA connector for VGA monitor support

6.3.2 Checklist of Components

This section describes the steps for assembling a CTP( )-U10 ETU.

Confirm that you have all of the components for the installation. If you did not receive all the components, call your sales representative.

- CTP( )-U10 ETU
- Memory SO-DIMM 256M
- DSPII-U10 Unit, two for 12- or 16-port installations
- Drive

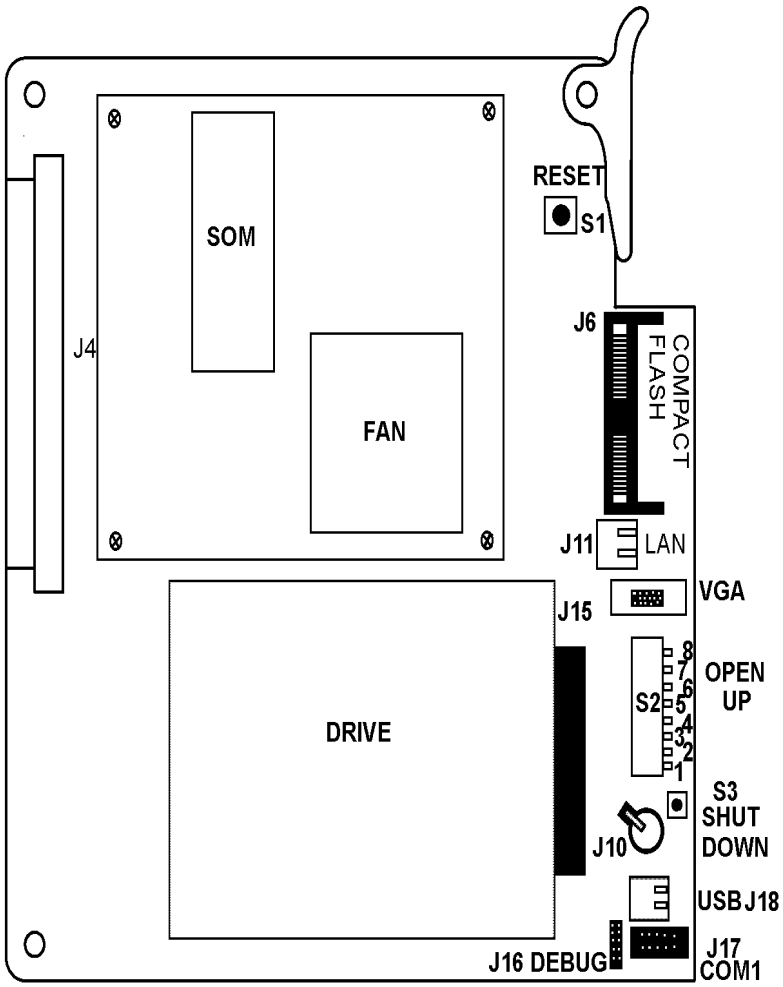


Figure 6-48 CTP( )-U10 ETU (Front View)

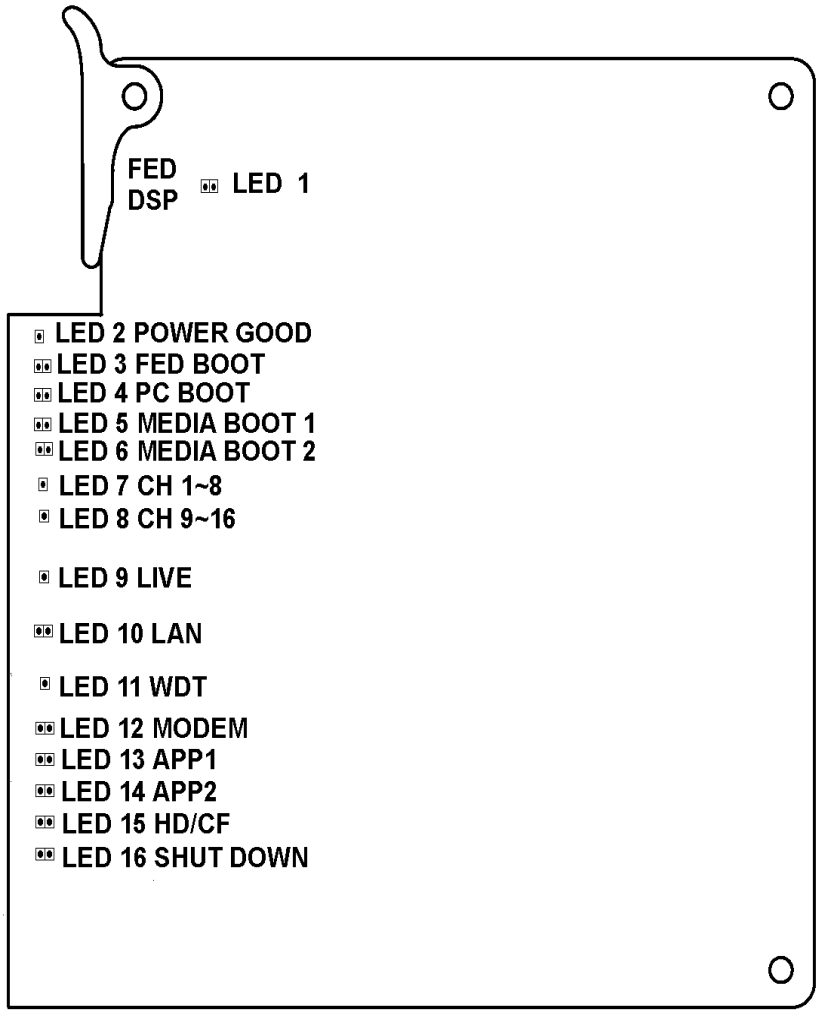


Figure 6-49 CTP( )-U10 ETU (Back View)

6.3.3 Installation

Basic Port Package

Only one CTP( )-U10 ETU can be installed in slots S1~S8.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

Expanded Port PAckage

Only one CTP( )-U10 ETU can be installed in slots S1~S8.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

Handle the drive and DSP carefully! Do not drop the drive or apply pressure to it. Do not touch the printed circuit board unnecessarily. Doing so can make it inoperable.

This unit makes extensive use of CMOS technology that is very susceptible to static; therefore, extreme care must be taken to **avoid static discharge** when handling.

✎ A 4-port CTP( )-U10 ETU must be programmed as an 8-port CTP( )-U10 ETU. Ports 5~8 should not be assigned extension numbers or included in the hunt group.

✎ A 12-port CTP( )-U10 ETU must be programmed as a 16-port CTP-U10 ETU. Ports 13~16 should not be assigned extension numbers or included in the hunt group.

6.3.4 Installing Drive on CTP( )-U10 ETU

1. Before installing the drive, make sure the four screws are started, as shown in Figure 6-50 Before Installing the Drive. They should not be tightened down all the way, as this prevents mounting the drive on the ETU.

Figure 6-50 Before Installing the Drive

2. Line up the four screws with the four slots in the drive mounting bracket, then lower the drive into the bracket. Make sure all four screws are seated in the bracket. Refer to Figure 6-51 Line up Four Screws.

Figure 6-51 Line up Four Screws

3. Slide the drive toward the connector, making sure all the pins line up with the connector. Push until it is firmly seated into the connector. There should be no exposed pins. Refer to Figure 6-52 Slide Drive Toward Connector.

Figure 6-52 Slide Drive Toward Connector

4. Carefully tighten the four screws.

5. The ETU is now ready to be installed in the KSU.

6.3.5 Removing the Drive

1. Loosen the four screws that hold the drive in place. Refer to Figure 6-53 Loosen the Four Screws.

Figure 6-53 Loosen the Four Screws

2. After the four screws are loosened, push the drive towards the back plane connector until it is unplugged from the drive connector. Refer to Figure 6-54 Push Drive Toward Backplane.

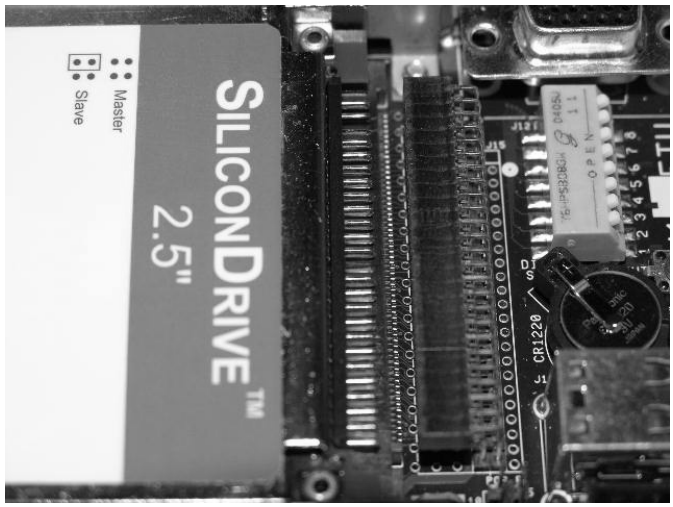


Figure 6-54 Push Drive Toward Backplane

3. Carefully lift the drive up to remove it from the ETU. You can now access the DSP Module slots. Refer to Figure 6-55 Lift up and Remove Drive from ETU.

Figure 6-55 Lift up and Remove Drive from ETU

6.3.6 Installing DSPs on the CTP( )-U10 ETU

✎ Slot DSP Module 1 is always used so 4-port and 8-port configurations have a DSP8-U10 in this slot only. Slot DSP Module 2 is used only for 12-port and 16-port configurations.

1. Wear a grounding strap while handling the CTP( )-U10 ETU and DSP, and lay both on a flat workspace.

2. The DSPs are installed under the drive, so the drive must be removed first. Refer to section 6.3.5 Removing the Drive for instructions on removing the drive.

3. Start by inserting the end with the brass connectors into the DSP Module 1 slot first. Refer to Figure 6-56 Insert Brass Connector End.

Figure 6-56 Insert Brass Connector End

4. Push the other end down until the locks on both sides click to hold it in place. Refer to Figure 6-57 Push Other End Down Until it Locks.
   Repeat steps 2 and 3, using the slot labeled DSP Module 2, to install another DSP. Otherwise you are now ready to install the drive.

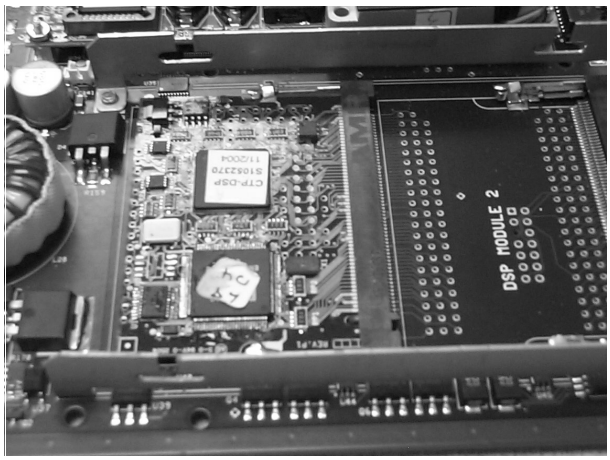


Figure 6-57 Push Other End Down Until it Locks

6.3.7 Installing and Removing the CTP( )-U10 ETU

✎ A 4-port CTP( )-U10 ETU must be programmed as an 8-port CTP-U10 ETU. Ports 5~8 should not be assigned extension numbers or included in the hunt group.

✎ A 12-port CTP( )-U10 ETU must be programmed as a 16-port CTP-U10 ETU. Ports 13~16 should not be assigned extension numbers or included in the hunt group.

1. Make sure the KSU power is off.
2. Install the ETU in the KSU.
3. Turn **ON** the KSU system power.
4. Wait for the APP1 LED to turn green.
5. Verify that all ports answer.
6. To shut down the voice mail, press the **SHUT DOWN Switch S3,** and wait for the **SHUT DOWN LED** to light green.

   ✎ It may take several minutes for the voice mail to shutdown.
7. Turn **OFF** the KSU power, and remove the ETU from the KSU.
8. Make sure to transport the ETU in the original packaging.

6.3.8 Switch Settings

For switch setting information, refer to documentation for the Specific application.

6.3.9 LED Indications

For LED indication information, refer to documentation for the Specific application.

6.3.10 Connectors

The CTP( )-U10 ETU has the following connectors:

- USB
  Connectors for USB mouse and Keyboard
- DIMM1
  Slot for SO-DIMM memory
- Compact Flash
  Flash drive slot
- Hard Drive
  Connection for drive media
- LAN
  RJ-45 LAN connector for network connection
- DSP Module 1
  Port expansion connector for first DSP8-U10; this slot should be used for 4-and 8-port configurations.
- DSP Module 2
  Port expansion connector for second DSP8-U10; this slot should be used when adding a second DSP8-U10 for 12-and 16-port configurations.
- VGA
  Connector for VGA type video monitor

6.4 FMS(2)/(4)/(8)- U( )

6.4.1 Description

The FMS(2)/(4)/(8)-U( ) ETU is a Digital Voice Mail system that supports a maximum of eight ports.

This ETU is a PC platform installed in the Electra Elite IPK II that contains Flash ROM data storage for voice recording and application software. A digital signal processor/voice processing section handles the following functions:

- DTMF detection
- DTMF generation
- General tone detection
- FAX CNG tone detection
- PCM compression for audio recording/playback
- Automatic gain control (AGC)
- A serial port (direct connect speeds up to 19.2 Kbps)

This ETU provides 2-, 4-, or 8-ports for digital voice mail. Refer to Table 6-35 Configuration Support Table.

Table 6-35 Configuration Support Table

Function	Configuration Support
Applications	Automated Attendant/Voice Mail with call forwarding (release transfer) Automated Attendant/Voice Mail without call forwarding (await answer transfer) Voice Mail only (No transfer)
Call Forwarding	Supported
Connections	Connects to backplane connector of the KSU.
Hardware	One FMS(2)/(4)/(8)-U( ) ETU
Message Notification	Through message waiting lamp
Operator Console	100 (default) Positive disconnect: Digital Signal
MDM-F-20 Unit	Used for remote connection.

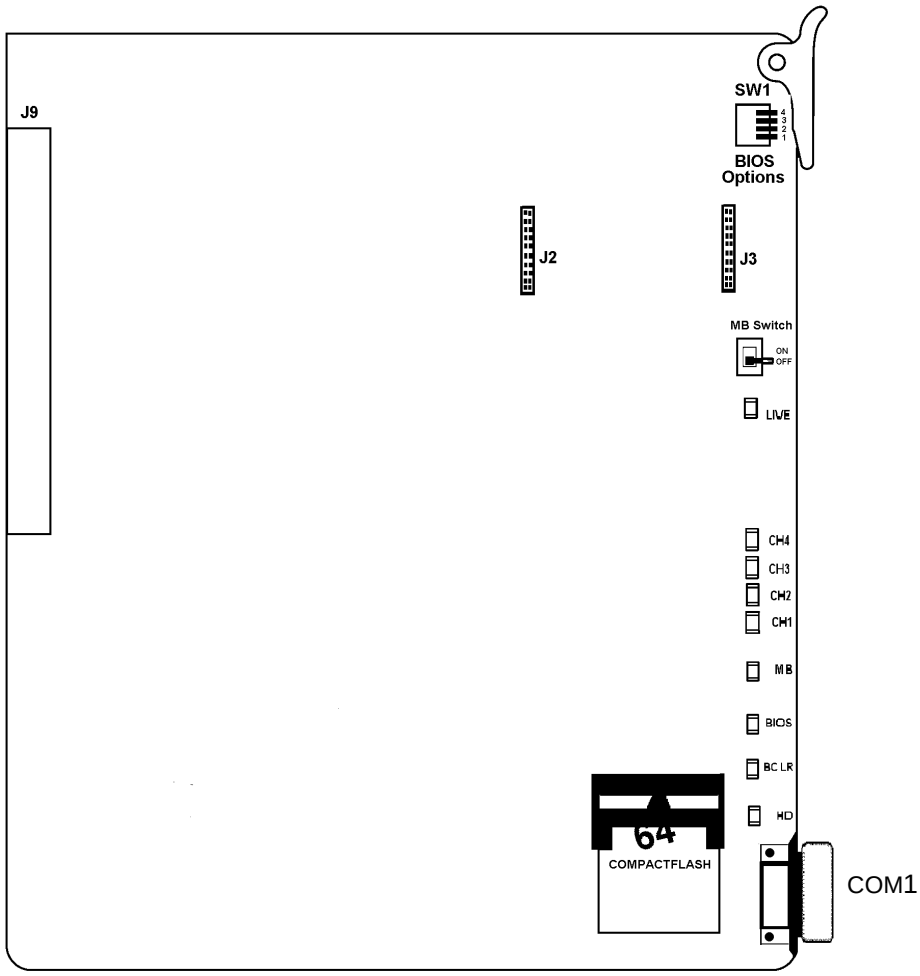


Figure 6-58 FMS(2)/(4)-U( ) ETU

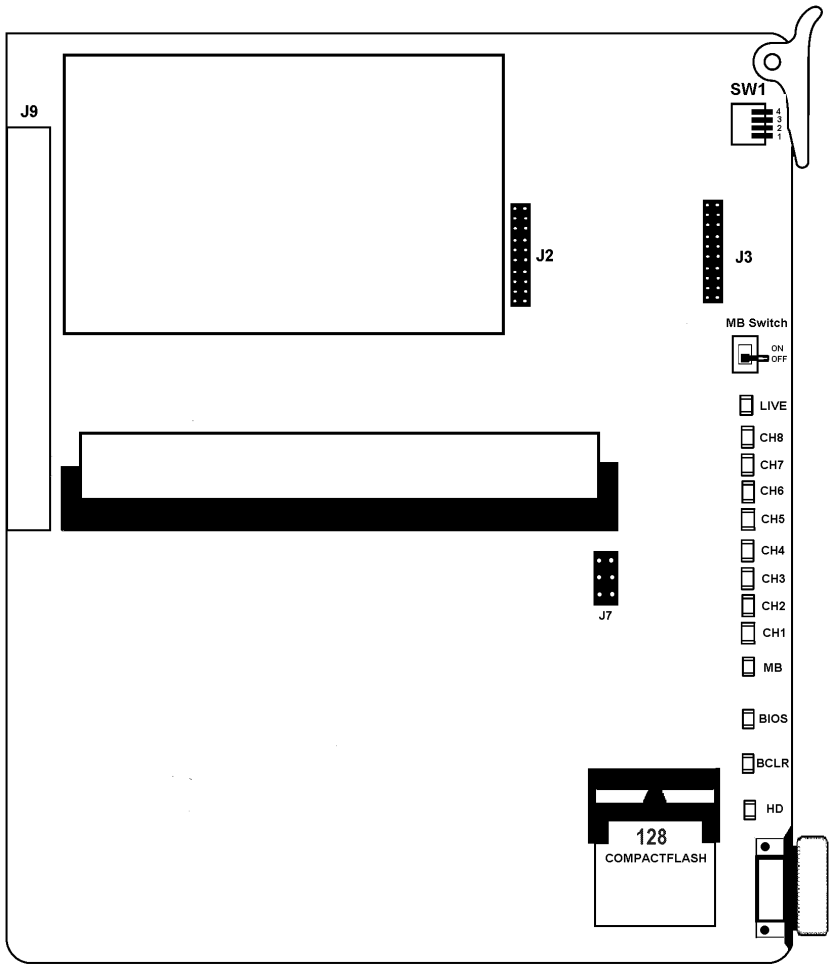


Figure 6-59 FMS(8)-U( ) ETU

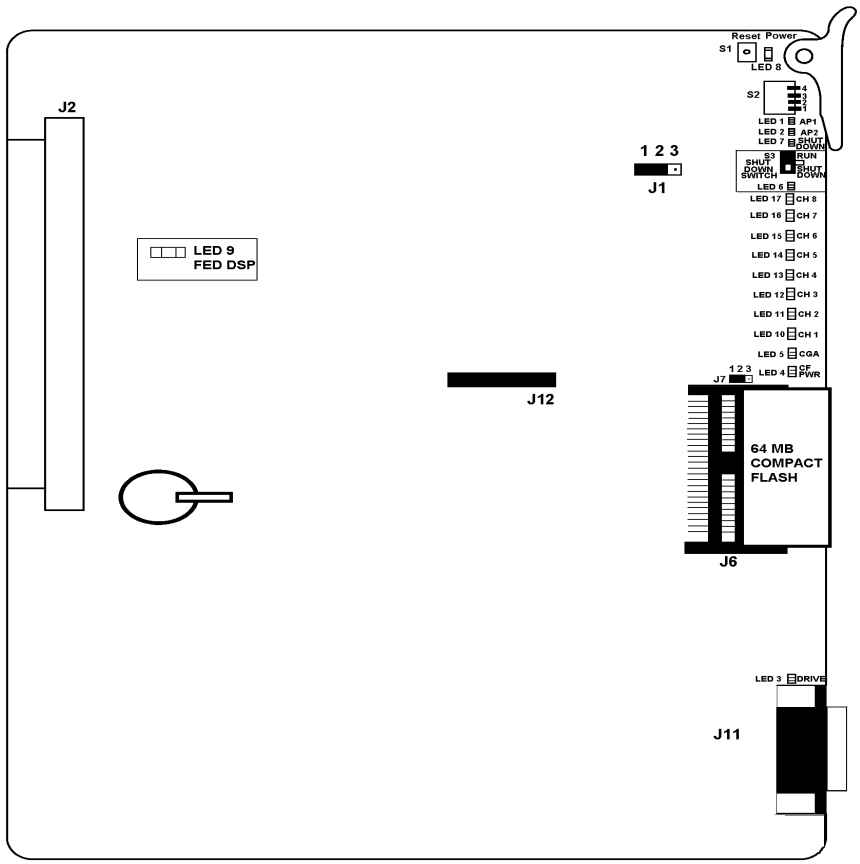


Figure 6-60 FMS-U30 ETU

6.4.2 Installation

Basic Port Package

Only one FMS(2)/(4)/(8)-U( ) ETU or one FMS-U30 can be installed in slots S1~S8.

This ETU shares the total number of station ports in the system.

Expanded Port Package

Only one FMS(2)/(4)/(8)-U( ) ETU or one FMS-U30 can be installed in slots S1~S8.

This ETU shares the total number of station ports in the system.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that KSU is off.

6.4.3 Switch Settings

Refer to Table 6-36 FMS(2)/(4)/(8)-U( ) ETU Switch Settings, for Revision Q26031 v 6.65 or lower. For Revision Q26031 v 6.68 or higher, refer to Table 6-37 FMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions.

Table 6-36 FMS(2)/(4)/(8)-U( ) ETU Switch Settings

Switch	Description
1	Normally Off. (On to enable COM1.)
2	Normally Off. When 1 and 2 are both On, COM1 is enabled for HOSTKEY and the VM application is stopped for Maintenance.
3	On to enable COM2 for remote RS-232/RJ-11. Off to allow COM1 local connection.
4	Not Used.

➢ Used for Revision Q26031 v 6.65 or lower.

Table 6-37 FMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions

DIP 1	DIP 2	DIP 3	DIP 4	Description
ON				To enable HostKey and run Manufacturing Test (NEC Production only).
ON	ON			To enable HostKey with floppy disk redirection and run Manufacturing Test (NEC Production only).
		ON		To connect to CoSession using modem instead of direct cable connection.
			ON	To start BRU Host with direct cable connection.
		ON	ON	To start BRU Host with modem connection.
	ON		ON	To connect to CoSession using direct cable connection but not start voice mail software (Troubleshooting or Maintenance Mode).

➢ Used for Revision Q05631 v 6.68 or higher.

6.4.4 LED Indications

Refer to Table 6-38 FMS(2)/(4)/(8)-U( ) ETU LED Indications.

Table 6-38 FMS(2)/(4)/(8)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Receiving Power	Not Used	No Power
CH1	Port Status	Busy	Not Used	Idle/Not Used
CH2	Port Status	Busy	Not Used	Idle/Not Used
CH3	Port Status	Busy	Not Used	Idle/Not Used
CH4	Port Status	Busy	Not Used	Idle/Not Used
CH5	Port Status	Busy	Not Used	Idle/Not Used
CH6	Port Status	Busy	Not Used	Idle/Not Used

Table 6-38 FMS(2)/(4)/(8)-U( ) ETU LED Indications (Continued)

LED	Description	On	Flashing	Off
CH7	Port Status	Busy	Not Used	Idle/Not Used
CH8	Port Status	Busy	Not Used	Idle/Not Used
MB	MB Switch Status	ON	Not Used	OFF
BIOS	DOS Status	BIOS Error	Not Used	No error
BCLR	Application Status	**Red:** DOS started (VM Not Ready) **Green:** VM Running **Orange:** Error	Not Used	Idle

- *When BCLR LED is orange, check error type on console screen. After error is corrected, LED automatically changes to green. Do Not connect link between console and ETU until BCLR turns green during booting.*

HD	Flash Status	Not Used	Compact Flash Disk Active	Flash Inactive

- *Do not reset the ETU while the HD LED is flashing.*

Table 6-39 FMS-U30 ETU LED Indications

LED	Name	Description
LED 1	APP1	Indicates status of voice mail application software: Green: Application running without errors. Amber: Application running with errors. Red: Application not running.
LED 2	APP 2	Not Used
LED 3	Drive	HDD active light is red when the hard drive is accessed. ➢ Do not reset the ETU while this switch is on.
LED 4	CF Power	On when shutdown switch in Run to indicate power on the ETU.

Table 6-39 FMS-U30 ETU LED Indications (Continued)

LED	Name	Description
LED 5	ICGA	Live LED flashes every 125 ms during normal operation
LED 6	Shut Down Switch	Indicates that the switch has no software control. On red only when SHUTDOWN switch is in Run
LED 7	Shutdown	On red when Switch S3 is in SHUT DOWN to indicate that voice mail can be safely removed form the KSU
LED 8	Power	On red when ETU is receiving power from the KSU
LED 9	FED DSP	Used only for development purposes
LED 10	CH 1	On red when voice channel 1 is Off Hook
LED 11	CH 2	On red when voice channel 2 is Off Hook
LED 12	CH 3	On red when voice channel 3 is Off Hook
LED 13	CH 4	On red when voice channel 4 is Off Hook
LED 14	CH 5	On red when voice channel 5 is Off Hook
LED 15	CH 6	On red when voice channel 6 is Off Hook
LED 16	CH 7	On red when voice channel 7 is Off Hook
LED 17	CH 8	On red when voice channel 8 is Off Hook

- The first four channel LEDs are also used during startup to show that the BICOM driver is loaded (LED 1), Scan disk successfully completed (LED 2), CoSession Host successfully Loaded (LED 3), and voice mail started successfully (LED 4). After the system is up and running and all channels are ready to receive calls, these LEDs are Off. When voice mail does not start successfully, all eight channel LEDs and LED 1 are On.

6.4.5 FMS(2)/(4)/(8)-U( ) ETU Connectors

The following connectors are included:

- J2 and J3

  Used to install the MDM-F-20 Unit.

- J9

  Connects to the backplane.

- 9-pin RS-232 (COM2)

  Not used (MDM-F-20 Unit).

- RJ-11 modem port (COM2)

  Remote connector on serial interface (MDM-F-20 Unit)

- 9-pin RS-232(COM1)

  Local serial connector on main ETU for direct connection

6.4.6 FMS-U30 ETU Jumper Settings

J1	Used only on FMS/CMS
Pin 1 to Pin 2	No external modem connected (default)
Pin 2 to Pin 3	External modem connected

6.4.7 FMS-U30 ETU Connectors

The following connectors are included:

- J2 Connects to the backplane.
- J6 Used for Compact flash drive on FMS.
- J11 COM port for console programming connection
- J12 Port expansion connector for DSP-U30

6.5 VMS(2)/(4)/(8)-U( ) ETU

6.5.1 Description

The VMS(2)/(4)/(8)-U( ) ETU is a 2-, 4-, or 8-port Digital Voice Mail system.

This ETU is a PC platform installed in the Electra Elite IPK II and contains hard disk space for voice recording storage and application software. A digital signal processor/voice processing section handles the following functions:

- DTMF detection
- DTMF generation
- General tone detection
- FAX CNG tone detection
- PCM compression for audio recording/playback
- Automatic gain control (AGC)
- A serial port (direct connect speeds up to 19.2 Kbps) to connect external modem

This ETU provides 2-, 4-, or 8-ports for digital voice mail. The 2- and 4-port require the included digital signal processor (DSP); the 8-port configuration requires a DSP-F-21 Unit. Refer to This ETU provides 2-, 4-, or 8-ports for digital voice mail. The 2- and 4-port require the included digital signal processor (DSP); the 8-port configuration requires a DSP-F-21 Unit. Refer to Table 6-40 Configuration Support Table.

Table 6-40 Configuration Support Table

Function	Configuration Support
Applications	Automated Attendant/Voice Mail with call forwarding (release transfer) Automated Attendant/Voice Mail without call forwarding (await answer transfer) Voice Mail only (No transfer)
Call Forwarding	Supported
Connections	Connects to backplane connector of the KSU.
Hardware	One VMS(2)/(4)/(8)-U( ) ETU
Message Notification	Through message waiting lamp
MDM-F-20 Unit	Used for remote connection

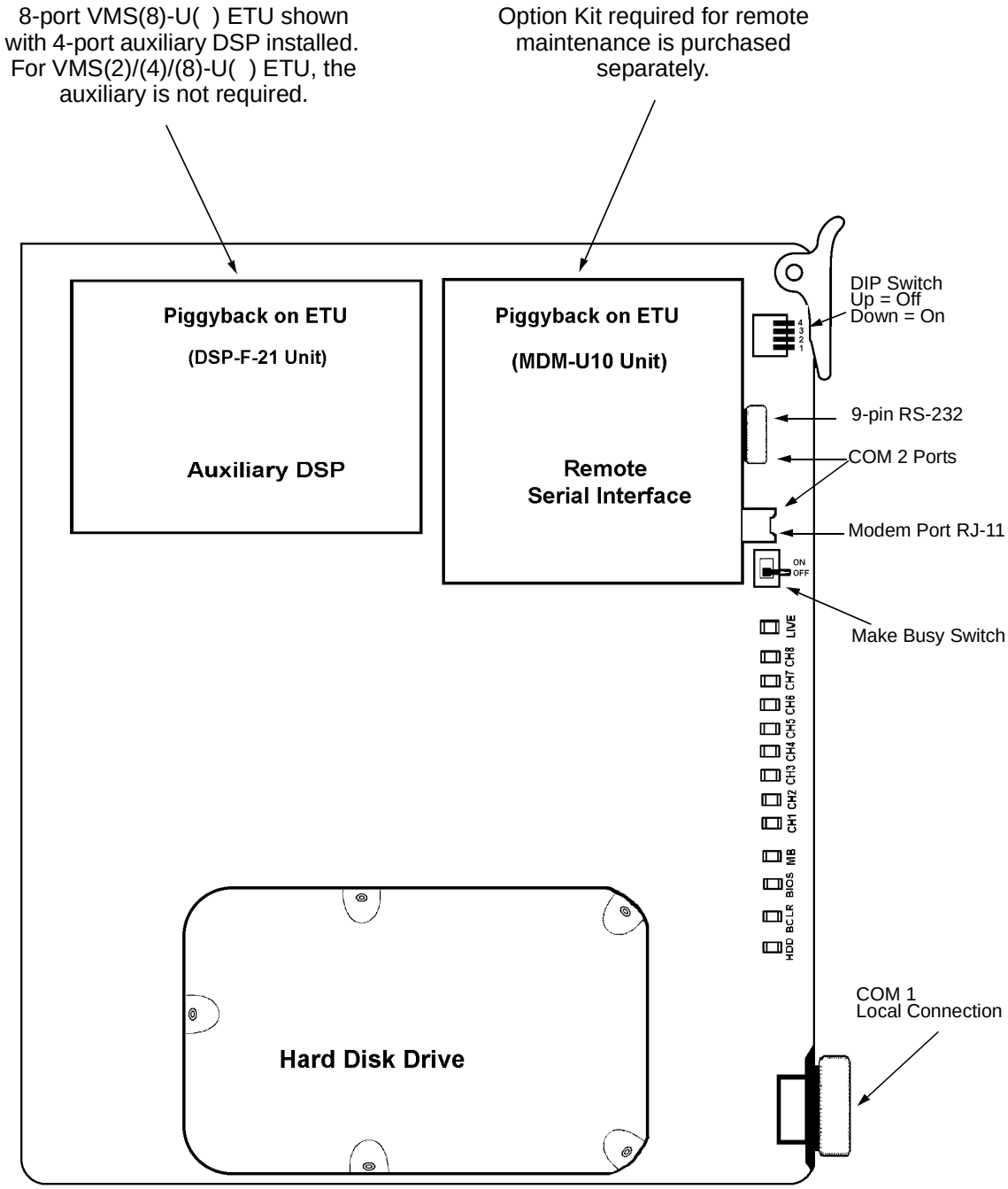


Figure 6-61 VMS(2)/(4)/(8)-U( ) ETU

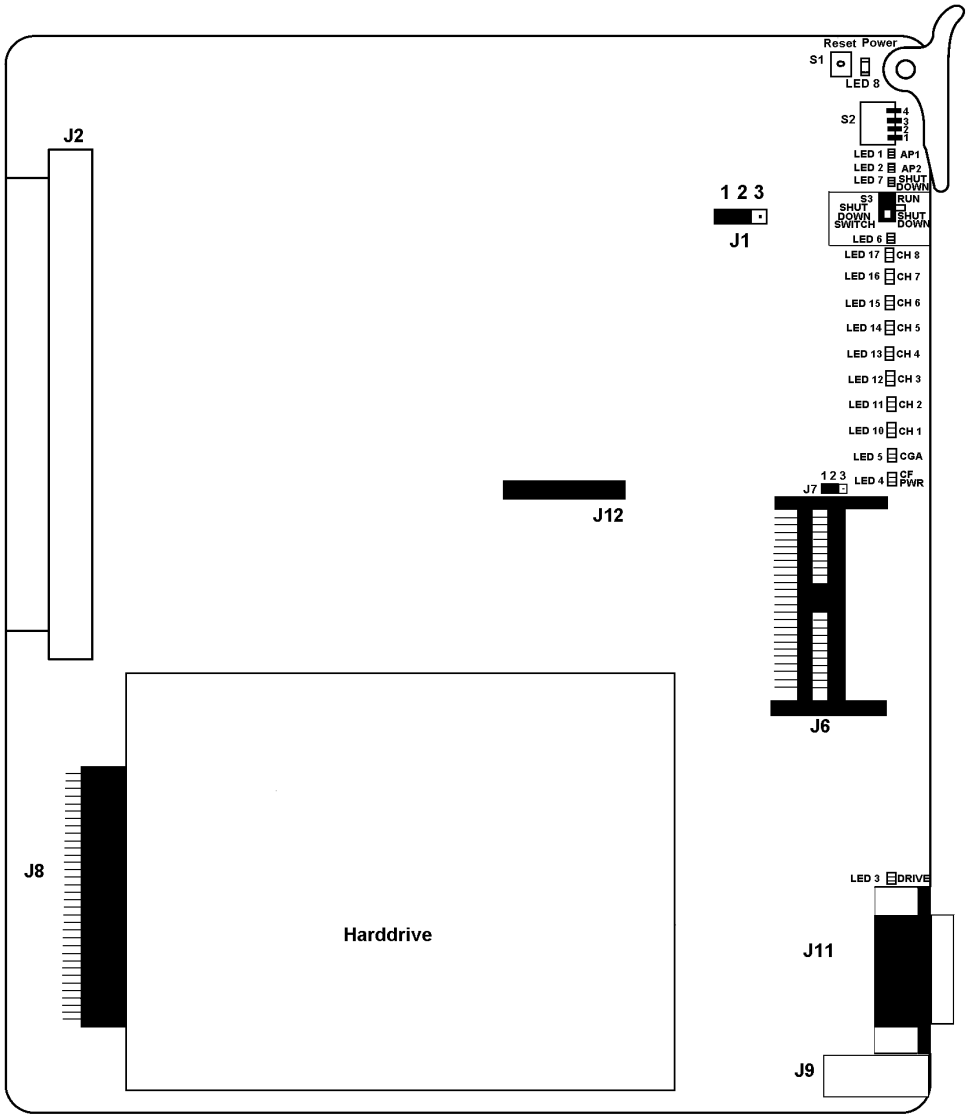


Figure 6-62 VMS-U30 ETU

6.5.2 Installation

The VMS(2)-U10 ETU has two channels of built-in Voice Mail.

The VMS(4)-U10 ETU has four channels of built-in Voice Mail.

The VMS(8)-U10 ETU has eight channels of built-in Voice Mail.

Basic Port Package

Only one VMS(2)/(4)/(8)-U( ) ETU or one VMS-U30 ETU can be installed in each system in slots S1~S8.

This ETU shares the total number of station ports in the system.

Expanded Port Package

Only one VMS(2)/(4)/(8)-U( ) ETU or one VMS-U30 ETU can be installed in each system in slots S1~S8.

This ETU shares the total number of station ports in the system.

✎ Each system can support only one CMS, CTI/VP, CTP, FMS, VMS, or VMP ETU.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that the KSU is off.

6.5.3 Switch Settings

Refer to Table 6-41 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Settings. (Revision Q30931 v 6.65 or lower). For Revision Q30931 v 6.68 or higher, refer to Table 6-42 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions.

Table 6-41 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Settings

Switch	Description
1	Normally Off. (On to enable COM1.)
2	Normally Off. When 1 and 2 are both On, COM1 is enabled for HOSTKEY and the VM application is stopped for Maintenance.
3	On to enable COM2 for remote RS-232/RJ-11. Off to allow COM1 local connection.
4	Not Used.

➢ Used for Revision Q30931 v 6.65 or lower.

Table 6-42 VMS(2)/(4)/(8)-U( ) ETU DIP Switch Functions

DIP 1	DIP 2	DIP 3	DIP 4	Description
ON				To enable HostKey and run Manufacturing Test (NEC Production only).
ON	ON			To enable HostKey with floppy disk redirection and run Manufacturing Test (NEC Production only).
		ON		To connect to CoSession using modem instead of direct cable connection.
			ON	To start BRU Host with direct cable connection.
		ON	ON	To start BRU Host with modem connection.
	ON		ON	To connect to CoSession using direct cable connection but not start voice mail software (Troubleshooting or Maintenance Mode).

➢ Used for Revision Q00631 v 6.68 or higher.

6.5.4 LED Indications

Refer to Table 6-43 VMS(2)/(4)/(8)-U( ) ETU LED Indications.

Table 6-43 VMS(2)/(4)/(8)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LIVE	ETU status	Receiving power	Not Used	No Power
CH1	Port status	Busy	Not Used	Idle/Not used
CH2	Port status	Busy	Not Used	Idle/Not used
CH3	Port status	Busy	Not Used	Idle/Not used
CH4	Port status	Busy	Not Used	Idle/Not used
CH5	Port status	Busy	Not Used	Idle/Not used
CH6	Port status	Busy	Not Used	Idle/Not used
CH7	Port status	Busy	Not Used	Idle/Not used
CH8	Port status	Busy	Not Used	Idle/Not used
MB	MB Switch status	ON	Not Used	OFF
BIOS	BIOS Error Status	BIOS Error	Not Used	No error
BCLR	Application status	**Red:** DOS started (VM not ready) **Green:** VM running **Orange:** Error	Not Used	Idle

➢ *When BCLR LED is orange, check error type on console screen. After error is corrected, LED automatically changes to green. Do Not connect link between console and ETU until BCLR turns green during booting.*

HDD	Hard Disk status	Not Used	Hard Disk active	Hard Disk inactive

➢ *Do not reset the ETU while the HDD LED is flashing.*

Refer to Table 6-44 VMS-U30 ETU LED Indications.

Table 6-44 VMS-U30 ETU LED Indications

LED	Name	Description
LED 1	APP1	Indicates status of voice mail application software: Green Application is running without errors. Amber Application is running with errors. Red Application is not running.
LED 2	APP 2	Not Used
LED 3	Drive	HDD active light is red when the hard drive is accessed. ➢ Do not reset the ETU while this switch is On.
LED 4	CF Power	On when shutdown switch in Run to indicate power on the ETU.
LED 5	ICGA	Live LED flashes every 125 ms during normal operation.
LED 6	Shut Down Switch	Indicates that the switch has no software control. On red only when SHUTDOWN switch is in Run.
LED 7	Shutdown	On red when Switch S3 is in SHUT DOWN to indicate that voice mail can be safely removed form the KSU.
LED 8	Power	On red when ETU is receiving power from the KSU.
LED 9	FED DSP	Used only for development purposes.
LED 10	CH 1	On red when voice channel 1 is Off Hook.
LED 11	CH 2	On red when voice channel 2 is Off Hook.
LED 12	CH 3	On red when voice channel 3 is Off Hook.
LED 13	CH 4	On red when voice channel 4 is Off Hook.
LED 14	CH 5	On red when voice channel 5 is Off Hook.
LED 15	CH 6	On red when voice channel 6 is Off Hook.
LED 16	CH 7	On red when voice channel 7 is Off Hook.
LED 17	CH 8	On red when voice channel 8 is Off Hook.

➢ The first four channel LEDs are also used during startup to show that the BICOM driver is loaded (LED 1), Scan disk successfully completed (LED 2), CoSession Host successfully Loaded (LED 3), and voice mail started successfully (LED 4). After the system is up and running and all channels are ready to receive calls, these LEDs are Off. When voice mail does not start successfully, all eight channel LEDs and LED 1 are on.

6.5.5 VMS(2)/(4)/(8)-U( ) ETU Connectors

The following connectors are included:

- CN1

  Connects to the backplane.

- 9-pin RS-232 (COM2)

  Not used (MDM-F-20 Unit)

- RJ-11 modem port (COM2)

  Remote connector on serial interface (MDM-F-20 Unit)

- 9-pin RS-23 (COM1)

  Local Serial connector on main ETU for direct connection

6.5.6 VMS-U30 ETU Jumper Settings

J7	Used only on VMS
Pin 1 to Pin 2	Compact flash is master drive.
Pin 2 to Pin 3	Hard Drive is master drive (default).

6.5.7 VMS-U30 ETU Connectors

The following connectors are included:

- J2 Connects to the backplane.
- J6 Used for Compact flash drive on FMS.
- J9 RJ-45 LAN connector for network connection
- J11 COM port for console programming connection
- J12 Port expansion connector for DSP-U30

SECTION 7 OPTIONAL ETUS

This section describes optional Electronic Telephone Units that provide additional functions for an Electra Elite IPK II system.

7.1 BSU(4M)-U20 ETU

7.1.1 Description

The BSU(4M)-U20 ETU is the Master Base Station Interface Unit ETU that provides connection for four Base Stations and up to 16 simultaneous calls on the Electra Elite IPK II Wireless – DECT feature.

Only one BSU(4M)-U20 ETU can be installed in the Basic or Expanded Electra Elite IPK II system.

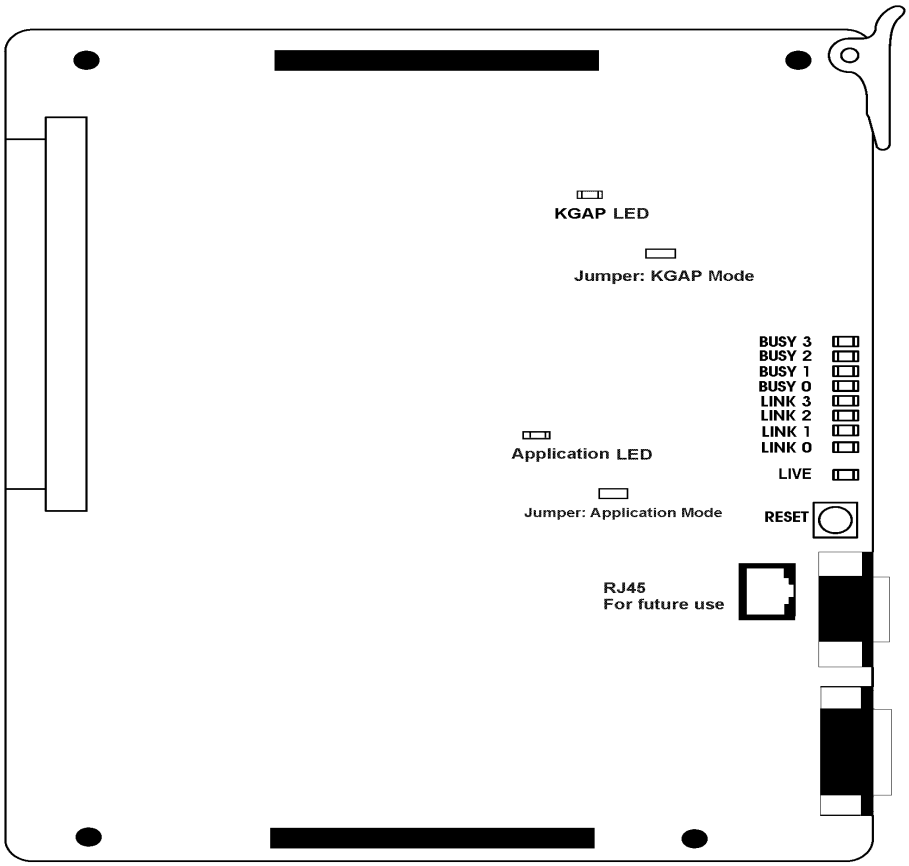


Figure 6-63 BSU(4M)-U20 ETU

7.1.2 Installation

As a single unit, the BSU(4M)-U20 ETU (Master) can be installed in slots S1~S8 in any KSU. Two Slave ETUs [BSU(2S) or BSU(6S)] can be cascaded on four corner posts to the Left of the BSU(4M) in accordance with the tables below. The complete assembly requires three adjacent slots and limits installation of the BSU(4M) to slots S3~S8.

Only one BSU(4)-U20 ETU can be installed in any interface slot in the Basic or Expanded Port Package of the Electra Elite IPK II.

No.	Slot N-2	Slot N-1	Slot N	No. of Base Stations	Note
1	None	None	BSU(4M) ETU	4	
2	None	BSU(2S) ETU	BSU(4M) ETU	6	
3	None	BSU(6S) ETU	BSU(4M) ETU	10	
4	BSU(2S) ETU	BSU(2S) ETU	BSU(4M) ETU	8	
5	BSU(6S) ETU	BSU(2S) ETU	BSU(4M) ETU	12	
6	BSU(2S) ETU	BSU(6S) ETU	BSU(4M) ETU	12	
7	BSU(6S) ETU	BSU(6S) ETU	BSU(4M) ETU	16	

Base Station number assignments are shown in the table below:

Slot	ETU	Channel	BS No.	Note
N	BSU(4M) ETU	1	1	
		2	2	
		3	3	
		4	4	
N-1	BSU(6S) ETU	1	5	
		2	6	
		3	7	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	8	
		5	9	
		6	10	

Slot	ETU	Channel	BS No.	Note
N-2	BSU(6S) ETU	1	11	
		2	12	
		3	13	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	14	
		5	15	
		6	16	

7.1.3 LED Indications

LIVE LED (Red) — On indicates communication between this ETU and the Main CPU.

LINK (0~3) LED — On indicates Layer 1 and Layer 2 link between the Wireless – DECT and the indicated Base Station (1~4).

Flashes (0.5sec ON-0.5sec OFF) when Layer 1 Link between Wireless – DECT and BSU ETU is established, but not Link 2.

Off indicates that Link 1 is not established.

Busy (0~3) LED — Flashes when the indicated Base Station (1~4) is busy. Refer to Figure 6-66 Busy LED Flash Pattern.

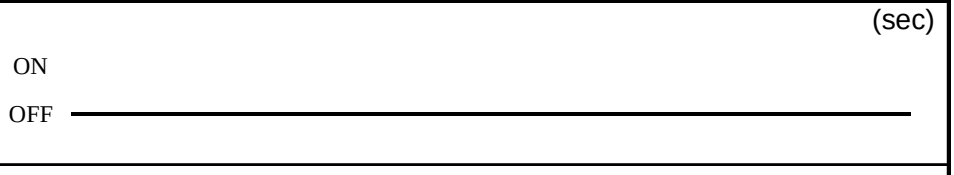
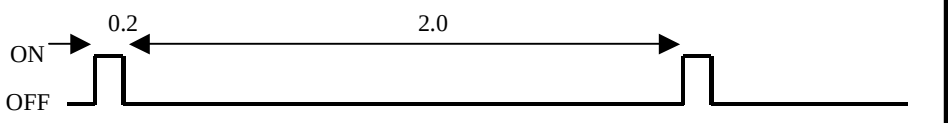
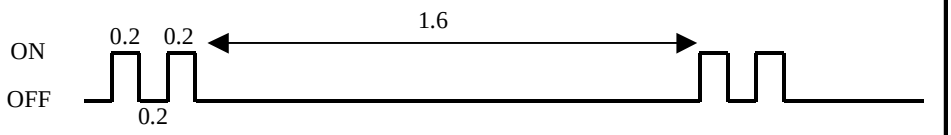
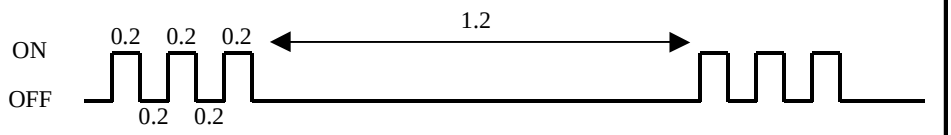
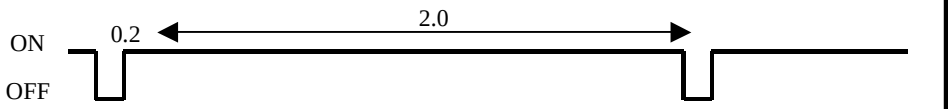
Status	Flashing Cycle
No calls exist	
1 call exists	
2 calls exist	
3 calls exist	
4 calls exist	

Figure 6-64 Busy LED Flash Pattern

7.1.4 Connectors

CN 1 Connects to the backboard.

CN 4 Connects to RJ-45 connector at mid-top of the BSU(2S) or BSU(6S) ETU.

CN 5 Connects to RJ-45 connector at mid-bottom of the BSU(2S) or BSU(6S) ETU.

The BSU(4M) has two serial interfaces: The upper port is for KGAP Applications, Cable Delay Measurement, and Electra Elite IPK II to Wireless Card administration. The lower port is for Applications, telephone registration, and system information. The Administration Program is used to communicate with ether port, depending on operation required. The specifications for the Serial Ports are as follows:

Specification	RS-232C
Connector	DB-9 Female
DCE/DTE	DCE (connected by straight cable to PC)
Speed	19200 bps
Data Length	8 bits
Parity	None
Stop Bit	None
Flow Control	Hardware Handshake

7.2 BSU(2S)-U20 ETU

7.2.1 Description

The BSU(2S)-U20 ETU is the Base Station Interface Unit Slave ETU that provides connection for two additional Base Stations when connected to the BSU(4M)-U20 (Master) ETU.

A maximum of two BSU(2S)-U20 ETUs can be installed in the Basic or Expanded Electra Elite IPK II system.

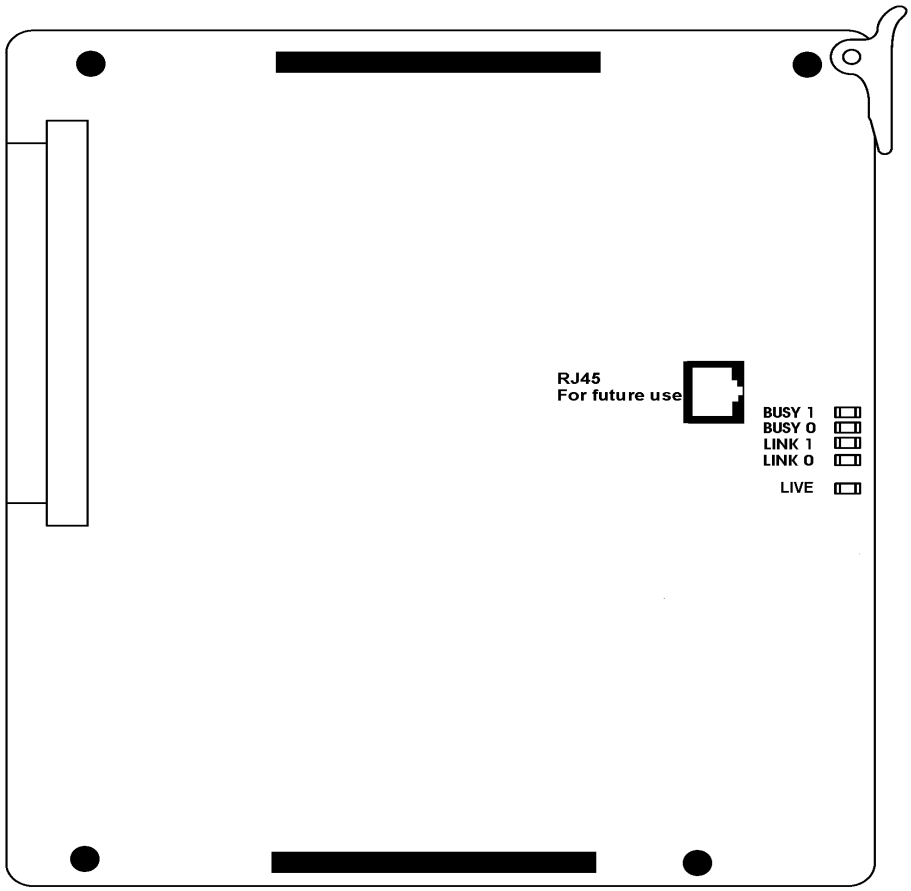


Figure 6-65 BSU(2S)-U20 ETU

7.2.2 Installation

The BSU(2S)-U20 ETU (Slave) is installed on four corner posts on the front of a BSU(4M)-U20 ETU or on the front of a BSU(6S)-U20 or on front of another BSU(2S). Slave ETUs are cascaded on posts to the left of the BSU(4M)-U20 in accordance with the tables below. Only two BSU(2S)-U20 ETUs can be installed in any interface slot in the Basic or Expanded Port Package of the Electra Elite IPK II.

No.	Slot N-2	Slot N-1	Slot N	No. of Base Stations	Note
1	None	None	BSU(4M) ETU	4	
2	None	BSU(2S) ETU	BSU(4M) ETU	6	
3	None	BSU(6S) ETU	BSU(4M) ETU	10	
4	BSU(2S) ETU	BSU(2S) ETU	BSU(4M) ETU	8	
5	BSU(6S) ETU	BSU(2S) ETU	BSU(4M) ETU	12	
6	BSU(2S) ETU	BSU(6S) ETU	BSU(4M) ETU	12	
7	BSU(6S) ETU	BSU(6S) ETU	BSU(4M) ETU	16	

Base Station number assignments are shown in the table below:

Slot	ETU	Channel	Base Station No.	Note
N	BSU(4M) ETU	1	1	
		2	2	
		3	3	
		4	4	
N-1	BSU(6S) ETU	1	5	
		2	6	
		3	7	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	8	
		5	9	
		6	10	
N-2	BSU(6S) ETU	1	11	
		2	12	
		3	13	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	14	
		5	15	
		6	16	

7.2.3 LED Indications

LIVE LED (Red)	On indicates communication between this ETU and the Main CPU.
LINK (0 or 1) LED	On indicates Layer 1 and Layer 2 link between the Wireless – DECT and the indicated Base Station (5/6 or 11/12) is established. Flashes (0.5 sec. ON-0.5 sec. OFF) when Layer 1 Link between Wireless – DECT and BSU ETU is established, but not Link 2. Off indicates that Link 1 is not established.
Busy (0 or 1) LED	Flashing when the indicated Base Station (5/6 or 11/12) is busy. Refer to Figure 6-66 Busy LED Flash Pattern

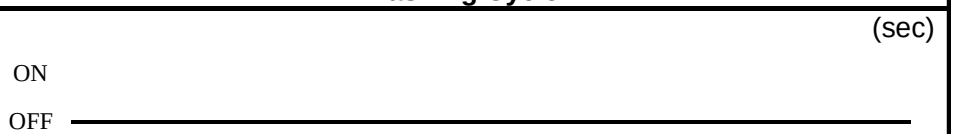
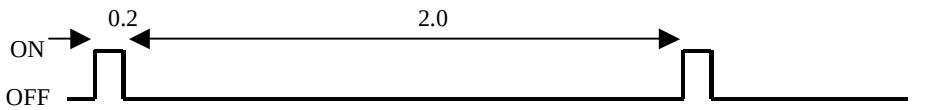
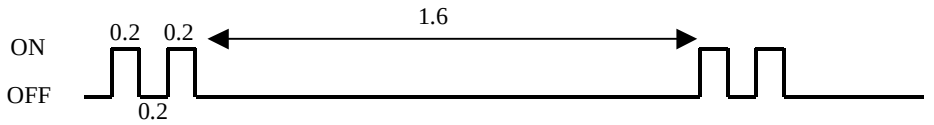
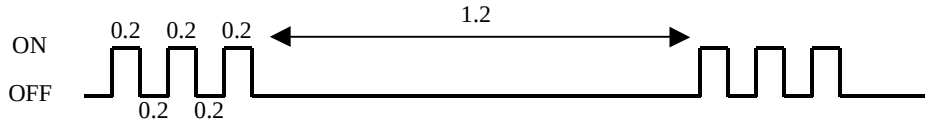
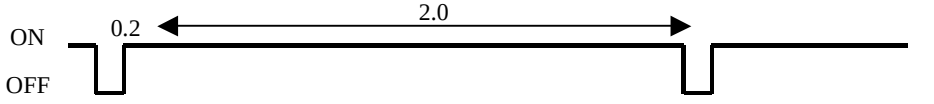
Status	Flashing Cycle
No calls exist	
1 call exists	
2 calls exist	
3 calls exist	
4 calls exist	

Figure 6-66 Busy LED Flash Pattern

7.2.4 Connectors

CN 1 Connects to the backboard

CN 4 Connects to RJ-45 connector at mid-top of another BSU(2S), BSU(6S), or BSU(4M) ETU.

CN 5 Connects to RJ-45 connector at mid-bottom of another BSU(2S), BSU(6S), or BSU(4M) ETU.

7.3 BSU(6S)-U20 ETU

7.3.1 Description

The BSU(6S)-U20 ETU is the Base Station Interface Unit slave ETU that provides connection for an additional six Base Stations when used with the BSU(4M)-U20 (Master) ETU.

A maximum of two BSU(6S)-U20 ETUs can be installed in the Basic or Expanded Electra Elite IPK II system.

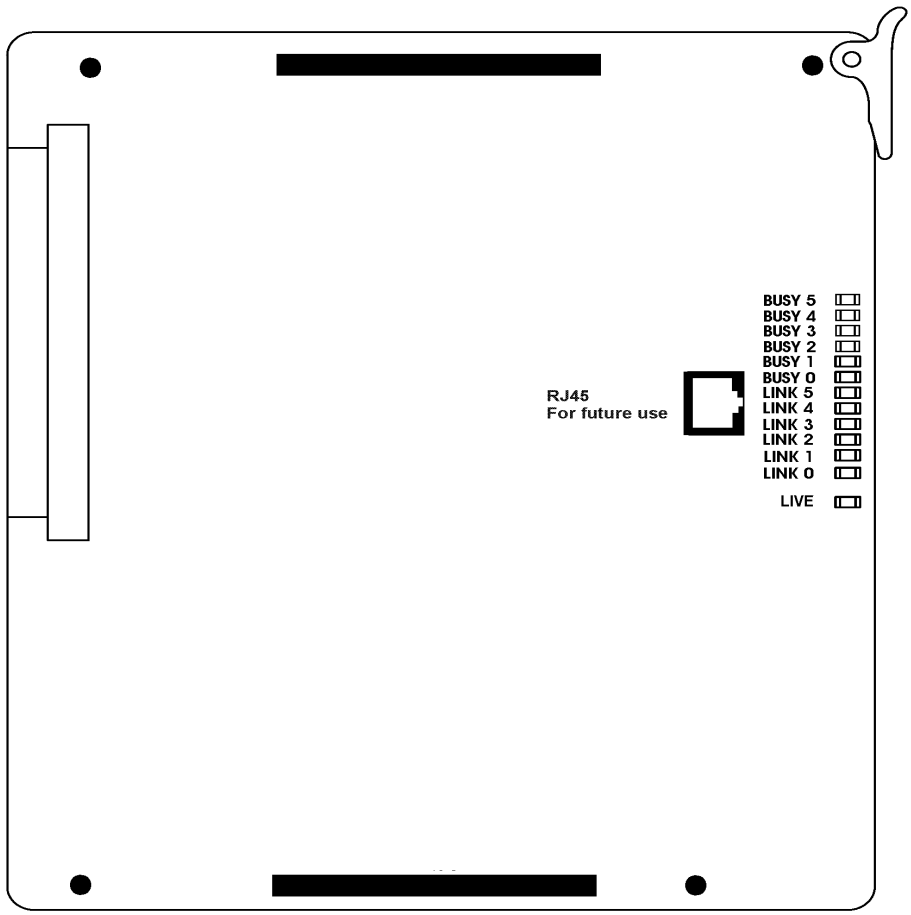


Figure 6-67 BSU(6S)-U20 ETU

7.3.2 Installation

The BSU(6S)-U20 ETU (Slave) is installed on four corner posts on the front of a BSU(4M)-U20 ETU or on the front of a BSU(2S)-U20 or on front of another BSU(6S). Slave ETUs are cascaded on posts to the left of the BSU(4M)-U20 in accordance with the tables below. Only two BSU(6S)-U20 ETUs can be installed in any interface slot in the Basic or Expanded Port Package of the Electra Elite IPK II.

No.	Slot N-2	Slot N-1	Slot N	No. of Base Stations	Note
1	None	None	BSU(4M) ETU	4	
2	None	BSU(2S) ETU	BSU(4M) ETU	6	
3	None	BSU(6S) ETU	BSU(4M) ETU	10	
4	BSU(2S) ETU	BSU(2S) ETU	BSU(4M) ETU	8	
5	BSU(6S) ETU	BSU(2S) ETU	BSU(4M) ETU	12	
6	BSU(2S) ETU	BSU(6S) ETU	BSU(4M) ETU	12	
7	BSU(6S) ETU	BSU(6S) ETU	BSU(4M) ETU	16	

Base Station number assignments are shown in the table below:

Slot	ETU	Channel	BS No.	Note
N	BSU(4M) ETU	1	1	
		2	2	
		3	3	
		4	4	
N-1	BSU(6S) ETU	1	5	
		2	6	
		3	7	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	8	
		5	9	
		6	10	

Slot	ETU	Channel	BS No.	Note
N-2	BSU(6S) ETU	1	11	
		2	12	
		3	13	When BSU(2S) ETU is installed, these numbers are not assigned.
		4	14	
		5	15	
		6	16	

7.3.3 LED Indications

LIVE LED (Red) — On to indicate communication between this ETU and the Main CPU.

LINK (0~5) LED — On to indicate Layer 1 and Layer 2 link between the Wireless – DECT and indicated Base Station (5~10 or 11~16).

Flashes (0.5sec ON-0.5sec OFF) when Layer 1 Link between Wireless – DECT and BSU ETU is established, but not Link 2.

Off to indicate that Link 1 is not established.

Busy (0~5) LED — Flashing when the indicated Base Station (5~10 or 11~16) is busy. Refer to Figure 6-68 Busy LED Flash Pattern.

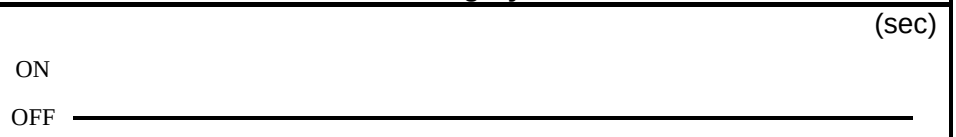
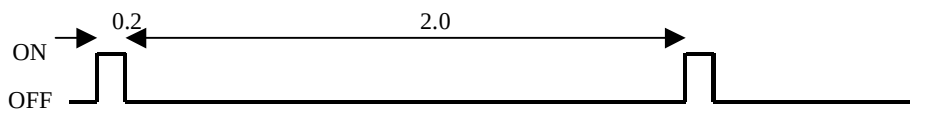
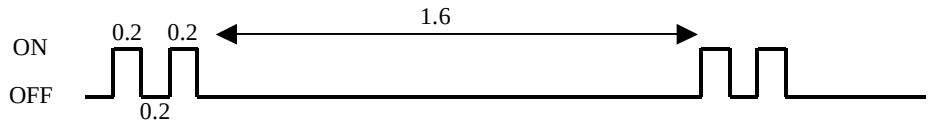
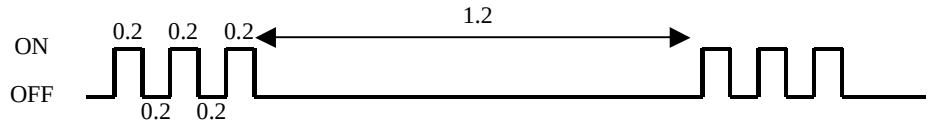
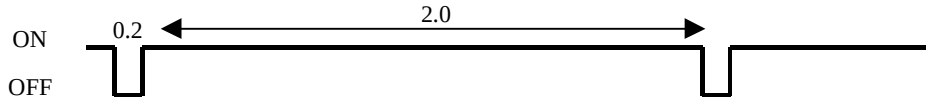
Status	Flashing Cycle
NO calls exist	
1 call exists	
2 calls exist	
3 calls exist	
4 calls exist	

Figure 6-68 Busy LED Flash Pattern

7.3.4 Connectors

CN 1 Connects to the backboard

CN 4 Connects to RJ-45 connector at mid-top of the BSU(2S), another BSU(6S), or BSU(4M) ETU.

CN 5 Connects to RJ-45 connector at mid-bottom of the BSU(2S), another BSU(6S), or BSU(4M) ETU.

7.4 CCH(4)-U( ) ETU

7.4.1 Description

The Common Channel Handler is an optional Interface ETU that provides a common channel signal through the DTI-U30 ETU to a K-CCIS network and controls the signaling between the KTS and the CPU. Each CCH ETU supports four K-CCIS links.

✎ CCH(4)-U( ) ETU firmware V5.1 or higher is required for Electra Elite IPK II compatibility.

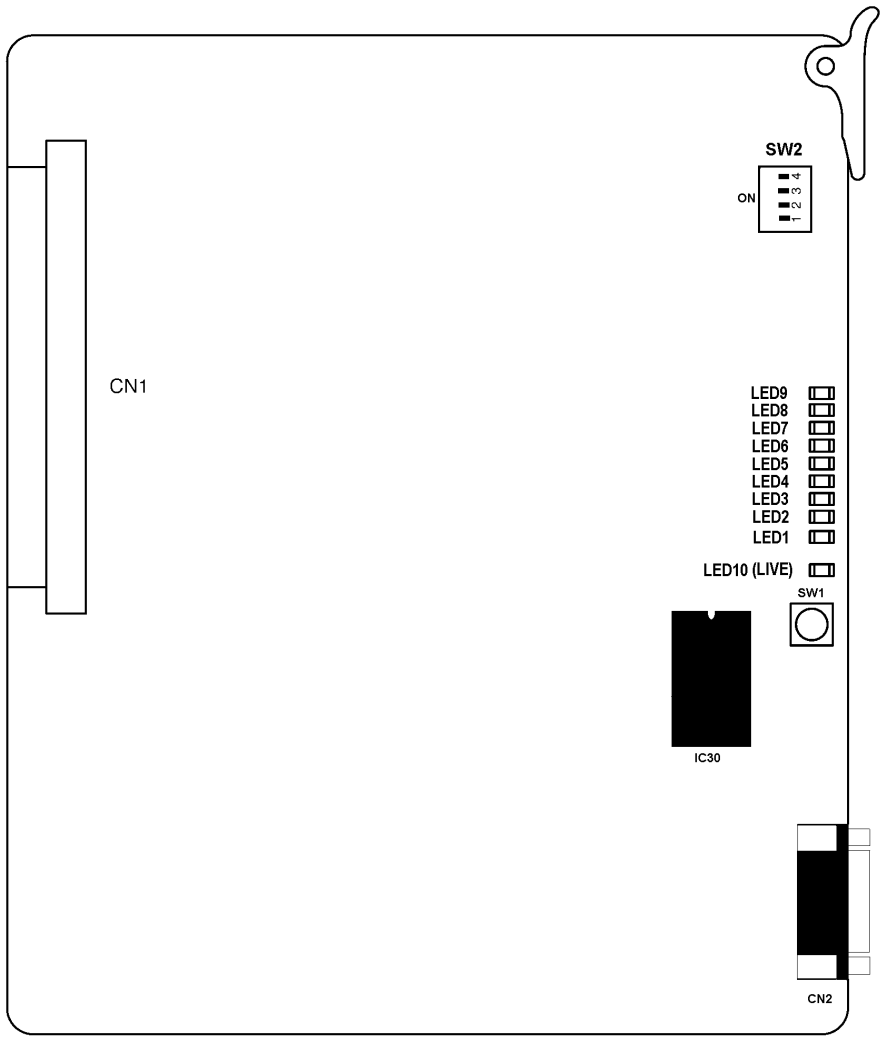


Figure 6-69 CCH(4)-U( ) ETU

7.4.2 Installation

Basic Port Package

Only one CCH(4)-U( ) ETU can be installed in any interface slot.

Expanded Port Package

Only one CCH(4)-U( ) ETU can be installed in any interface slot.

7.4.3 Switch Settings

Refer to Table 6-45 CCH(4)-U( ) ETU Default Switch Settings.

Table 6-45 CCH(4)-U( ) ETU Default Switch Settings

Switch	Setting/Description
SW1	Momentary Switch Resets the CCH ETU. When this switch is pressed, all K-CCIS users connected to the CCH ETU are interrupted. ***Use this switch only after all other options have failed.***
SW2–1	Off: Normal Operation **(Default)** On: Test Mode
SW2–2	Off: Boot from Flash Memory **(Default)** On: Boot from E-PROM (IC30)
SW2–3	Off: Normal Operation **(Default)** On: Test Mode
SW2–4	Off: Watch Dog Timer On **(Default)** On: Watch Dog Timer Off

7.4.4 LED Indications

Refer to Table 6-46 CCH(4)-U( ) ETU LED Indications.

Table 6-46 CCH(4)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
1	Link Status for CCH1	Layer 2: Up	Not Used	Layer 2: Down
2	Link Status for CCH2	Layer 2: Up	Not Used	Layer 2: Down
3	Link Status for CCH3	Layer 2: Up	Not Used	Layer 2: Down
4	Link Status for CCH4	Layer 2: Up	Not Used	Layer 2: Down

Table 6-46 CCH(4)-U( ) ETU LED Indications (Continued)

LED	Description	On	Flashing	Off
5	Link Status for CCH1	Data Sent/ Received	Not Used	Idle
6	Link Status for CCH2	Data Sent/ Received	Not Used	Idle
7	Link Status for CCH3	Data Sent/ Received	Not Used	Idle
8	Link status for CCH4	Data Sent/ Received	Not Used	Idle
9	CCH status	Alarm	Normal Operation	Not Operating
10	LIVE	Operation Stopped (Power Still On)	Normal Operation	No Power

7.4.5 Connectors

The following connectors are included:

- CN1 Connects to the backplane.
- CN2 Performs maintenance functions.

7.4.6 Connections

There are no physical connections to the MDF for the CCH(4)-U( ) ETU.

7.5 CNF(8)-U( ) ETU

7.5.1 Description

The Multiline Conference Bridge allows any intercom user or outside party calling to a port of the CNF(8)-U( ) ETU to join or make a multiparty conference call.

Each CNF(8)-U( ) ETU supports one 8-party conference or two 4-party conferences regulated by a switch setting.

The system recognizes this ETU as SLI(8)-U( ) ETU. This ETU shares the total number of station ports in the system.

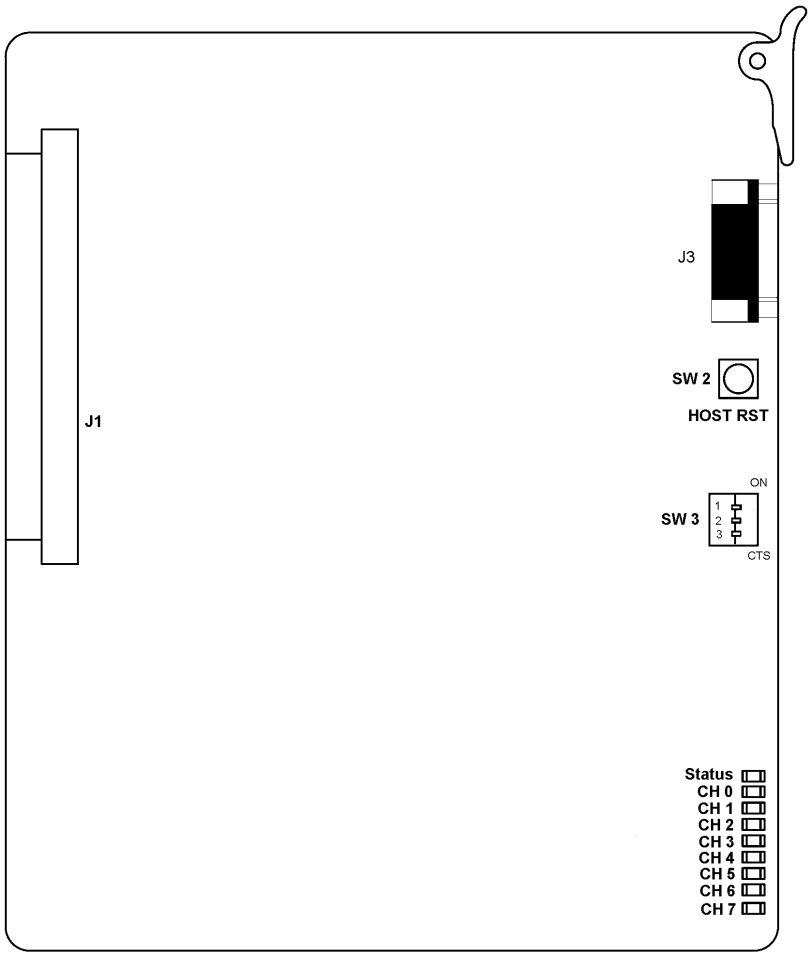


Figure 6-70 CNF(8)-U( ) ETU

7.5.2 Installation

Basic Port Package

A maximum of two CNF(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of CNF(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

Expanded Port Package

A maximum of two CNF(8)-U( ) ETUs can be installed in slots S1~S8.

The maximum number of CNF(8)-U( ) ETUs that can be installed depends on other station cards installed. The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

Calculating maximum capacities is based on the system having a minimum of eight Electronic Station Interface (ESI) ports and four trunk ports.

7.5.3 Switch Settings

The CNF(8)-U( ) ETU has the following switches.

- Reset Switch

  Refer to Table 6-47 CNF(8)-U( ) ETU Reset Switch.

- Conference Time Switch

  Refer to Table 6-48 CNF(8)-U( ) ETU Maximum Conference Time Switch.

- Party Size Switch

Table 6-47 CNF(8)-U( ) ETU Reset Switch

Switch	Setting	Description
SW2	Press to Reset	Host Reset Switch

Table 6-48 CNF(8)-U( ) ETU Maximum Conference Time Switch

Switch	Setting		Max Conference Time
	SW3-2	SW3-3	
CTS	ON	ON	1 Hour
	ON	OFF	2 Hour
	OFF	ON	3 Hour
	OFF	OFF	No Limit

Table 6-49 CNF(8)-U( ) ETU Party Size Switch

Switch	Setting	Description
SW3-1	ON	1 Eight-Party Conference
SW3-1	OFF	2 Four-Party Conferences

7.5.4 LED Indications

Refer to Table 6-50 CNF(8)-U( ) ETU LED Indications.

Table 6-50 CNF(8)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
Status	ETU Status	Operation stopped (Power On)	Normal Operation	No Power
CH 0	Status	Busy	Not Used	Idle
CH 1	Status	Busy	Not Used	Idle
CH 2	Status	Busy	Not Used	Idle
CH 3	Status	Busy	Not Used	Idle
CH 4	Status	Busy	Not Used	Idle
CH 5	Status	Busy	Not Used	Idle
CH 6	Status	Busy	Not Used	Idle
CH 7	Status	Busy	Not Used	Idle

7.5.5 Connectors

The following connectors are included:

- J1 Connects to the backplane.
- J2 Not currently used
- J3 Nine-pin RS-232C connector for maintenance

7.6 CNF(16)-U20 ETU

7.6.1 Description

The CNF(16)-U20 ETU is a Conference Bridge that is used with the Electra Elite IPK II system. Refer to Figure 6-71 CNF(16)-U20 ETU. Each CNF(16)-U20 supports the following conferences and conditions:

- Simple Mode (8 Ports)
  - One 8-party conference
  - Two 4-party conferences
- Simple Mode (16 Ports)
  - One16-party conference
  - Two 8-party conferences
  - One 6-party and two 5-party conferences
  - Four 4-party conferences
  - Password Protection for each conference
  - Applicable voice messages and announcements (*e.g.*, Entry, password request, or exit).
- Advanced Mode Conditions
  - Password protection option for each conference
  - Applicable voice messages and announcements (*e.g.*,Entry, password request, exit)
  - E-mail notification, when enabled, requires the organizer to enter the E-mail address of each participant requiring notification of a pending conference. This option is used for setting up a new conference.
  - Host Required, when enabled, requires the host/ organizer to be logged into the conference before any other participant can enter. This option is used for setting up a new conference.
  - Admission Control, when enabled, requires the organizer to dial a digit allowing each participant to enter the conference. This FUTURE option is to be used for setting up a new conference.

- ❑ Using a predefined password, the technician can record a personalized Welcome Greeting for each Multimedia Conference Bridge.

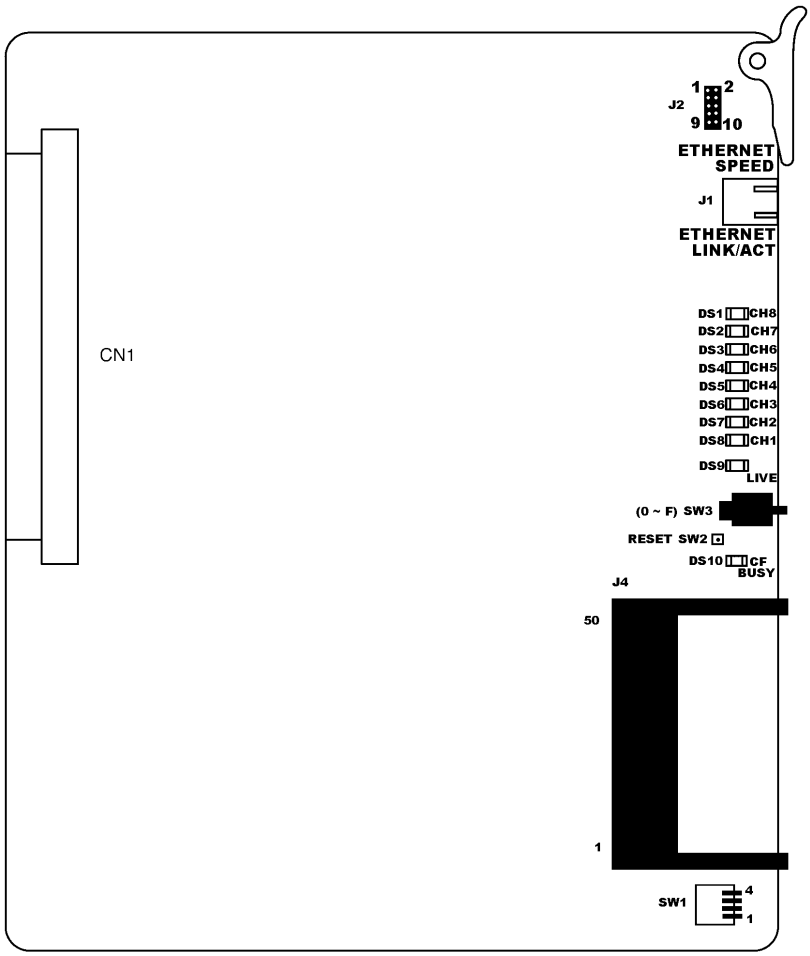


Figure 6-71 CNF(16)-U20 ETU

7.6.2 Installation

The CNF(16)-U20 ETU is a hot-swappable ETU that can fit in any interface slot in a KTS chassis and is recognized by the CPU as a CNF( )-U20 ETU.

Only one CNF(16)-U20 ETU can be installed in any interface slot in the Basic Port or Expanded Port Package of the Electra Elite IPK II.

The Ethernet connector can use a Category 5 (CAT5) unshielded twisted pair (UTP) cable to connect to an Ethernet hub or switch on the customer premises.

To install the CNF(16)-U20 ETU:

1. Select the number of ports the ETU supports using SW1 DIP switch 3 or 4.
2. Place SW1 DIP switch 2 ON to configure for simple conference mode.
3. Place the ETU into the desired slot in the KSU chassis.
4. After LEDs1~3 (DS11~13) are On, the ETU is operational.

   ✎ These LEDs are located on the lower back side of the ETU.

5. Connect the Ethernet cable coming from a hub or switch from the customer premises to the J1 connector on the CNF ETU. Verify that the link lamp is on green.

7.6.3 Configuring

When installed for the first time the CNF(16)-U20 ETU comes up with factory default settings shown in Table 6-51 Default Network Settings for TCP/IP Addressing.

Table 6-51 Default Network Settings for TCP/IP Addressing

IP Address	192.168.1.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0

These parameters must be redefined before the ETU can work in your environment. Refer to the Elite Multimedia Conference Bridge Installation Manual for more information.

7.6.4 Switch Settings

The CNF(16)-U20 ETU has the following switches.

- DIP switch SW1

  Refer to Table 6-52 CNF(16)-U20 ETU Dip Switch SW1. This switch has four selector switches:

  - SW1-1 Restores ETU Port and /Modes settings to Factory Default
  - SW1-2 Defines either Simple or Advanced Mode
  - SW1-3 Defines the 16 Port configuration
  - SW1-4 Defines the 8 Port configuration

Table 6-52 CNF(16)-U20 ETU Dip Switch SW1

Multimedia ETU Port and Mode	SW1-1	SW1-2	SW1-3	SW1-4
8 port Simple Mode	OFF	ON	OFF	ON
16 port Simple Mode	OFF	ON	ON	OFF
8 port Advanced Mode	OFF	OFF	OFF	ON
16 port Advanced Mode	OFF	OFF	ON	OFF

- RESET Switch SW2

  This switch allows the technician to reset the CNF(16)-U20 ETU without having to remove and insert it again in the KTS.

- Rotary Switch SW3

  This switch is a 16-position (0~9,A~F) rotary switch to select display options. Refer to Table 6-53 CNF(16)-U20 ETU Rotary Switch SW3.

Table 6-53 CNF(16)-U20 ETU Rotary Switch SW3

Position	Channel	Status	Channel	Status
0	CH8 (DS1)	ON	CH16 (DS1)	OFF
0	CH7 (DS2)	ON	CH15 (DS2)	OFF
0	CH6 (DS3)	ON	CH14 (DS3)	OFF
0	CH5 (DS4)	ON	CH13 (DS4)	OFF
0	CH4 (DS5)	ON	CH12 (DS5)	OFF
0	CH3 (DS6)	ON	CH11 (DS6)	OFF
0	CH2 (DS7)	ON	CH10 (DS7)	OFF
0	CH1 (DS8)	ON	CH9 (DS8)	OFF
1	CH8 (DS1)	OFF	CH16 (DS1)	ON
1	CH7 (DS2)	OFF	CH15 (DS2)	ON
1	CH6 (DS3)	OFF	CH14 (DS3)	ON
1	CH5 (DS4)	OFF	CH13 (DS4)	ON
1	CH4 (DS5)	OFF	CH12 (DS5)	ON
1	CH3 (DS6)	OFF	CH11 (DS6)	ON

Table 6-53 CNF(16)-U20 ETU Rotary Switch SW3 (Continued)

Position	Channel	Status	Channel	Status
1	CH2 (DS7)	OFF	CH10 (DS7)	ON
1	CH1 (DS8)	OFf	CH9 (DS8)	ON

7.6.5 LED Indications

Refer to Table 6-54 CNF(16)-U20 ETU LED Indications.

Table 6-54 CNF(16)-U20 ETU LED Indications

LED	Description	On	Off
DS1	Channel Status	CH8/CH16 On	CH8/CH16 Off
DS2	Channel Status	CH7/CH15 On	CH7/CH15 Off
DS3	Channel Status	CH6/CH14 On	CH6/CH14 Off
DS4	Channel Status	CH5/CH13 On	CH5/CH13 Off
DS5	Channel Status	CH4/CH12 On	CH4/CH12 Off
DS6	Channel Status	CH3/CH11 On	CH3/CH11 Off
DS7	Channel Status	CH2/CH10 On	CH2/CH10 Off
DS8	Channel Status	CH1/CH9 On	CH1/CH9 Off
DS9	LIVE	ETU Active	ETU Inactive
DS10	CF BUSY	Flash Access	No Flash Access
LED 3 (DS13)	Conference Status (Back of ETU)	Conference Initialized	Conference not Initialized
LED 2 (DS12)	Insertion Status (Back of ETU)	Insertion Complete	Insertion not Complete
LED 1 (DS11)	Boot Status (Back of ETU)	Boot Complete	Boot Incomplete

7.6.6 Connectors

The following connectors are used:

- J1 Ethernet Connector

  This connector is a single 10/100 MPS Ethernet Connector. This port has Auto-Medium Dependent Interface Crossover (MDIX) to allow using either a straight-through Ethernet cable for connection to a PC or a crossover Ethernet cable.

The Ethernet Interface setting allows manual configuration of the Ethernet port from the Web Interface, and can be set to operate in the following port speed and duplex mode combinations: 10MB/Full Duplex, 10MB/HalfDuplex,100MB/ Half Duplex, or 100MB/Full Duplex, Auto-Negotiate.

- J2 Serial Connector

  This 10-pin serial terminal is used for debugging operations only.

7.7 HUB(8)-U( ) ETU

7.7.1 Description

The HUB(8)-U( ) ETU is an optional Ethernet interface for the Electra Elite IPK II KSU that supports eight Ethernet ports. Each port has two LEDs that indicate status and activity.

A HUB is a switching point for data that comes together from individual ports. A switch determines the port where the data should be forwarded and regulates transmission. The HUB(8)-U( ) ETU provides an efficient platform when multiple ETUs that require Ethernet connection are installed in the Electra Elite IPK II KSU. One port can be a source port, and another port can be set as a target port to mirror the source and monitor data traffic.

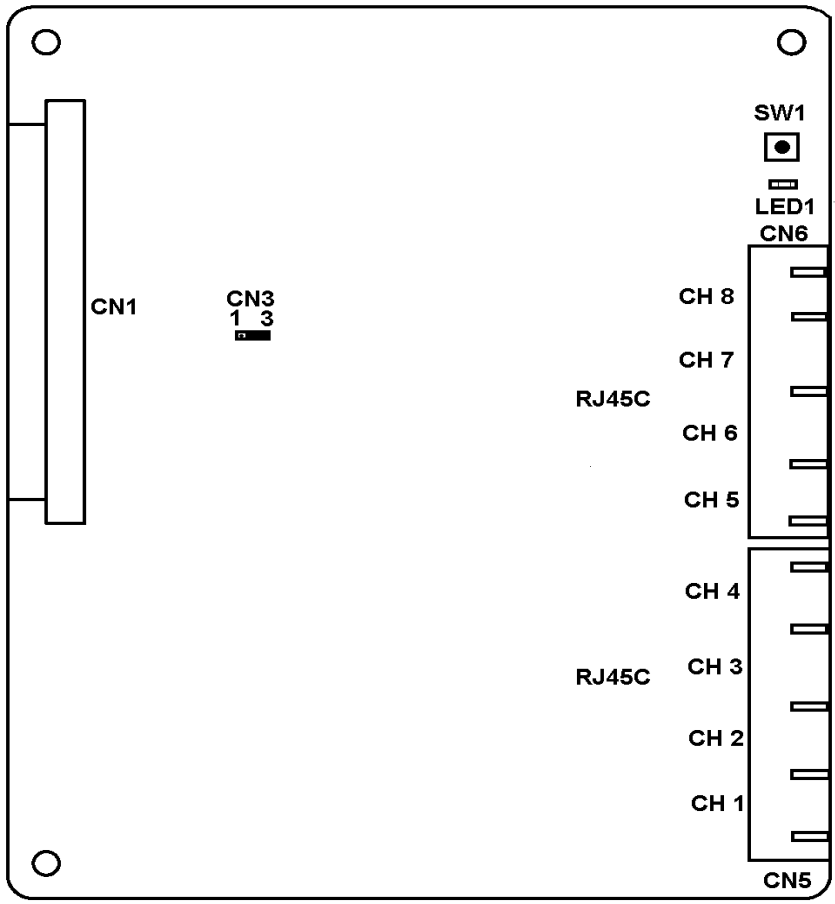


Figure 6-72 HUB(8)-U( ) ETU

7.7.2 Installation

The HUB(8)-U( ) ETU cannot be installed in a KSU that contains an EliteMail VP or CTI system.

✎ This ETU has an attached green cable that must be connected to frame ground.

Basic Port Package

Only one HUB(8)-U( ) ETU can be installed in slots S1~S8.

The system is limited by 64 trunk and station ports combined. This ETU shares the total number of station ports in the system.

Expanded Port Package

Only one HUB(8)-U( ) ETU can be installed in slots S1~S8.

The system is limited by 256 stations. This ETU shares the total number of station ports in the system.

7.7.3 Switch Settings

Press switch SW1 to Reset the HUB(8)-U( ) ETU.

7.7.4 LED Indications

Refer to Table 6-55 HUB(8)-U( ) LEDS.

Table 6-55 HUB(8)-U( ) LEDS

LED	ON	OFF	Blinking
LED1		No Power to ETU	Normal Operation
RJ45C Yellow	100 Mbps	10 Mbps	N/A
RJ45C Green	LINK	No Link	Data Tx/Rx

7.7.5 Connectors

The following connectors are included:

- ❍ CN1 Connects to the backplane.
- ❍ CN3 Three pin Jumper. Pins 2 and 3 are shorted for Normal operation.
- ❍ CN5 Channel 1~4 RJ45C Connectors
- ❍ CN6 Channel 5~8 RJ45C Connectors

7.8 IAD(8)-U( )

7.8.1 Description

The IAD(8)-U( ) ETU is an optional interface integration device ETU for the Electra Elite IPK II KSU. The IAD(8)-U( ) ETU supports various IP applications such as the CCISoIP application and the MEGACO Station Application. Currently used configurations are indicated in Figure 6-73 IAD(8)-U( ) ETU on page 6-148.

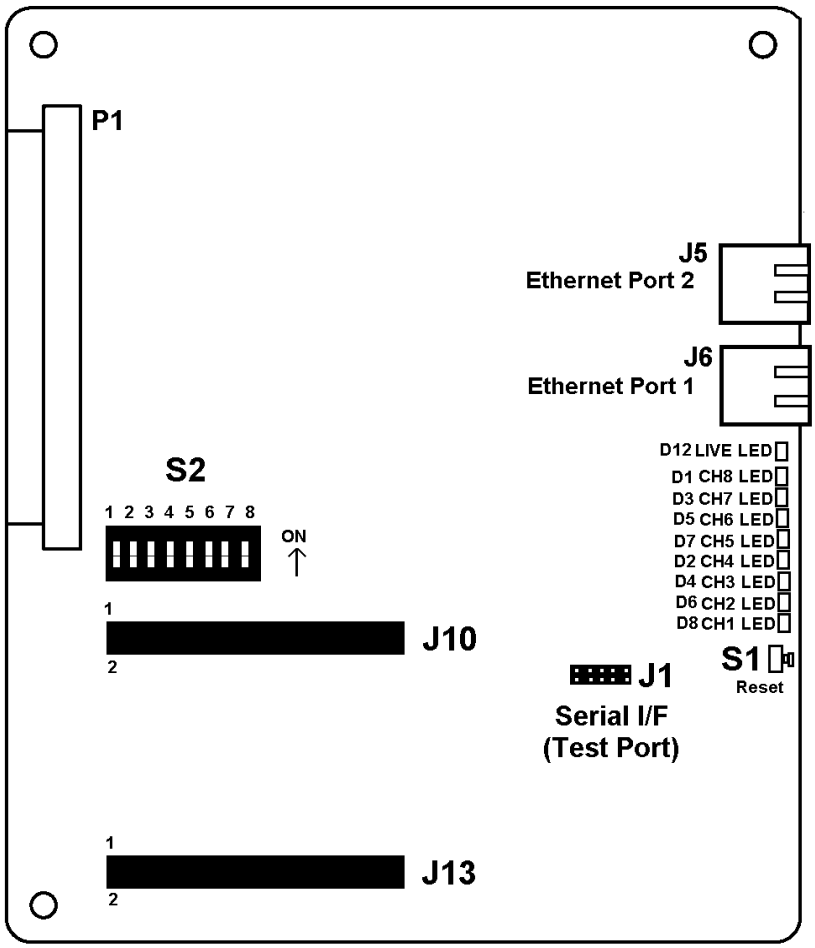


Figure 6-73 IAD(8)-U( ) ETU

Table 6-56 IAD(8)-U( ) Configurations

Configuration	Ports	Installation slot Electra Elite IPK II	Application
CCISoIP	8	S1~S8	CCISoIP ETU
ESI(8)-U( )	8	S1~S8	Megaco Station ETU

7.8.2 Boot Up Sequence Status Identification

Status of the IAD(8)-U( ) ETU during boot up is shown in Table 6-57 IAD(8)-U( ) ETU LED Boot Sequence Indications.

Table 6-57 IAD(8)-U( ) ETU LED Boot Sequence Indications

State	D8 CH 1	D6 CH 2	D4 CH 3	D2 CH 4	D7 CH 5	D5 CH 6	D3 CH 7	D1 CH 8	*D12 LIVE	Approximate Time
1	Off	Off	Off	Off	Off	Off	Off	Off	Flash	1 second (from Cold Boot)
2	**ON**	**ON**	**ON**	**ON**	Off	Off	Off	Off	Flash	5 seconds
3	Off	Off	Off	Off	Off	Off	Off	Off	Flash	3 seconds
4	Off	Off	Off	Off	**ON**	**ON**	Off	Off	Flash	5 seconds
5	Off	Off	Off	Off	Off	Off	**ON**	**ON**	Flash	5 seconds
6	Off	Off	Off	Off	Off	Off	Off	Off	Flash	5 seconds

* LIVE LED D12 also flashes when ETU is receiving power from the KSU.

7.8.3 Installation

This ETU can be installed in any KSU slot that supports the applicable ETU simulated.

Basic Port Package

A maximum of three IAD(8)-U( ) ETUs can be installed in slots S1~S8 when used as an ESI.

A maximum of six IAD(8)-U( ) ETUs can be installed in slots S1~S8 when used as a CCISoIP ETU.

Expanded Port Package

A maximum of 14 IAD(8)-U( ) ETUs can be installed in slots S1~S8 when used as an ESI.

A maximum of 22 IAD(8)-U( ) ETUs can be installed in slots S1~S8 when used as a CCISoIP ETU.

7.8.4 Switch Settings

Refer to Table 6-58 IAD(8)-U( ) ETU Switches.

Table 6-58 IAD(8)-U( ) ETU Switches

Switch	Setting	Description
S1	Press to Reset	Host Reset Switch
S2	Shown below	Eight-position DIP Switch
S2-1~3	Always Off	Reserved
S2-4	On (default) to enable Off to disable	Auto Card Discovery Selection - On only for first power on to recognize ETU and set defaults or for ESI(8)-U( ) ETU simulation
S2-5	Always On to enable 8 ports (Off enables 4 ports)	Number of Voice Ports Selection
S2-6~-8	S2-8 On for CCISoIP mode. S2-6 On for ESI Mode	IAD(8)-U( ) ETU Mode Selection to show simulated ETU

7.8.5 Ethernet Status

Two Built-in LEDs (One green and one yellow) on the front of each RJ-45 Connector indicate Ethernet connection status. The yellow LED is On when the link is up; the green LED is On to indicate activity.

7.8.6 Connectors

The following connectors are included:

- P1 Connects to the backplane.
- J1, J10, J11 Reserved for future use.
- J5 RJ-45 Ethernet connector for future use
- J6 Default RJ-45 Ethernet connector

7.9 IVR Application

7.9.1 Description

The EliteApps – Interactive Voice Response application is a man-machine interface that uses scripting language to play prompts that guide a caller to select different available options using a touchtone telephone key pad (DTMF tones).

This application is implemented using a VMP(4)-U( ) ETU and an IVR Compact Flash (CF) to support four ports for IVR applications. When the DSP-U( ) module is attached eight ports are available.

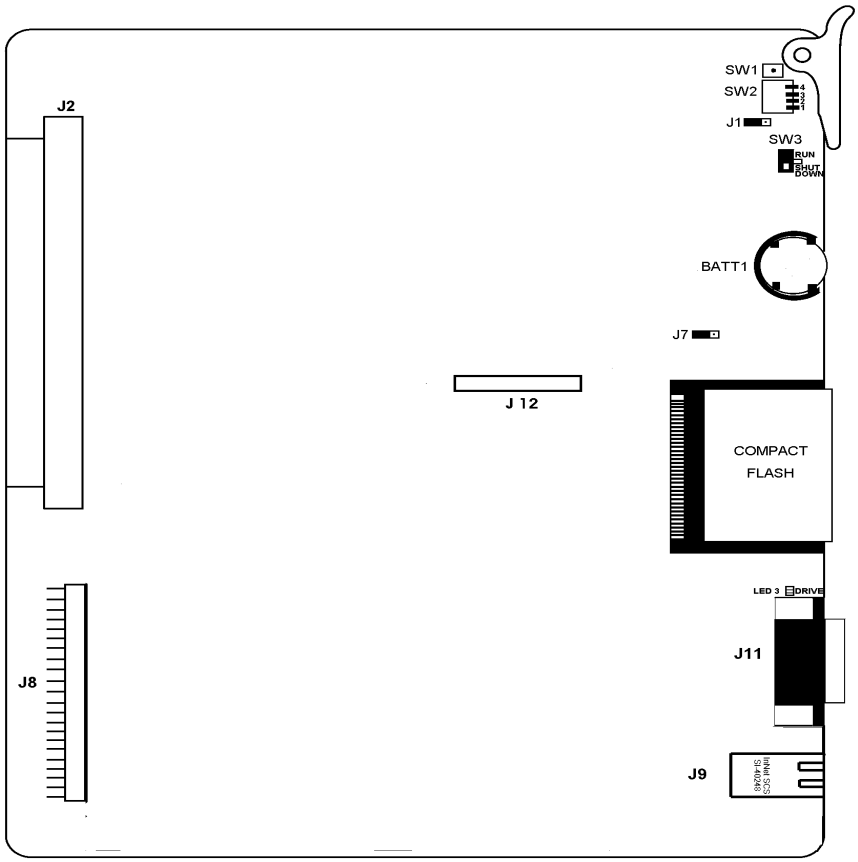


Figure 6-74 VMP(4)-U( ) ETU With IVR Compact Flash

7.9.2 Installation

Basic Port Package

Only one VMP ETU can be installed in slots S1~S8.

This ETU shares the total number of station ports in the system. The system is limited by 256 stations.

Expanded Port Package

Only one VMP ETU can be installed in slots S1~S8.

This ETU shares the total number of station ports in the system. The system is limited by 256 stations.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that KSU is off.

7.9.3 Switch Settings

The following default switch settings are used for the VMP(4)/(8)-U( ) ETU. Typically these settings should remain at factory default.

Table 6-59 Switch Settings for VMP(4)/(8)-U( ) ETU

Switch	Default Setting	Description
SW 1	Off	Resets the ETU. Leave at factory default setting.
SW 2-1	Off	Not used for IVR ETU. Leave at factory default setting.
SW 2-2	Off	Restores the ETU to factory default settings if set to On. Leave at factory default unless factory defaults must be restored, then set SW2-2 and SW2-3 to On.
SW2-3	Off	Restores the ETU to factory default settings if set to On. Leave at factory default unless factory defaults must be restored, then set SW2-2 and SW2-3 to On.
SW3	Off	Toggles to switch the IVR application On or Off.

7.9.4 LED Indications

Refer to Table 6-60 VMP(4)/(8)-U( ) ETU LED Indications.

Table 6-60 VMP(4)/(8)-U( ) ETU LED Indications

LED	Description	On	Flashing	Off
LED 1, AP1 Application Software	Running without errors Running with errors Not Running	Green Amber Red	Not Used	Not Used
LED 2, AP2	Not Used	Not Used	Not Used	Not Used
LED 3, DRIVE	Hard Drive Access	Red if accessed	Not Used	When not accessed
LED 4, CF PWR	Power to the ETU	Red if power is on	Not Used	No power to ETU
LED 5, ICGA	Live LED	Not Used	Red every 125ms during operation	Operation is shut down
LED 6, Switch S3 Indication	Do not remove Voice Mail from KSU	Red when S3 in RUN	Not Used	S3 not in RUN position
LED 7, SHUT DOWN	Safe to remove Voice Mail from KSU	Red when S3 in SHUT DOWN	Not Used	S3 not in SHUT DOWN position
LED 8, Power	Receiving KSU power	Red if power is on	Not Used	No KSU power
LED 9, FED DSP	For development only	Not Used	Not Used	Not Used
LED 10, CH1	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 11, CH2	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 12, CH3	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 13, CH4	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 14, CH5	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 15, CH6	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook
LED 16, CH7	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook

Table 6-60 VMP(4)/(8)-U( ) ETU LED Indications (Continued)

LED	Description	On	Flashing	Off
LED 17, CH8	OFF/ON HOOK status	Red for Off-hook	Not Used	On Hook

✎ The first four channel LEDS are also used during startup to signify:
LED 1 - BICOM driver loaded
LED 2 - Scandisk completed successfully
LED 4 - Application started successfully

✎ After system is up and running these LEDs are turned off, and all channels are ready to receive calls.

✎ When the VMP(4)/(8) fails to start, all eight channel LEDs and the BCLR LED (AP1) are on.

Table 6-61 VMP(4)/(8)-U( ) ETU Ready LED Indications shows the status of the VMP(4)/(8)-U( ) ETU after it has been installed, initialized and is ready to process calls.

Table 6-61 VMP(4)/(8)-U( ) ETU Ready LED Indications

LED	Description	Status
LED 1, AP1 Application Software	Running without errors	Solid Green
LED 4, CF PWR	Power to the ETU	Solid Red
LED 5, ICGA	Live LED	Blinking Red
LED 7, SHUT DOWN	**Initialized application**	Solid Green
LED 8, Power	Receiving KSU power	Solid Red

7.9.5 Jumper Settings

The following jumper settings apply.

J1	Setting
Pin 1 to Pin 2	IVR Integration (default)
Pin 2 to Pin 3	Not Used

J7	Setting
Pin 1 to Pin 2	Not Used
Pin 2 to Pin 3	Hard Drive is master drive (default)

7.9.6 Connectors

The following connectors are included:

- J2 Connects to the backplane.
- J8 Connects to Hard Disk memory.
- J9 RJ45 LAN connector for network connection
- J11 9-pin RS232 local serial connector for direct connection
- J12 Port expansion connector for DSP-U( ) module

7.10 PVA( )-U10 ETU

7.10.1 Description

The Packet Voice Application, PVA( )-U10 ETU is an optional interface that supports IP Application Packages (Media Gateway MG16 or IP CCISoIP) Refer to Figure 6-75 PVA( )-U10 ETU. This ETU can be assigned as an MG16 Package to support Megaco Stations or as a CCISoIP Package to support the IP CCIS Network Trunks.

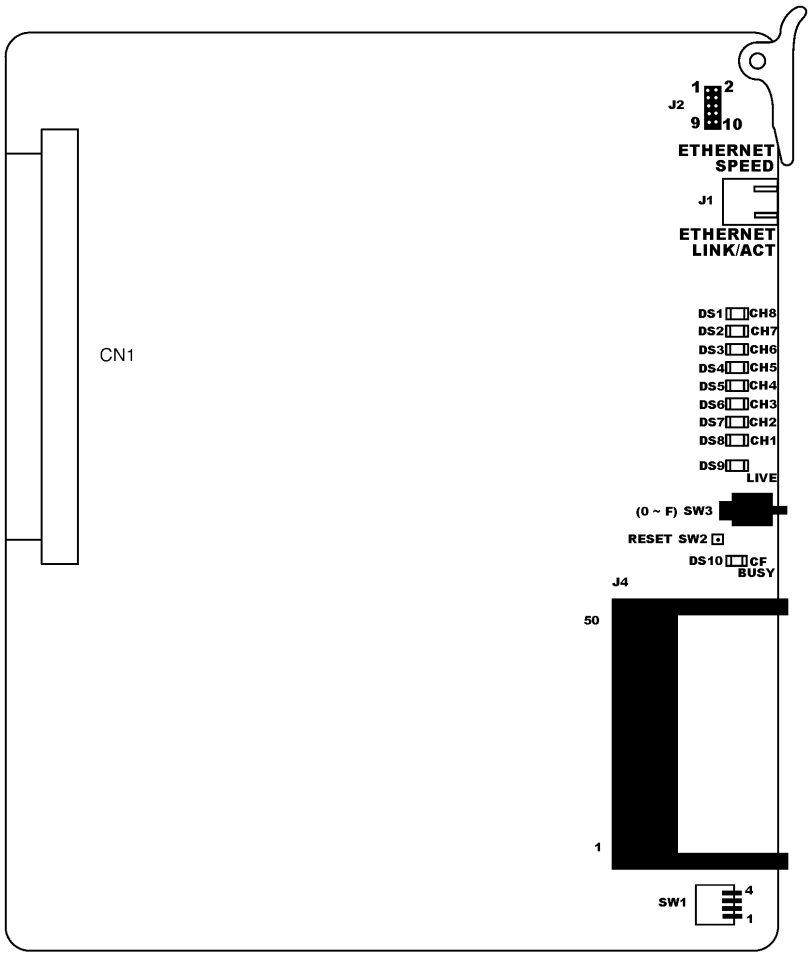


Figure 6-75 PVA( )-U10 ETU

7.10.2 Installation

Installed as IP Station (MEGACO) – MG16

Basic Port Package

Two PVA( )-U10 ETUs can be installed.

Expanded Port Package

Thirteen PVA( )-U10 ETUs can be installed.

Installed as K-CCIS – IP with PVA

Basic Port Package

Two PVA( )-U10 ETUs can be installed.

Expanded Port Package

Eleven PVA( )-U10 ETUs can be installed.

7.10.3 Applications

Table 6-62 PVA( )-U10 ETU Configurations

Configuration	Ports	Electra Elite IPK II Installation slot	Application
MG16	16	S1~S8	MG16 Package
IP CCISoIP	24	S1~S8	CCISoIP Package

7.10.4 Removal Procedure

The PVA( )-U( ) ETU is hot swappable and can be removed form the KTS without powering down the ETU or the Electra Elite IPK II system.

When the Electra Elite IPK II KSU requires system reset, this ETU comes back on line.

7.10.5 Configuring

When installed for the first time the PVA( )-U( ) ETU comes up with factory default settings shown in Table 6-63 Default Network Settings for TCP/IP Addressing.

Table 6-63 Default Network Settings for TCP/IP Addressing

IP Address	192.168.1.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0

These parameters must be redefined before the ETU can work in your environment. Refer to the Applicable IP Application Features and Specifications and installation instructions.

The PVA( )-U( ) ETU has the following switches.

- DIP switch SW1

  Refer to Table 6-64 PVI(16)-U10 ETU Rotary Switch SW3. This switch has four selector switches:

  - SW1-1 N/A
  - SW1-2 N/A
  - SW1-3 N/A
  - SW1-4 Placed ON to restore factory default software package when used with Rotary Switch SW3.
  - RESET Switch SW2

  This switch allows the technician to reset the PVA( )-U( ) without having to remove and insert it again in the KTS.

- Rotary Switch SW3

  This 16-position (0~9,A~F) rotary switch selects display options. Only A is currently used. Refer to Table 6-64 PVI(16)-U10 ETU Rotary Switch SW3.

Table 6-64 PVI(16)-U10 ETU Rotary Switch SW3

SW1-4 Setting	SW3 Position	Status
0N	A	Restores Factory Default Package

Notes:
1. When setting factory configuration, the ETU must initially boot up with configured switch settings.
2. When Rotary Switch SW3 is selected, Switch SW1-4 must be ON.
3. Restoring the factory software package may take up to five minutes.
4. When the ETU has completed booting, return Switch SW1-4 to OFF and Rotary Switch SW3 to 0.

7.10.6 LED Indications

Refer to Table 6-65 Default Boot Sequence: In Active PVA( )-U10 ETU without IP Application Loaded.

The Boot sequence in this table occurs when the ETU is at factory default and the IP Application is not loaded.

Refer to Table 6-66 Active PVA( )-U10 ETU with IP Application Loaded.

The Boot sequence in this table occurs when the IP Application is loaded.

✎ The PVA( )-U( ) should be removed only after the ETU has completed booting, and LEDs 1~3 on the back of the ETU are ON.

Table 6-65 Default Boot Sequence: In Active PVA( )-U10 ETU without IP Application Loaded

State	DS8 CH1	DS7 CH2	DS6 CH3	DS5 CH4	DS4 CH5	DS3 CH6	DS2 CH7	DS1 CH8	DS9 Live	DS10 CF Busy	LED 3	LED 2	LED 1	Approximate Time
1	ON	ON	ON	ON	ON	ON	ON	ON	Flash	OFF	OFF	OFF	ON	CH1~CH8 Simultaneous
2	ON	ON	ON	ON	ON	ON	ON	ON	Flash	OFF	OFF	OFF	ON	CH1~CH8 Incremental
3	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	Slow Blink	OFF	OFF	ON	1~3 Minutes
4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	Flash	OFF	OFF	ON	1~5 Seconds
5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	Slow Blink	OFF	OFF	ON	1~3 Minutes
6	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	Fast Blink	OFF	OFF	ON	1~3 Minutes
7	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	OFF	OFF	OFF	ON	ACTIVE

Table 6-66 Active PVA( )-U10 ETU with IP Application Loaded

State	DS8 CH1	DS7 CH2	DS6 CH3	DS5 CH4	DS4 CH5	DS3 CH6	DS2 CH7	DS1 CH8	DS9 Live	DS10 CF Busy	LED 3	LED 2	LED 1	Approximate Time
1	ON	ON	ON	ON	ON	ON	ON	ON	Flash	OFF	OFF	OFF	ON	CH1~CH8 Simultaneous
2	ON	ON	ON	ON	ON	ON	ON	ON	Flash	OFF	OFF	OFF	ON	CH1~CH8 Incremental
3	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	Flash	OFF	OFF	ON	1~3 Minutes
4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	OFF	OFF	OFF	ON	1~5 Seconds
5	ON	ON	ON	ON	ON	ON	ON	OFF	Flash	OFF	ON	OFF	ON	CH1~CH7 Incremental
6	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Flash	OFF	ON	ON	ON	ACTIVE

7.10.7 Connectors

The following connectors are used:

- J1 Ethernet Connector

  This connector is a single 10/100 Mbps Ethernet Connector. This port has Auto-Medium Dependent Interface Crossover (MDIX) to allow using either a straight-through Ethernet cable for connection to a PC or a crossover Ethernet cable.

  The Ethernet Interface setting allows manual configuration of the Ethernet port from the Web Interface, and can be set to operate in the following port speed and duplex mode combinations: 10MB/Full Duplex, 10MB/HalfDuplex,100MB/ Half Duplex, or 100MB/Full Duplex, Auto-Negotiate.

- J2 Serial Connector

  This 10-pin serial terminal is used for debugging operations only.

- J4 Compact Flash

  Reserved for future use.

7.11 VMP( )-U40 ETU

7.11.1 Description

This ETU is a PC-platform that contains disk space for voice recording storage and application software. It can be configured as a 2-port, 4-port, or 8-port interface.

The 2- or 4-port interface includes one digital signal processor (DSP); a DSP-U30 Unit must be installed for the 8-port interface.

Major features include:

- A faster running 486-based processor allows quicker boot and faster operation.
- Cosession direct connection speed of 57,000 baud is supported as the only direct connection speed for all U40 ETUs.
- Port upgrades are performed by replacing the Compact Flash drive with another drive with the needed port configuration.
- All ETUs have a built-in modem for remote console programming. An external modem and single-line port can also be used for remote programming. The internal modem is accessed from the automated attendant by dialing the modem extension ID that is only an ID used by voice mail, *not* an extension on the telephone system.
- The voice mail application efficiently shuts down after active calls are completed, and the ETU turns off when the shutdown switch is placed in SHUTDOWN (Q51231 or higher database is required).
- The system manager can select a special language for a particular subscriber at the console, and the subscriber hears the language when login is complete. The default language must be the system default language (Q51231 or higher database is required).
- A database entity, the Language Selection Box, allows outside callers to choose a language. Each database entity (*e.g.*, personal message box) also has the selected language associated with it (Q51231 or higher database is required).

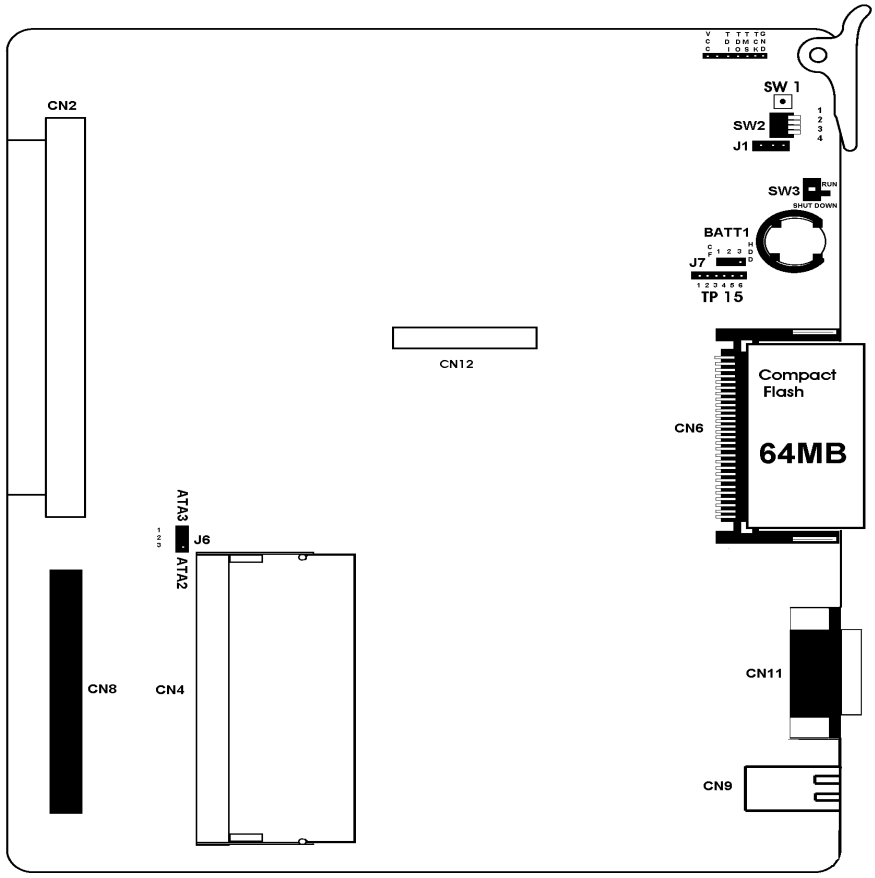


Figure 6-76 VMP( )-U40 ETU

7.11.2 Installation

The VMP(2)-U40 ETU has two channels of built-in Voice Mail.

The VMP(4)-U40 ETU has four channels of built-in Voice Mail.

The VMP(8)-U40 ETU has eight channels of built-in Voice Mail.

Only one VMP(2)/(4)/(8)-U40 ETU can be installed in any interface slot in the Basic or Expanded Port Package of the Electra Elite IPK II system.

This ETU shares the total number of station ports in the system.

When installing this ETU, make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that the KSU is off.

7.11.3 Installing Flash Drive on the VMP( )-U40 ETU

Use the following instructions to install the Flash Drive.

1. Remove the VMP( )-U40 ETU and selected Flash Drive from the box.
2. Locate slot CN6 on VMP( )-U40 ETU.
3. The side with the SanDisk name in large red letters should be facing up, as shown in Figure 6-77 Installing the Flash Drive on the VMP( )-U40 ETU.

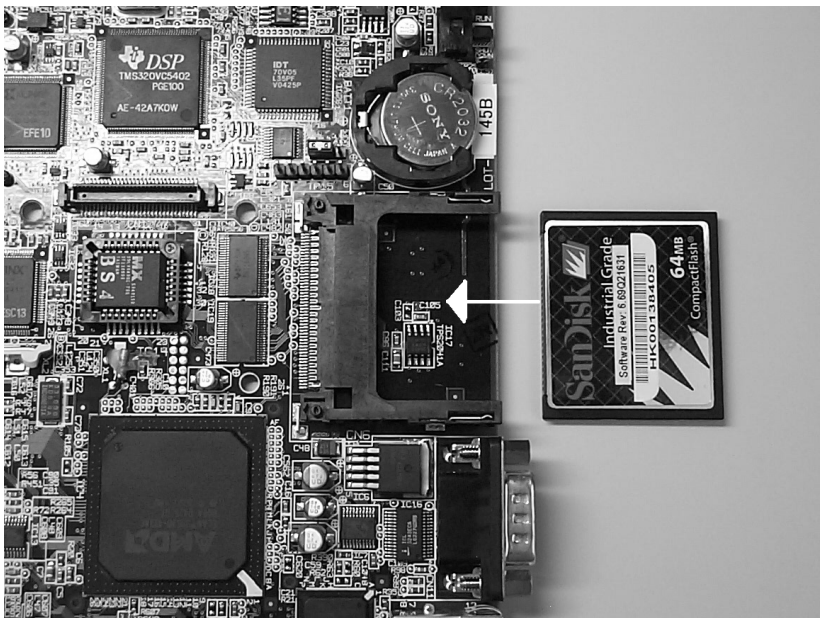


Figure 6-77 Installing the Flash Drive on the VMP( )-U40 ETU

✎ The Flash Drive goes in only one way, and does not take much force to insert it.

4. Push the drive in until it is fully seated, as shown in Figure 6-78 Flash Drive Seated on VMP( )-U40 ETU.

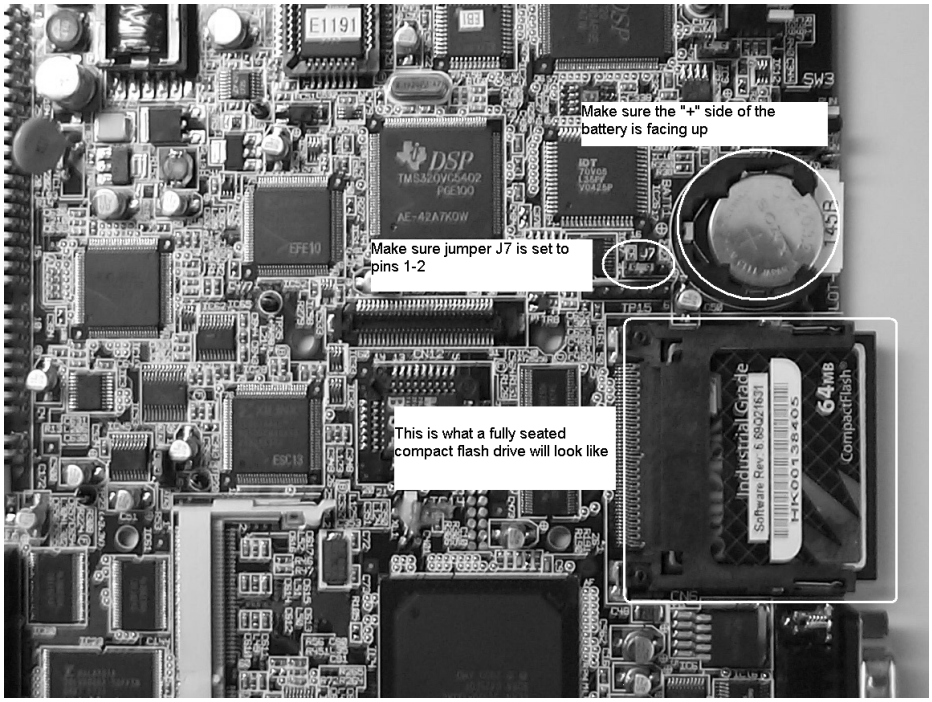


Figure 6-78 Flash Drive Seated on VMP( )-U40 ETU

5. Ensure that jumper J1 is set across pins 1 and 2.

6. Ensure that jumper J7 is set across pins 1 and 2.

7. Insert Sony battery CR-2032 into BATT1 connector with the + sign facing up as shown in Figure 6-78 Flash Drive Seated on VMP( )-U40 ETU on page 6-164. When an eight port ETU is used go to 7.11.5 Installing DSP( )-U30 on VMP( )-U40 ETU on page 6-169, otherwise your voice mail ETU is ready for installation.

7.11.4 Installing Hard Drive on the VMP( )-U40 ETU

Warning! Handle the hard drive carefully! Do not drop the drive or apply pressure to it! Do not touch the printed circuit board of the drive or ETU unnecessarily. Doing so can make a drive inoperable!

This unit makes extensive use of CMOS technology that is very susceptible to static; therefore, extreme care must be taken to avoid static discharge when handling.

1. Before mounting the drive make note of the connection to the hard drive, notice the four pins to the left of the drive, These pins are not connected for normal operation, see Figure 6-79 Connecting the Hard Drive.

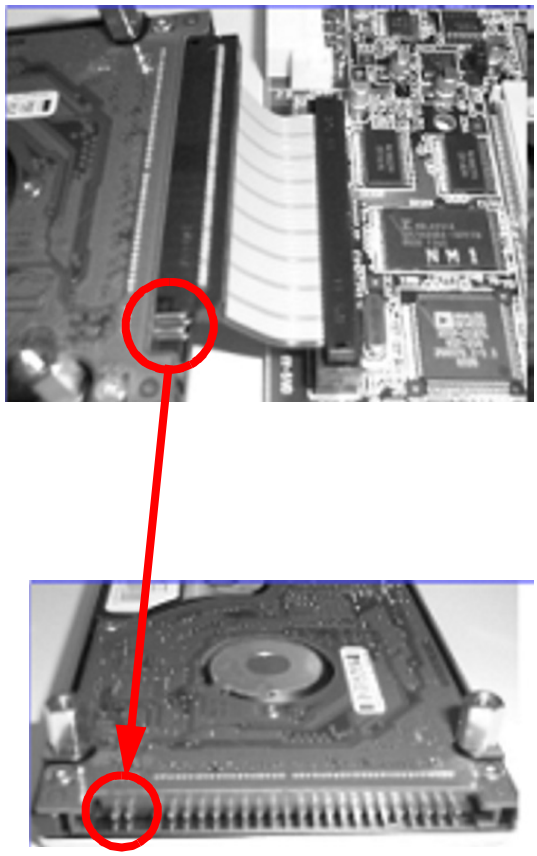


Figure 6-79 Connecting the Hard Drive

2. Check jumper J-7 and make sure it is on pins 2-3, see Figure 6-80 Plus Sign on Battery Displayed Up.

3. Check jumper J-1 and make sure it is on pins 1-2, see Figure 6-80 Plus Sign on Battery Displayed Up.

4. Insert Sony battery CR-2032 into BATT1 connector, the + sign should be facing up as shown in Figure 6-80 Plus Sign on Battery Displayed Up.

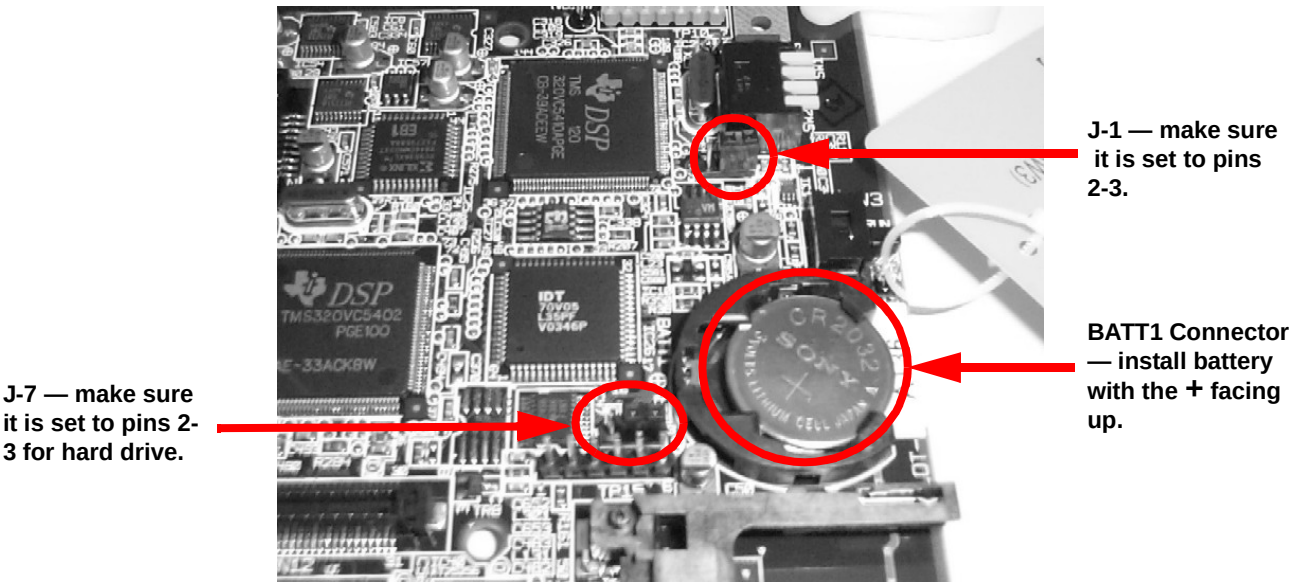


Figure 6-80 Plus Sign on Battery Displayed Up

5. Insert keyed end of ribbon cable into connector CN8, the keyed connector only goes into connector CN8 one way and should not be forced. The red stripe of the cable is towards the bottom of the ETU as given in Figure 6-81 Connecting the Ribbon Cable on page 6-167.

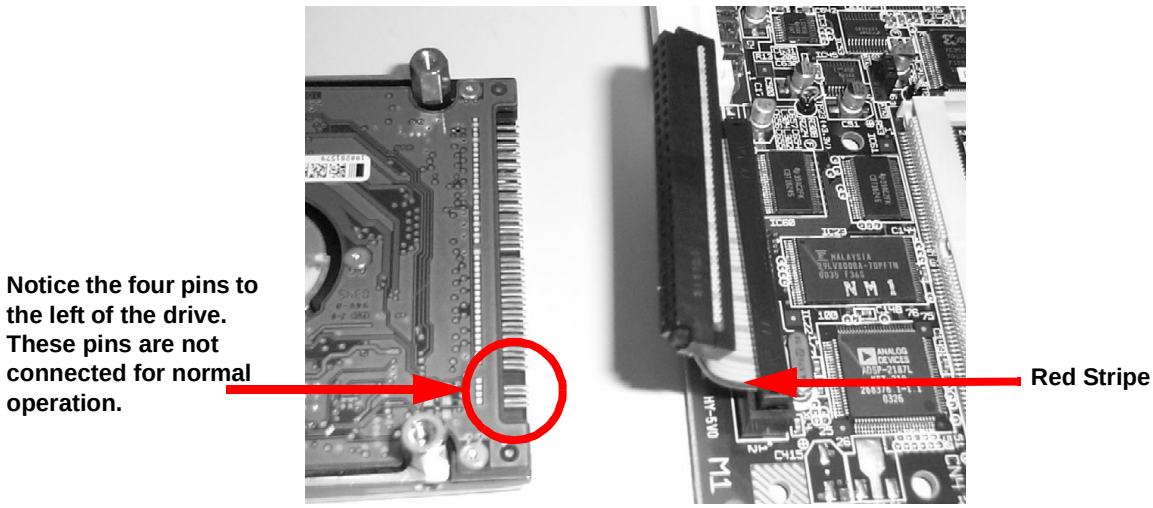


Figure 6-81 Connecting the Ribbon Cable

6. Place hard drive on table with printed circuit board side up and the pins facing the card as shown in Figure 6-81 Connecting the Ribbon Cable.

7. Connect the hard drive to the cable making sure that the four pins on right side of the drive are not connected as shown in Figure 6-82 Leaving Four Pins Unconnected.

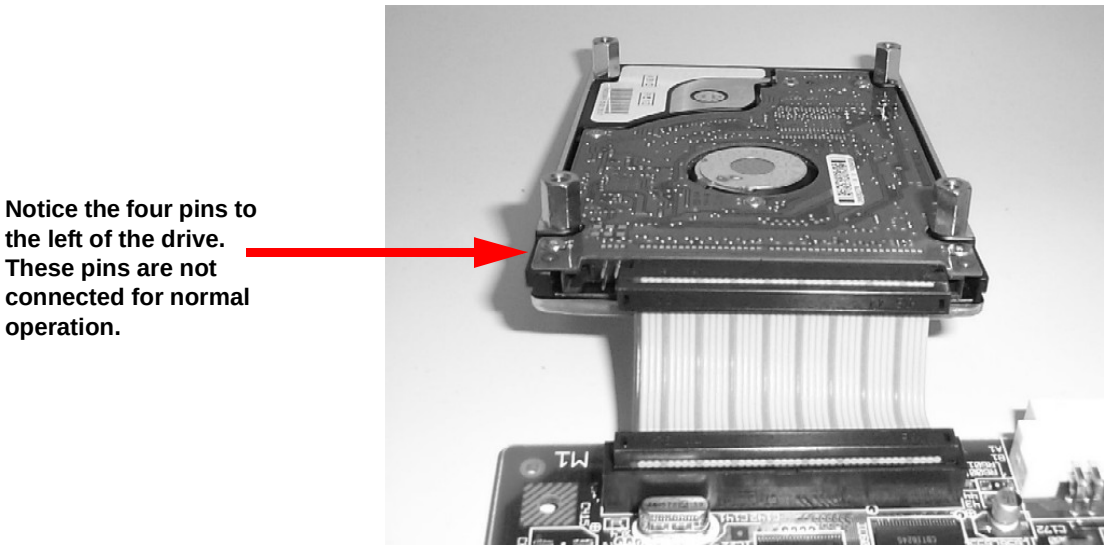


Figure 6-82 Leaving Four Pins Unconnected

8. Carefully place the hard drive on the ETU as shown in Figure 6-83 Placing the Hard Drive on the ETU.

Figure 6-83 Placing the Hard Drive on the ETU

9. Holding the drive so it does not move turn the ETU over and put the four mounting screws in place as shown in Figure 6-84 Placing the Four Mounting Screws. The screws only need to be lightly torque down. *Tightening the screws too much can damage the board*.

Figure 6-84 Placing the Four Mounting Screws

7.11.5 Installing DSP( )-U30 on VMP( )-U40 ETU

For an 8-port VMP( )-U40 ETU, the DSP-U30 must be installed. Refer to Figure 6-85 Installing the DSP-U30 on the VMP( )-U40 ETU.

1. Wearing a grounding strap, remove the VMP( )-U40 and DSP-U30 from the box and lay on a flat work surface.

2. Locate connector CN12 in the center of the ETU and position the DSP-U30 over it. Press down firmly on the DSP-U30 unit until a secure connection is made. Ensure that all the standoffs are snapped completely.

3. Place Switch SW3 in **RUN**.

4. Install the ETU in the KSU.

5. Turn **ON** the KSU system power.

6. Wait for the APP1 LED to turn green, then connect the support PC to the VMP(8)-U40 ETU.

7. Verify that eight ports are shown on the banner screen.

8. When the unit is to be installed at another location, shut down the voice mail application by pressing the **ESC** key.

9. Enter **Y** for yes, and enter the password (default is **nec**).

10. From the Utility menu enter **x** to exit to DOS.

11. Disconnect from the system.

12. Place SW3 in **SHUT DOWN**.

13. Wait for the SHUT DOWN LED to light red.

14. Turn **OFF** the KSU power and remove the ETU from the KSU.

15. Make sure to transport the ETU in the original packaging.

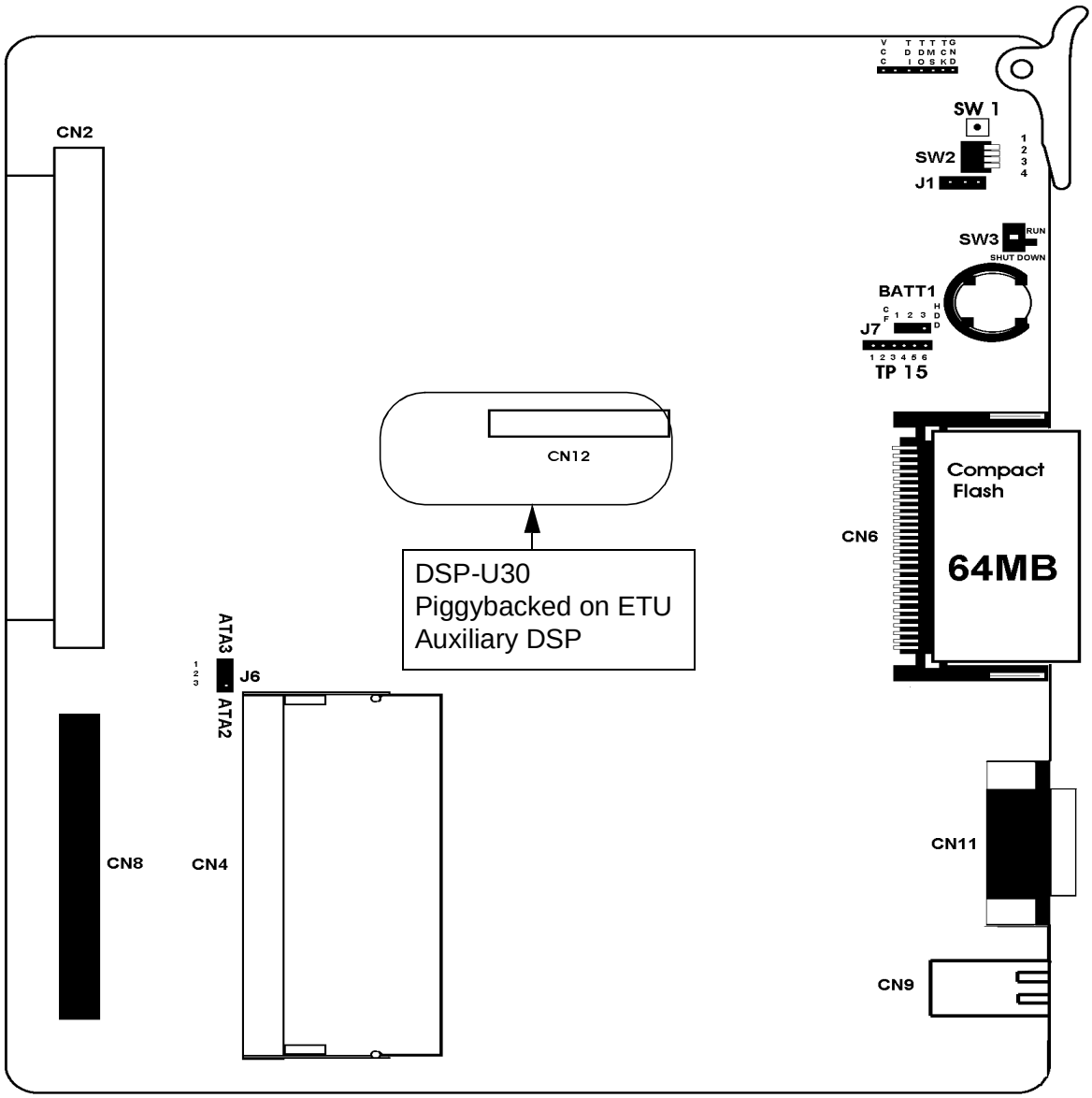


Figure 6-85 Installing the DSP-U30 on the VMP( )-U40 ETU

7.11.6 Switch Settings

Table 6-67 VMP( )-U40 ETU Switch Settings

Reset Power Switch SW1				Used for development only
DIP Switch SW2				
1	**2**	**3**	**4**	**Description**
ON				Enable HostKey and run Manufacturing Test (NEC Production use only.
ON	ON			Enable HostKey with floppy disk redirection and run Manufacturing Test (NEC Production use only.Production use only.
		ON		Connect to Cosession using modem instead of direct cable.
			ON	Start BRU host with direct cable connection
		ON	ON	Start BRU host with modem connection
	ON		ON	Connect to Cosession using direct cable connection, but do not start voice mail software (for troubleshooting and maintenance only)
Switch SW3 Positions				Used to identify ETU operation
RUN				LED 6 is on red.
SHUT DOWN				LED 7 is on red.

7.11.7 Jumper Settings

Table 6-68 VMP( )-U40 ETU Jumper Settings

J1	
1-2	External modem not connected (**default**)
2-3	External modem connected
J7	
1-2	Compact Flash is master drive
2-3	HDD is master drive (**default**)

7.11.8 VMP( )-U40 LED Indications

Table 6-69 VMP( )-U40 ETU LED Indications (on back of ETU)

LED No.	Name	On	Flashing	Off
1	AP1 Application Software	Green (Run no errors) Amber (Run with errors) Red (Not running)	Not Used	Not Used
2	AP2	Not Used	Not Used	Not Used
3	DRIVE access	Red for access	Not Used	Not accessed
4	CF POWER	Red (Receiving ETU power)	Not Used	No ETU power
5	LIVE	Not Used	Red every 125ms during operation	Operation shutdown
6	SW3 in RUN	Red (**don't remove ETU**)	Not Used	Not in RUN
7	SW3 in SHUTDOWN	Red (**ETU can be removed**)	Not Used	Not SHUTDOWN
8	Power	Red (ETU Receiving KSU power)	Not Used	No KSU power
9	Development only	Not Used	Not Used	Not Used
10	CH1	Red (Off Hook)	Not Used	On Hook
11	CH2	Red (Off Hook)	Not Used	On Hook

Table 6-69 VMP( )-U40 ETU LED Indications (on back of ETU)

LED No.	Name	On	Flashing	Off
12	CH3	Red (Off Hook)	Not Used	On Hook
13	CH4	Red (Off Hook)	Not Used	On Hook
14	CH5	Red (Off Hook)	Not Used	On Hook
15	CH6	Red (Off Hook)	Not Used	On Hook
16	CH7	Red (Off Hook)	Not Used	On Hook
17	CH8	Red (Off Hook)	Not Used	On Hook

CH LEDs 1~4 light during startup to indicate:
LED1 BICOM driver loaded
LED2 Scandisk completed successfully
LED3 CoSession Host loaded successfully
LED4 Voice Mail started successfully

✎ After the system is up and running these LEDs are off, and channels can receive calls.

✎ When Voice Mail fails to start, all CH LEDs and the AP1 LED are on.

7.11.9 Connectors

Table 6-70 VMP( )-U40 ETU Connectors

Connector	
CN2	Backplane connector
CN4	SO-MIDD memory connector
CN6	Compact Flash Connector
CN8	Hard Drive connector
CN9	Ethernet Port
CN11	COM port for console programming connection
CN12	Port expansion connector for DSP-U30 Unit

TABLE OF CONTENTS
CHAPTER 7

Section 1 General Information 7-1

Section 2 Music on Hold 7-1

2.1 Connecting Audio Sources to the KSU 7-1

Section 3 Station Background Music 7-1

Section 4 Paging Connections 7-2

Section 5 Connecting a KSU to a Personal Computer 7-2

5.1 Connecting the PC to the KSU 7-2

5.2 Connecting the Printer to the KSU 7-3

Section 6 PGD(2)-U10 ADP 7-3

6.1 Using a PGD(2)-U10 ADP 7-3

6.2 LED Indications 7-4

6.3 Setting Up PGD(2)-U10 ADP Connections 7-5

6.4 Wall Mounting the PGD(2)-U10 ADP (Optional) 7-9

6.5 Installing a Door Box 7-11

6.6 External Page 7-14

6.7 Connecting to the PGD(2)-U10 ADP : 7-14

6.7.1 External Page Relays 7-15

6.7.2 Connecting a Dry Contact Relay Device to the PGD(2)-U10 ADP 7-15

6.8 External Recording System or External Ringer 7-16

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LIST OF FIGURES
CHAPTER 7

Figure 7-1 Music Source Connections 7-1
Figure 7-2 Connecting a PC to the KSU 7-3
Figure 7-3 PGD(2)-U10 ADP 7-4
Figure 7-4 Remove Cover from PGD(2)-U10 ADP 7-5
Figure 7-5 Remove Plastic Cover from Cable Hole 7-5
Figure 7-6 Jumper Settings 7-6
Figure 7-7 PGD(2)-U10 ADP Connection Diagram 7-7
Figure 7-8 Connecting Cable to the PGD(2)-U10 ADP 7-8
Figure 7-9 PGD(2)-U10 ADP Connections 7-9
Figure 7-10 Installing the Screws 7-10
Figure 7-11 Wall Mounting the PGD(2)-U10 ADP 7-10
Figure 7-12 Setting the PGD(2)-U10 ADP for a Door Box 7-12
Figure 7-13 Installing a Door Box 7-13
Figure 7-14 PGD(2)-U10 ADP Cable Connection 7-15
Figure 7-15 PGD(2)-U10 ADP Cable Connection 7-17

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Installing Electra Elite IPK II KSU Common Optional Equipment CHAPTER 7

SECTION 1 GENERAL INFORMATION

The Electra Elite IPK II system supports Music on Hold, Station Background Music and external paging. This chapter provides information regarding these options.

SECTION 2 MUSIC ON HOLD

The Electra Elite IPK II KSU allows external Music on Hold source to be connected to the Electra Elite IPK II system. The external Music on Hold source can be connected using the PGD(2)-U10 ADP or the KSU cabinet. Refer to the PGD(2)-U10 ADP section for details

2.1 Connecting Audio Sources to the KSU

Connect the plug end into the audio jack on the side of the base KSU.

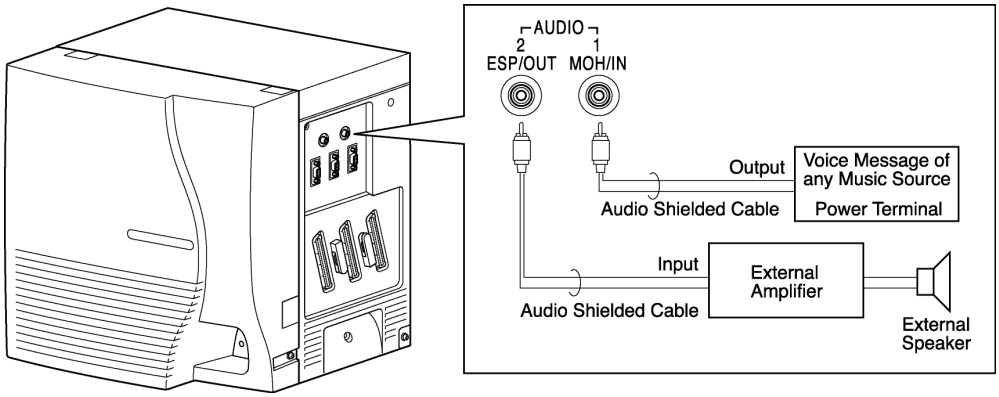


Figure 7-1 Music Source Connections

SECTION 3 STATION BACKGROUND MUSIC

Station Background Music can be provided using an internal or an external source. The same connection method used for Music on Hold is used for Station Background Music.

SECTION 4 PAGING CONNECTIONS

When connecting External Paging, the PGD(2)-U10 ADP is the interface with Paging In/Out, Background Music (External Speaker) Out and/or External Tone Ringer/Night Chime Out.

SECTION 5 CONNECTING A KSU TO A PERSONAL COMPUTER

To use the PC Programming, specialized software must installed in the user PC and the PC must be connected via a serial port to the KSU.

5.1 Connecting the PC to the KSU

Using RS-232C straight cable, connect the PC to one of the COM ports on the side of the KSU. Refer to Figure 7-2 Connecting a PC to the KSU.

The functions and the communication port connections are:

Function	Port
PC Programming	COM 1
Station Message Detail Recording (SMDR)	COM 2

Serial-port characteristics include:

Characteristic	Value
Baud Rate	38.4 K (maximum)
Parity	None
Stop Bit	1 stop bit
Data Bit	8 bits
Port Type	DCE

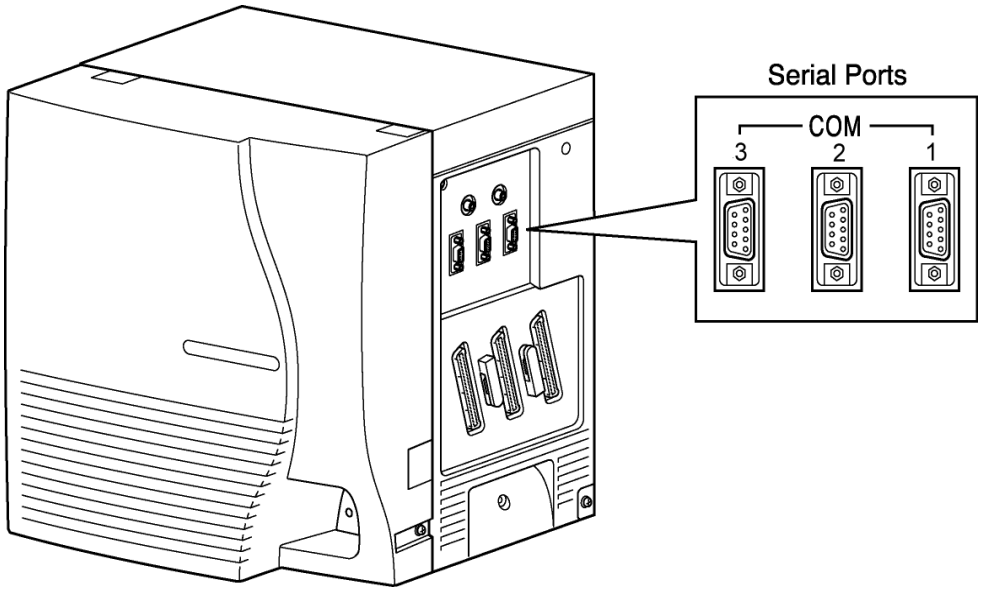


Figure 7-2 Connecting a PC to the KSU

5.2 Connecting the Printer to the KSU

When using the charge control ability, connect the printer to the KSU to allow the printing of the charge data. Connect the printer to the serial port on the side of the KSU with an RS-232C straight cable. Use the COM 2 port to connect the printer.

SECTION 6 PGD(2)-U10 ADP

6.1 Using a PGD(2)-U10 ADP

The PGD(2)-U10 ADP (adapter) provides two circuits which allow connection to external terminals such as:

- Door Box (8 maximum per system)
- External Speaker with Amplifier (8 maximum with PGD(2)-U10 ADP
- External Music Source (external MOH) (96 maximum per system)
- External Recording System (96 maximum per system)
- External Ringing

The Electra Elite IPK II allows a maximum of 56 PGD(2)-U10 ADPs to be installed [48 for ACI (external MOH or external recording system) ports, 4 for Door Boxes, and 4 for Paging]. The PGD(2)-U10 ADP also provides multipurpose controls. These control relays can be used to control the external amplifier, external music source and door lock control using a Door Box. The system allows up to eight general purpose relays with the PGD(2)-U10 ADP.

The PGD(2)-U10 ADP connects to any available digital extension port. The terminal connections made within the PGD(2)-U10 ADP and the jumper settings determine what features are used for each circuit.

The PDG(2)-U10 ADP can be connected only to an ESIB(8)-U20 ETU. If the PDG(2)-U10 ADP is connected to an ESIE(8)-U20 ETU, it is not recognized. When an ESIB(8)-U20 ETU has an ESIE(8)-U20 ETU installed [ESIB/E(16)], the PGD(2)-U10 ADP has both channels available for Paging, MOH, External Ringers or Door Box according to the strapping on ports 1~8. The corresponding port on the ESIB(8)-U20 ETU does not support a station or other hardware (It is used by the PGD(2)-U10 ADP for channel 2). When an ESIB(8)-U20 is installed without the SLIE(8)-U20 ETU installed, a PGD(2)-U10 ADP installed on ports 1~8 is recognized, but only channel 1 on the PGD(2)-U10 ADP is supported. Channel 2 is unavailable. ESIB(8)-U20 ETUs and ESIE(8)-U20 ETUs do not support the PGD(2)-U10 ADP.

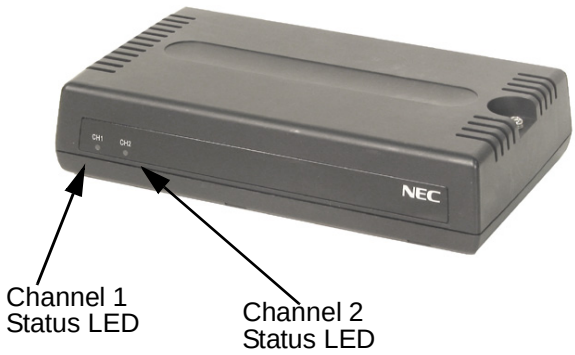


Figure 7-3 PGD(2)-U10 ADP

6.2 LED Indications

LED	Indication	Note
LED 1	Green LED when CH1 in use.	Flashing green LED indicates dip switch setting and programming for CH1 are in conflict.
LED 2	Green LED when CH2 in use.	Flashing green LED indicates dip switch setting and programming for CH2 are in conflict.

6.3 Setting Up PGD(2)-U10 ADP Connections

When the PGD(2)-U10 ADP is to be wall mounted, all the cable connections should be made first.

For the module to ID correctly after setting the jumpers, set the circuit to 0 for the module port in Program 10-03-01 prior to connecting the line cord to the PGD(2)-U10 ADP.

1. Remove the screw from the front of the PGD(2)-U10 ADP.

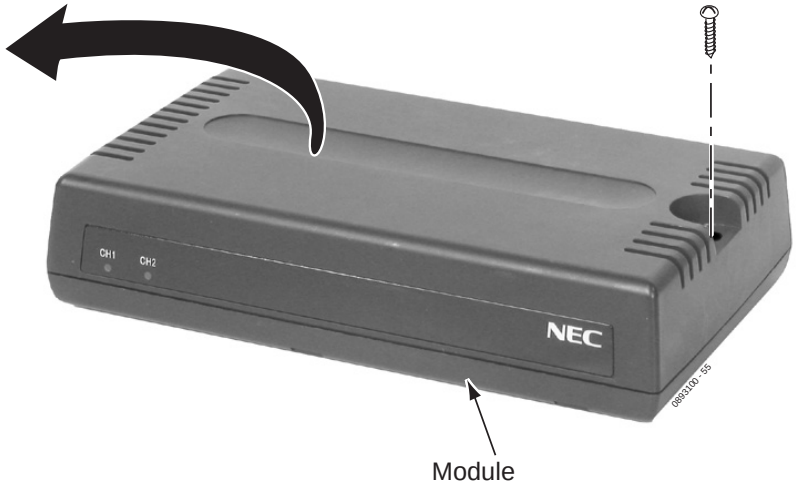


Figure 7-4 Remove Cover from PGD(2)-U10 ADP

2. Using a screwdriver, break out the plastic piece covering the cable hole.

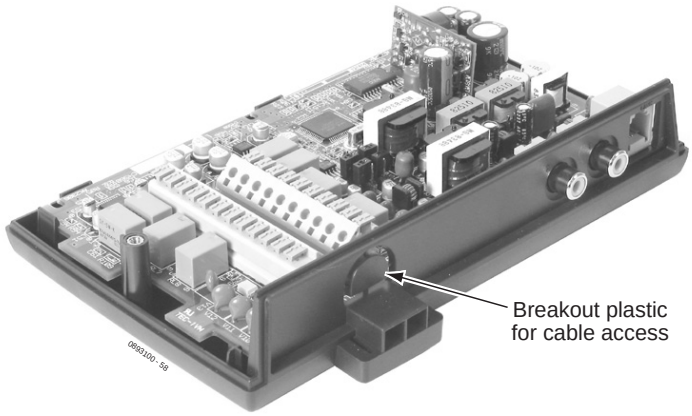


Figure 7-5 Remove Plastic Cover from Cable Hole

3. Set the S3 - S6 jumpers to the proper setting for the function to be used.

Channel 1	S3	S4	Function	LED Indication
	Open	Open	Door Box	On when in use.
	Open	Short	External Paging Speaker	On when in use.
	Short	Open	External Ringer	On when in use.
	Short	Short	External Music on Hold/Recording System	On steady.
Channel 2	**S5**	**S6**	**Function**	**LED Indication**
	Open	Open	Door Box	On when in use.
	Open	Short	External Paging Speaker	On when in use.
	Short	Open	External Ringer	On when in use.
	Short	Short	External Music on Hold/Recording System	On steady.

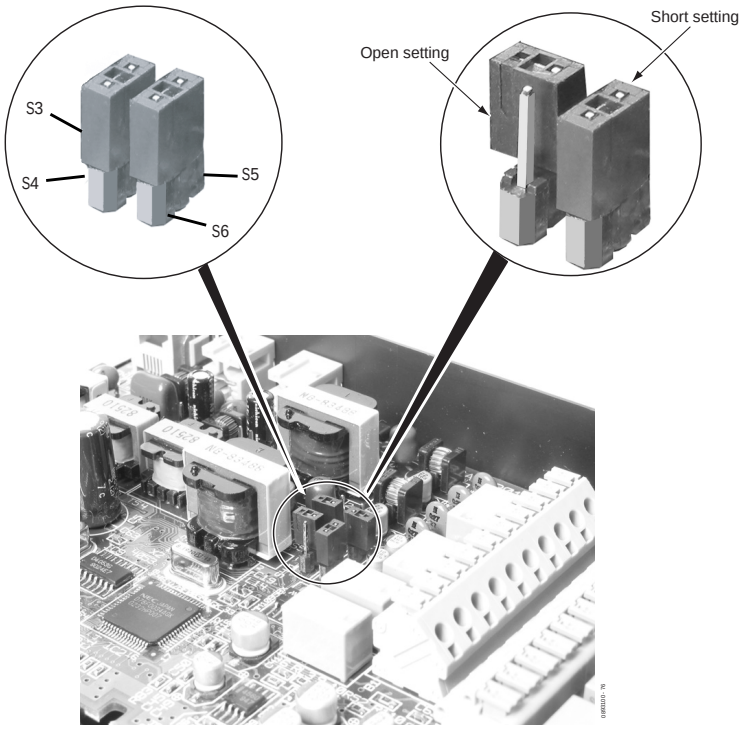
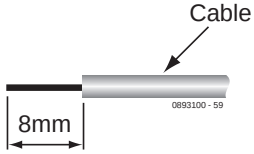


Figure 7-6 Jumper Settings

4. Strip one end of the cable to be connected to the control relay or door box so that approximately 1/4” (8 mm) of bare wire is exposed



5. Insert the cable in the proper CN4 or CN5 location while holding down the lock button with a flat-head screwdriver. After the cable is in place, release the lock button.

✎ *Refer to the specific function being connected for more detail on PGD(2)-U10 ADP connections.*

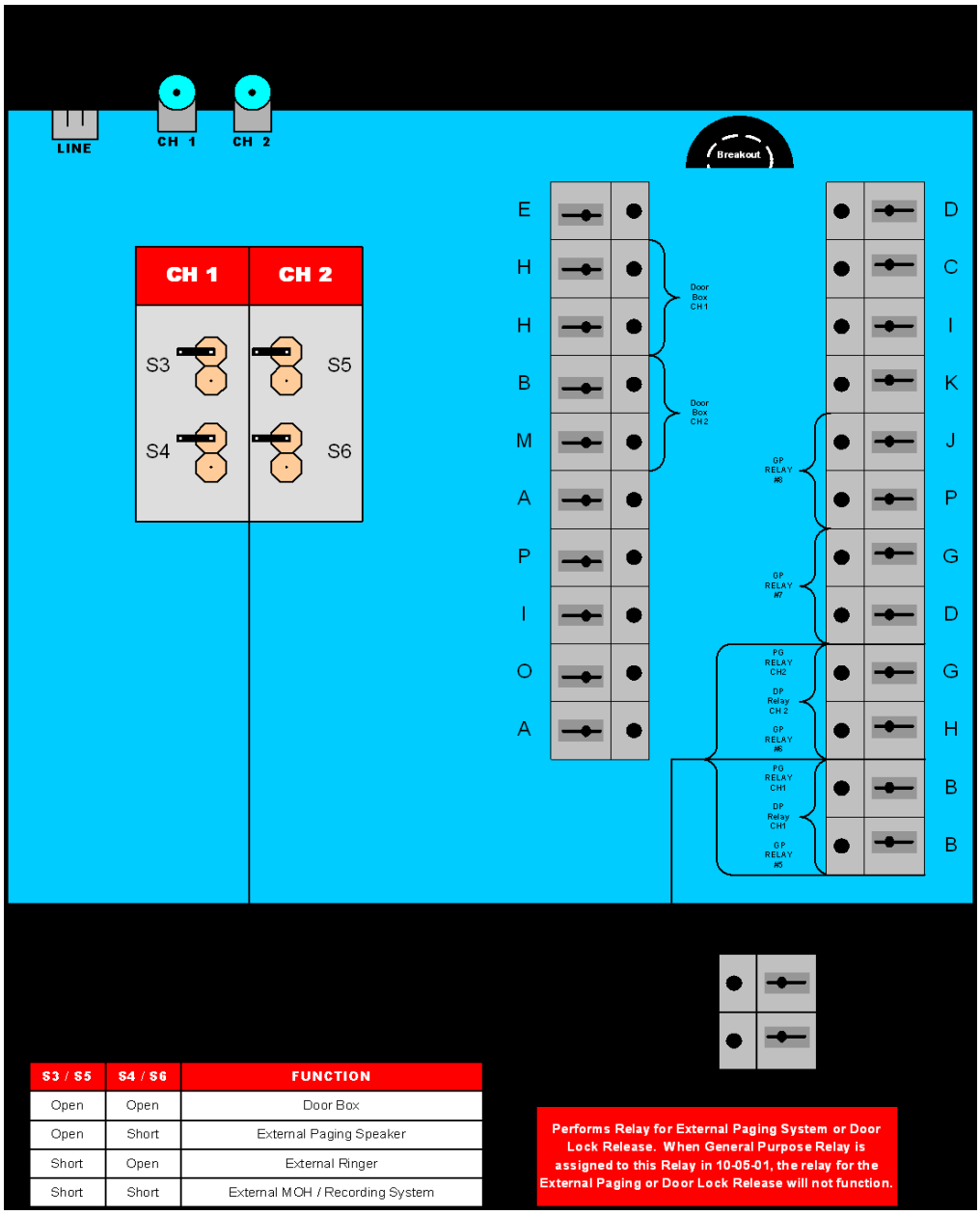


Figure 7-7 PGD(2)-U10 ADP Connection Diagram

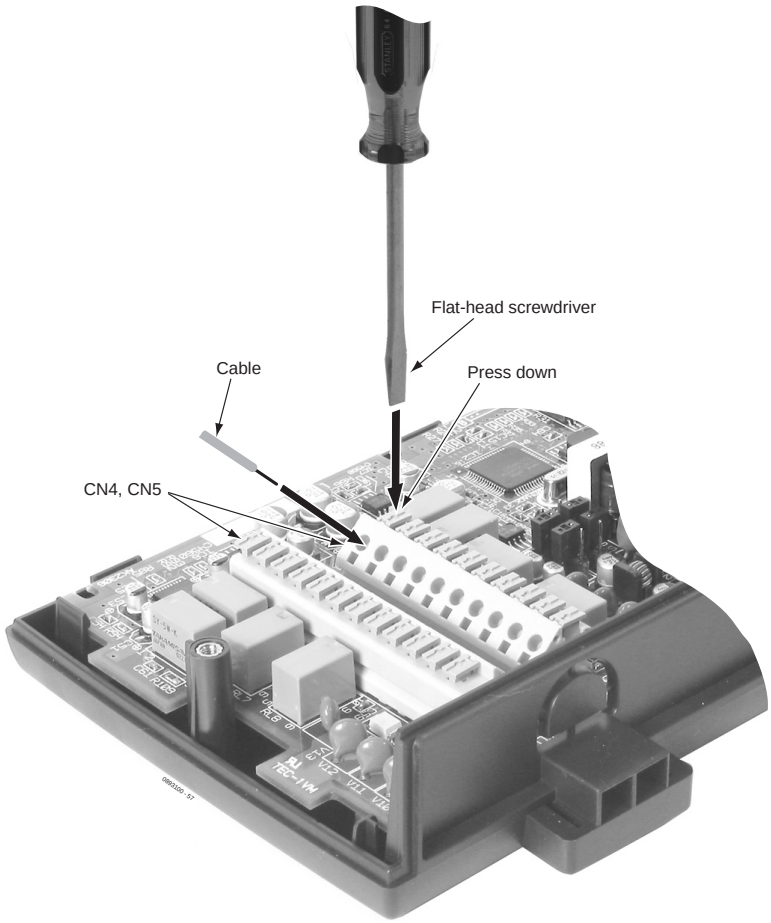


Figure 7-8 Connecting Cable to the PGD(2)-U10 ADP

6. Repeat Steps 4 and 5 for any additional connections required.
7. Replace the cover and tighten the screw to hold the cover in place.
8. When required for the function being used, insert the RCA connectors into the CN3 (Channel 1) and CN3 (Channel 2) connectors on the back of the PGD(2)-U10 ADP.

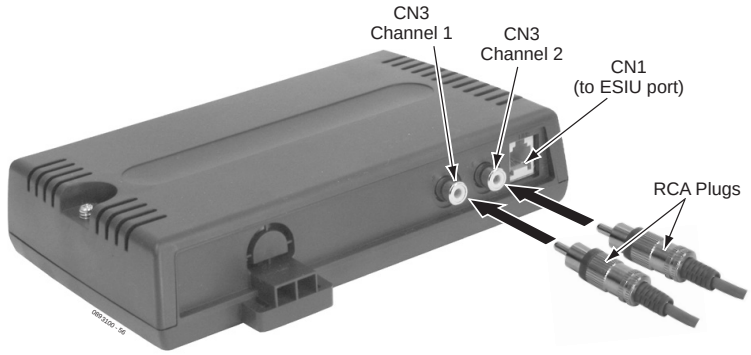


Figure 7-9 PGD(2)-U10 ADP Connections

9. Install a modular jack for each PGD(2)-U10 ADP. For each module, run one-pair 24 AWG station cable from the crossconnect block to a modular jack. Ground the unused pair.

10. Terminate the extension leads to GRN/RED of the modular jack. Terminate the unused leads to the jack.

11. Install bridging clips as required.

    ✎ For the module to ID correctly, set the circuit type to 0 for the port in Program 10-03-01 prior to connecting the line cord.

12. Plug a modular line cord from the mod jack to the CN1 connector on the PGD(2)-U10 ADP.

6.4 Wall Mounting the PGD(2)-U10 ADP (Optional)

1. To wall mount the PGD(2)-U10 ADP, insert two wood screws 100mm apart (3 15/16”). Leave 3mm (1/8”) of the screw exposed. The screws can be installed either vertical or horizontal, depending on which position fits best for your location.

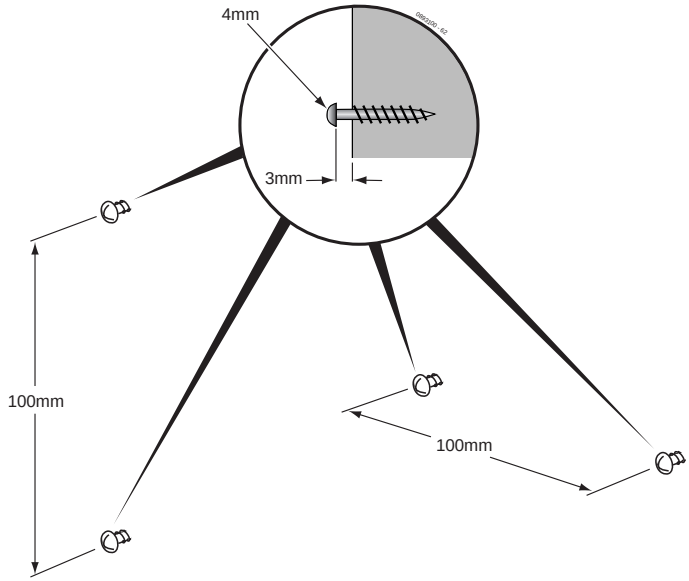


Figure 7-10 Installing the Screws

2. The back of the PGD(2)-U10 ADP has two key-hole type openings. Place the PGD(2)-U10 ADP over the two screws and slide it down or over (depending on the positioning) to lock it in place

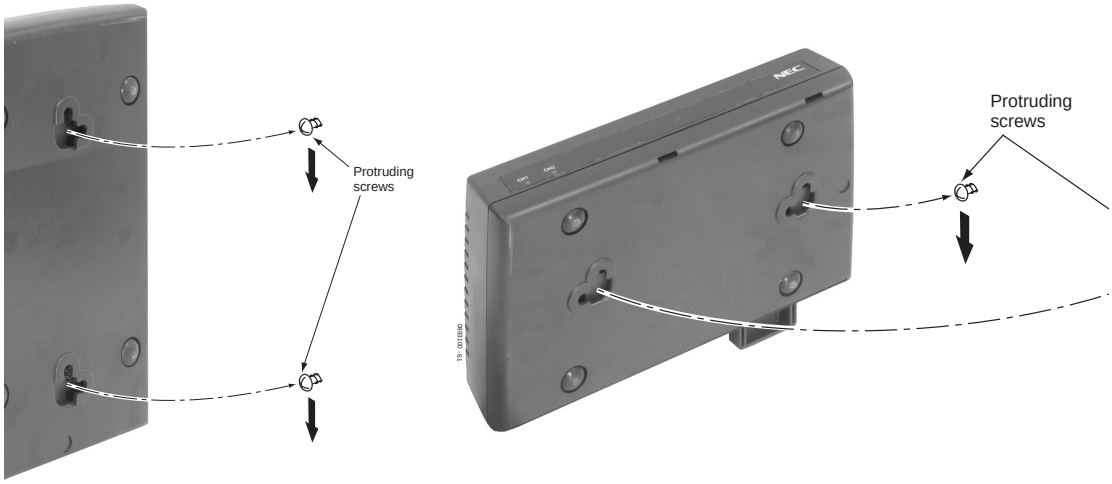


Figure 7-11 Wall Mounting the PGD(2)-U10 ADP

6.5 Installing a Door Box

✎ ***A* PGD(2)-U10 ADP *is required for this feature.***

The Door Box is a self-contained Intercom unit typically used to monitor an entrance door. A visitor at the door can press the Door Box call button (like a door bell). The Door Box then sends chime tones to all extensions programmed to receive chimes.

Each PGD(2)-U10 ADP audio output can optionally support two analog Door Boxes. In addition, you can connect each circuit's control relay to an electric door strike. This allows an extension user to remotely activate the door strike while talking to a visitor at the Door Box. The control relays are normally open. The NTCPU also provides 1 relay. This relay is defined as relay '0' in programming. The relays on the PGD(2)-U10 ADP are numbered 1-8. The system can have up to eight Door Boxes.

✎ **A PGD(2)-U10 ADP circuit used for an analog Door Box cannot be used for External Paging.**

1. Make sure the jumper in the PGD(2)-U10 ADP for the associated Door Box is set correctly. (Refer to Figure 7-6 Jumper Settings).
2. If a line cord was not previously connected to the PGD(2)-U10 ADP, complete Steps 3~6. Otherwise, skip to Step 7.
3. Install a modular jack for each PGD(2)-U10 ADP. For each module, run one-pair 24 AWG station cable from the crossconnect block to a modular jack. Ground the unused pair.
4. Terminate the extension leads to GRN/RED of the modular jack. Terminate the unused leads to the jack.
5. Install bridging clips as required.
6. Plug a modular line cord from the mod jack to the CN1 connector on the PGD(2)-U10 ADP.
7. When wall mounting the Door Box, remove the screw on the front of the Door Box.
8. Remove the back half of the Door Box and attach this mounting bracket to the wall with the two provided screws.

9. Connect the two-conductor station cable from the CN4 connectors in the PGD(2)-U10 ADP to the Door Box terminals. These wires must be routed through the opening in the bottom of the Door Box mounting bracket.

   ☞ Be sure to maintain the proper polarity.

10. Replace the front half of the Door Box and reattach the screw to secure it in place.

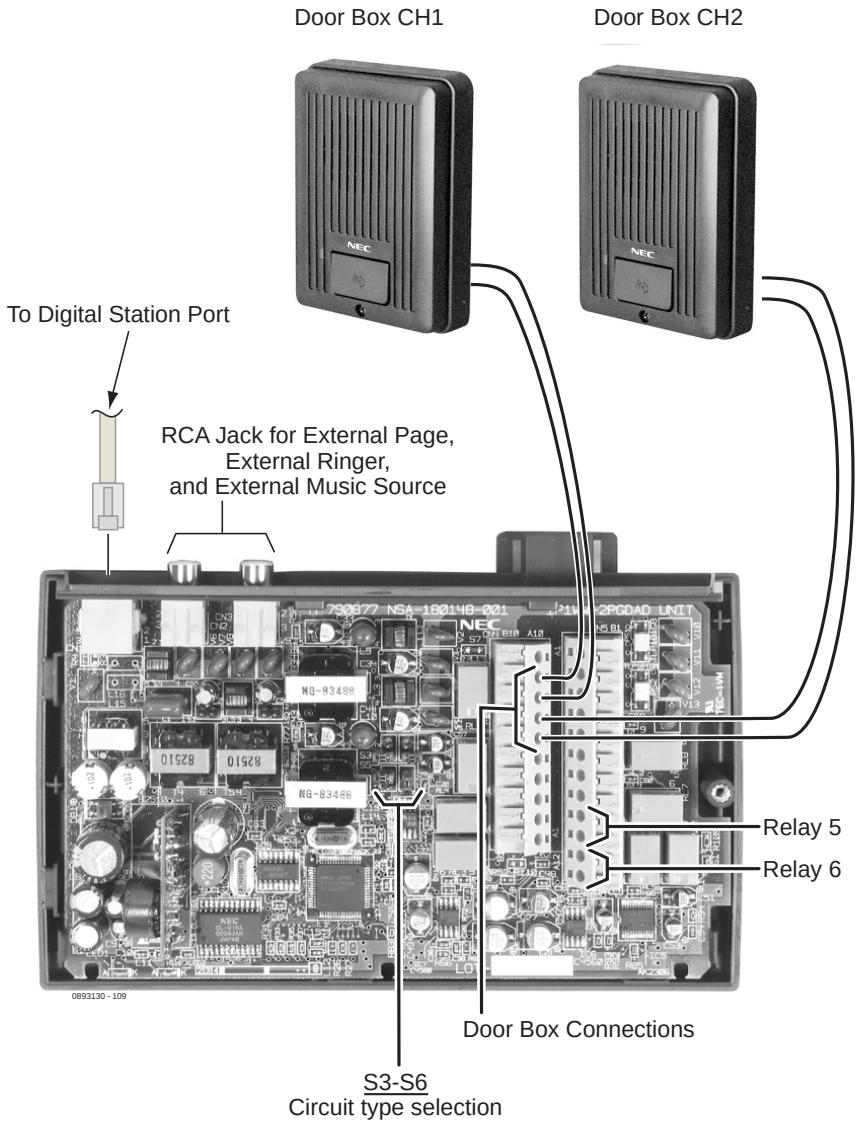


Figure 7-12 Setting the PGD(2)-U10 ADP for a Door Box

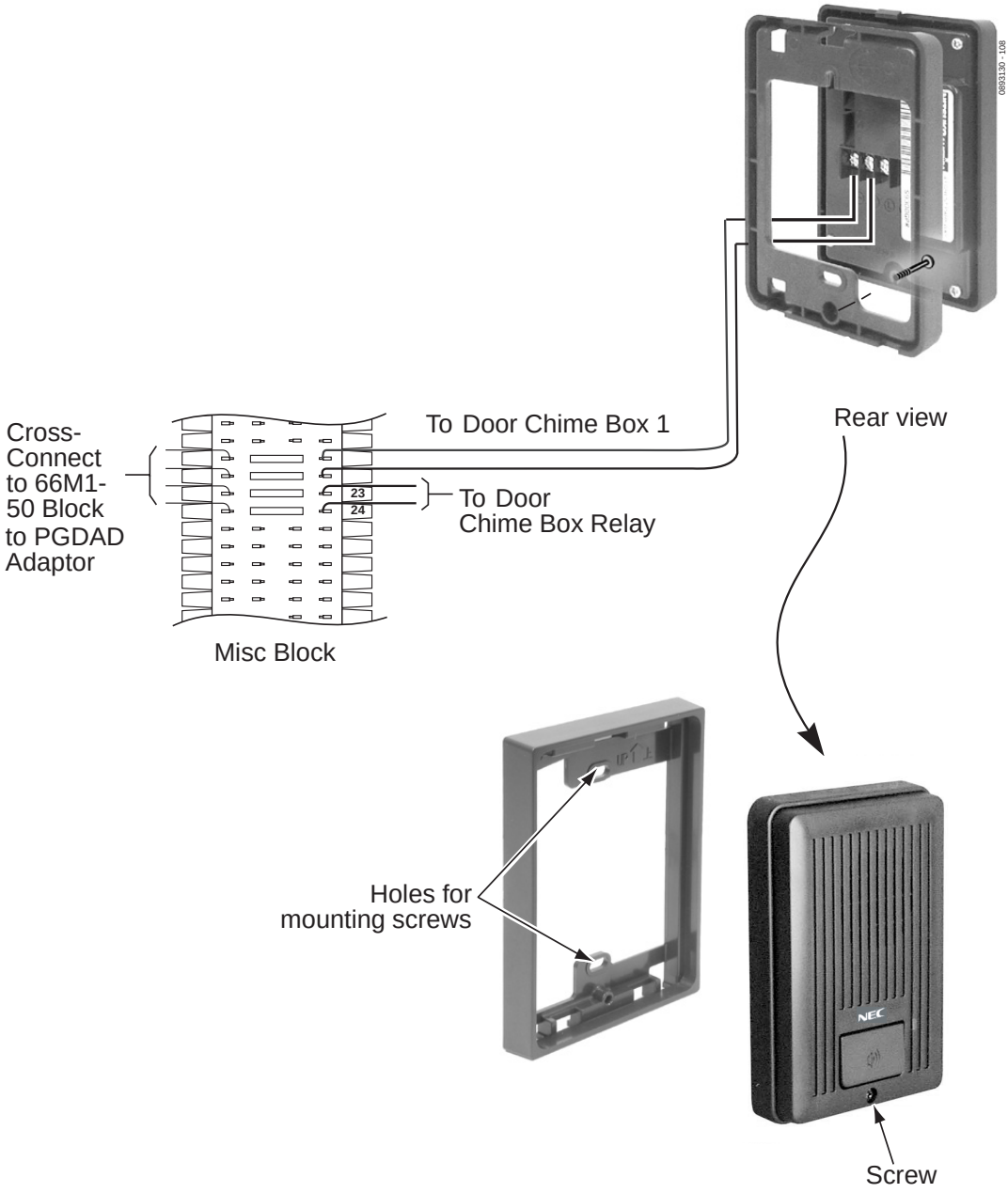


Figure 7-13 Installing a Door Box

6.6 External Page

Two external page zone/door box circuits are provided by each PGD(2)-U10 ADP installed. Each Door Box/external page circuit provides a dry relay contact. The external page speakers provided by the PGD(2)-U10 ADP are 1-8 – the relays on the PGD(2)-U10 ADP are numbered 1~8. Refer to Paging, External in the Software Manual for additional details.

✎ A PGD(2)-U10 ADP circuit used for External Paging cannot be used for an analog Door Box.

6.7 *Connecting to the PGD(2)-U10 ADP:*

1. Make sure the jumper in the PGD(2)-U10 ADP for the channel is set correctly. (Refer to Figure 7-6 Jumper Settings).
2. If a line cord was not previously connected to the PGD(2)-U10 ADP, complete Steps 3-6. Otherwise, skip to Step 7.
3. Install a modular jack for each PGD(2)-U10 ADP. Run one-pair 24 AWG station cable from the crossconnect block to a modular jack. Ground the unused pair.
4. Terminate the extension leads to GRN/RED of the modular jack. Terminate the unused leads to the jack.
5. Install bridging clips as required.
6. Plug a modular line cord from the mod jack to the CN1 connector on the PGD(2)-U10 ADP.
7. Connect the two-conductor station cable from the CN5 connector in the PGD(2)-U10 ADP to the external relay/external page.

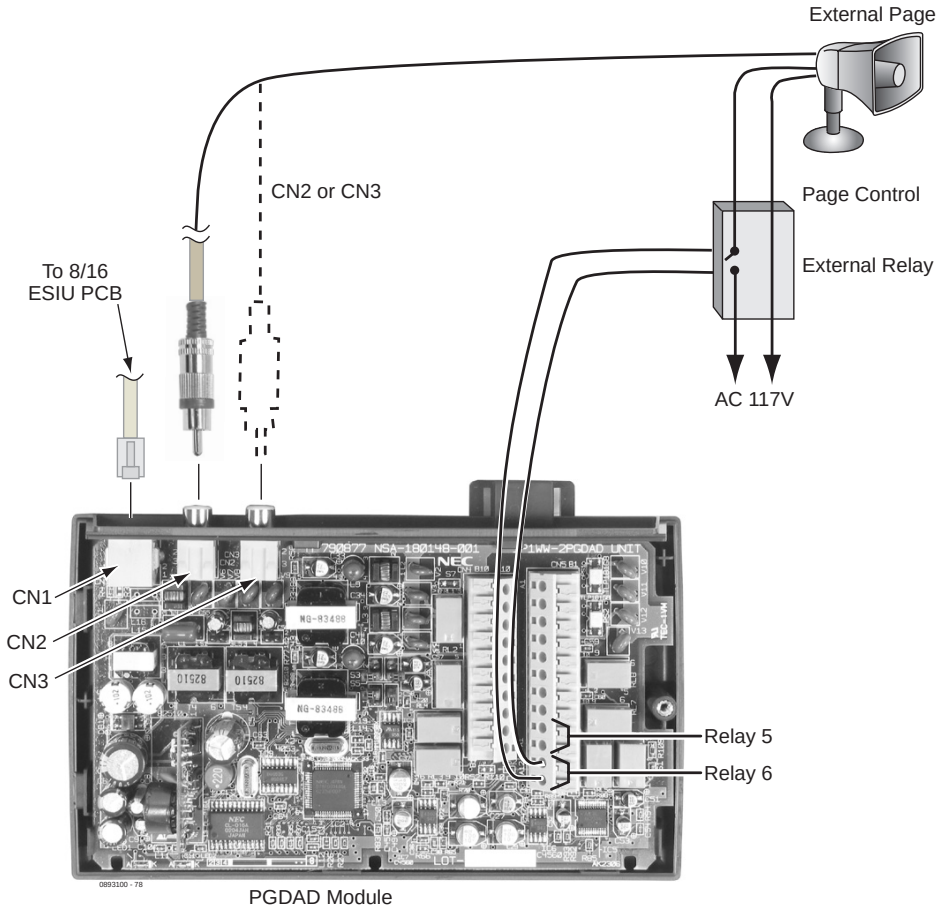


Figure 7-14 PGD(2)-U10 ADP Cable Connection

✎ Page amplification is not provided by the PGD(2)-U10 ADP and must be accommodated by using an external page amplifier.EXTERNAL PAGING AND PAGE RELAYS

6.7.1 External Page Relays

Two external dry contact relays are available when a PGD(2)-U10 ADP is installed that can be used to activate ancillary devices (*i.e.*, door unlock devices). The relays on the PGD(2)-U10 ADP are numbered 1~8. Each Door Box/external page circuit provides a dry relay contact.

6.7.2 Connecting a Dry Contact Relay Device to *the* PGD(2)-U10 ADP

✎ Make sure the jumper in the PGD(2)-U10 ADP for the channel is set correctly. (Refer to Figure 7-6 Jumper Settings).

1. If a line cord was not previously connected to the PGD(2)-U10 ADP, complete Steps 3-6. Otherwise, skip to Step 7.

2. Install a modular jack for each PGD(2)-U10 ADP. Run one-pair 24 AWG station cable from the crossconnect block to a modular jack. Ground the unused pair.

3. Terminate the extension leads to GRN/RED of the modular jack. Terminate the unused leads to the jack.
4. Install bridging clips as required.
5. Plug a modular line cord from the mod jack to the CN1 connector on the PGD(2)-U10 ADP.
6. Connect the two-conductor station cable from the CN5 connectors within the PGD(2)-U10 ADP to the external relay.

   ✎ The relay closes when the Door Box/external page zone is called. The maximum applied voltage is 24vDC at .5A for each contact.

6.8 External Recording System or External Ringer

The PGD(2)-U10 ADP allows for the connection of an external recording system or external ringer.

1. Make sure the jumper in the PGD(2)-U10 ADP for the channel is set correctly. (Refer to Figure 7-6 Jumper Settings).
2. If a line cord was not previously connected to the PGD(2)-U10 ADP, complete Steps 3-6. Otherwise, skip to Step 7.
3. Install a modular jack for each PGD(2)-U10 ADP. Run one-pair 24 AWG station cable from the crossconnect block to a modular jack. Ground the unused pair.
4. Terminate the extension leads to GRN/RED of the modular jack. Terminate the unused leads to the jack.
5. Install bridging clips as required.
6. Plug a modular line cord from the mod jack to the CN1 connector on the PGD(2)-U10 ADP.
7. Connect an RCA jack to the audio output(s) on the back of the PGD(2)-U10 ADP.
8. The opposite end of this cable is connected to the external recording system or external ringer either directly or by connecting to the cross-connect block where the item is connected.

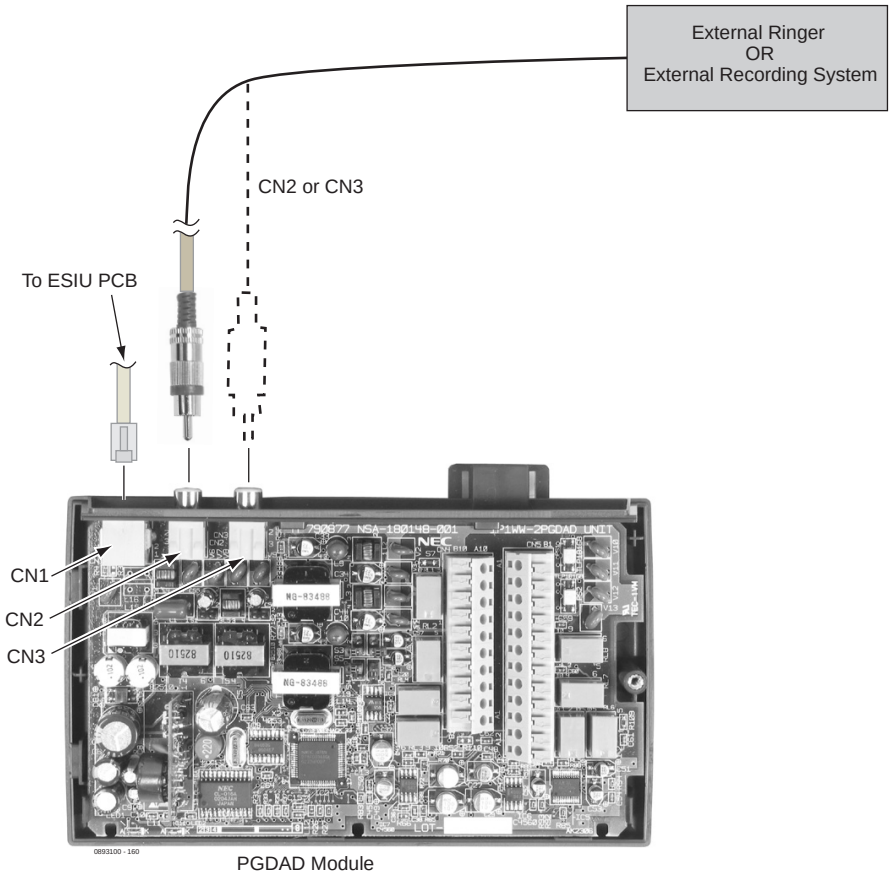


Figure 7-15 PGD(2)-U10 ADP Cable Connection

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TABLE OF CONTENTS
CHAPTER 8

Section 1 General Information 8-1

Section 2 Multiline Terminals 8-1

2.1 DTR-2DT-1 TEL 8-1

2.2 DTR-4D-1 TEL 8-3

2.3 DTH-8-1/2 TEL 8-4

2.4 DTH-8D-1/2 TEL 8-5

2.5 DTH-16-1/2 TEL 8-6

2.6 DTH-16D-1/2 TEL 8-7

2.7 DTH-16(BL)-1/2 TEL 8-8

2.8 DTH-16LD-1/2 TEL 8-9

2.9 DTH-32D-1 TEL 8-10

2.10 ITR-4D-3 TEL 8-11

2.11 ITH-8D-2/3 TEL 8-12

2.12 ITH-16D-2/3 TEL 8-13

2.13 DCR-60-1( ) Console 8-14

Section 3 Connecting a Multiline Terminal to the System 8-15

Section 4 Applying Power to IP Terminals 8-16

Section 5 Connecting an IP Multiline Terminal to the Network and PC 8-18

Section 6 Connecting the Attendant Console to a Multiline Terminal 8-20

Section 7 Adjusting the LCD on a Multiline Terminal 8-21

Section 8 Installing Line Cards and Plastic Panels 8-22

8.1 Installing the Line Card and Plastic Panel 8-22

8.2 Removing the Plastic Panel 8-23

Section 9 Installing a Directory Card on a Multiline Terminal 8-23

Section 10 Installing a Button Set on a Multiline Terminal 8-25

Section 11 Adjusting the Height on a Multiline Terminal 8-26

Section 12 Removing or Installing the Base Plate on a Multiline Terminal 8-27

12.1 Removing the Base Plate 8-27

12.2 Installing the Base Plate 8-28

Section 13 Wall Mounting Multiline Terminals 8-29

13.1 Wall Mounting a Multiline Terminal using the Base Plate 8-29

13.1.1 Adjusting the Hanger Hook 8-29

13.1.2 Wall Mounting the Telephone 8-30

13.1.3 Removing the Wall Mounted Multiline Terminal from the Base Plate 8-33

13.1.4 Wall Mounting the Base Plate on a Switch Box 8-33

Section 14 Installing ITH-4D-3 *D*^{term} IPK Terminals 8-35

14.1 Description 8-35

14.2 Power Source 8-35

14.2.1 AC-2R/AC-3R 8-35

14.2.2 Power Over Ethernet (POE) 8-35

14.3 Connecting the IP Terminal to the System 8-36

14.4 Installing Line Cards and Plastic Panels 8-37

14.5 Removing the Base Cover 8-38

14.6 Wall Mounting ITH-4D-3 Multiline Terminals 8-40

14.6.1 Using a Switch Box 8-40

14.6.2 Installing Base Cover directly to the wall 8-41

Section 15 Wall Mounting a Multiline Terminal using the Wall Mount Unit (WM-R Unit) 8-43

15.0.1 Removing the Wall Mounted Multiline Terminal from the Wall Mount Unit .. 8-45

15.0.2 Mounting the Wall Mount Unit on a Switch Box 8-46

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LIST OF FIGURES
CHAPTER 8

Figure 8-1 DTR-2DT-1 TEL 8-2
Figure 8-2 DTR-4D-1 TEL 8-3
Figure 8-3 DTH-8-1 TEL Multiline Terminal 8-4
Figure 8-4 DTH-8D-1 TEL Multiline Terminal 8-5
Figure 8-5 DTH-16-1 TEL Multiline Terminal 8-6
Figure 8-6 DTH-16D-1 TEL Multiline Terminal 8-7
Figure 8-7 DTH-16(BL)-1 TEL Multiline Terminal 8-8
Figure 8-8 DTH-16LD-1 TEL Multiline Terminal 8-9
Figure 8-9 DTH-32D-1 TEL Multiline Terminal 8-10
Figure 8-10 ITR-4D-3 TEL IP Multiline Terminal 8-11
Figure 8-11 ITH-8D-2/3 TEL Multiline Terminal 8-12
Figure 8-12 ITH-16D-2/3 TEL Multiline Terminal 8-13
Figure 8-13 DCR-60-1( ) Console 8-14
Figure 8-14 Connecting a Multiline Terminal to the System 8-15
Figure 8-15 Leading Line Cords on a Multiline Terminal 8-15
Figure 8-16 Plug in AC-2R/AC-3R Adapter 8-16
Figure 8-17 Switch SW2 Position 8-17
Figure 8-18 IP Terminal Rear Connector Locations 8-18
Figure 8-19 Typical Network IP Connection 8-19
Figure 8-20 Connecting the DCR Console to a Multiline Terminal 8-20
Figure 8-21 Connecting the Line Cord and AC Adapter when Installing a DCR Attendant Console 8-20

Figure 8-22 Attendant Console and Multiline Terminal 8-21
Figure 8-23 Adjusting the LCD on a Multiline Terminal 8-21
Figure 8-24 Installing Line Card and Plastic Panel on a Multiline Terminal 8-22
Figure 8-25 Installing Plastic Panel on a DTH/DTR Multiline Terminal 8-22
Figure 8-26 Removing the Plastic Panel from the Multiline Terminal 8-23
Figure 8-27 Attaching Directory Card to Directory Card Holder 8-23
Figure 8-28 Attaching Directory Card Holder to the Multiline Terminal 8-24
Figure 8-29 Removing the Button Set from a Multiline Terminal 8-25
Figure 8-30 Inserting a New Button Set into a Multiline Terminal 8-25
Figure 8-31 Raising the Height on the DTH/DTR/ITH Multiline Terminal 8-26
Figure 8-32 Lowering the Base Plate on the Multiline Terminal 8-26
Figure 8-33 Removing Base Plate 8-27
Figure 8-34 Installing Base Plate 8-28
Figure 8-35 Removing the Hanger Hook on a Multiline Terminal 8-29
Figure 8-36 Sliding the Hanger Hook into Position 8-29
Figure 8-37 Removing the Cutout 8-30
Figure 8-38 Bundling the Line Cord 8-30
Figure 8-39 Wall Mounting the Base Plate 8-31
Figure 8-40 Installing the Multiline Terminal 8-31
Figure 8-41 Plugging in Line Cord 8-32
Figure 8-42 Hiding Excess Cord 8-32
Figure 8-43 Removing the Multiline Terminal 8-33
Figure 8-44 Wall Mounting Base Plate on Switch Box 8-33
Figure 8-45 Wall Mounted Multiline Terminal 8-34
Figure 8-46 ITH-4D-3 Terminal 8-35
Figure 8-47 ITH-4D-3 Power Sources 8-36
Figure 8-48 Connecting the Terminal to the System 8-36
Figure 8-49 Removing Plastic Panel 8-37

Figure 8-50 Installing New Line Card 8-37
Figure 8-51 Connecting Terminal to the System 8-38
Figure 8-52 Pressing Knob to Release Base Cover 8-38
Figure 8-53 Removing Base Cover 8-39
Figure 8-54 Lining up Tabs and Slots 8-39
Figure 8-55 Installing Base Cover 8-40
Figure 8-56 Attaching Base Cover to Switch Box 8-40
Figure 8-57 Installing Terminal on Base Cover 8-41
Figure 8-58 Clipping Off Notches 8-41
Figure 8-59 Using Screws to Attach Base Cover To Wall 8-42
Figure 8-60 Connecting Terminal to the Base Cover 8-42
Figure 8-61 Attaching the Wall Mount Unit to the Wall 8-43
Figure 8-62 Attaching the Multiline Terminal to the Wall Mount Unit 8-44
Figure 8-63 Plugging in Line Cord 8-44
Figure 8-64 Hiding Excess Cord Behind the Wall Mount Unit 8-45
Figure 8-65 Removing Multiline Terminal from the Wall Mount Unit 8-45
Figure 8-66 Mounting Wall Mount Unit on the Switch Box 8-46
Figure 8-67 Wall Mounted Multiline Terminal 8-46

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Installing Electra Elite IPK Multiline Terminals

CHAPTER 8

SECTION 1 GENERAL INFORMATION

The Electra Elite IPK II system supports several different Multiline Terminals and an Attendant Console. This chapter describes each terminal and the console and provides instructions for attaching the terminals to the system and for wall mounting.

SECTION 2 MULTILINE TERMINALS

2.1 DTR-2DT-1 TEL

This digital nondisplay Multiline Terminal has two programmable line keys (each with a 2-color LED), nine function keys, a built-in speakerphone, and a large LED to indicate incoming calls and messages. This terminal is available in black or white.

This terminal has a built-in data port that is available for analog devices. Each terminal requires a digital port.

✎ The DTR-2DT-1 TEL does not support adapters.

Basic Port Package

A maximum of 56 DTR-2DT-1 TELs can be installed in the Basic Port Package. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 239 DTR-2DT-1 TELs can be installed in the Expanded Port Package. The combined total of all Multiline Terminals that can be installed is 240.

Figure 8-1 DTR-2DT-1 TEL

2.2 DTR-4D-1 TEL

This digital display Multiline Terminal has four multifunction keys, four programmable line keys (each with a 2-color LED), nine function keys, two volume keys, four softkeys a built-in speakerphone, and a large LED to indicate incoming calls and messages. This terminal is available in black only.

Basic Port Package

A maximum of 56 DTR-4D-1 TELs can be installed in the Basic Port Package. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTR-4D-1 TELs can be installed in the Expanded Port Package. The combined total of all Multiline Terminals that can be installed is 240.

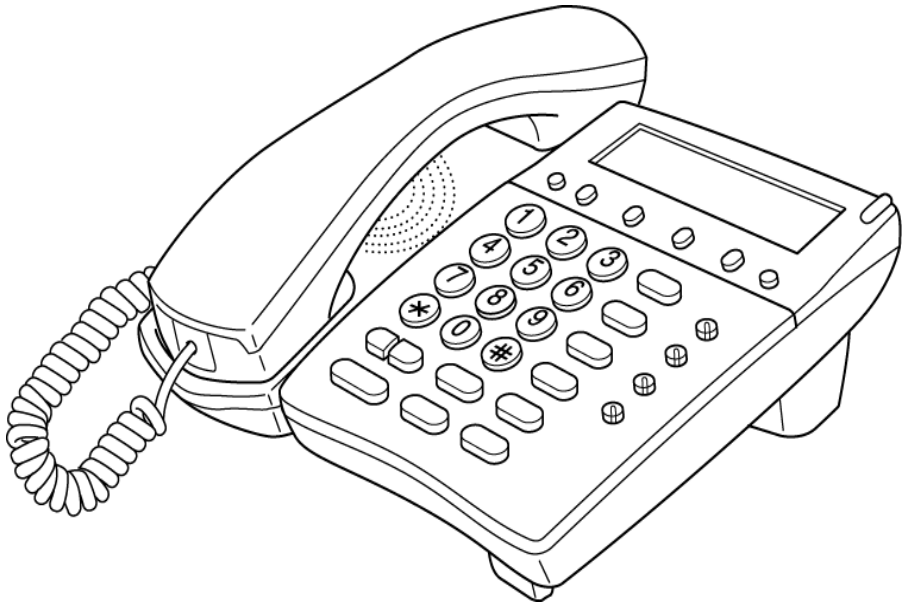


Figure 8-2 DTR-4D-1 TEL

2.3 DTH-8-1/2 TEL

This digital nondisplay Multiline Terminal has eight programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, or HF-R, Unit. This terminal is available in black or white.

The DTR-8-1/2 TEL is similar to the DTH-8-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-8-1/2 or DTR-8-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-8-1/2 or DTR-8-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

Figure 8-3 DTH-8-1 TEL Multiline Terminal

2.4 DTH-8D-1/2 TEL

This digital Multiline Terminal has eight programmable line keys (each with the 2-color LED), a built-in speakerphone, headset jack, a Large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, HF-R, or IP-R Unit. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTR-8D-1/2 TEL is similar to the DTH-8D-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-8D-1/2 or DTR-8D-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-8D-1/2 or DTR-8D-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

Figure 8-4 DTH-8D-1 TEL Multiline Terminal

2.5 DTH-16-1/2 TEL

This digital nondisplay Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, or HF-R, Unit. This terminal is available in black or white.

The DTR-16-1/2 TEL is similar to the DTH-16-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-16-1/DTR-16-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-16-1/2 or DTR-16-1/2 TELs can be installed in the Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

Figure 8-5 DTH-16-1 TEL Multiline Terminal

2.6 DTH-16D-1/2 TEL

This digital Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, HF-R, or IP-R Unit. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTR-16D-1/2 TEL is similar to the DTH-16D-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-16D-1/2 or DTR-16D-1/2 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-16D-1/2 or DTR-16D-1/2 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

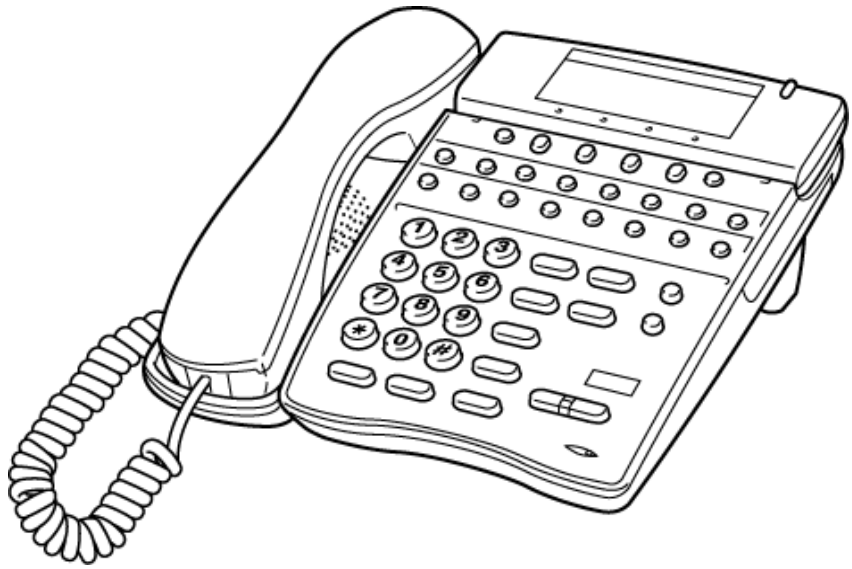


Figure 8-6 DTH-16D-1 TEL Multiline Terminal

2.7 DTH-16(BL)-1/2 TEL

This digital Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in half-duplex speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, HF-R, or IP-R Unit. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Back-Lighted (BL) Liquid Crystal Display (LCD) and four softkeys.

The DTR-16(BL)-1/2 TEL is similar to the DTH-16(BL)-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-16(BL)-1/2 or DTR-16(BL)-1/2 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-16(BL)-1/2 or DTR-16(BL)-1/2 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

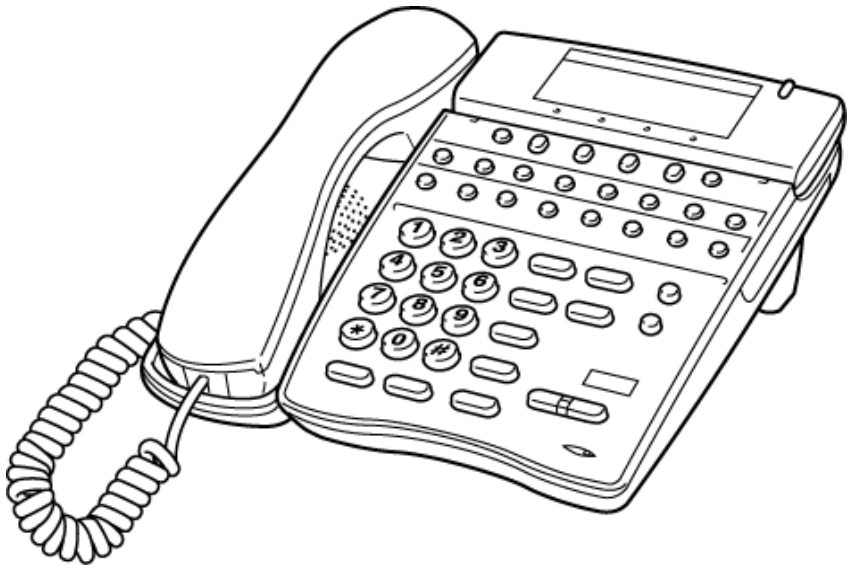


Figure 8-7 DTH-16(BL)-1 TEL Multiline Terminal

2.8 DTH-16LD-1/2 TEL

This digital Multiline Terminal has 16 programmable line keys, a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, HF-R or IP-R Unit. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

This terminal is equipped with two additional 8-character LCDs. These can be programmed to identify the line key designations.

The DTR-16LD-1/2 TEL is similar to the DTH-16LD-1/2 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-16LD-1/2 or DTR-16LD-1/2 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-16LD-1/DTR-16LD-1 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

Figure 8-8 DTH-16LD-1 TEL Multiline Terminal

2.9 DTH-32D-1 TEL

This digital Multiline Terminal has 32 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-R, AP(A)-R, AP(R)-R, CT(A)-R, CT(U)-R, HF-R, or IP-R Unit. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTR-32D-1 TEL is similar to the DTH-32D-1 TEL and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTH-32D-1/DTR-32D-1 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTH-32D-1/DTR-32D-1 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 240.

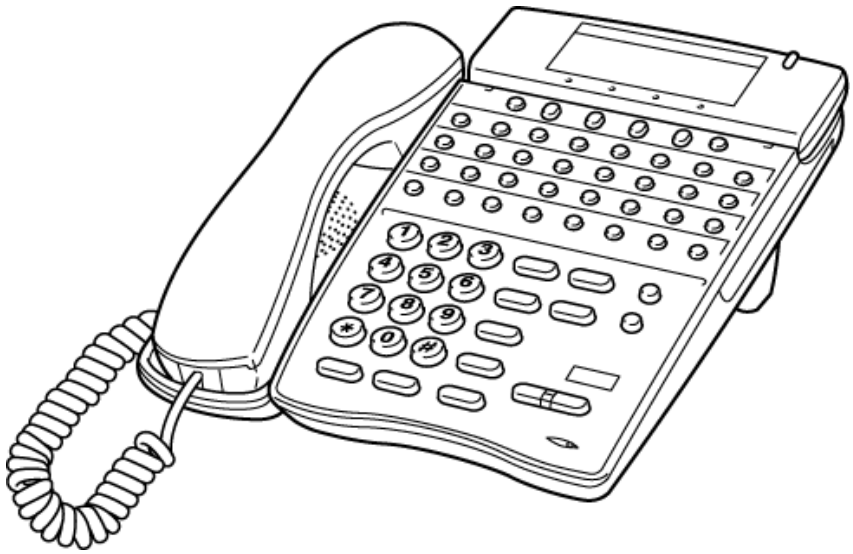


Figure 8-9 DTH-32D-1 TEL Multiline Terminal

2.10 ITR-4D-3 TEL

This IP Multiline Terminal has 4 programmable line keys (each with a 2-color LED), a built-in speakerphone, and a large LED to indicate incoming calls and messages. This terminal is available only in black.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

Basic Port Package

A maximum of 56 ITR-4D-3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Electra Elite IPK/IP Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 ITR-4D-3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Electra Elite IPK/IP Multiline Terminals that can be installed is 240.

✎ AC Adapter is required.

✎ Some headsets introduce hum or echo on IP terminals.

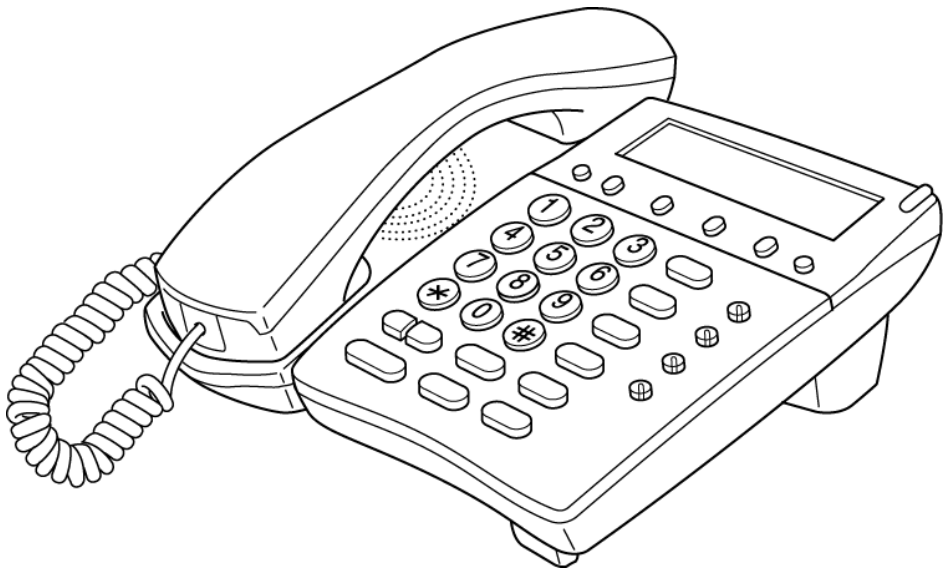


Figure 8-10 ITR-4D-3 TEL IP Multiline Terminal

2.11 ITH-8D-2/3 TEL

This IP Multiline Terminal has 8 programmable line keys (each with a 2-color LED), a built-in full-duplex speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-2R. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

Basic Port Package

A maximum of 56 ITH-8D-2/3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 256 ITH-8D-2/3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 256.

✎ AC Adapter is required.

✎ Some headsets introduce hum or echo on IP terminals.

Figure 8-11 ITH-8D-2/3 TEL Multiline Terminal

2.12 ITH-16D-2/3 TEL

This IP Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in full-duplex speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with AD(A)-2R. This terminal is available in black or white.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

Basic Port Package

A maximum of 56 ITH-16D-2/3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 256 ITH-16D-2/3 TELs can be installed in an Electra Elite IPK II system. The combined total of all Multiline Terminals that can be installed is 256.

✎ ACR or in-line power is required.

✎ Some headsets introduce hum or echo on IP terminals.

Figure 8-12 ITH-16D-2/3 TEL Multiline Terminal

2.13 DCR-60-1( ) Console

The Attendant Console has 60 programmable line keys (each with a 2-color LED). These 60 line keys can be programmed as 48 Direct Station Selection keys, 12 function keys, or as outside line keys. An AC adapter is required and provided with the Attendant Console.

Basic Port Package

A maximum of 32 DCR-60-1( ) Consoles can be installed in any Electra Elite IPK II system. An Attendant Position can have all 32 associated DCR-60-1( ) Consoles.

Expanded Port Package

A maximum of 32 DCR-60-1( ) Consoles can be installed in any Electra Elite IPK II system. An Attendant Position can have all 32 associated DCR-60-1( ) Consoles.

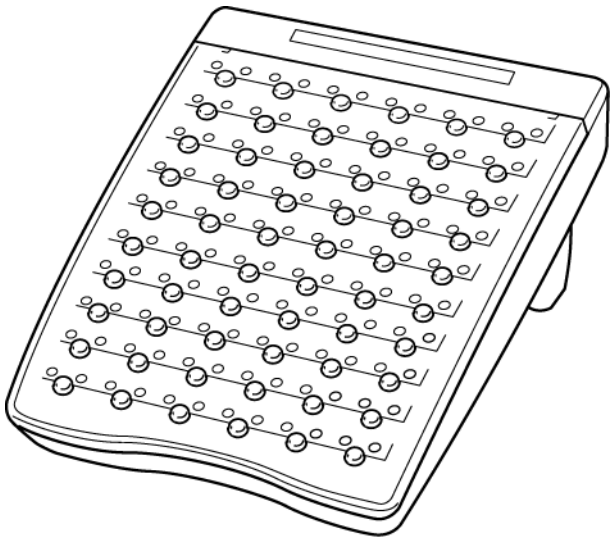


Figure 8-13 DCR-60-1( ) Console

SECTION 3 CONNECTING A MULTILINE TERMINAL TO THE SYSTEM

This instruction applies to all DTH/DTR/IP Electra Elite IPK Multiline Terminals except DTR-2DT-1 TEL.

1. Plug the telephone cord into the modular jack on the bottom side of the Multiline Terminal. The handset is also attached to the bottom side of the Multiline Terminal.

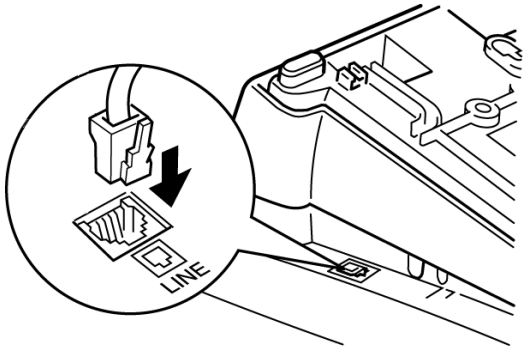


Figure 8-14 Connecting a Multiline Terminal to the System

2. Lead the telephone and handset cords through the appropriate grooves.

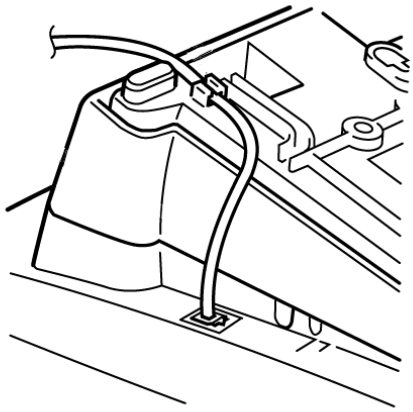


Figure 8-15 Leading Line Cords on a Multiline Terminal

SECTION 4 APPLYING POWER TO IP TERMINALS

The ITH-8D/16D-2 terminals support two different methods to power the terminal:

- AC-2R/AC-3R

  Plug the optional AC-2R/AC-3R AC Adapter input Jack in the terminal base unit, and plug the 2-prong wall plug of the AC Adapter in a standard 120 Vac wall outlet.

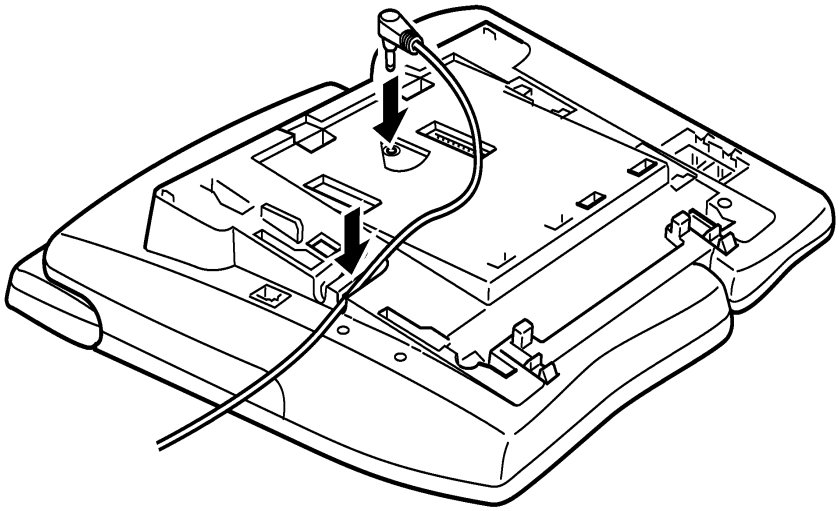


Figure 8-16 Plug in AC-2R/AC-3R Adapter

- In-Line Power/POE (Power Over Ethernet)

  In-Line Power (sometimes called Power Over Ethernet) is a LAN technology that allows standard 10/100 Base-T data cables to pass electrical current from a power source to a requesting end device.

  Refer to Table 8-1 Power Configuration Switch Settings (ITH-3) and Figure 8-17 Switch SW2 Position to allow different power sources for the ITH-8D/16D-3 terminals.

- Power Configuration Switch Settings

Table 8-1 Power Configuration Switch Settings (ITH-3)

Power Method	Equipment Used	Switch SW2 Position
NEC AC Adapter	AC-2R , AC-3R	1
IEEE 802.3af	any IEEE 802.3af compliant equipment	
Cisco Equipment (CDP)	Cisco In-Line Power Switches	2

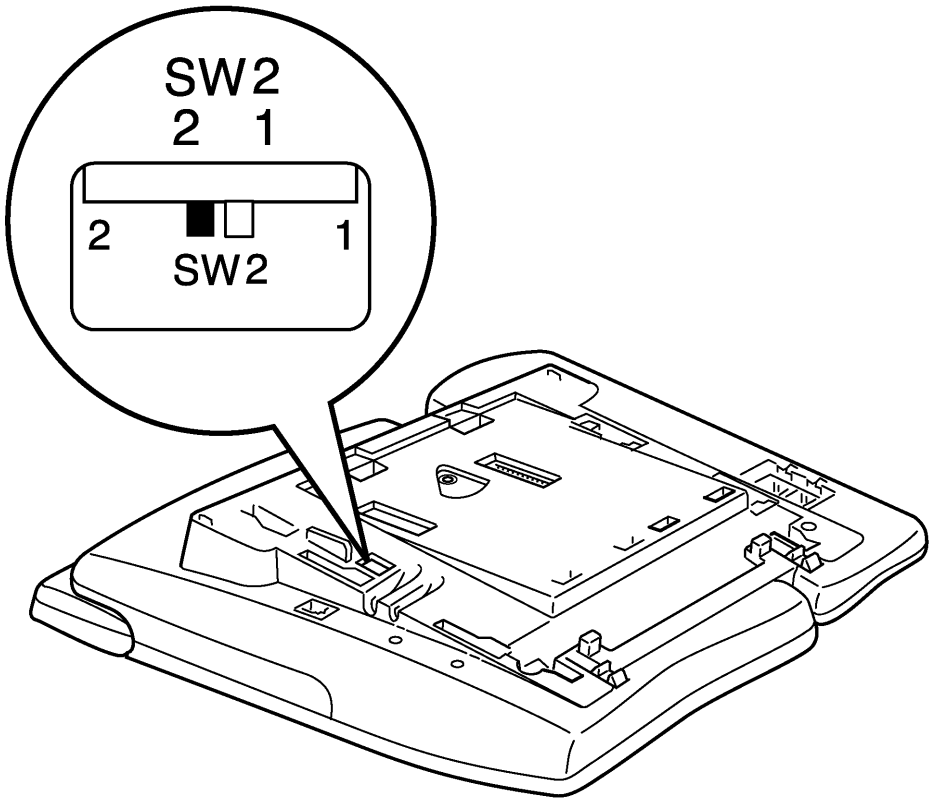
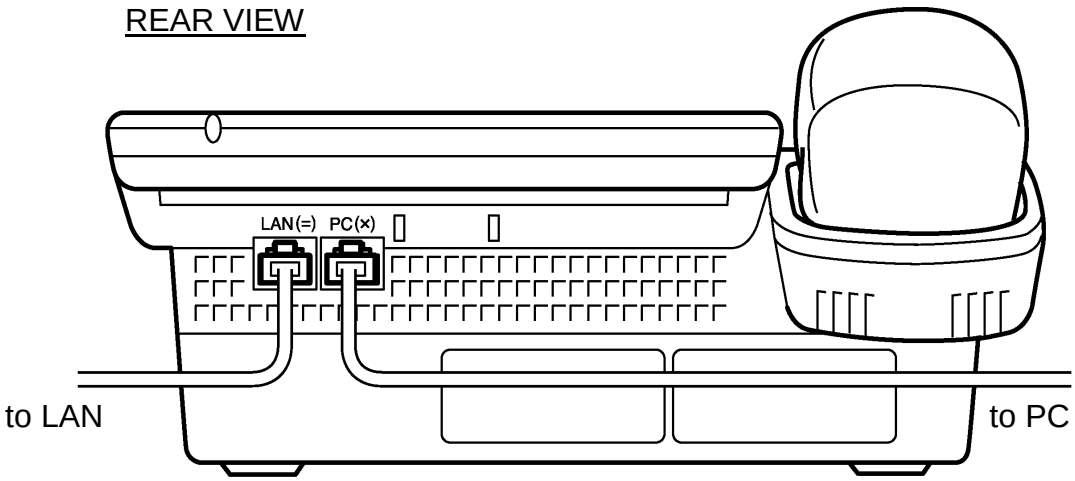


Figure 8-17 Switch SW2 Position

SECTION 5 CONNECTING AN IP MULTILINE TERMINAL TO THE NETWORK AND PC

These instructions for connecting an IP Multiline Terminal to the Network and PC apply to ITH-8D/16D-2/3 Multiline Terminals. Refer to Figure 8-18 IP Terminal Rear Connector Locations.

1. Connect the LAN Network 10/100 Base-T cable to the LAN (=) connector.
2. The IP terminal has a switching HUB to connect a PC to the LAN Network. Connect the 10/100 Base-T/TX straight cable used for this connection to the PC(x) connector and to the PC.



Note: *The PC connector on the IP terminal is exclusively for a PC connection, not a second IP terminal.*

Figure 8-18 IP Terminal Rear Connector Locations

Refer to Figure 8-19 Typical Network IP Connection.

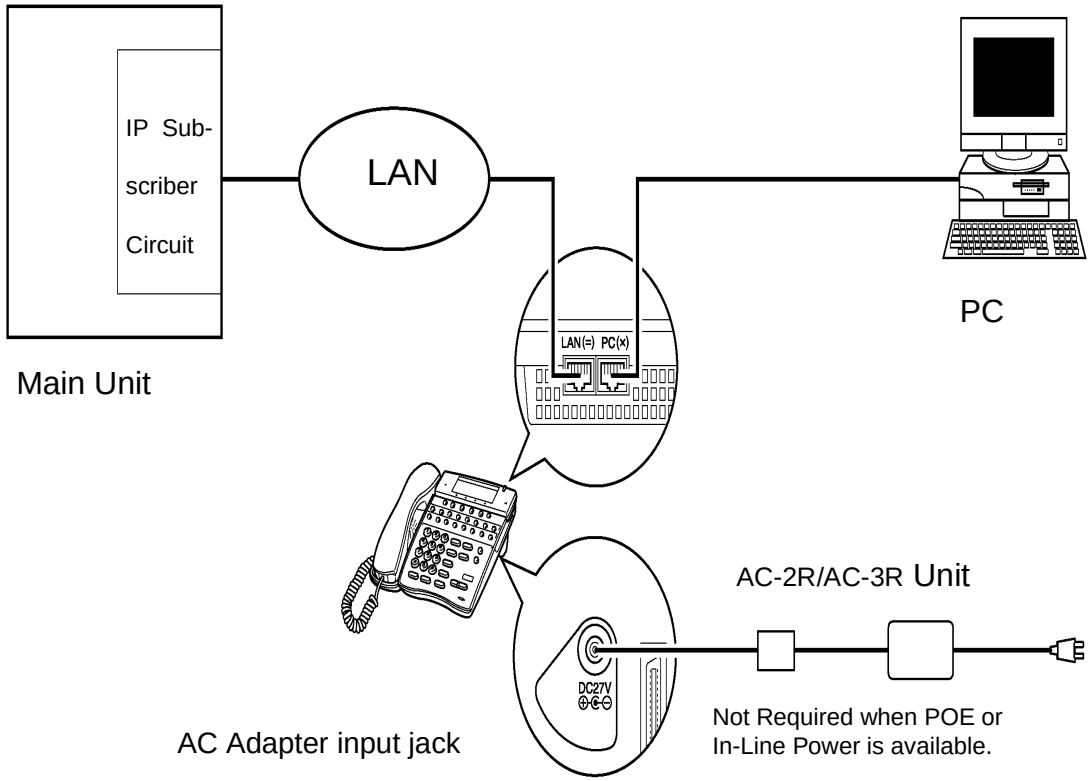


Figure 8-19 Typical Network IP Connection

SECTION 6 CONNECTING THE ATTENDANT CONSOLE TO A MULTILINE TERMINAL

An Attendant DCR-60-1 Console can be attached to a Multiline Terminal using the following procedure.

1. Place the Multiline Terminal and the Attendant Console face down.
2. Using the joining plate provided with the Attendant Console, attach the plate to the Multiline Terminal and the Attendant Console.

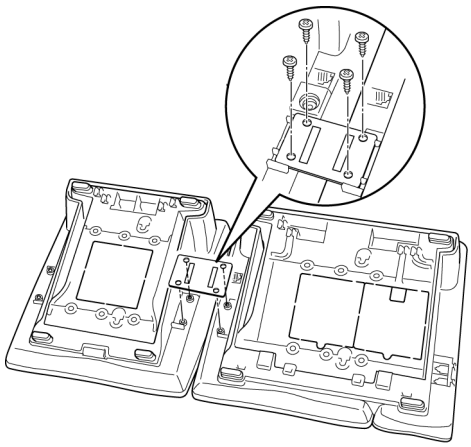


Figure 8-20 Connecting the DCR Console to a Multiline Terminal

3. Connect the line cord and the AC adapter to the indicated locations on the bottom of the Attendant Console.

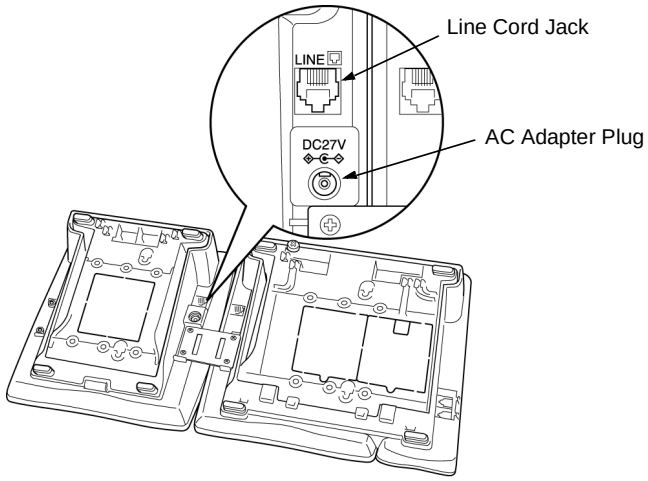


Figure 8-21 Connecting the Line Cord and AC Adapter when Installing a DCR Attendant Console

4. When the Attendant Console and the Multiline Terminal are properly connected, they sit side-by-side as shown in Figure 8-22 Attendant Console and Multiline Terminal.

   ✎ Use only the AC adapter, provided with the Attendant Console. Using a different AC adapter may cause problems. Check that the supplied voltage matches that specified for the adapter and plug it in an outlet.

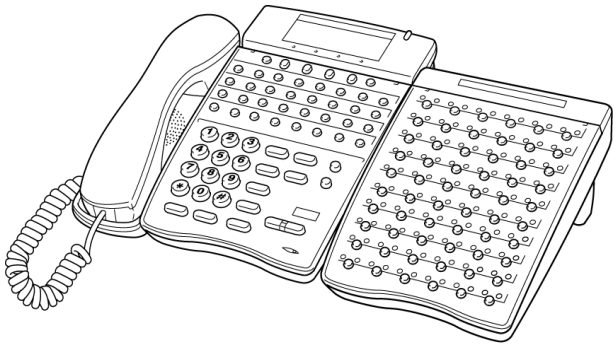


Figure 8-22 Attendant Console and Multiline Terminal

SECTION 7 ADJUSTING THE LCD ON A MULTILINE TERMINAL

Electra Elite IPK II display Multiline Terminals have an adjustable Liquid Crystal Display (LCD). The LCD can be adjusted by pulling up or pushing down as desired.

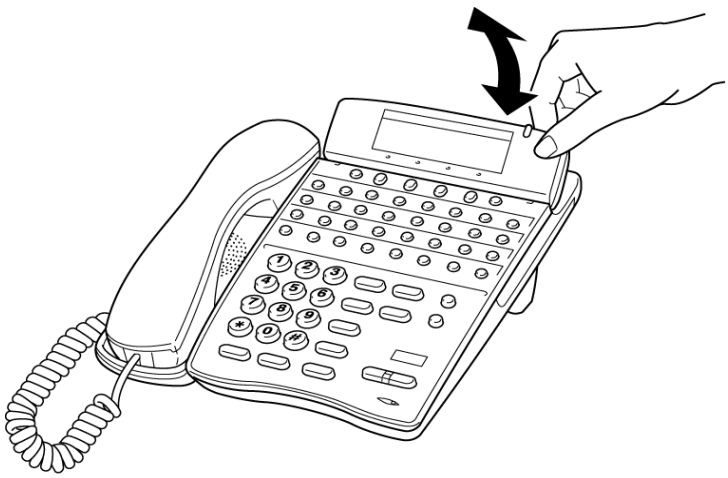


Figure 8-23 Adjusting the LCD on a Multiline Terminal

SECTION 8 INSTALLING LINE CARDS AND PLASTIC PANELS

8.1 Installing the Line Card and Plastic Panel

Line key designations are entered on the line card that is then placed on the telephone to provide a quick reference of key designations. The line cards can be changed as necessary. The plastic panel is placed on top of the line card to hold it in place.

1. Place the line card over the keys on the Multiline Terminal.

   ✎ When replacing an existing plastic panel or line card refer to paragraph 8.2 Removing the Plastic Panel.

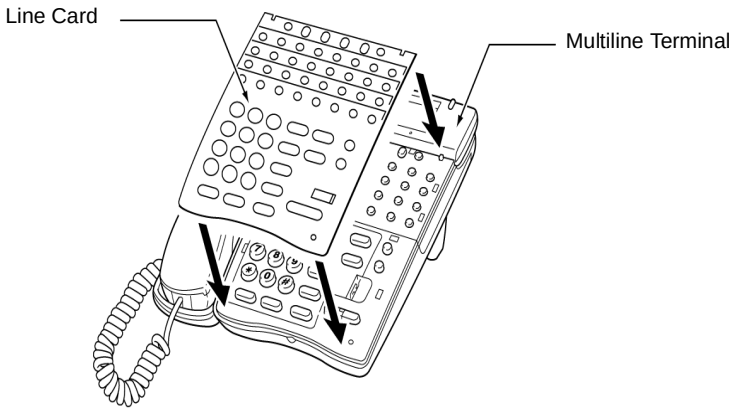


Figure 8-24 Installing Line Card and Plastic Panel on a Multiline Terminal

2. Place the plastic panel over the line card and push the corners of the plastic panel until they click into place.

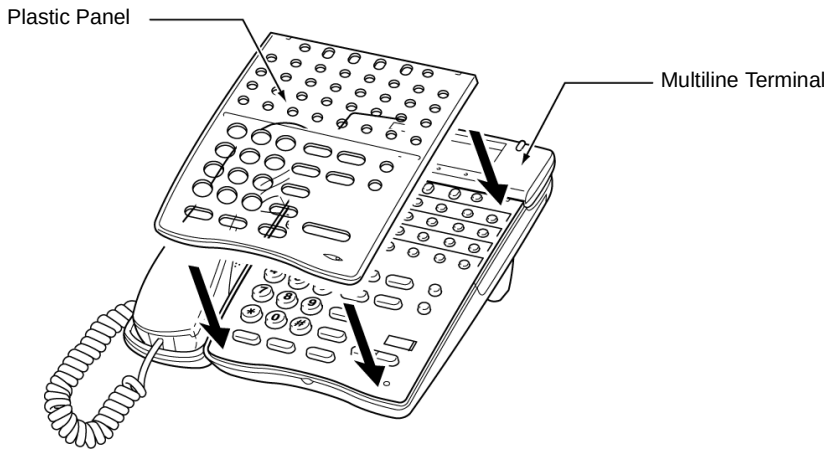


Figure 8-25 Installing Plastic Panel on a DTH/DTR Multiline Terminal

8.2 Removing the Plastic Panel

Lift up on the plastic panel as illustrated in Figure 8-26 Removing the Plastic Panel from the Multiline Terminal and remove it from the telephone.

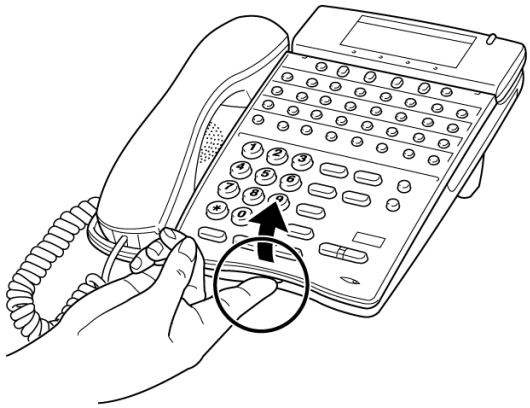


Figure 8-26 Removing the Plastic Panel from the Multiline Terminal

SECTION 9 INSTALLING A DIRECTORY CARD ON A MULTILINE TERMINAL

A directory card can be attached to DTH/DTR/ITH Multiline Terminals. The directory card can be used to record often dialed numbers or other important information.

1. After recording the information on the lined insert, reinsert it between the plastic panels of the directory card. Attach the directory card to the directory card holder as illustrated in Figure 8-27 Attaching Directory Card to Directory Card Holder. Note that the open end slides into the directory card holder.

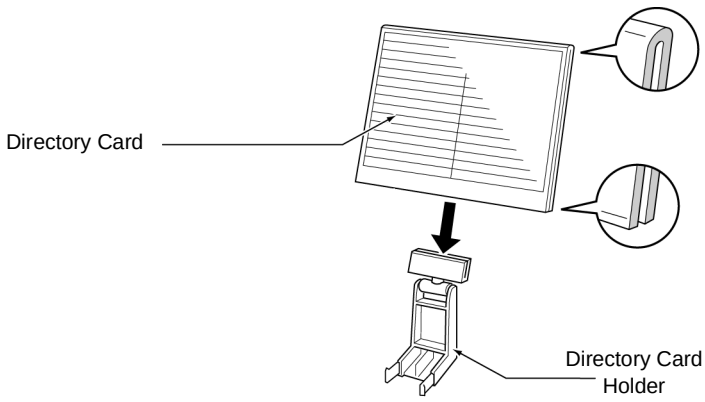


Figure 8-27 Attaching Directory Card to Directory Card Holder

2. Locate the two grooves on the top of the telephone as illustrated in Figure 8-28 Attaching Directory Card Holder to the Multiline Terminal. Push the directory card holder into the grooves on the Multiline Terminal until they snap into place.

   ✎ To remove the directory card, press the two sides of the directory card holder inward until the tabs release and pull the holder out of the grooves.

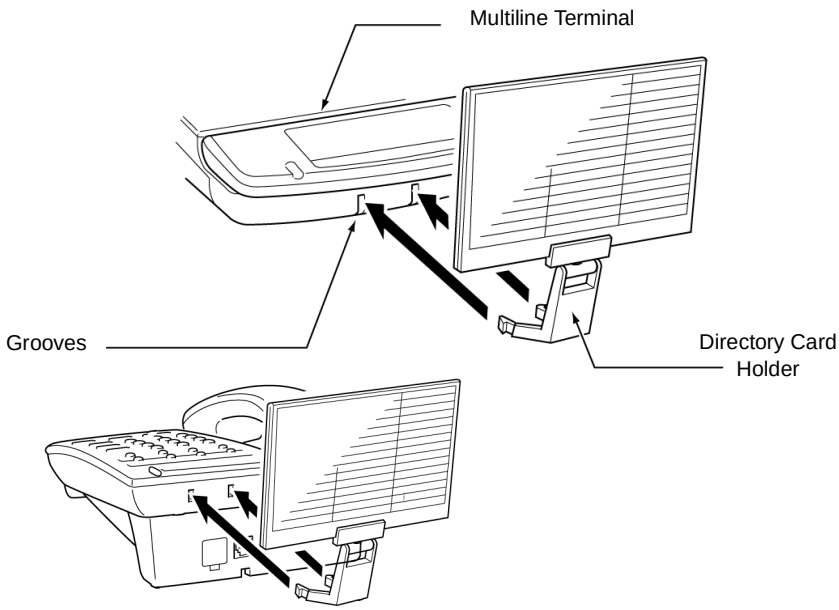


Figure 8-28 Attaching Directory Card Holder to the Multiline Terminal

SECTION 10 INSTALLING A BUTTON SET ON A MULTILINE TERMINAL

The BS( )-R Unit button set can be installed on a Multiline Terminal to accommodate French and Spanish languages. The keypad provides the appropriate language designations.

1. Remove the plastic cover. (Refer to paragraph 8.2 Removing the Plastic Panel on page 8-23.)

2. Pull up on the tab and lift the button pad away from the telephone to remove the existing button.

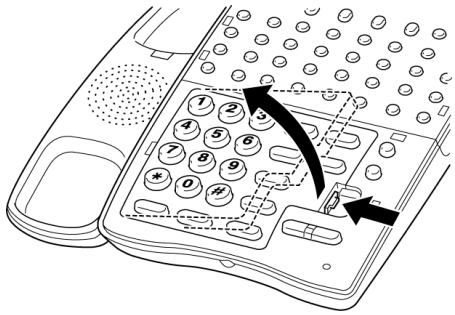


Figure 8-29 Removing the Button Set from a Multiline Terminal

3. Slide the new button set into the grooves located on the inside of the telephone, then press down on the button set to snap it into place.

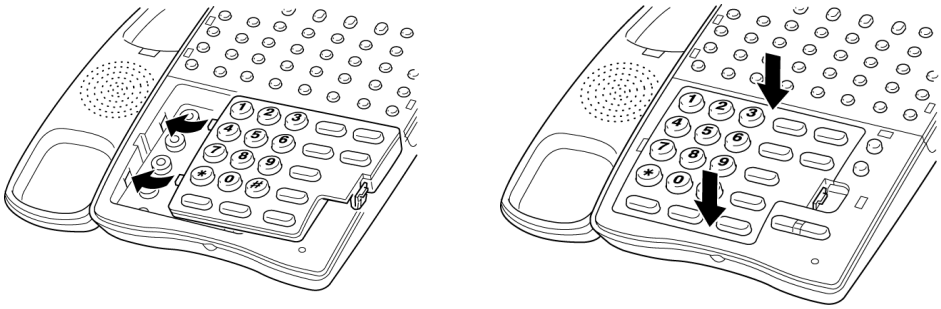


Figure 8-30 Inserting a New Button Set into a Multiline Terminal

4. Insert the line card and plastic panel on the Multiline Terminal.

SECTION 11 ADJUSTING THE HEIGHT ON A MULTILINE TERMINAL

The base plate on the Multiline Terminal is hinged to allow the height of the terminal to be raised or lowered.

1. Grasp in the middle of the hollow spaces at the top and pull up until the retaining tabs click to raise the base plate. Refer to Figure 8-31 Raising the Height on the DTH/DTR/ITH Multiline Terminal.

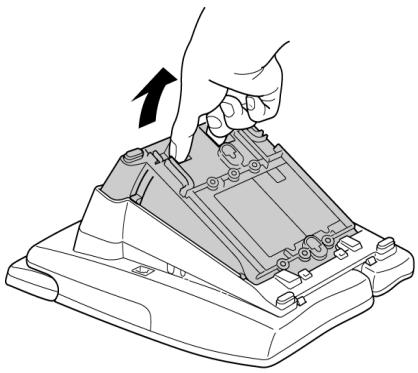


Figure 8-31 Raising the Height on the DTH/DTR/ITH Multiline Terminal

2. After the height is adjusted, pull the line cord though the groove in the bottom of the Multiline Terminal and adjust it.

3. Push on the adjustment tabs on the side of the stand and push downward to lower the base plate. Refer to Figure 8-32 Lowering the Base Plate on the Multiline Terminal.

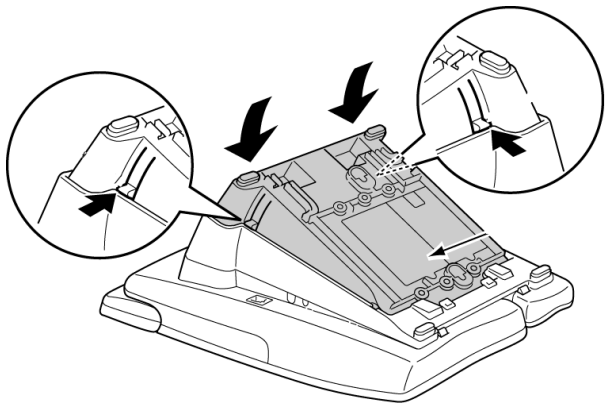


Figure 8-32 Lowering the Base Plate on the Multiline Terminal

SECTION 12 REMOVING OR INSTALLING THE BASE PLATE ON A MULTILINE TERMINAL

DTH/DTR/ITH Multiline Terminals come equipped with a base cover.

12.1 Removing the Base Plate

1. Extend the base plate to maximum height.

2. Press the tabs as illustrated in Figure 8-33 Removing Base Plate, and slide the base cover in the direction of the arrows until it clicks.

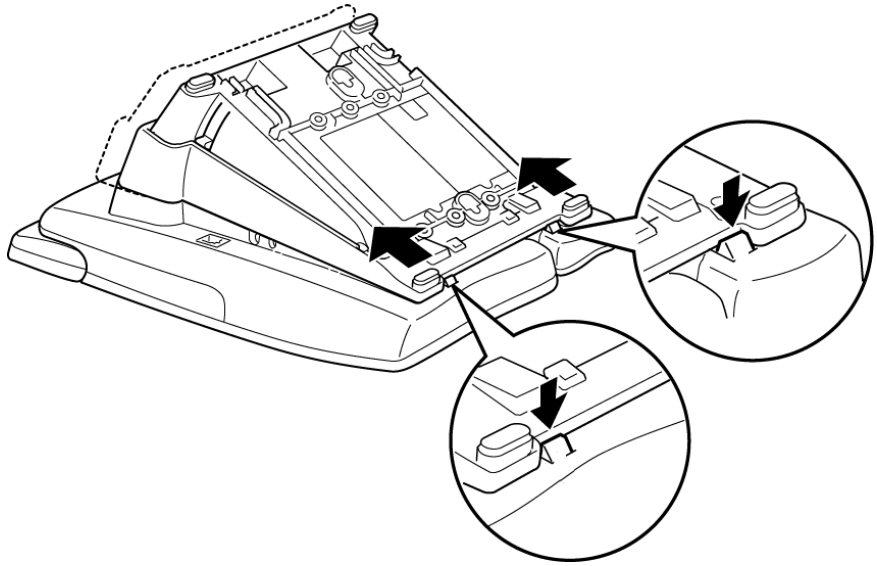


Figure 8-33 Removing Base Plate

12.2 Installing the Base Plate

1. Line up the four tabs on the extended base cover with corresponding slots on the Multiline Terminal as illustrated in Figure 8-34 Installing Base Plate.

2. Slide the cover in the direction of the arrows until it clicks in place.

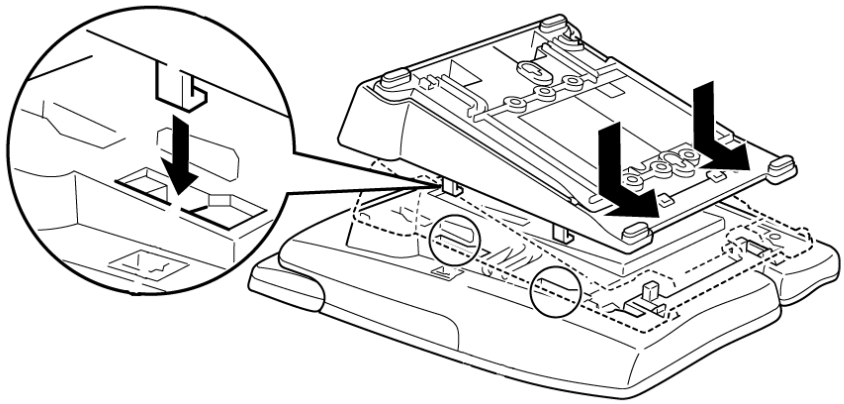


Figure 8-34 Installing Base Plate

SECTION 13 WALL MOUNTING MULTILINE TERMINALS

You can wall mount a DTH/DTR/IP connection Multiline Terminal (except for DTR-2D-1 TEL) using the base cover or an optional wall mount unit. A wall mount unit must be used if adapters are installed on the Multiline Terminal.

13.1 Wall Mounting a Multiline Terminal using the Base Plate

13.1.1 Adjusting the Hanger Hook

1. Remove the hook from the unit.

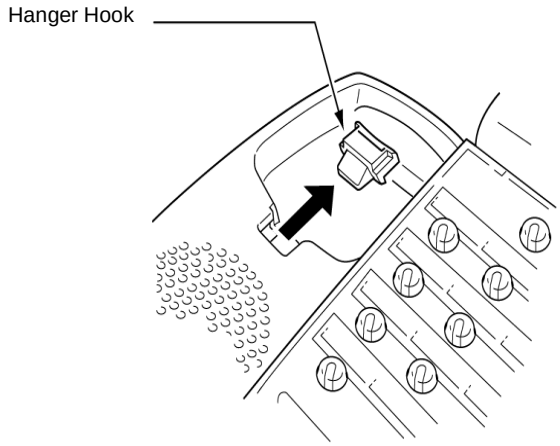


Figure 8-35 Removing the Hanger Hook on a Multiline Terminal

2. Turn the hook with the tab toward the top.

3. Slide the hook until it glides into position forming the hanger hook for the handset.

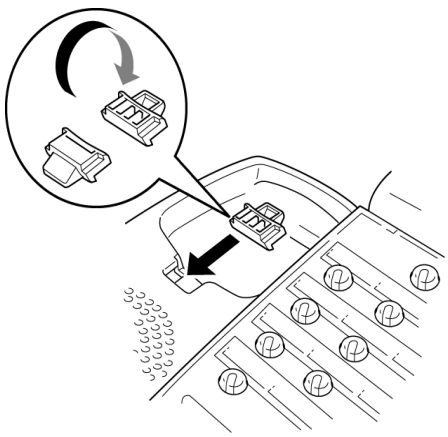


Figure 8-36 Sliding the Hanger Hook into Position

13.1.2 Wall Mounting the Telephone

1. Extend and remove the base cover from the telephone. Refer to Section 12 Removing or Installing the Base Plate on a Multiline Terminal.

2. Remove cutout shown in Figure 8-37 Removing the Cutout.

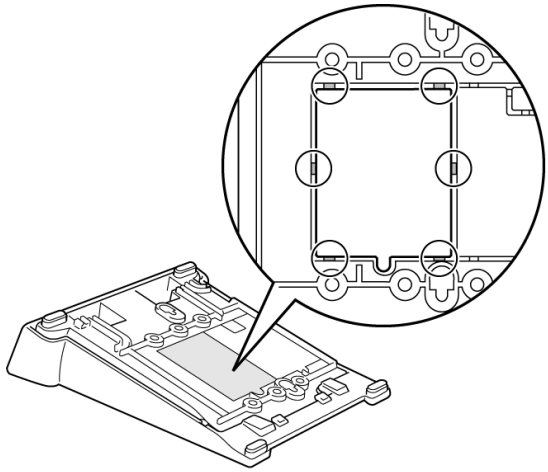


Figure 8-37 Removing the Cutout

3. Plug line cord in the wall receptacle. Leave about 8 inches of cord and bundle the rest as shown in Figure 8-38 Bundling the Line Cord.

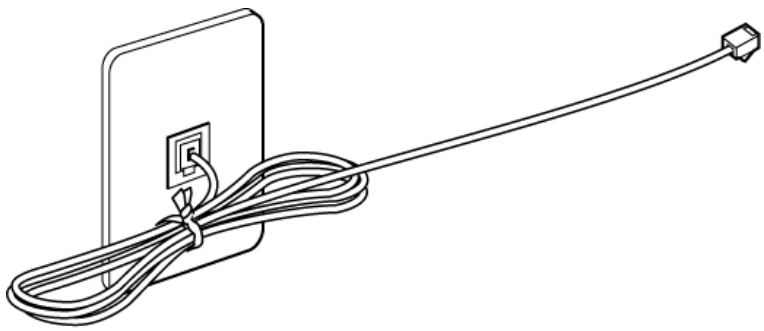


Figure 8-38 Bundling the Line Cord

4. Turn the base cover upside down, feed the line cord through the cutout and attach the cover to the wall using six screws as shown in Figure 8-39 Wall Mounting the Base Plate.

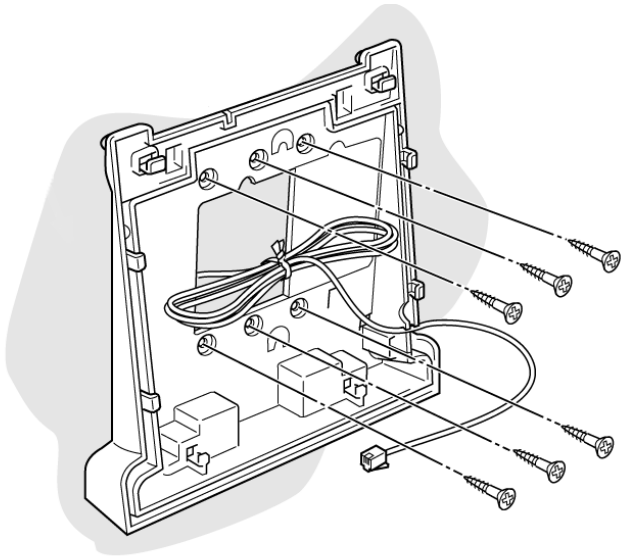


Figure 8-39 Wall Mounting the Base Plate

5. Install the Multiline Terminal over the four tabs on the base cover, and push down until it clicks in place.

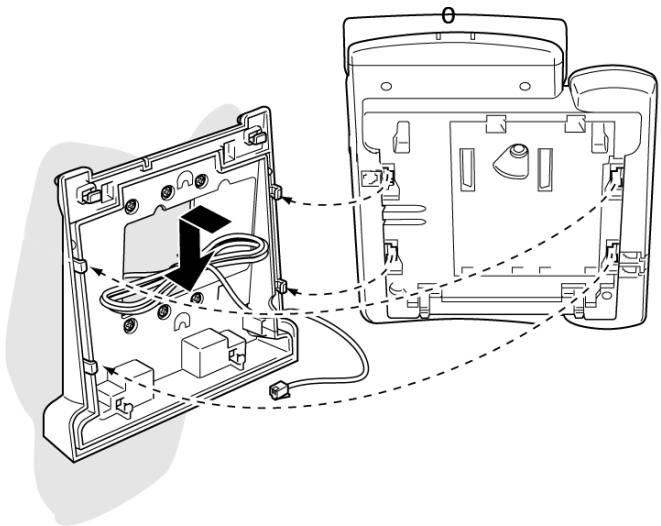


Figure 8-40 Installing the Multiline Terminal

6. Plug the line cord into the Multiline Terminal as illustrated in Figure 8-41 Plugging in Line Cord.

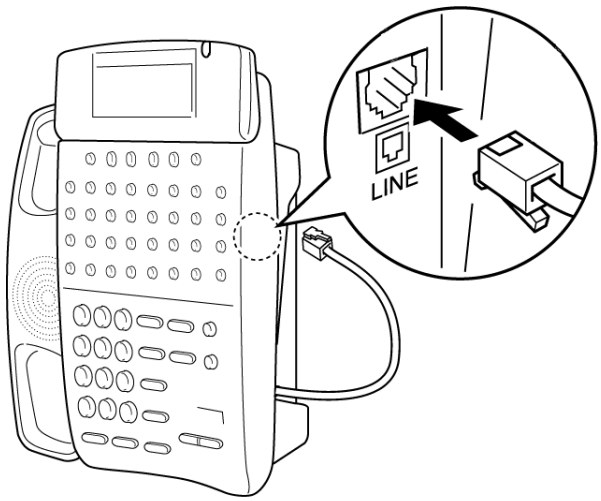


Figure 8-41 Plugging in Line Cord

7. Push spare line cord behind the Multiline Terminal as shown in Figure 8-42 Hiding Excess Cord.

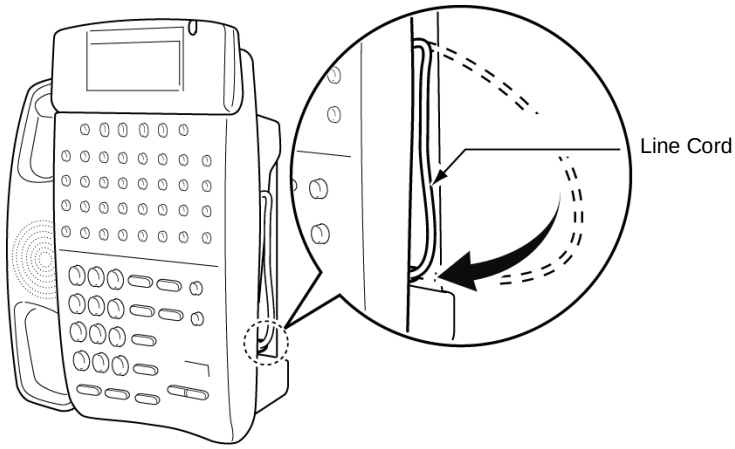


Figure 8-42 Hiding Excess Cord

13.1.3 Removing the Wall Mounted Multiline Terminal from the Base Plate

To remove the Multiline Terminal, press the tabs at the bottom as shown in Figure 8-43 Removing the Multiline Terminal, and push up on the Telephone until it comes loose.

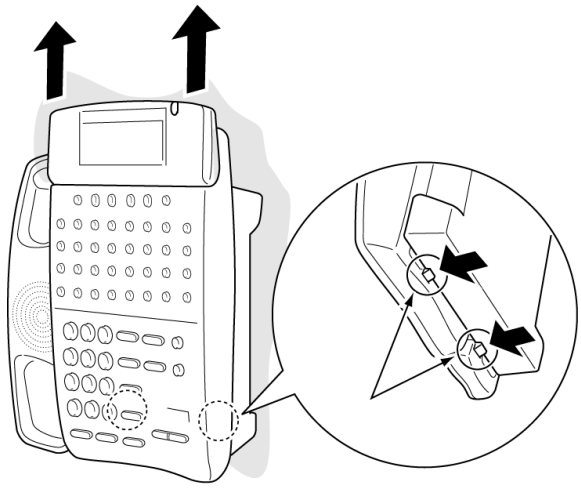


Figure 8-43 Removing the Multiline Terminal

13.1.4 Wall Mounting the Base Plate on a Switch Box

1. Locate the screw holes on the base cover and hang the cover over the screws on the switch box as illustrated in Figure 8-44 Wall Mounting Base Plate on Switch Box.

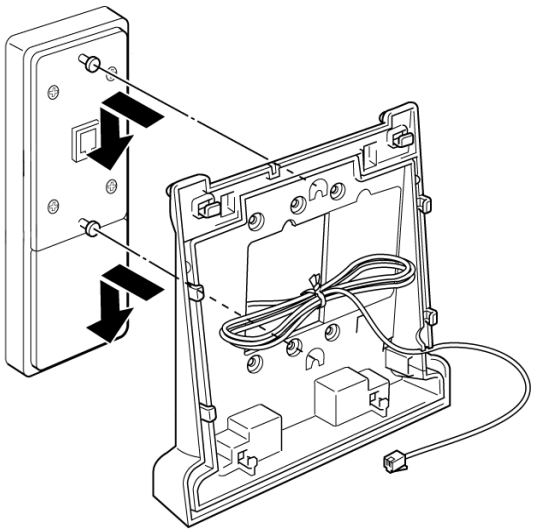


Figure 8-44 Wall Mounting Base Plate on Switch Box

2. Hang the Multiline Terminal on the base cover.

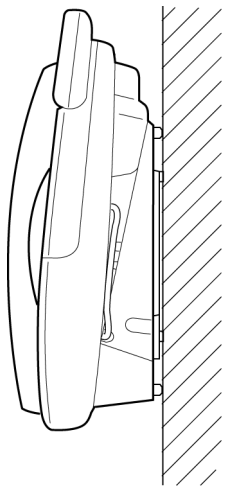


Figure 8-45 Wall Mounted Multiline Terminal

✎ Because of strength variation in switch boxes, this method is not recommended.

SECTION 14 INSTALLING ITH-4D-3 *D*^{term} IPK TERMINALS

14.1 Description

This Terminal has four programmable line keys (each with a 2-color LED), a built-in speakerphone, a large LED to indicate incoming calls and messages, a 3-line, 24-character LCD display, and four softkeys. Refer to Figure 8-46 ITH-4D-3 Terminal.

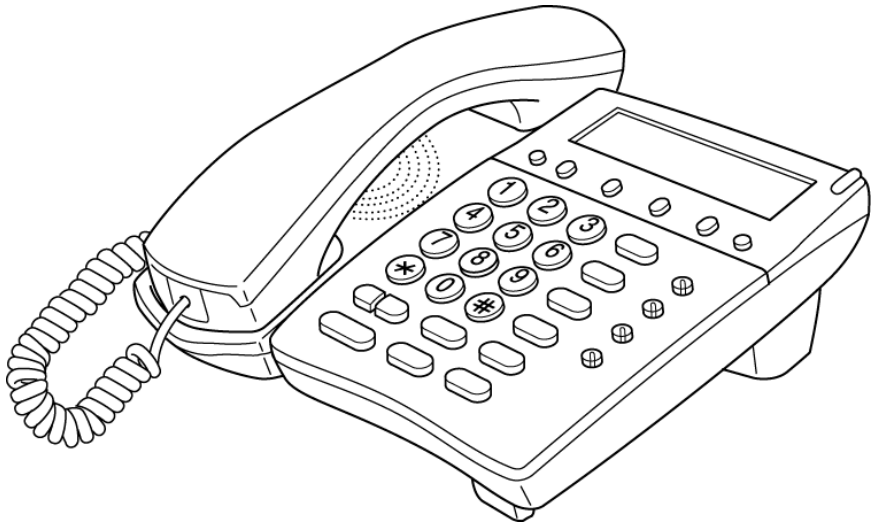


Figure 8-46 ITH-4D-3 Terminal

14.2 Power Source

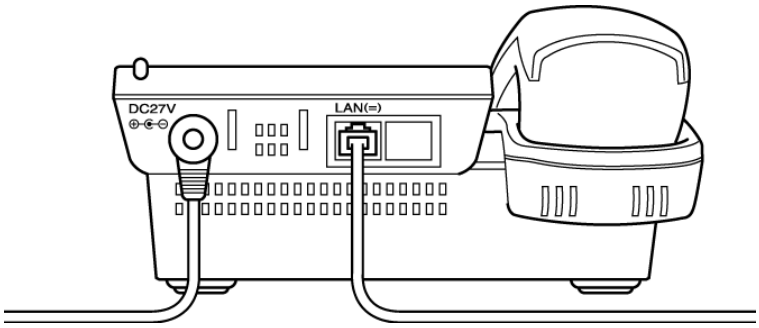
Two power sources are possible. Refer to Figure 8-47 ITH-4D-3 Power Sources.

14.2.1 AC-2R/AC-3R

The AC Adapter is not included.

14.2.2 Power Over Ethernet (POE)

Use IEEE802.3af compatible power over Ethernet.



AC Adapter Ethernet

Figure 8-47 ITH-4D-3 Power Sources

14.3 Connecting the IP Terminal to the System

Refer to Figure 8-48 Connecting the Terminal to the System, and connect a 10/100 Base-T/TX cable to each IP terminal and to the networking equipment.

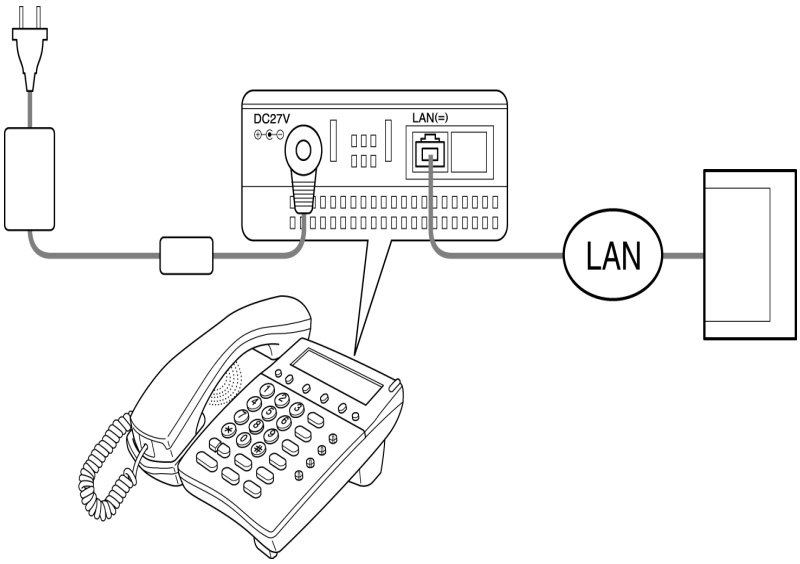


Figure 8-48 Connecting the Terminal to the System

14.4 Installing Line Cards and Plastic Panels

Line key designations are entered on a line card that is placed on the terminal to provide quick line-key reference. The line card can be changed when necessary. The plastic panel is placed on top of the line card to hold it in place. To change line card:

1. Refer to Figure 8-49 Removing Plastic Panel, and lift up on the plastic panel to remove it.

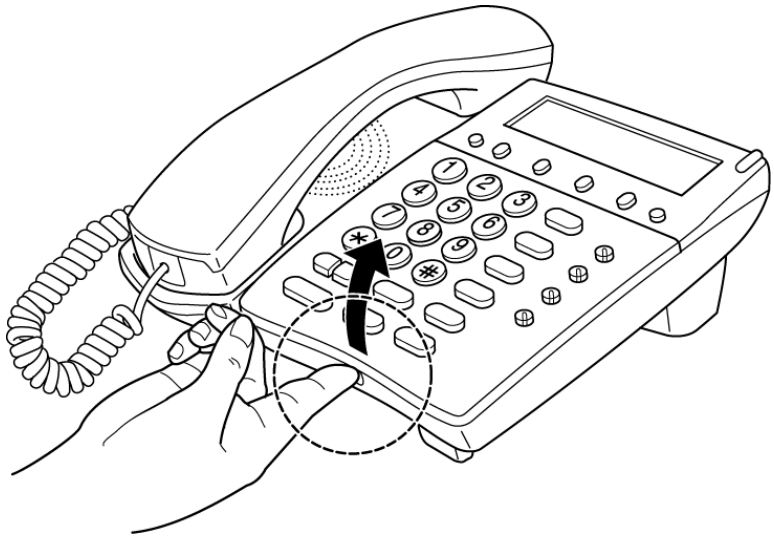


Figure 8-49 Removing Plastic Panel

2. Refer to Figure 8-50 Installing New Line Card, and place new line card over the keys on the Terminal.

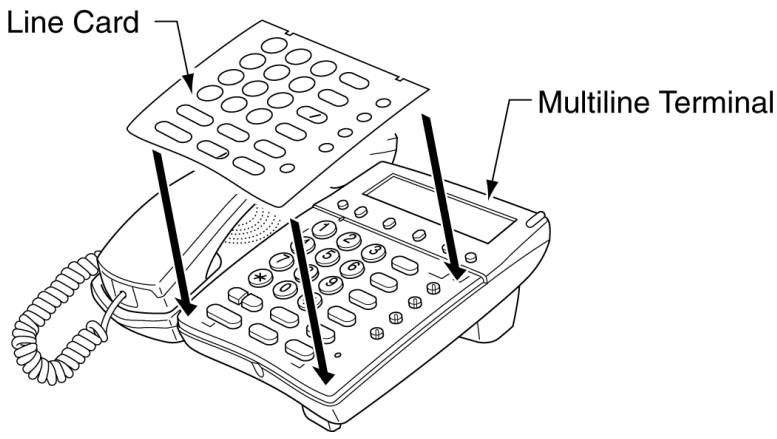


Figure 8-50 Installing New Line Card

3. Refer to Figure 8-51 Connecting Terminal to the System, place the plastic panel over the Line Card, and push down the corners until they click into place.

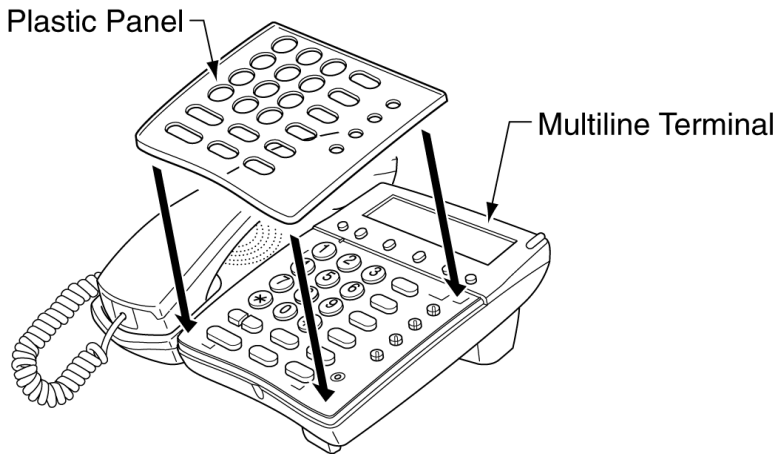


Figure 8-51 Connecting Terminal to the System

14.5 Removing the Base Cover

The height of the Multiline Terminal can be lowered by removing the Base Cover:

1. Turn the Multiline Terminal upside down, refer to Figure 8-52 Pressing Knob to Release Base Cover, and press on the knob to release the Base Cover.

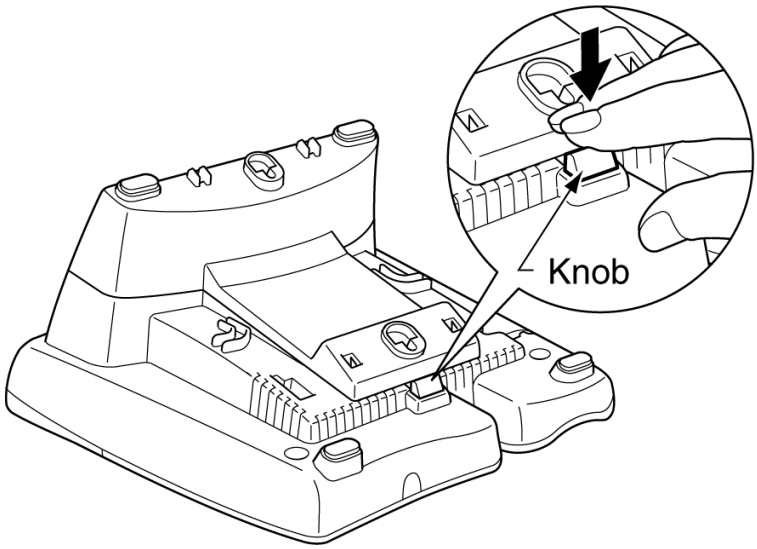


Figure 8-52 Pressing Knob to Release Base Cover

2. Refer to Figure 8-53 Removing Base Cover, and pull up on the Base Cover to remove it.

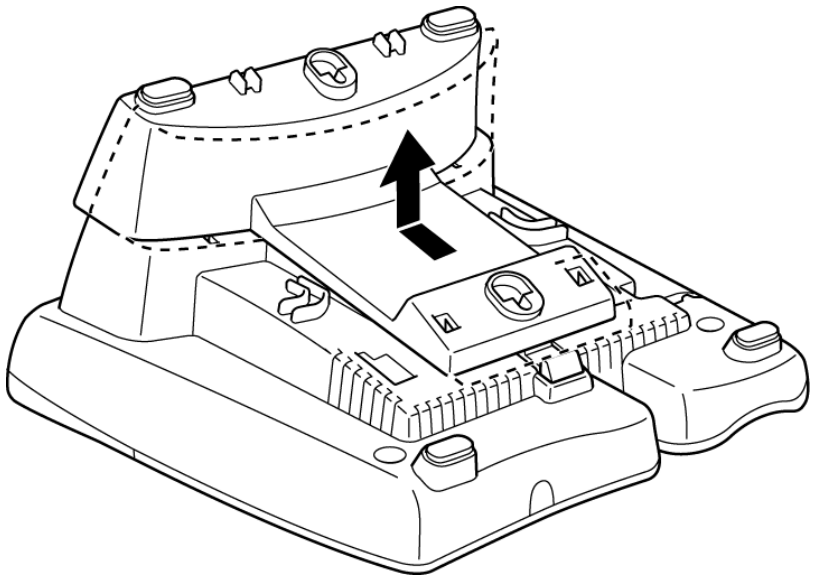


Figure 8-53 Removing Base Cover

3. To replace the Base Cover, refer to Figure 8-54 Lining up Tabs and Slots, and line up the tabs and slots.

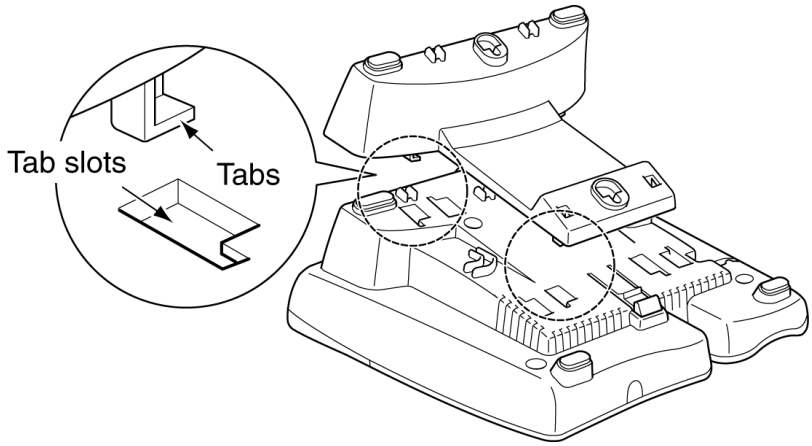


Figure 8-54 Lining up Tabs and Slots

4. Refer to Figure 8-55 Installing Base Cover, Press down on the base cover and move it toward the knob until it clicks in place.

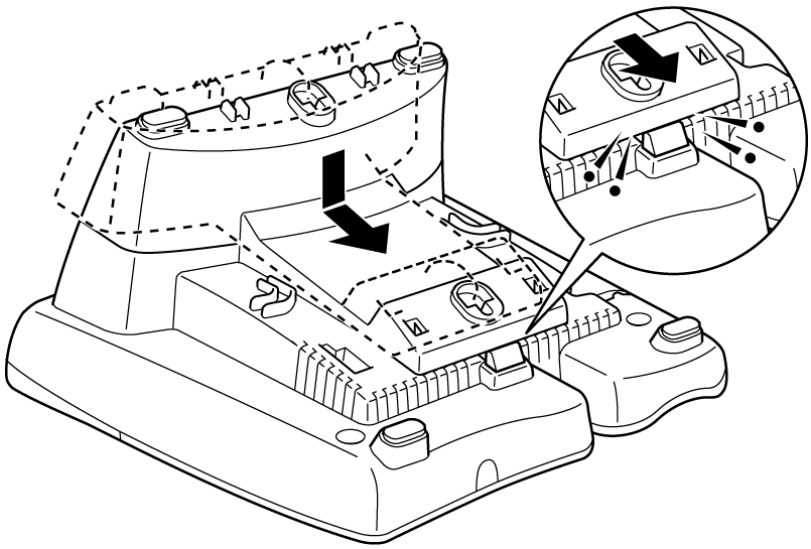


Figure 8-55 Installing Base Cover

14.6 Wall Mounting ITH-4D-3 Multiline Terminals

The ITH-4D-3 terminal can be installed on the wall either by using a switch box or by direct connection.

14.6.1 Using a Switch Box

1. Remove the Base Cover, and hook it on a switch box as shown in Figure 8-56 Attaching Base Cover to Switch Box.

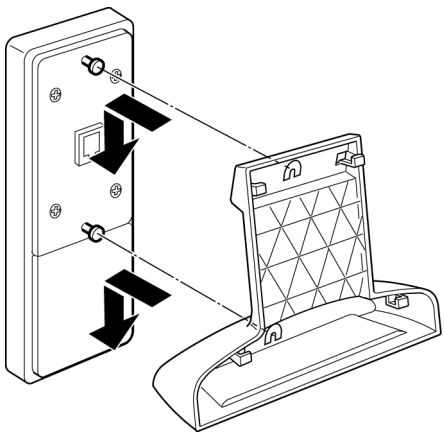


Figure 8-56 Attaching Base Cover to Switch Box

2. Attach the terminal to the Base Cover as shown in Figure 8-57 Installing Terminal on Base Cover.

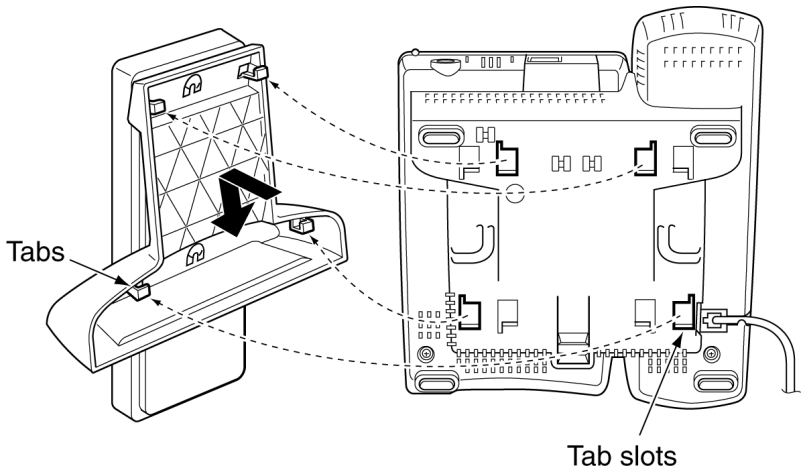


Figure 8-57 Installing Terminal on Base Cover

14.6.2 Installing Base Cover Directly to the Wall

1. Remove Base Cover and clip off the notches as shown on Figure 8-58 Clipping Off Notches.

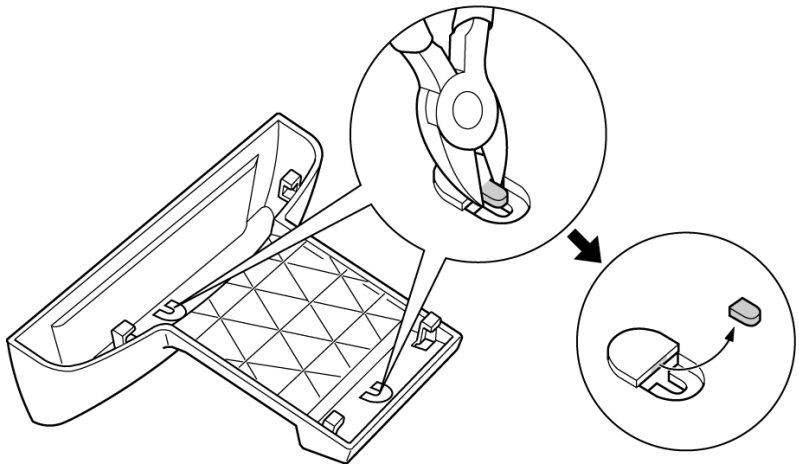


Figure 8-58 Clipping Off Notches

2. Connect the Base Cover to the wall as shown on Figure 8-59 Using Screws to Attach Base Cover To Wall.

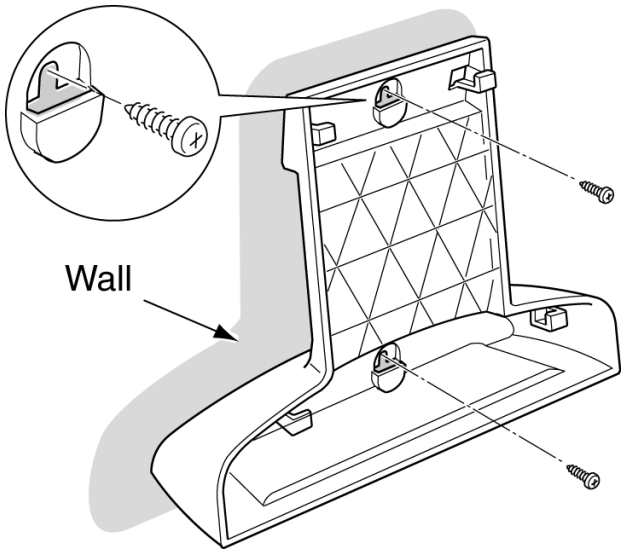


Figure 8-59 Using Screws to Attach Base Cover To Wall

3. Install the terminal on the Base Cover as shown on Figure 8-60 Connecting Terminal to the Base Cover. To remove the Terminal from the wall, press the knob used to unlatch the base cover and push the terminal up until it disconnects.

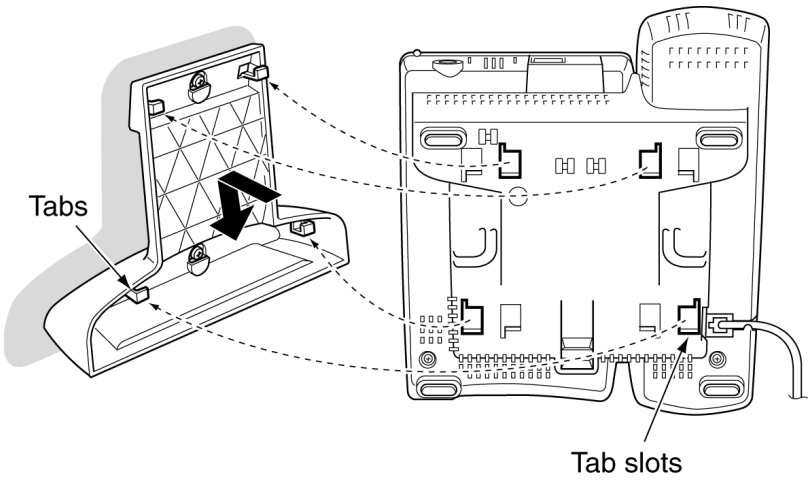


Figure 8-60 Connecting Terminal to the Base Cover

SECTION 15 WALL MOUNTING A MULTILINE TERMINAL USING THE WALL MOUNT UNIT (WM-R UNIT)

The Wall Mount Unit is used to attach any DTH/DTR/IP connection Multiline Terminal (except the DTR-2DT-1 TEL and the ITR-4D-3 TEL) to the wall. This unit connects to the back side of the telephone.

When adapters are used, the Multiline Terminal must be installed on the wall using the WM-R Unit.

1. Plug line cord in the wall receptacle. Leave about 8 inches of cord and bundle the rest.

2. Feed the line cord through the opening in the wall mount unit as illustrated in Figure 8-61 Attaching the Wall Mount Unit to the Wall.

3. Attach the WM-R Unit using six screws.

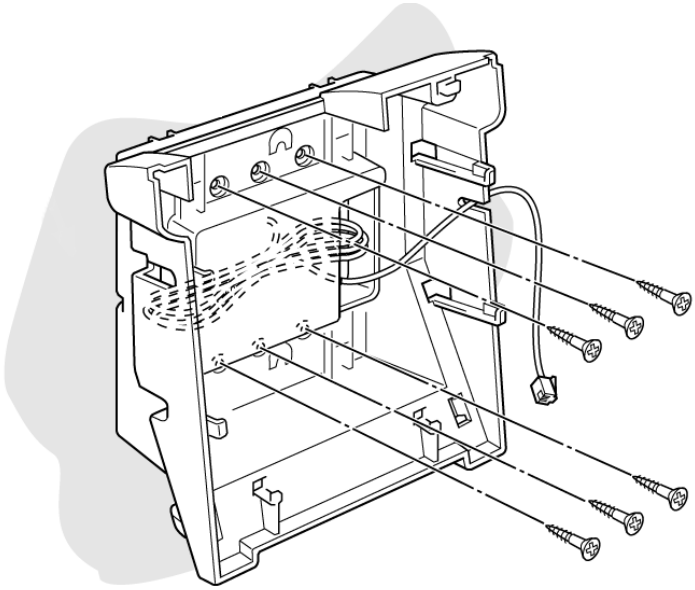


Figure 8-61 Attaching the Wall Mount Unit to the Wall

4. Install the Multiline Terminal over the four tabs on the base cover, and push down until it clicks in place as illustrated in Figure 8-62 Attaching the Multiline Terminal to the Wall Mount Unit.

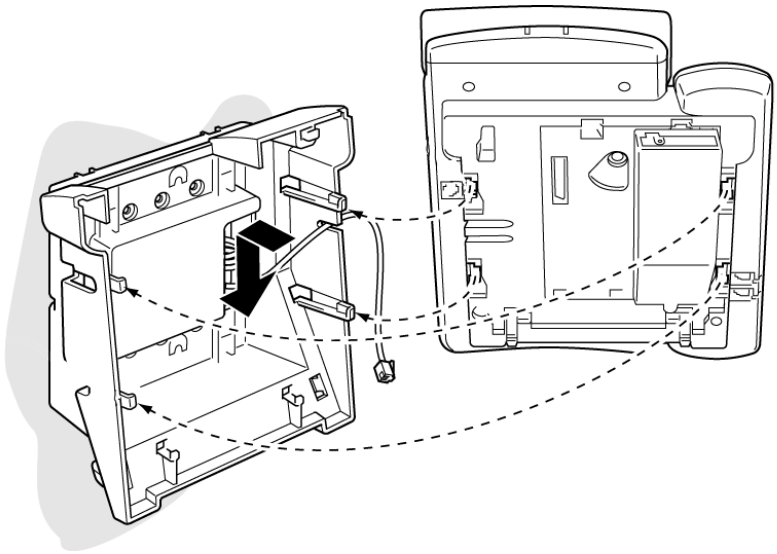


Figure 8-62 Attaching the Multiline Terminal to the Wall Mount Unit

5. Plug the line cord into the Multiline Terminal as illustrated in Figure 8-63 Plugging in Line Cord.

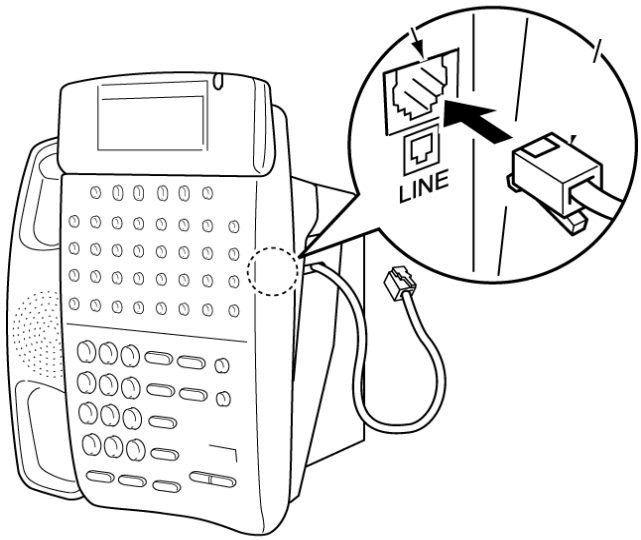


Figure 8-63 Plugging in Line Cord

6. Push spare line cord behind the Multiline Terminal as shown in Figure 8-64 Hiding Excess Cord Behind the Wall Mount Unit.

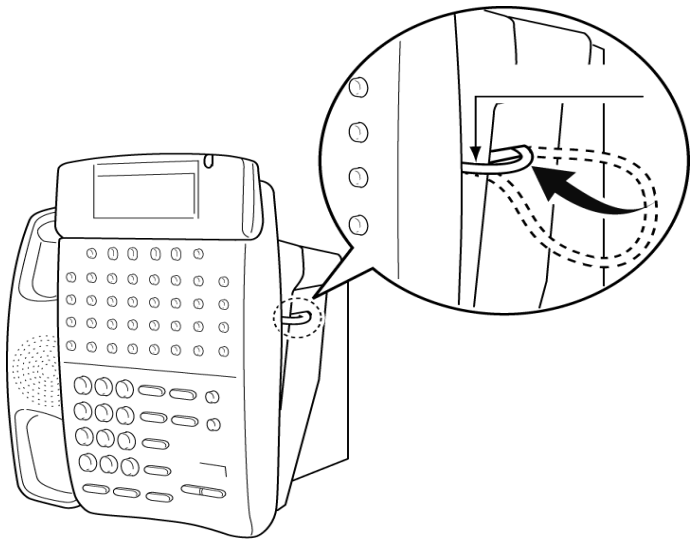


Figure 8-64 Hiding Excess Cord Behind the Wall Mount Unit

15.0.1 Removing the Wall Mounted Multiline Terminal from the Wall Mount Unit

To remove the Multiline Terminal, press the tabs at the bottom as shown in Figure 8-65 Removing Multiline Terminal from the Wall Mount Unit, and push up on the Multiline Terminal until it comes loose.

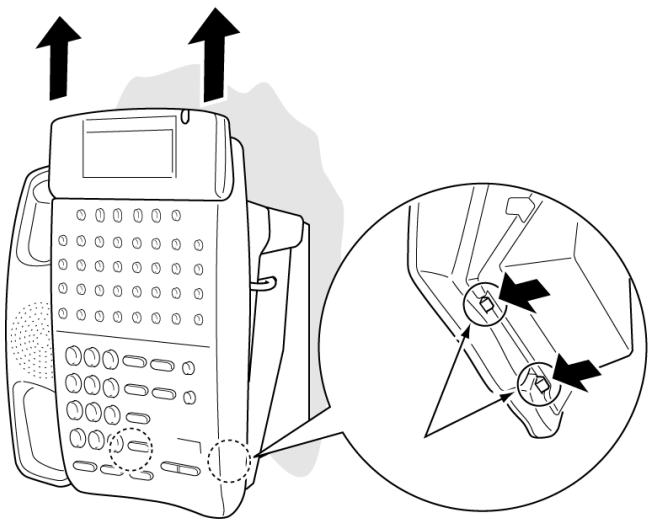


Figure 8-65 Removing Multiline Terminal from the Wall Mount Unit

15.0.2 Mounting the Wall Mount Unit on a Switch Box

1. Locate the screw holes on the wall mount unit and hang the cover over the screws on the switch box as illustrated in Figure 8-66 Mounting Wall Mount Unit on the Switch Box.

   ✎ This method is not recommended because of varied strength of switch boxes.

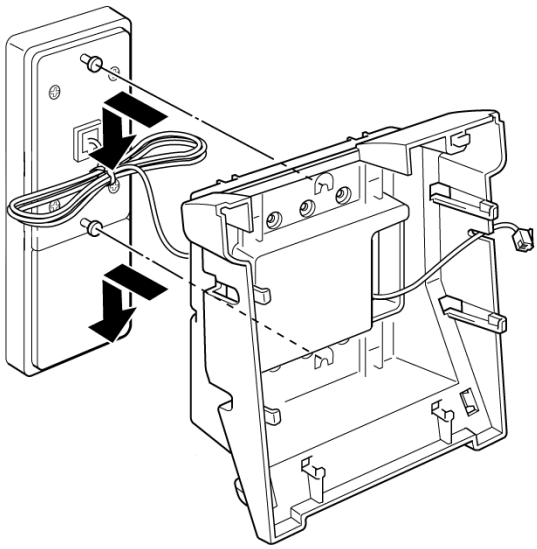


Figure 8-66 Mounting Wall Mount Unit on the Switch Box

2. Hang the Multiline Terminal on the base cover.

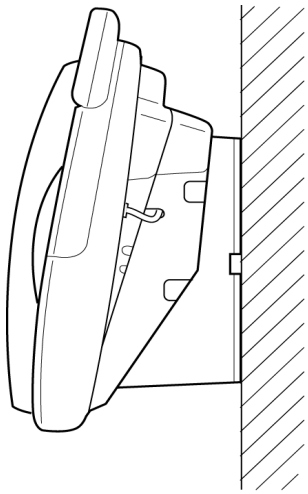


Figure 8-67 Wall Mounted Multiline Terminal

TABLE OF CONTENTS
CHAPTER 9

Section 1 General Information 9-1

Section 2 Preparing Multiline Terminal for Adapter Installation..... 9-1

Section 3 Installing Adapters 9-4

3.1 AC-2R/AC-3R Unit (AC Adapter) 9-4

3.1.1 Connecting the AC-2R/AC-3R Unit 9-4

3.2 AD(A)-R/AD(A)-2R Unit (Ancillary Device Adapter) 9-6

3.2.1 Connecting Cables to the AD(A)-R Unit 9-7

3.2.2 Switch Settings 9-11

3.2.3 Installing the AD(A)-R Unit on a Multiline Terminal 9-12

3.3 AP(A)-R Unit/AP(R)-R Unit (Port Adapter) 9-14

3.3.1 Switch Settings 9-15

3.3.2 Installing AP(A)-R or AP(R)-R Unit on a Multiline Terminal 9-16

3.4 CT(A)-R Unit (Computer Telephony Adapter) 9-19

3.4.1 Installing the CT(A)-R Unit 9-20

3.4.2 Connecting the CT(A)-R Unit to the PC 9-22

3.4.3 Installing the Optional Headset 9-22

3.4.4 Installing the Driver on the PC 9-23

3.5 CT(U)-R Unit (Computer Telephony Adapter) 9-23

3.5.1 Installing the CT(U)-R Unit 9-24

3.5.2 Connecting the CT(U)-R Unit to the PC 9-26

3.5.3 Installing the Optional Headset 9-26

3.5.4 Installing the Driver on the PC 9-26

3.6 HF-R Unit (Handsfree Unit) 9-27
3.6.1 Installing an HF-R Unit on any DTR/DTH Multiline Terminal (except DTR-2DT-1 and ITH-8D/16D-2 9-27
3.6.2 Installing the External Microphone 9-28
3.7 IP-R Unit 9-29
3.7.1 IP-R Unit Specifications 9-29
3.7.2 Applying Power to the IP-R Unit 9-30
3.7.3 Installing the IP-R Unit on the Multiline Terminal 9-31
3.7.4 Connection Example 9-35
3.7.5 Quick Setup and Configuration Procedures 9-35
3.8 PS(A)-R Unit 9-38
3.8.1 Description 9-38
3.8.2 Switch Settings 9-39
3.8.3 LAN/PSTN Selection Switch Operation 9-39
3.8.4 Switch Mode Operation 9-40
3.8.5 LCD Display 9-41
3.8.6 Installing the PS(A)-R Unit 9-42
3.9 *D*^{term} Voice Security Recorder 9-46
3.9.1 Description 9-46
3.9.2 Connection Configuration 9-46
3.9.3 Connectors 9-47
3.9.4 Requirements for Installation 9-47
3.9.5 Installation Procedures for Windows 98 or ME 9-48
3.9.6 Installation Procedures for Windows 2000 or XP 9-48
3.9.7 VSR Application Software 9-50
3.9.8 VSR User Interface Tab Options 9-51
3.9.9 VSR Playback Tab 9-51
3.9.10 VSR Record Tab 9-54
3.9.11 About Tab 9-55
3.9.12 Options Tab 9-56

3.9.13 File Management Tab 9-58
3.9.14 Custom Program Settings 9-58
3.10 Installing Add on Module (ADM) 9-61
3.10.1 Connecting the Interface Unit: 9-61
3.10.2 Wall Mounting ADM and Multiline Terminal 9-64
3.11 NEC Conference Max™ 9-66
3.11.1 Description 9-66
3.11.2 Installation 9-67
3.11.3 Keypad Functions 9-67
3.11.4 Programming Options 9-68
3.11.5 Compliance 9-69

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LIST OF FIGURES AND TABLES
CHAPTER 9

Figure 9-1 Raising the Base Plate 9-1

Figure 9-2 Removing the Multiline Terminal Base Plate 9-2

Figure 9-3 Modifying Base Plate for Adapter Installation 9-3

Figure 9-4 AC-2R/AC-3R Unit (AC Adapter) 9-4

Figure 9-5 Connecting the AC Adapter to an Installed Adapter 9-5

Figure 9-6 AD(A)-R/AD(A)-2R Unit 9-6

Figure 9-7 Connecting a Multiline Terminal to a Recording Device using an AD(A)-R Unit (Example) 9-6

Figure 9-8 AD(A)-R Unit Connection without Pause Control 9-7

Figure 9-9 AD(A)-R Unit Connection with Pause Control 9-7

Figure 9-10 Removing AD(A)-R Unit Cover 9-8

Figure 9-11 Attaching Cables to the AD(A)-R Unit 9-8

Table 9-1 AD(A)-R Unit Cable Connections 9-9

Figure 9-12 AD(A)-R Unit Cable Access Port 9-11

Figure 9-13 AD(A)-R Switch Default Settings 9-11

Table 9-2 AD(A)-R Unit Switch Settings 9-12

Figure 9-14 Attaching the AD(A)-R Unit to the Multiline Terminal 9-13

Figure 9-15 Connecting a Multiline Terminal to an Analog Telephone using an AP(A)-R Unit/AP(R)-R Unit (Example) 9-14

Figure 9-16 AP(A)-R Unit/AP(R)-R Unit Switches 9-15

Table 9-3 AP(A)-R/AP(R)-R Unit Switch Settings 9-15

Figure 9-17 Attaching the AP(A)-R/AP(R)-R Unit to the Multiline Terminal 9-17

Figure 9-18 Installing the Ferrite Core on the AP(A)-R/AP(R)-R Unit 9-18

Figure 9-19 CT(A)-R Unit 9-19
Figure 9-20 Connecting a Multiline Terminal to a PC using a CT(A)-R Unit (Example) 9-19
Figure 9-21 Attaching the CT(A)-R Unit to the Terminal 9-21
Figure 9-22 Connecting the RS-232C Cable to the CT(A)-R Unit 9-22
Figure 9-23 Attaching the Headset to the Multiline Terminal 9-22
Figure 9-24 CT(U)-R Unit 9-24
Figure 9-25 Connecting a Multiline Terminal to a PC using a CT(U)-R Unit (Example) 9-24
Figure 9-26 Attaching the CT(U)-R Unit to the Multiline Terminal 9-25
Figure 9-27 Connecting the USB Cable to the CT(U)-R Unit 9-26
Figure 9-28 Attaching the HF-R Unit to the Multiline Terminal 9-27
Figure 9-29 Microphone with Mute 9-28
Table 9-4 IP-R Unit Specifications 9-29
Figure 9-30 IP Terminal Rear Connector Locations 9-30
Figure 9-31 IP-R Unit SW1 Setting for Power Source 9-30
Table 9-5 Switch SW1 Setting for Power Configuration 9-31
Figure 9-32 Raising the Base Plate 9-32
Figure 9-33 Removing the Base Plate 9-32
Figure 9-34 Removing Cutouts 9-33
Figure 9-35 Plugging in the IP-R Unit 9-34
Figure 9-36 Attaching the Base Plate 9-34
Figure 9-37 Connection Example 9-35
Figure 9-38 PS(A)-R Unit 9-38
Table 9-6 Selection Switch in LAN 9-39
Table 9-7 Selection Switch in PSTN 9-40
Table 9-8 IP Telephone Operation when LAN/PSTN Switch is Changed 9-40
Figure 9-39 LCD Display when Making a Call Through PSTN 9-41
Table 9-9 LCD Display for Each State 9-41
Table 9-10 Volume/Contrast Display Using PSTN Line 9-42

Figure 9-40 Raise the Base Stand 9-42
Figure 9-41 Remove Base Stand 9-43
Figure 9-42 Remove Covers 9-43
Figure 9-43 Install PS(A)-R Unit 9-44
Figure 9-44 Replace Base Stand 9-44
Figure 9-45 Connect Handset and PSTN Line Cords 9-45
Figure 9-46 *D^term* Voice Security Recorder 9-46
Figure 9-47 VSR Connection Configuration 9-47
Figure 9-48 Wizard Welcome Screen 9-48
Figure 9-49 Search and Installation Options 9-49
Figure 9-50 Software Not Compatible Warning 9-49
Figure 9-51 Hardware Update Completed 9-50
Figure 9-52 VSR User Interface Tab Options 9-51
Figure 9-53 VSR Playback Tab 9-52
Figure 9-54 Caller ID or Comment Editor 9-53
Figure 9-55 View Levels and Control Recording 9-54
Figure 9-56 VSR About Tab 9-55
Figure 9-57 Select VSR Setup Options 9-56
Figure 9-58 Manage Calls at Completion 9-57
Figure 9-59 File Management Tab 9-58
Figure 9-60 Comvurgent Options for Additional Adjustments 9-59
Figure 9-61 Customizing Application to Meet Requirements 9-60
Figure 9-62 ADM Interface Unit 9-61
Table 9-11 DSW1 Switch Positions 9-62
Figure 9-63 ADM and Multiline Terminal with Base Covers Removed 9-63
Figure 9-64 Installing the Connector Plate 9-64
Figure 9-65 Installing Base Units on the Wall 9-65
Figure 9-66 NEC Conference Max™ 9-66

Table 9-12 Keypad Functions 9-67

Table 9-13 Programming Options 9-68

Installing Electra Elite IPK II Optional Terminal Equipment

CHAPTER 9

SECTION 1 GENERAL INFORMATION

The Electra Elite IPK II system provides several adapters that allow peripheral equipment to be attached to the Multiline Terminals. This optional equipment enhances the Electra Elite IPK II system and can be purchased separately as a customer business grows. Each Multiline Terminal (except DTR-2DT-1) can have up to two adapters installed at the same time. Only one IP-R Unit or IPW-2U Unit is allowed per terminal. This chapter describes each adapter and provides applicable installation instructions.

SECTION 2 PREPARING MULTILINE TERMINAL FOR ADAPTER INSTALLATION

To prepare the Multiline Terminal for adapter installation:

1. Unplug the telephone line from the terminal.
2. Grasp in the middle of the hollow spaces at the top and pull up until the retaining tabs click to raise the base plate. Refer to Figure 9-1 Raising the Base Plate.

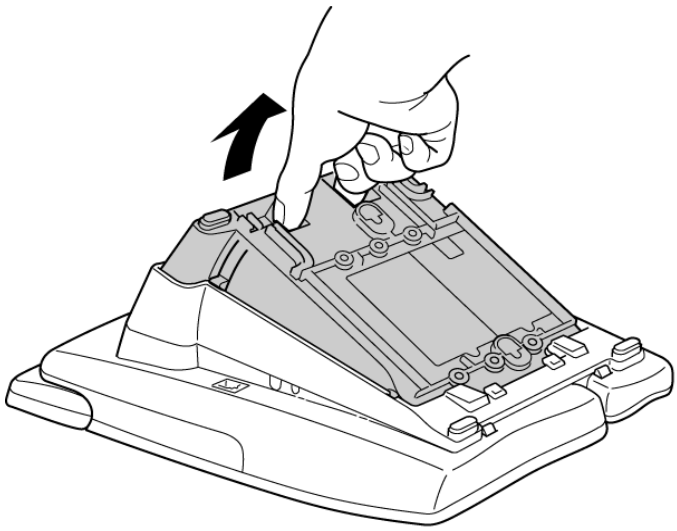


Figure 9-1 Raising the Base Plate

3. Press down on the tabs indicated in Figure 9-2 Removing the Multiline Terminal Base Plate, and push forward on the base plate to remove it.

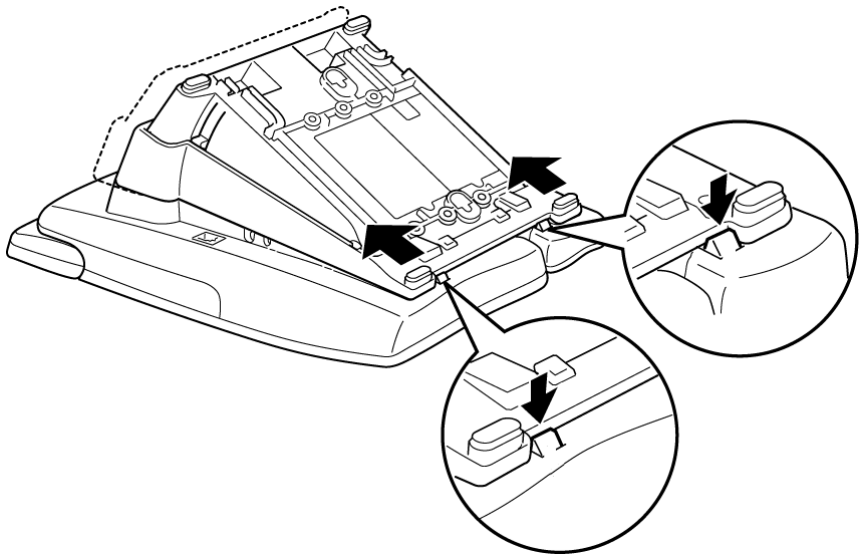


Figure 9-2 Removing the Multiline Terminal Base Plate

4. When an adapter is installed for the first time, the base cover on the Multiline Terminal must be modified. Two adapters can be installed in the Multiline Terminal, and two separate cutouts are provided. Remove the applicable cutout/cutouts on the bottom of the base plate. When only one adapter is being installed and it needs an AC-2R/AC-3R Unit for power, remove only the right cutout as shown in Figure 9-3 Modifying Base Plate for Adapter Installation.

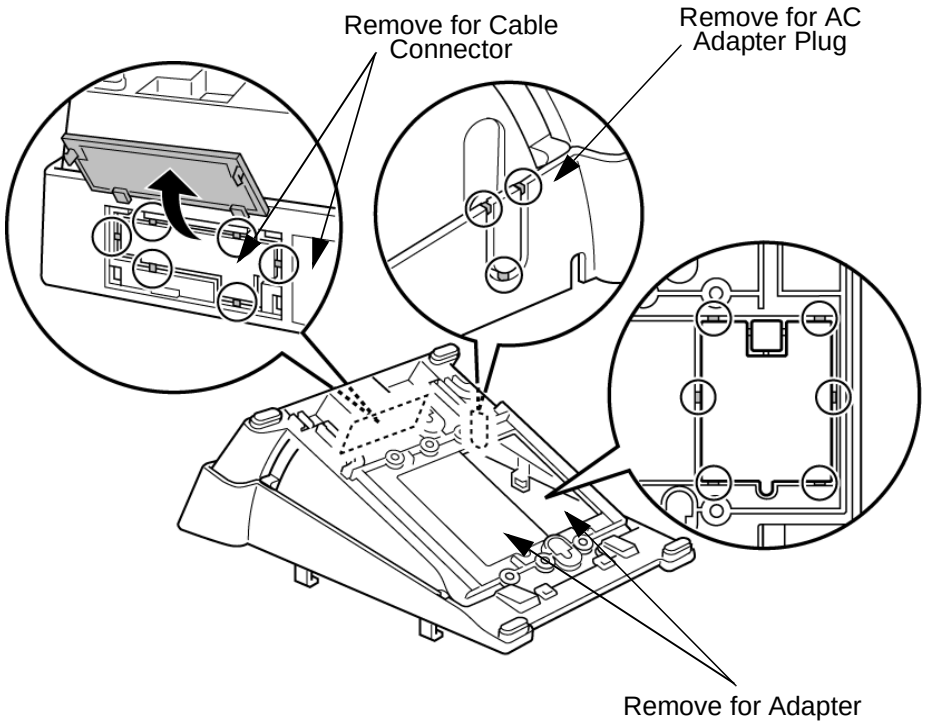


Figure 9-3 Modifying Base Plate for Adapter Installation

SECTION 3 INSTALLING ADAPTERS

3.1 AC-2R/AC-3R Unit (AC Adapter)

This unit shown on Figure 9-4 AC-2R/AC-3R Unit (AC Adapter) provides power to ancillary devices or to an Attendant Console. The AC-2R/AC-3R Unit must be connected to some adapters that are installed on a Multiline Terminal. When more than one adapter is installed on a Multiline Terminal, only **one** AC-2R/AC-3R Unit is necessary.

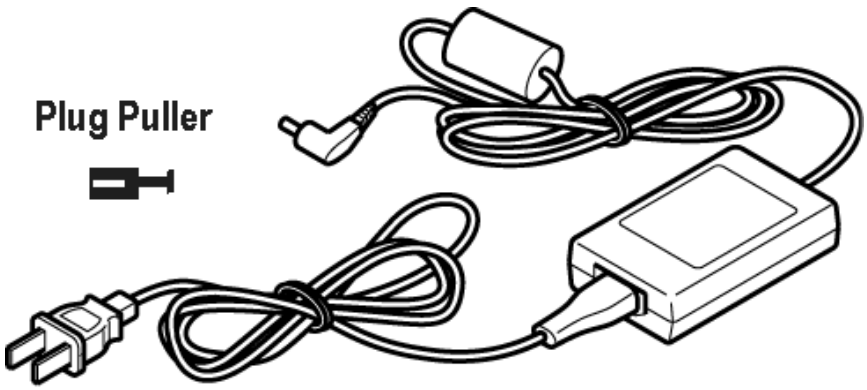


Figure 9-4 AC-2R/AC-3R Unit (AC Adapter)

The power requirements for the AC-2R/AC-3R Unit are:

- ❑ Input: 110~240 Vac, 50/60 Hz, 45 VA
- ❑ Output: 27 Vdc, 750 mA
- ❑ Polarity: ⊖———— ●) ———— ⊕

3.1.1 Connecting the AC-2R/AC-3R Unit

1. Unplug the AC-2R/AC-3R Unit from the AC outlet.

Failing to do this can damage the unit and/or the Multiline Terminal.

2. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation on page 9-1.

3. The Plug Puller shown in Figure 9-4 AC-2R/AC-3R Unit (AC Adapter) is a hollow cylindrical sleeve with a post and a circular rim on the base. The plug of the adapter is inserted in this hole, and the sleeve is pulled over the back of the plug to seat the post that can then be used to unplug the adapter.

4. Locate the plug on the ancillary device that is connected to the bottom of the Multiline Terminal and plug in the AC Adapter.

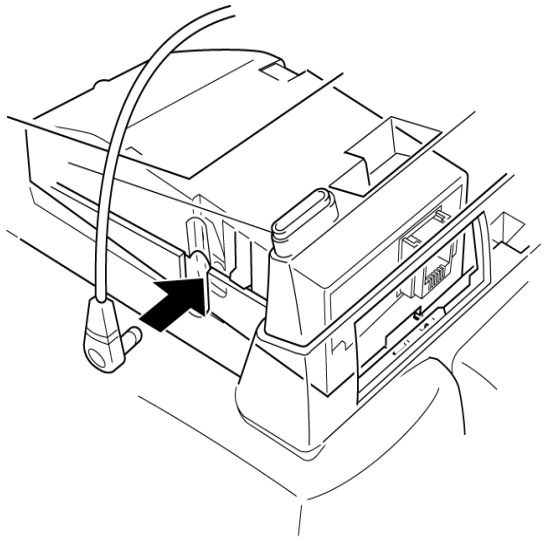


Figure 9-5 Connecting the AC Adapter to an Installed Adapter

3.2 AD(A)-R/AD(A)-2R Unit (Ancillary Device Adapter)

This Ancillary Device Adapter, shown on Figure 9-6 AD(A)-R/AD(A)-2R Unit, allows connection of a tape recorder to all Multiline Terminals except the DTR-2DT-1. The AD(A)-2R is used with ITH-8D/16D-2 Multiline Terminals.

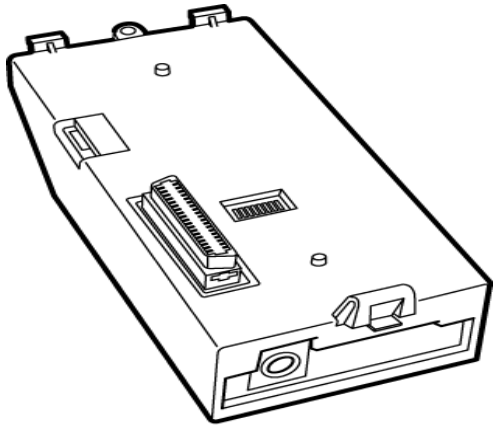


Figure 9-6 AD(A)-R/AD(A)-2R Unit

Figure 9-7 Connecting a Multiline Terminal to a Recording Device using an AD(A)-R Unit (Example) illustrates how the AD(A)-R Unit is connected to the ESI(8)-U( ) ETU and to the recording device.

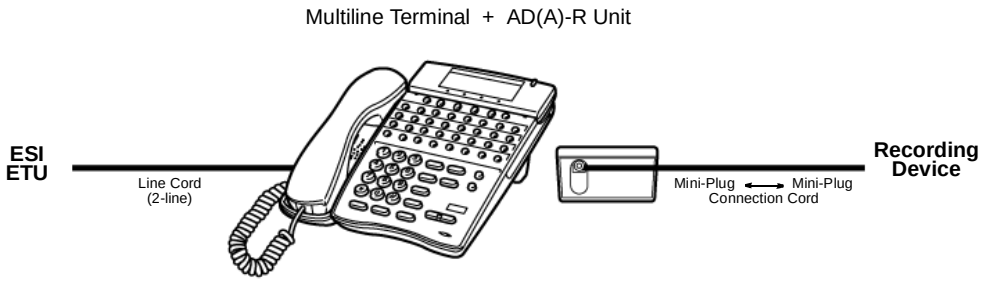


Figure 9-7 Connecting a Multiline Terminal to a Recording Device using an AD(A)-R Unit (Example)

When installing the AD(A)-R Unit, connect the cables to the AD(A)-R Unit, set the dip switches, and then install the AD(A)-R Unit on the Multiline Terminal.

3.2.1 Connecting Cables to the AD(A)-R Unit

The first step in installing the AD(A)-R Unit is to connect the cables between the recording device and the AD(A)-R Unit.

Cable terminal connectors are located on the side of the AD(A)-R Unit. Cables should be connected on this unit ***before*** installing the unit on the Multiline Terminal.

Cables can be connected to determine whether or not pause control is provided for the recording.

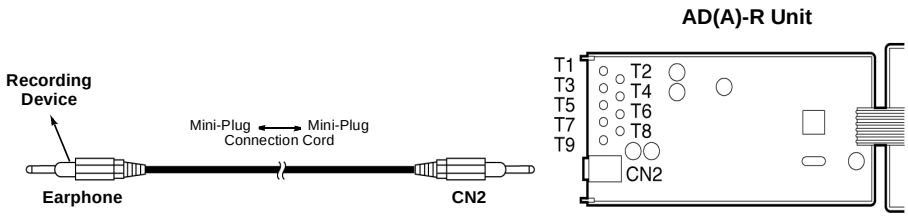


Figure 9-8 AD(A)-R Unit Connection without Pause Control

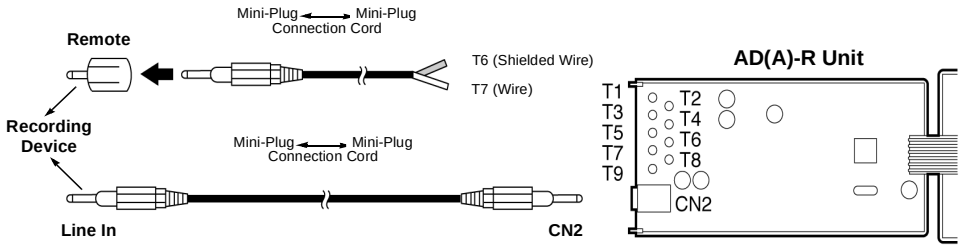


Figure 9-9 AD(A)-R Unit Connection with Pause Control

To connect the cables:

1. Cut off the plug on one end of the cable.

2. Remove the screw as illustrated in Figure 9-10 Removing AD(A)-R Unit Cover and open the unit cover.

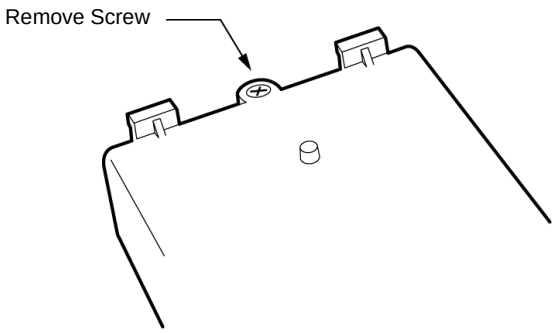


Figure 9-10 Removing AD(A)-R Unit Cover

3. Locate the adapter terminals on the unit.

4. Remove the cap on the adapter terminal to expose the metal receptacle. Push the cable in the applicable receptacle, and replace the cap. Line up the slot on the cap with the slot on the metal receptacle to ensure proper contact. Refer to Figure 9-11 Attaching Cables to the AD(A)-R Unit.

   Attach the cables to the AD(A)-R Unit according to Table 9-1 AD(A)-R Unit Cable Connections.

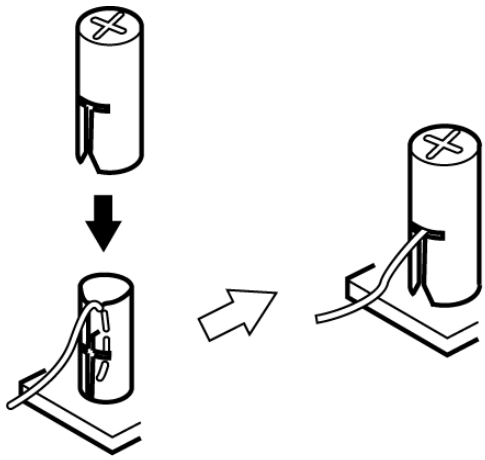


Figure 9-11 Attaching Cables to the AD(A)-R Unit

Table 9-1 AD(A)-R Unit Cable Connections

Terminal Number	Cables to Connect	Terminal Specifications
T1	When warning tone is not being sent from the recorder, connect wire pair input from tone generator to T1:T2. The warning tones from the generator are sent to T1:T2 on a dedicated wire pair while the speech path is sent from the AD(A)-R on T3:T4 over a separate wire pair to the recorder.	Input Terminal: T1 and T2 are enabled for tone generating device when switches SW1-3 and SW1-4 are OFF. When switches SW1- 3 and SW1-4 are ON, a humming sound may be recorded due to impedance mismatch. Input Impedance on T1 and T2: 100K Ω Input Level on T1 and T2: –15 dB ~ 40 dB
T2		
T3:T4	Connect recorder device wire pair speech input to T3:T4. When the recorder used supplies a warning tone, this tone may also be sent over the T3:T4 wire pair back to the terminal.	Input/Output Terminal: Refer to dip switch settings in Table 9-2 AD(A)-R Unit Switch Settings.
T5	Connect the bare end of the control cable.	When a Multiline Terminal is idle, this contact is closed. When the Multiline Terminal goes off-hook (using the handset, headset, or speakerphone), this contact is open. When recording device owner's manual specifies start on open circuit, connect T5 and T6.
T6	Connect the shielded end of the control cable.	Provides common connection for control cable.
T7	Connect the bare end of the control cable.	When the Multiline Terminal is idle, this contact is open. When the Multiline Terminal is busy (using the handset, headset, or speakerphone), this contact is closed. When recording device owner's manual specifies start on closed circuit, connect T6 and T7.
T8	Unused	
T9		

Table 9-1 AD(A)-R Unit Cable Connections (Continued)

Terminal Number	Cables to Connect	Terminal Specifications

Notes:

- When recording in handsfree (half-duplex) mode using the built-in speakerphone, the record warning tone may not be audible to the far-end party.
- The transmit recording level is lower than the receiving voice level for intercom calls; the transmit recording level for CO calls is normal.
- Depending on the recording device(s), separate cables may be required for the warning tone and speech path. Then connect the warning tone cables to input terminals T1 and T2 on the AD(A)-R Unit (T3 and T4 are used as the recording device input).
- When remote control of the recorder is necessary, the record start/stop control is provided by connecting to T5 (or T7) and T6 on the AD(A)-R Unit. (Connecting to T5 or T7 is determined by the specifications of the recording device.)
- When a warning tone is provided from the recording equipment, it should be input via T3 and T4 on AD(A)-R Unit. Do not use T1 and T2 to input beep tone.
- Conversations cannot be recorded from terminals connected to an AP(R)/AP(A)-R Unit.
- Speakerphone calls through the HF-R Unit cannot be recorded.

5. Insulate the end of the cable that needs to be shielded with insulating tape.

6. Feed the installed cable through the cable access port, located on the back of the unit, as illustrated in Figure 9-12 AD(A)-R Unit Cable Access Port.

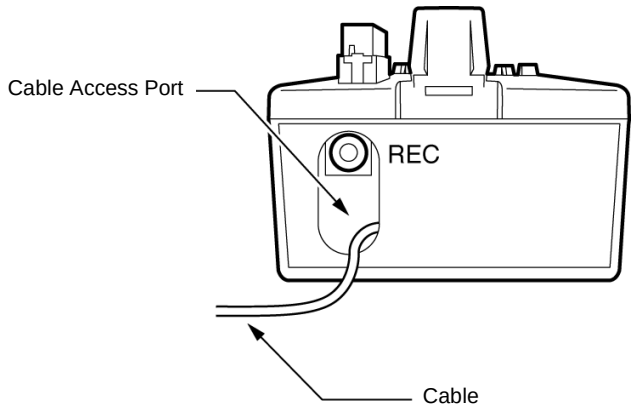


Figure 9-12 AD(A)-R Unit Cable Access Port

3.2.2 Switch Settings

The AD(A)-R Unit has two switch locations; SW1/SW2 and the DSW switches. The location of the switches on the AD(A)-R Unit is illustrated in Figure 9-13 AD(A)-R Switch Default Settings. The dip switches (DSW) allow a technician to configure the unit for specific settings.

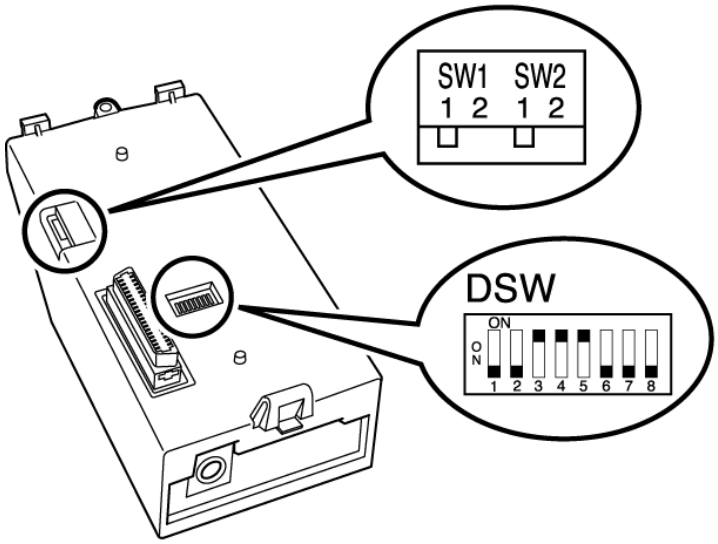


Figure 9-13 AD(A)-R Switch Default Settings

To provide control to the recorder or to enable/disable the record start warning tones, refer to Table 9-2 AD(A)-R Unit Switch Settings.

Table 9-2 AD(A)-R Unit Switch Settings

Switch		Description/Settings
SW1	SW1-1	Connects to Multiline Terminal Connect = Default
	SW1-2	Not Used
SW2	SW2-1	Sets External Equipment Impedance to 600 Ω
	SW2-2	Used for Complex Impedance Devices (< 30 Ω Input Impedance)
Dip Switches (DSW)	DSW 1	Output Hook Signal to External Device On = Output Off = No Output (Default)
	DSW 2	Record Confirmation Tone On = Tone On Off = Tone Off (Default)
	DSW 3 and DSW 4	Use T1/T2 On = Disable (Default) Off = Enable
	DSW 5	Reset Signal Upgrade On = Normal (Default) Off = Debugging
	DSW 6~8	Firmware Upgrade On = Firmware Upgrade Off = Disable (Default)

➢ *Do not connect T1 and T2 when DSW switches 3 and 4 are On*.

3.2.3 Installing the AD(A)-R Unit on a Multiline Terminal

The AD(A)-R Unit should be installed ***after*** the cables have been connected and the switches set.

✎ If wall mounting the Multiline Terminal, a WM-R Unit must be used. Refer to Section 13 Wall Mounting Multiline Terminals on page 8-29.

1. Unplug the telephone cord (and the AC-2R/AC-3R Unit cord if installed) from the Multiline Terminal.

2. Plug the tabs marked **A** and **B** into adapter slots, then snap the tab on the other end of the adapter into the receptacle marked **C**. Refer to Figure 9-14 Attaching the AD(A)-R Unit to the Multiline Terminal.

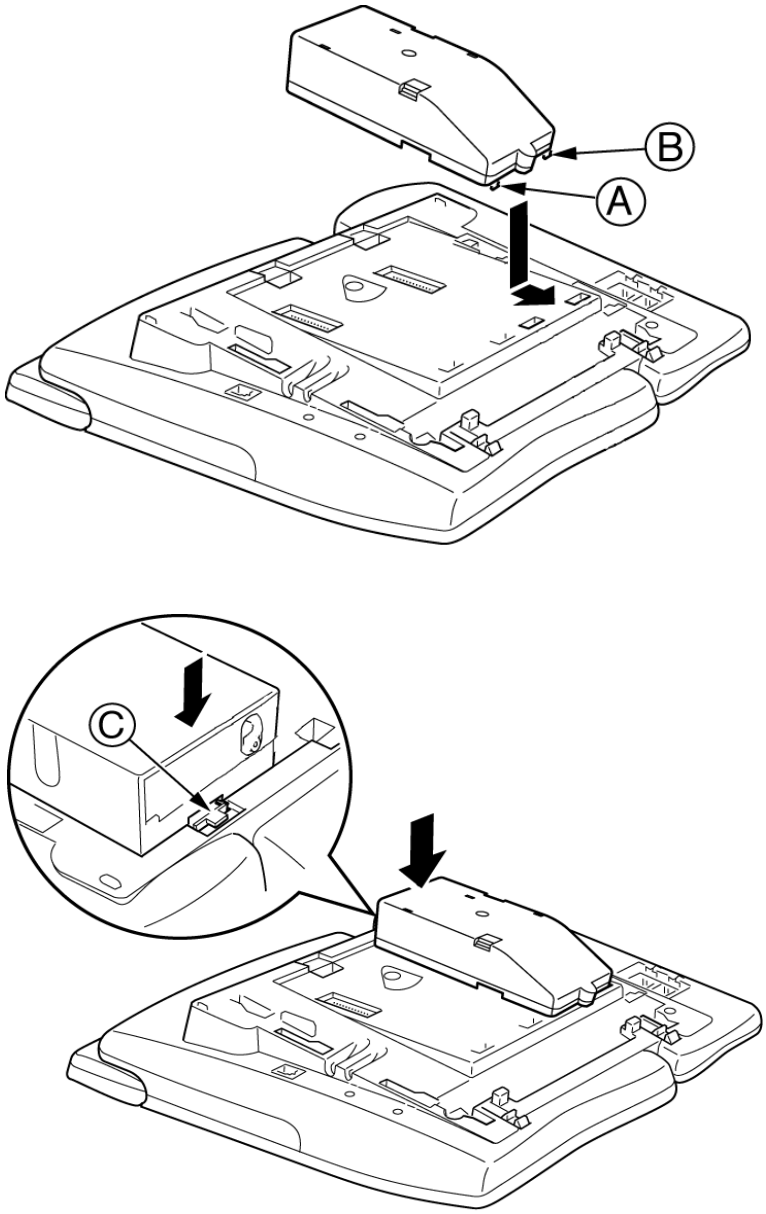


Figure 9-14 Attaching the AD(A)-R Unit to the Multiline Terminal

3. Replace the base plate (or wall mount unit) and attach the line cord. Refer to Section 3 Connecting a Multiline Terminal to the System on page 8-15.

3.3 AP(A)-R Unit/AP(R)-R Unit (Port Adapter)

The AP(A)-R Unit Analog Port Adapter without Ringer or the AP(R)-R Unit Analog Port Adapter with Ringer is used to install a Single Line Terminal, Modem, Credit Card Reader, Wireless Headset, or other compatible analog device.

The AP(R)-R Unit generates ringing signals and requires an AC-2R/AC-3R Unit.

The AP(A)-R Unit or the AP(R)-R Unit can be installed on all Multiline Terminals except the DTR-2DT-1 and ITH-8D/16D-2.

Figure 9-15 Connecting a Multiline Terminal to an Analog Telephone using an AP(A)-R Unit/AP(R)-R Unit (Example) illustrates how the AP(A)-R Unit/ AP(R)-R Unit is connected to the ESI(8)-U( ) ETU and to an analog telephone.

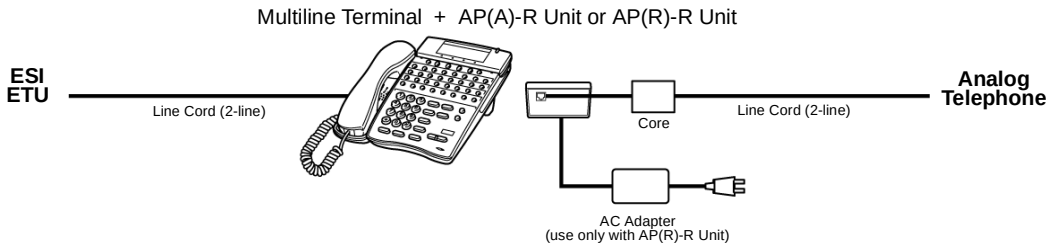


Figure 9-15 Connecting a Multiline Terminal to an Analog Telephone using an AP(A)-R Unit/AP(R)-R Unit (Example)

3.3.1 Switch Settings

The AP(A)-R Unit and AP(R)-R Unit have three switch locations. Refer to Table 9-3 AP(A)-R/AP(R)-R Unit Switch Settings for a description of each switch and an explanation of the settings.

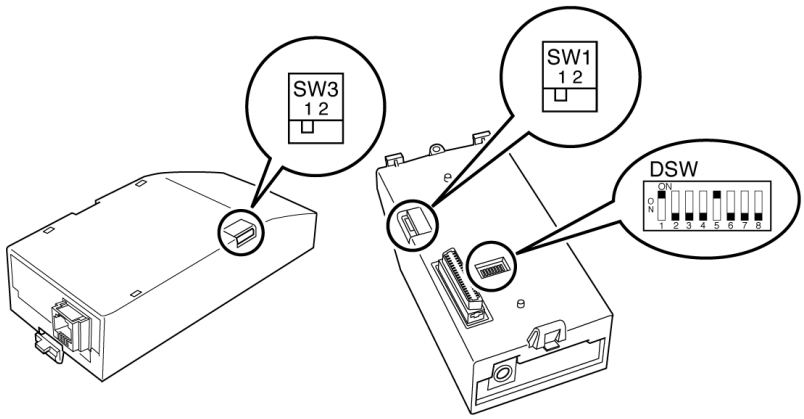


Figure 9-16 AP(A)-R Unit/AP(R)-R Unit Switches

Table 9-3 AP(A)-R/AP(R)-R Unit Switch Settings

Switch		Description/Settings
SW1	SW1-1	Connects to Multiline Terminal (Default).
	SW1-2	Not Used
SW3	SW3-1	Sets impedance to 600 Ω for devices such as modems or facsimile machines.
	SW3-2	Used for complex impedance devices such as Single Line Telephones.

Dip Switches (DSW)	DSW 1~8	Leave switches at default.

3.3.2 Installing AP(A)-R or AP(R)-R Unit on a Multiline Terminal

The AP(A)-R or AP(R)-R Unit should be installed *after* the switch settings are set.

✎ When wall mounting the Multiline Terminal, a WM-R Unit must be used. Refer to Section 13 Wall Mounting Multiline Terminals on page 8-29.

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation on page 9-1.

2. Plug the tabs marked *A* and *B* into adapter slots, then snap the tab on the other end of the adapter into the receptacle marked *C*. Refer to Figure 9-17 Attaching the AP(A)-R/AP(R)-R Unit to the Multiline Terminal.

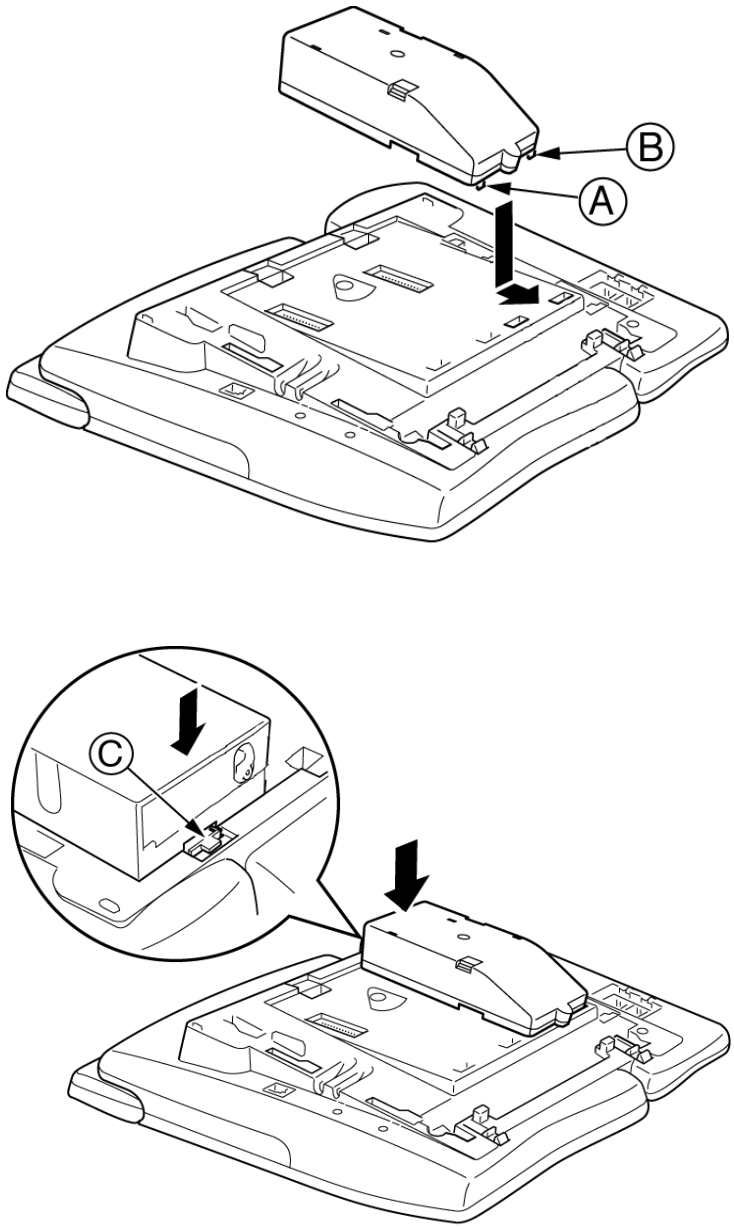


Figure 9-17 Attaching the AP(A)-R/AP(R)-R Unit to the Multiline Terminal

3. Install the ferrite core (provided with the unit) about two inches from the line cord plug.

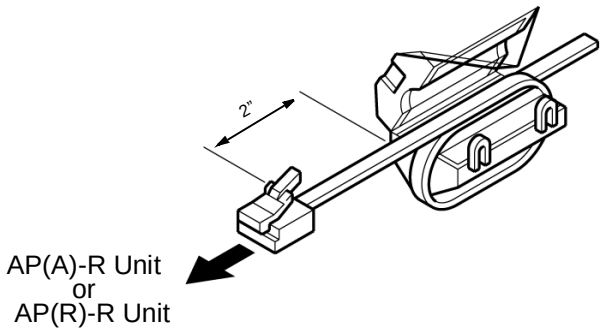


Figure 9-18 Installing the Ferrite Core on the AP(A)-R/ AP(R)-R Unit

4. Connect the line cord to the unit, limiting the cable length from the AP(A)/AP(R)-R Unit to the Single Line Telephone to a maximum of 50 feet.

   ✎ When only installing the AP(R)-R Unit, plug the AC Adapter (AC-2R/AC-3R Unit) power cord into the indicated AP(R)-R Unit receptacle and connect it to a power source. (Refer to Figure 9-5 Connecting the AC Adapter to an Installed Adapter on page 9-5.)

5. Replace the base plate (or wall mount unit) and attach the line cord. (Refer to Section 3 Connecting a Multiline Terminal to the System on page 8-15.)

3.4 CT(A)-R Unit (Computer Telephony Adapter)

The Computer Telephony Adapter, CT(A)-R Unit allows a Multiline Terminal to be connected to a PC. The PC can perform all Multiline Terminal functions using a TAPI-compatible application software (Microsoft Telephony Application Programming Interface).

The Multiline Terminal must be located within five feet (1.5 m) of the PC. An AC-2R/AC-3R Unit is necessary.

This adapter can be installed on any Multiline Terminal except the DTR-2DT-1 TEL and ITH-8D/16D-2.

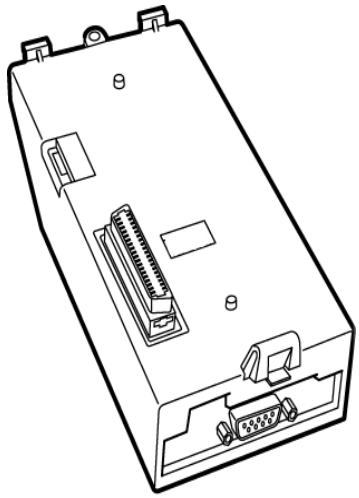


Figure 9-19 CT(A)-R Unit

Figure 9-20 Connecting a Multiline Terminal to a PC using a CT(A)-R Unit (Example) shows how the CT(A)-R Unit is connected to the ESI(8)-U( ) ETU and to the PC. The required AC-2R/AC-3R Unit adapter is not shown.

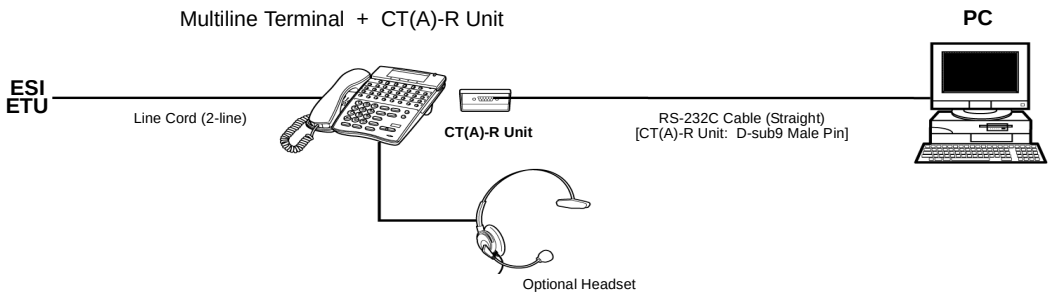


Figure 9-20 Connecting a Multiline Terminal to a PC using a CT(A)-R Unit (Example)

3.4.1 Installing the CT(A)-R Unit

The CT(A)-R Unit should be installed *before* connecting the PC and *before* connecting the ESI port to the Multiline Terminal.

✎ When wall mounting the Multiline Terminal, a WM-R Unit must be used. Refer to Section 13 Wall Mounting Multiline Terminals on page 8-29.

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation on page 9-1.

2. Plug the tabs marked *A* and *B* into adapter slots, then snap the tab on the other end of the adapter into the receptacle marked *C*. Refer to Figure 9-21 Attaching the CT(A)-R Unit to the Terminal.

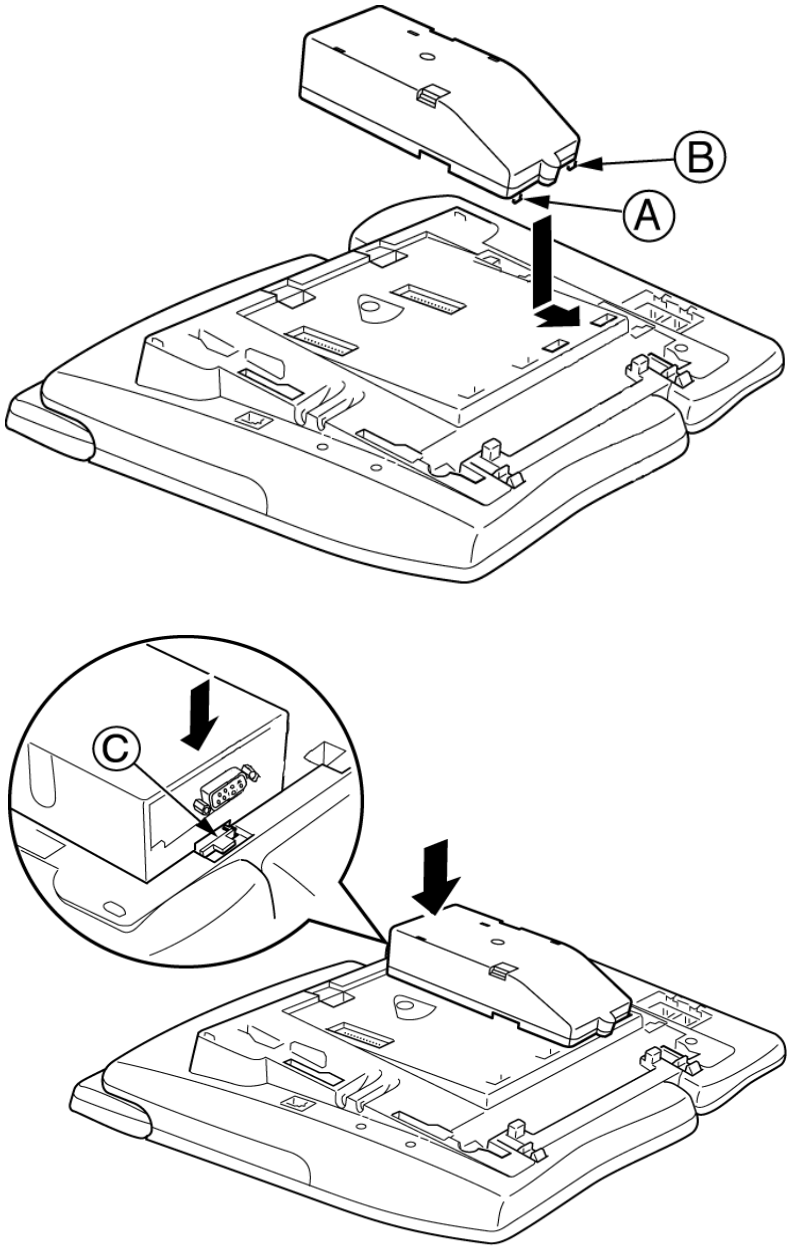


Figure 9-21 Attaching the CT(A)-R Unit to the Terminal

3. Replace the base plate (or wall mount unit) and attach the line cord. Refer to Section 3 Connecting a Multiline Terminal to the System on page 8-15.

3.4.2 Connecting the CT(A)-R Unit to the PC

Connect RS-232C cable from the PC to the CT(A)-R Unit as shown in Figure 9-22 Connecting the RS-232C Cable to the CT(A)-R Unit.

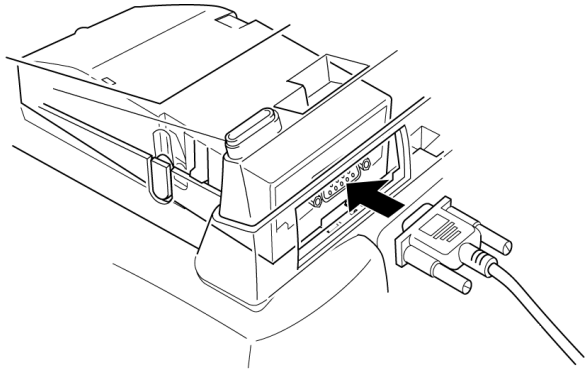


Figure 9-22 Connecting the RS-232C Cable to the CT(A)-R Unit

3.4.3 Installing the Optional Headset

Install the headset and anchor it in the cord slot on the Multiline Terminal as shown in Figure 9-23 Attaching the Headset to the Multiline Terminal.

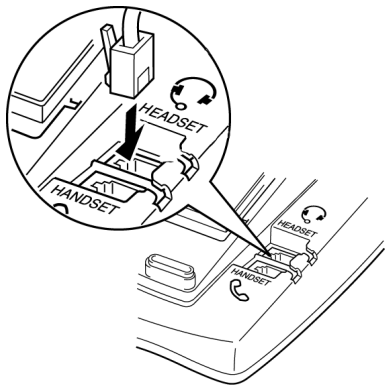


Figure 9-23 Attaching the Headset to the Multiline Terminal

✎ Headsets that have open style receivers (*i.e.,* Mirage, Duoset and Duopro) can cause echo problems on ITH-8D/16D-2 telephones. The echo suppression and receiver gain of the telephone determines the severity of the echo when using any headset.

Due to the environment where the telephones or headsets are located, ambient noise may affect performance. Please contact NEC for the recommended headset to use with VoIP applications.

3.4.4 Installing the Driver on the PC

Using the download from Web provided with the CT(A)-R Unit install the driver onto your PC. Refer to the CT(A)-R Unit installation instructions for installing the driver.

3.5 CT(U)-R Unit (Computer Telephony Adapter)

The CT(U)-R Unit Computer Telephony Adapter allows a Multiline Terminal to be connected to a PC using the PC USB port.

Connecting using the USB port provides telephony and sound device control. The general functions of the CT(U)-R Unit include:

- Telephony Control

  The application is based on the Microsoft Telephony Application Programming Interface (TAPI) and provides call handling on the PC (e.g., call, answer, hold, transfer, conference, or caller ID).

- User Interface to Support *D*^{term} Emulation

  This interface provides the functions of the *D*^{term} such as normal telephone indications, LCD, line keys or hookswitch.

- Sound Support

  Allows voice recording or recording playing on an audio device assigned to a PC. Voice Mail and Live Record are supported on the PC.

- Plug and Play

An AC-2R/AC-3R Unit is necessary when using this unit.

This adapter can be installed on any Multiline Terminal except the DTR-2DT-1 TEL and ITH-8D/16D-2.

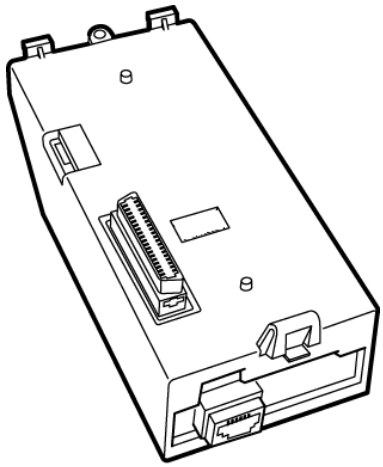


Figure 9-24 CT(U)-R Unit

Figure 9-25 Connecting a Multiline Terminal to a PC using a CT(U)-R Unit (Example) shows how the CT(U)-R Unit is connected to the ESI(8)-U( ) ETU and to the PC. The required AC-2R/AC-3R Unit is not shown.

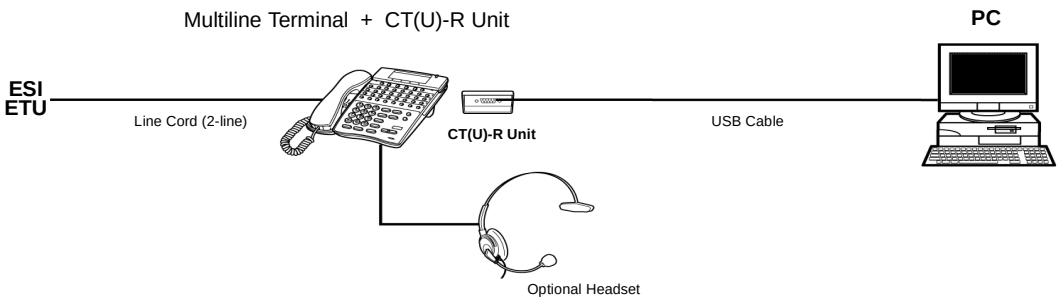


Figure 9-25 Connecting a Multiline Terminal to a PC using a CT(U)-R Unit (Example)

3.5.1 Installing the CT(U)-R Unit

The CT(U)-R Unit should be installed *after* the switch settings are set.

✎ When wall mounting the Multiline Terminal, a WM-R Unit must be used. Refer to Section 13 Wall Mounting Multiline Terminals on page 8-29.

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation on page 9-1.

2. Plug the tabs marked *A* and *B* into adapter slots, then snap the tab on the other end of the adapter into the receptacle marked *C*. (Refer to Figure 9-26 Attaching the CT(U)-R Unit to the Multiline Terminal.)

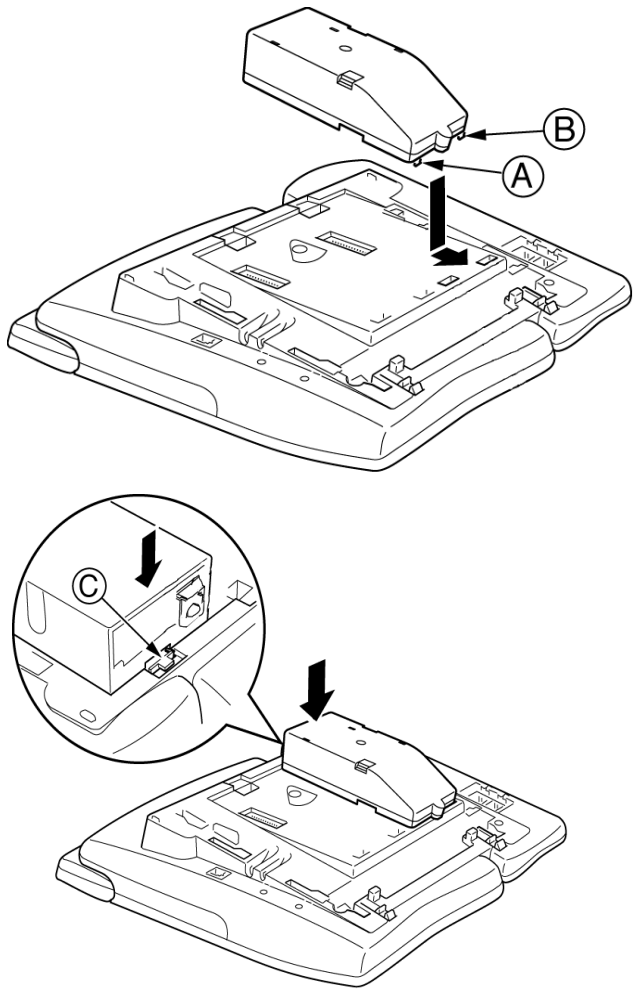


Figure 9-26 Attaching the CT(U)-R Unit to the Multiline Terminal

3. Replace the base plate (or wall mount unit) and attach the line cord. Refer to Section 3 Connecting a Multiline Terminal to the System on page 8-15.

4. Attach the AC-2R/AC-3R to the CT(U)-R Unit. Refer to Figure 9-5 Connecting the AC Adapter to an Installed Adapter on page 9-5.

3.5.2 Connecting the CT(U)-R Unit to the PC

Connect USB cable from the PC to the CT(U)-R Unit as shown in Figure 9-27 Connecting the USB Cable to the CT(U)-R Unit.

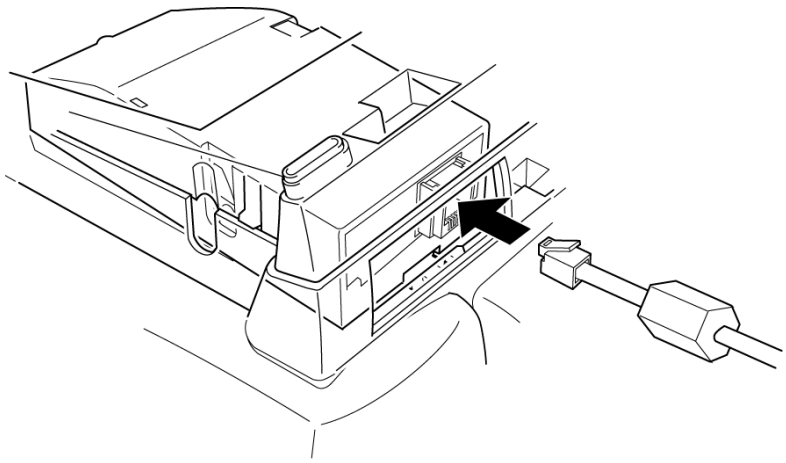


Figure 9-27 Connecting the USB Cable to the CT(U)-R Unit

3.5.3 Installing the Optional Headset

Install the headset and anchor it in the cord slot on the Multiline Terminal as shown in Figure 9-23 Attaching the Headset to the Multiline Terminal on page 9-22.

3.5.4 Installing the Driver on the PC

Using the download from Web with the CT(U)-R Unit install the driver onto your PC. Refer to the CT(U)-R Unit installation instructions for installing the driver.

3.6 HF-R Unit (Handsfree Unit)

The Handsfree Unit provides full-duplex handsfree communication for a desktop user. Large or enclosed areas may cause poor full-duplex operation. This unit comes with the handsfree adapter and an external microphone unit.

This adapter can be installed on any DTR/DTH Multiline Terminal except DTR-2DT-1 and ITH-8D/16D-2.

3.6.1 Installing an HF-R Unit on any DTR/DTH Multiline Terminal (except DTR-2DT-1 and ITH-8D/16D-2

1. With terminal upside down, facing from the bottom of the open cover, install this unit in terminal adapter Slot 1.

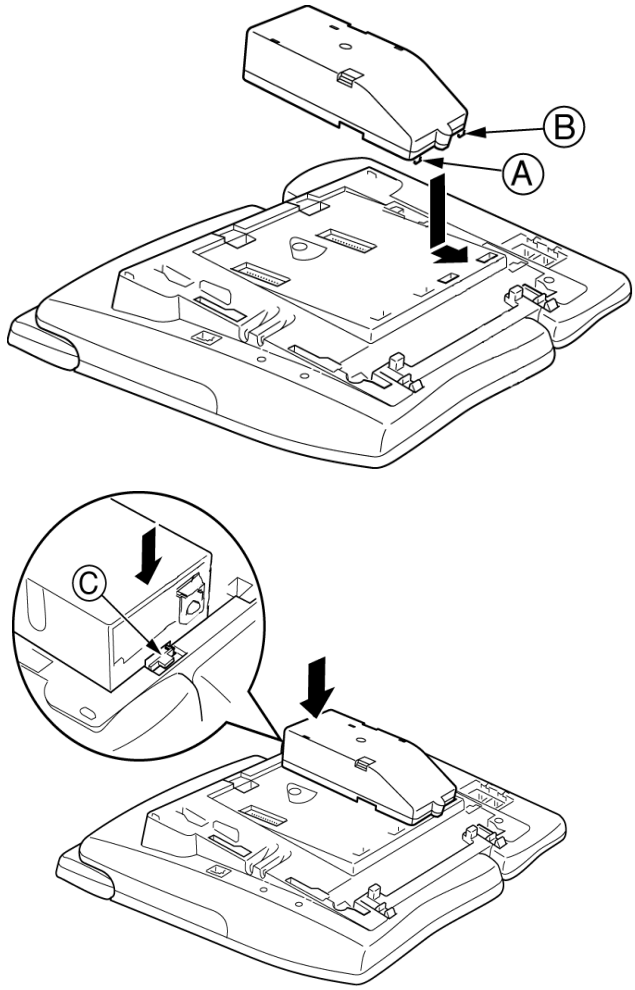


Figure 9-28 Attaching the HF-R Unit to the Multiline Terminal

2. Plug the tabs marked *A* and *B* into adapter slots, then snap the tab on the other end of the adapter into the receptacle marked *C*. Refer to Figure 9-28 Attaching the HF-R Unit to the Multiline Terminal.

3. Replace the base plate (or wall mount unit) and attach the line cord. Refer to Section 3 Connecting a Multiline Terminal to the System on page 8-15.

3.6.2 Installing the External Microphone

An external microphone can be installed on the HFU-U Unit. These instructions apply to the external microphone obtained from NEC. The microphone is equipped with a locking mute button and a red LED indicator that is off when the microphone is in mute.

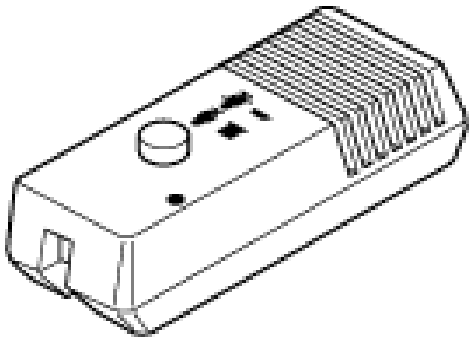


Figure 9-29 Microphone with Mute

1. Plug the microphone cord into the jack on the HF-R Unit.

   ✎ The microphone should be one~three feet away from the Multiline Terminal with the Mic grate facing the user.

3.7 IP-R Unit

The Elite IP-R Unit allows connection to an IAD(8)-U( ) ETU with a MEGACO Station Package in the Electra Elite IPK II.

Installing the IP-R Unit in the plug-in socket located at the bottom of the Terminal transforms a DTH Multiline Terminal into an IP station. The user can also connect a PC to the LAN through an RJ-45 Ethernet jack on the IP-R Unit that acts as a switching hub.

Any Terminal (8D/16D/32D-1) with an IP-R Unit installed, in conjunction with the IAD(8)-U() ETU (MEGACO Station Package), enables IP Telephony stations for the Electra Elite IPK II System. The IP stations can provide connectivity with the Corporate Elite over the local LAN (Ethernet).

3.7.1 IP-R Unit Specifications

Refer to Table 9-4 IP-R Unit Specifications.

Table 9-4 IP-R Unit Specifications

Feature	Specification
Interface	10/100 Base-T (IEEE 802.3), RJ-45
Protocol	Voice (UDP, RTP, and RTCP) Signal (TCP, H.225 and H.245)
Jitter Buffer	Max 90 ms
Quality of Station (QOS)	Network Managed switches supporting Type of Service (TOS) field and VLAN support
Local Power	27 V 750 mA via AC Adapter Base
Applications	TFTP (Client), DHCP Client, Megaco (H.248)
Standards	UL1459, FCC Part 68
Voice Specifications	G.711 (PCM Mu-law/A-law) G.729
Mountable *D*^{term}	*D*^{term} 8D, 16D, 32D-type telephone

3.7.2 Applying Power to the IP-R Unit

Power is provided to the IP-R Unit using an AC-2R/AC-3R Unit or Power Over the Ethernet.

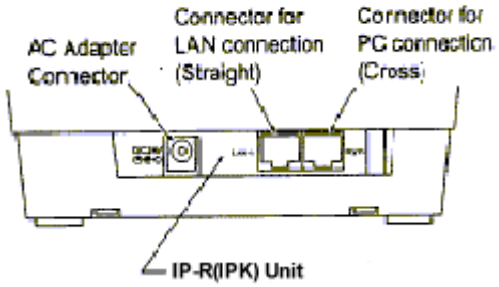


Figure 9-30 IP Terminal Rear Connector Locations

- AC-2R/AC-3R Unit (AC Adapter)

  Plug the optional AC-2R/AC-3R Unit input jack in the AC Adapter connection shown in Figure 9-30 IP Terminal Rear Connector Locations.

- Power over the Ethernet (POE)

  POE sometimes called In-Line Power, is a LAN technology that allows standard 10/100 Base-T data cables to pass current from a power source to a requesting-end device. Refer to Figure 9-31 IP-R Unit SW1 Setting for Power Source.

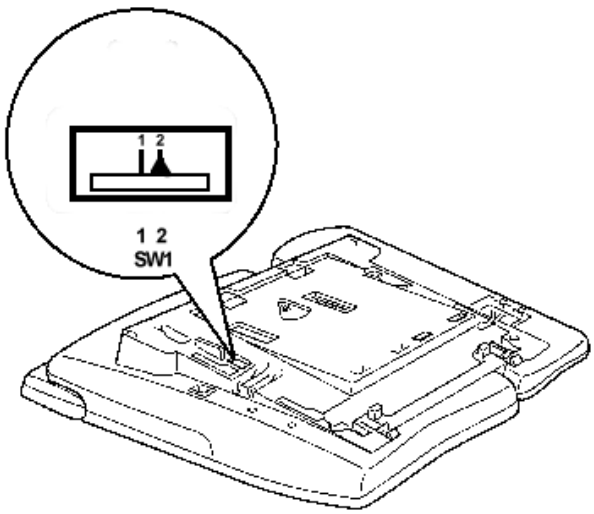


Figure 9-31 IP-R Unit SW1 Setting for Power Source

The IP-R Unit switch SW1 indicates to the system how the adapter is powered.

To set Switch SW1 for the applicable power source, Refer to Table 9-5 Switch SW1 Setting for Power Configuration.

Table 9-5 Switch SW1 Setting for Power Configuration

Switch (SW1) Settings	Power Method	Equipment Used
1	AC Adapter	NEC AC-2R/AC-3R AC Adapter (27V, 750 mA)
	NEC POE Equipment	❍ NEC Power Patch Panel SN1604 PRWMS (Stock No. 59022) ❍ NEC BF200/24 POE Switching Hub
2 (Default)	CICSO Equipment (CDP)	❍ Cisco Catalyst PRW Series ❍ Cisco Powered Patch Panel

3.7.3 Installing the IP-R Unit on the Multiline Terminal

The IP-R Unit can be installed on any DTH-8D/16D/32D-1/2 Multiline Terminal as shown below.

1. Unplug the telephone line from the terminal. Turn the terminal upside down, press the areas indicated on the diagram and raise the base plate until the retaining tabs click.

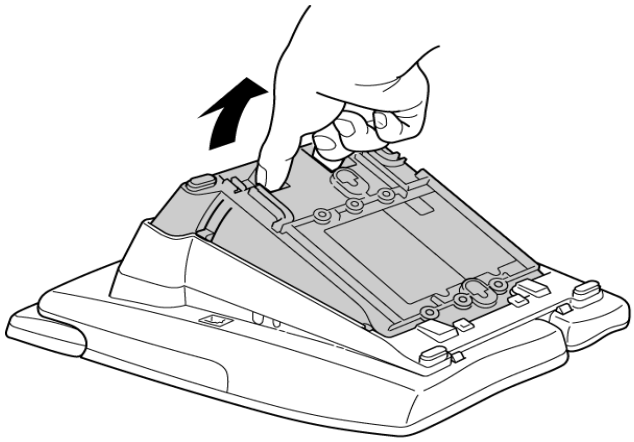


Figure 9-32 Raising the Base Plate

2. Press down on the tabs as shown in Figure 9-33 Removing the Base Plate and push the base plate forward to remove it.

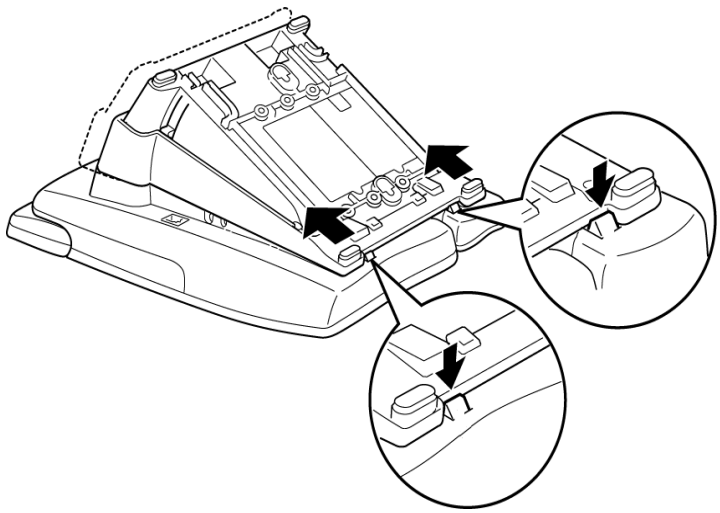


Figure 9-33 Removing the Base Plate

3. When an IP-R Unit is installed for the first time in a terminal, the base cover on the Multiline Terminal must be modified as shown in Figure 9-34 Removing Cutouts. Remove all cutouts on the bottom and back of the terminal base plate before installing the IP-R Unit.

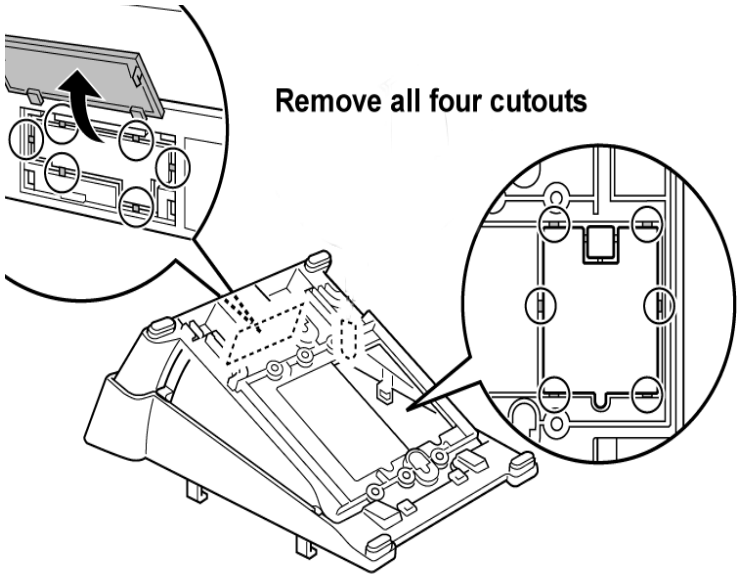


Figure 9-34 Removing Cutouts

4. Plug the IP-R Unit in Connector 1 on the Multiline Terminal (DTH-8D/16D/32D-1/2) as shown in Figure 9-35 Plugging in the IP-R Unit.

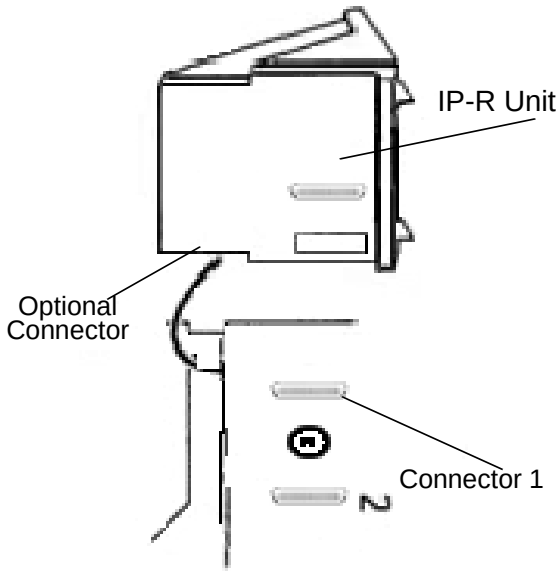


Figure 9-35 Plugging in the IP-R Unit

5. Attach the base plate by lining up the four tabs on the base cover with corresponding slots on the terminal as shown in Figure 9-36 Attaching the Base Plate, and slide the cover in the direction of the arrows until it clicks in place.

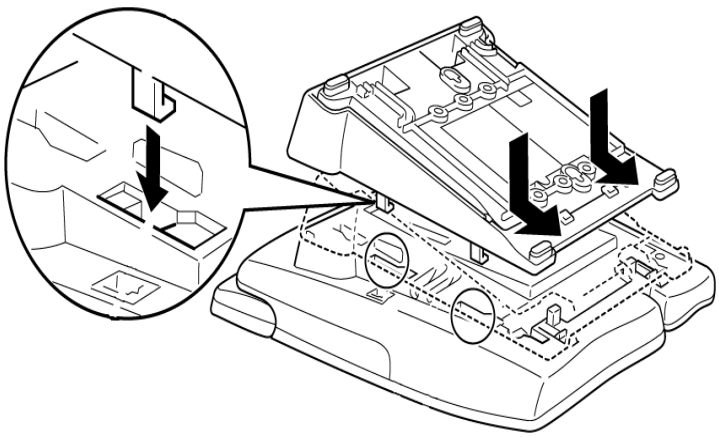
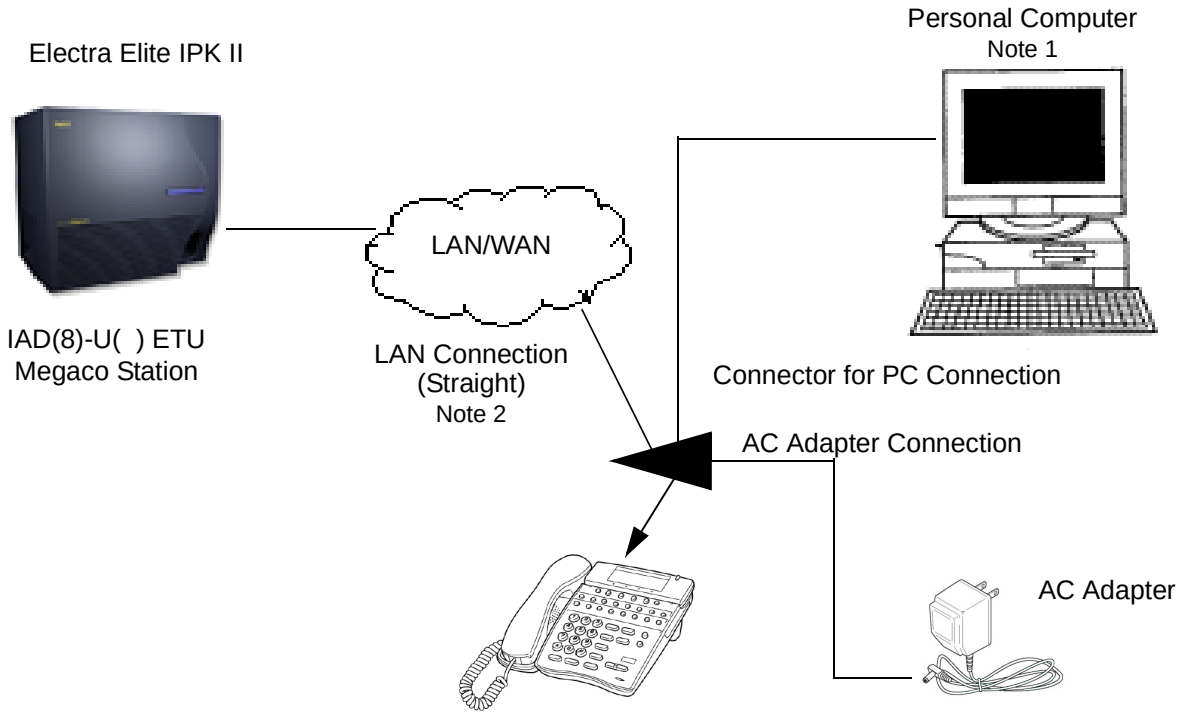


Figure 9-36 Attaching the Base Plate

3.7.4 Connection Example

Refer to Figure 9-37 Connection Example.



Note 1: The IP-R Unit is equipped with a switching Hub function, enabling connection to personal computers.

Note 2: When using 10 Base-T, a straight cable category 3 or higher is required (maximum length 100 meters). When using 100 Base-TX, a straight cable category 5 or higher is required (maximum length 100 meters).

Figure 9-37 Connection Example

3.7.5 Quick Setup and Configuration Procedures

This section provides step-by-step procedures for setting up and configuring the IP-R Unit.

1. Connect the LAN port of the IP-R Unit to the network and the PC port to an optional PC at your workstation. Plug in the AC-R Unit.

2. The IP-R Unit automatically attempts to locate the DHCP server when powered up. Wait until the server lookup times out, and *DHCP Server is Not Found* is displayed on the terminal, and then begin programming.

3. Press HOLD , TRANSFER,*, and # to enter the basic programming mode.

4. The *Programming Menu* is displayed. Press 1 to display the *Network Settings* options. This enables you to configure IP settings for IP Terminals.

5. Press 1 (DHCP mode is displayed). Press the corresponding digit (*1* or *2*) to enable or disable DHCP mode; then press the softkey that corresponds with *Set* on the LCD.

6. When DHCP is not used (Static IP assignment), select **1** (Disable), then select *Set*, and proceed to step 7. When DHCP is used, select *2* (Enable - factory default) and proceed to step 10.

7. From the *Network Settings* option, press 2 and enter the IP Address (XXX.XXX.XXX.XXX); then press the softkey that corresponds with *Set* on the LCD.

8. From the *Network Settings* option, press 3 and enter the Subnet Mask (XXX.XXX.XXX.XXX); then press the softkey that corresponds with *Set* on the LCD.

9. From the *Network Settings* option, press 4 and enter the Router IP Address (XXX.XXX.XXX.XXX); then press the softkey that corresponds with *Set* on the LCD. To return to *Programming Menu*, press the softkey that corresponds with *Prev* on the LCD.

10. Press 2 from the *Programming Menu* to access the MGC (Media Gateway Controller) IP Address and enter the IP Address for IAD(8)-U( ) or PVA ETU Megaco Station (XXX.XXX.XXX.XXX); then press the softkey that corresponds with *Set* on the LCD.

11. Press 3 from the *Programming Menu* to access the *Extension Number* option. Enter the extension number and press the softkey that corresponds with *Set* on the LCD.

12. The extension number is used to register the IP terminal with the IAD(8)-U( ) Megaco Station Card or PVA ETU. These settings must match the Electra Elite IPK II Programming Station Number Assignment in PRG 11-02. *This entry is required if DHCP mode is enabled*.

13. Press 9 from the *Programming Menu* to access *Advanced Settings* option.

14. Select *3, DRS Settings.*

15. Select *1, DRS Mode*, and *Disable this function*.

    ✎ This function must be Disabled prior to saving configuration.

16. Select Save; the system stores the new configuration and performs a software reset.

17. After the unit performs the software reset, the IP-R Unit searches for the MGC. After the unit locates the MGC, the terminal LCD restores the system time and the softkeys for System, Station, Up, and Down are restored.

18. The ITH 8D/16D-2 Telephone or the IP-R Unit installed is now ready for operation.

3.8 PS(A)-R Unit

3.8.1 Description

The PS(A)-R Unit, an optional adapter for the ITH/ITR-3 Terminals, is used with IP telephones to make or receive a call using the Public Switched Telephone Network (PSTN) when a call cannot be made or received using the Local Area Network (LAN). When a power failure occurs, the IP telephone is automatically switched to the PSTN. When power is restored, the IP telephone restarts and connects to the network unless a conversation is in progress on PSTN. The PSTN call must be completed by going On-hook before the connection to the LAN is restored. Refer to Figure 9-38 PS(A)-R Unit

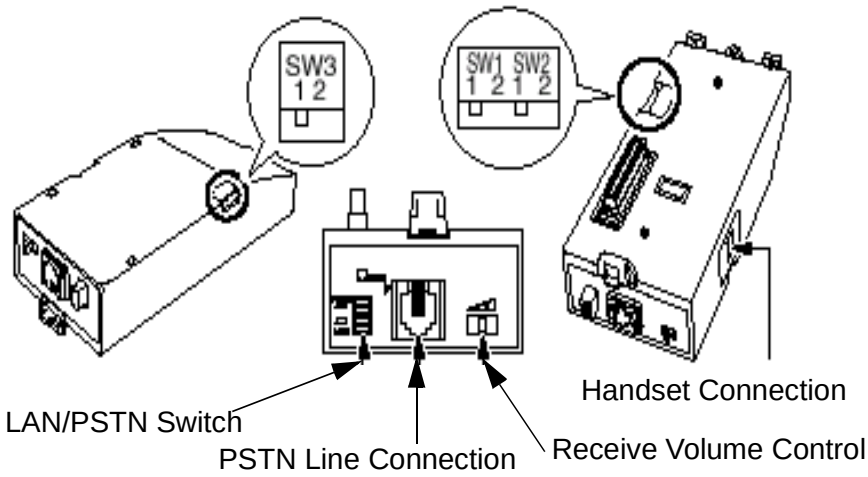


Figure 9-38 PS(A)-R Unit

3.8.2 Switch Settings

Refer to the following table.

Switch	Position 1	Position 2
LAN/PSTN Selection Switch	Out – LAN	In – PSTN
SW3: Mode	Dial Pulse	DTMF
SW1: Pulse Rate	20 pps	10 pps
SW2: Make Rate	33%	40%
Receive Volume Control	Three position volume control ➢ Use maximum position for hearing impaired only. Otherwise hearing damage may occur.	

3.8.3 LAN/PSTN Selection Switch Operation

When power is active, the user can manually select either a Local Area Network (LAN) or Public Switched Telephone Network (PSTN) communication path using this switch. When power failure occurs, a LAN path is automatically changed to PSTN. Refer to Table 9-6 Selection Switch in LAN.

Table 9-6 Selection Switch in LAN

		Power Active	Power Failure	Power Restored
IP-Network State	Normal	IP	PSTN	IP
	Network Failure	IP*	PSTN	IP*
	Network Power Restored	IP	PSTN	IP

* IP can communicate when changed to PSTN.

When selection switch is in PSTN, the communication path is always connected to PSTN. Refer to Table 9-7 Selection Switch in PSTN.

Table 9-7 Selection Switch in PSTN

		Power Active	Power Failure	Power Restored
IP-Network State	Normal	PSTN	PSTN	PSTN
	Network Failure	PSTN	PSTN	PSTN
	Network Power Restored	PSTN	PSTN	PSTN

3.8.4 Switch Mode Operation

Refer to Table 9-8 IP Telephone Operation when LAN/PSTN Switch is Changed.

Table 9-8 IP Telephone Operation when LAN/PSTN Switch is Changed

Mode	Changed from LAN to PSTN	Changed from PSTN to LAN
Idle	Sending/receiving IP packets stops. PSTN usage is displayed on the LCD.	Resets.
Communication	Sending/receiving IP packets stops. PSTN usage is displayed on the LCD. Communication Stops and DT is sent from PSTN.	Resets when communication ends.
Ring	Sending/receiving IP packets stops. PSTN usage is displayed on the LCD. Ringing stops	Stops ringing and resets.
Configuration	Continue normal operation. Does not change to PSTN	Cannot change until PSTN conversation ends

3.8.5 LCD Display

When power is on, the IP telephone displays the characters shown on Figure 9-39 LCD Display when Making a Call Through PSTN. Refer to Table 9-9 LCD Display for Each State.

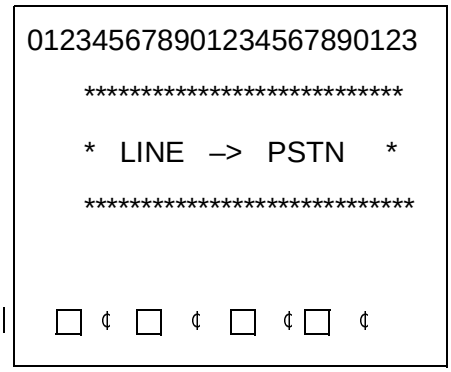


Figure 9-39 LCD Display when Making a Call Through PSTN

Table 9-9 LCD Display for Each State

		Switch in PSTN	Switch in IP
Power State	Active	LINE –> PSTN	Normal Display
	Failure	–	–
	Restored	LINE –> PSTN	Normal Display

The IP telephone displays volume/contrast for HANDSET, SPEAKER, RING, OFF-HOOK RING, LCD, or BGM when operating in D80/85 mode. However, when using a PSTN line only LCD contrast is displayed. Refer to Table 9-10 Volume/ Contrast Display Using PSTN Line.

Table 9-10 Volume/Contrast Display Using PSTN Line

Volume/ Contrast	Display
HANDSET	None [volume is controlled by PS(A)-R]
SPEAKER	None (Cannot be used for PSTN line)
RING	None [volume controlled by PS(A)-R switch]
OFF-HOOK RING	None (Cannot be used for PSTN line)
LCD	LCD contrast
BGM	None (Not Used)

3.8.6 Installing the PS(A)-R Unit

1. Turn over the ITR terminal, remove the LAN and headset cables, and disconnect the AC adapter when it is being used.

2. Raise the Base stand in the direction of the arrow until it locks in the fully expanded position.

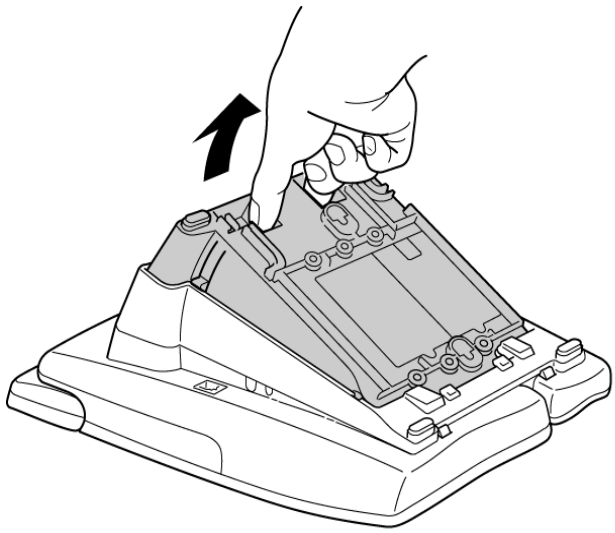


Figure 9-40 Raise the Base Stand

3. Press down the tabs, and slide the base stand in the direction of the arrows to remove it.

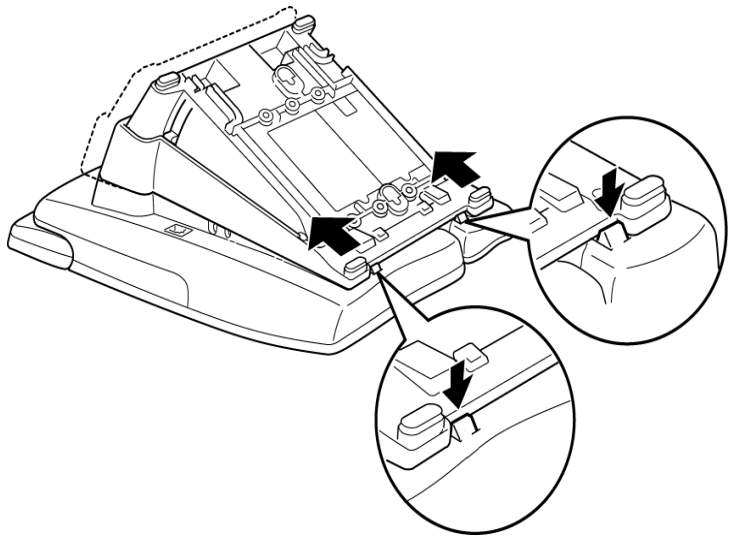


Figure 9-41 Remove Base Stand

4. Cut off the notches on the base stand with wire clippers, and remove the covers on the rear and bottom side of the unit.

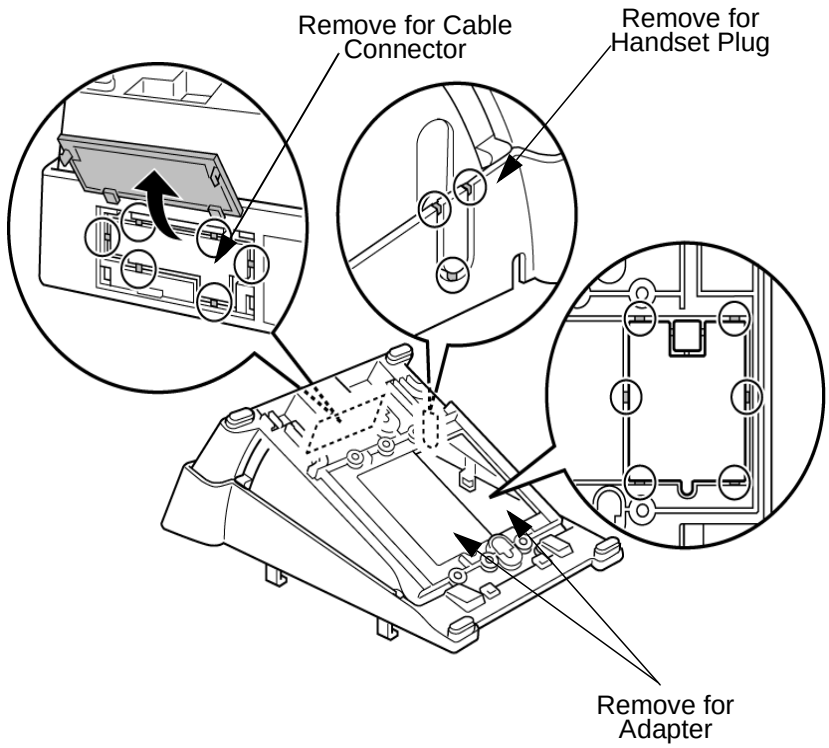


Figure 9-42 Remove Covers

5. Hook tabs A and B of the PS(A)-R Unit in the grooves and press down until it seats.

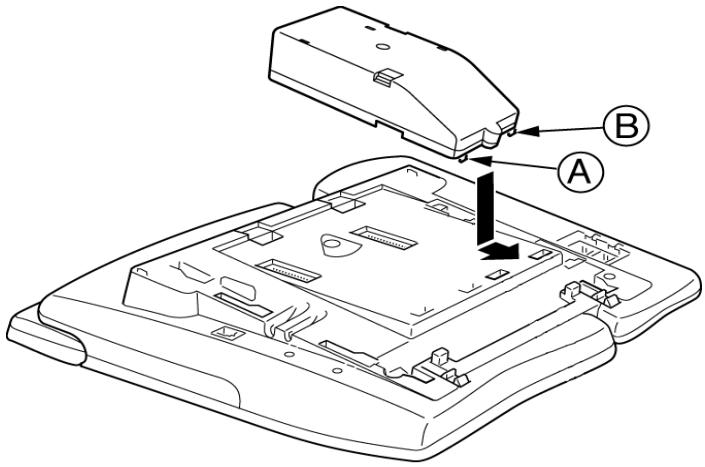


Figure 9-43 Install PS(A)-R Unit

6. Line up the four tabs of the base stand with the corresponding slots on the terminal, and slide the stand in the direction of the arrows until clicks in place.

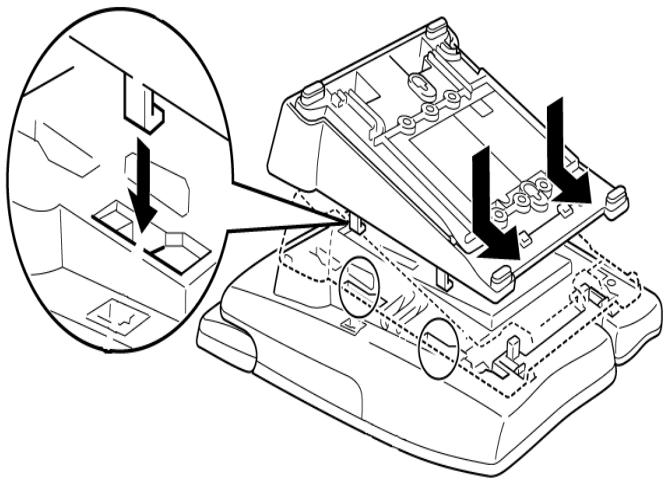


Figure 9-44 Replace Base Stand

7. .Insert the handset cord and the PSTN line cord in the connector slots.

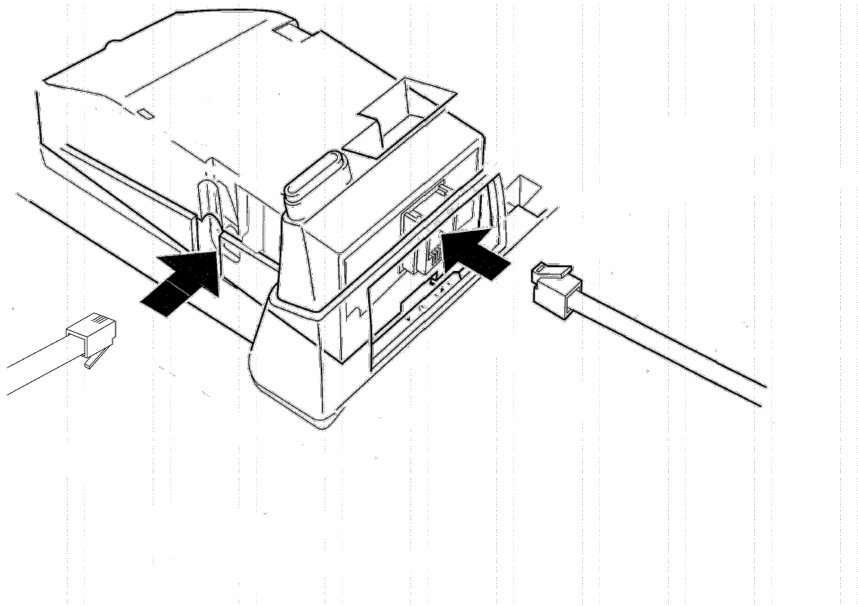


Figure 9-45 Connect Handset and PSTN Line Cords

8. Connect the LAN cable to the IP terminal. When the AC adapter is required plug it into the outlet after connecting the LAN cable.

3.9 *D*^{term} Voice Security Recorder

3.9.1 Description

The VSR Extension Recorder is a Universal Serial Bus (USB) device that taps across the digital extension pair of a *D*^{term} Digital extension port and includes software that enables the user to manage stored calls. VSR hardware connects in-line at the user desktop. Power is not required because the connection is a metallic wiring of the in and out connections. The recorder does nothing to affect operation of the Digital Telephone.

This device meets all applicable FCC and UL requirements for this type of communication device.

Figure 9-46 *D*^{term} Voice Security Recorder

3.9.2 Connection Configuration

The configuration connection is shown in Figure 9-47 VSR Connection Configuration.

3.9.3 Connectors

- One PC USB connector that provides power and streams all speech and control channel information to the host PC and desktop software.
- Two digital telephone line connections that passively tap across the *D*^{term} digital connection and listen in high impedance mode to the signaling on the line.

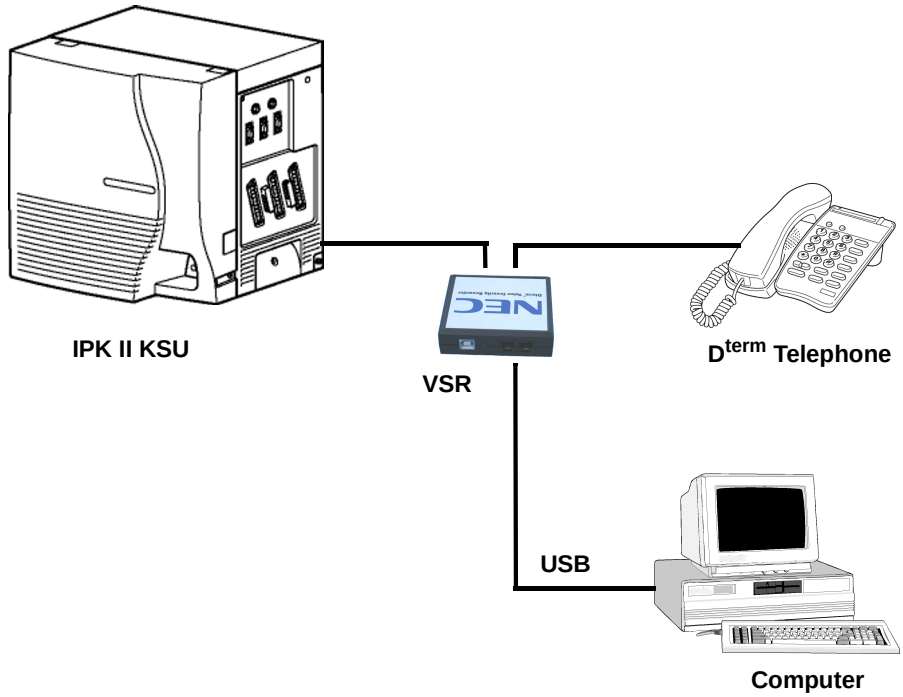


Figure 9-47 VSR Connection Configuration

3.9.4 Requirements for Installation

The VSR is packaged with everything necessary for installation including:

- Software CD
- USB Cable
- Telephone connection lead
- Quick-start installation manual

3.9.5 Installation Procedures for Windows 98 or ME

1. Run the Setup.exe program file from the NEC installation CD **before** connecting the telephone interface unit to your PC.

2. Connect the VRS UBC interface connector to your PC using the provided USB cable.

3. Connect your telephone to either VSR port.

4. Connect the other VSR port to the telephone system, and recording is enabled.

3.9.6 Installation Procedures for Windows 2000 or XP

1. Using the provided USB cable, connect the VRS USB interface to your PC.

2. Windows automatically detects the new hardware and displays a Wizard dialog box.

3. Select Install from a list or specific location (Advanced), and select next.

Figure 9-48 Wizard Welcome Screen

4. The next screen is displayed.

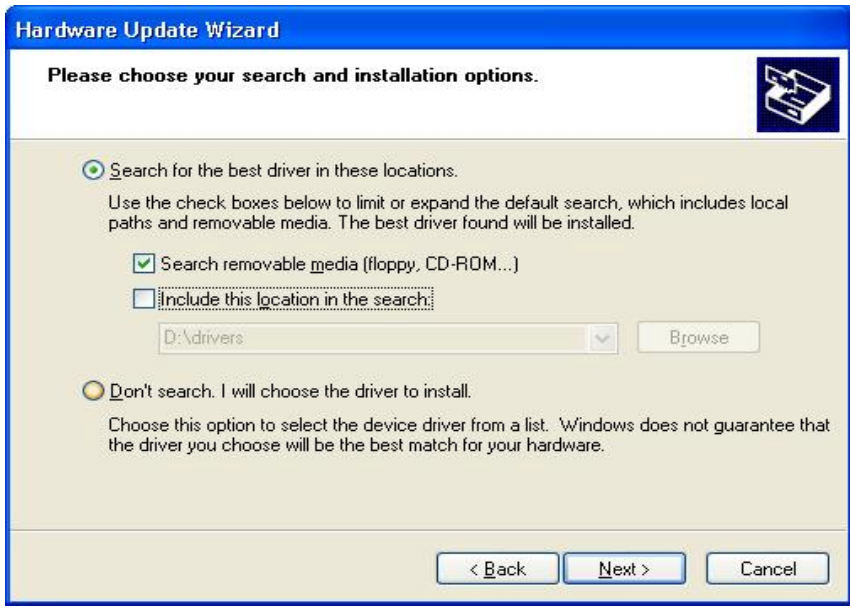


Figure 9-49 Search and Installation Options

5. If files were downloaded from the Internet, uncheck *Search Removable Media*, and check *Include this location in the search,* and enter the location where the downloaded files are to be stored (*e.g.*, C:\My Documents).

6. Select next and the next screen is displayed

Figure 9-50 Software Not Compatible Warning

7. The software is fully tested , but has not been sent to Microsoft for approval. Select Continue anyway and the next screen is displayed.

Figure 9-51 Hardware Update Completed

8. The necessary device drivers are installed.

9. Select Finish to close the dialogue.

10. Now run Setup.exe on your NEC installation CD to install necessary application software on your PC.

11. Connect your telephone to the VSR ports, and you are ready to record.

3.9.7 VSR Application Software

The VSR software is delivered on a Compact Disk using a self-starting install shield. The CD contains all applicable files and installation procedures to operate to this specification, including USB device drivers, software application, and Help files.

A quick-start instruction sheet and a pre-recorded user guide that steps the user through the various options are provided.

The VSR application supports Microsoft Operating Systems that support USB devices. The following systems meet this requirement:

- WIN 98SE
- WIN Millennium Edition (ME)
- WIN 2000
- WIN XP (all variants)

✎ **VSR does not support WIN 95 and below, or WIN NT.**

3.9.8 VSR User Interface Tab Options

VSR has the following tabs to allow the user to select features and options:

- Playback allows various playback features of recorded conversations.
- Record allows control of recording.
- About provides software version information.
- Options to set-up controls such as recording format.
- File Management allows the user to manage disk space used by the VSR.

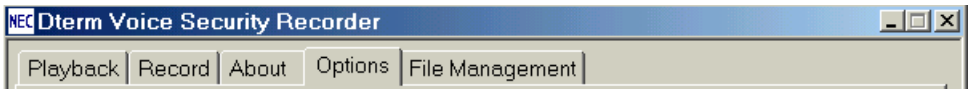


Figure 9-52 VSR User Interface Tab Options

3.9.9 VSR Playback Tab

This Tab allows the user to list and play recorded conversations. A graphical presentation of the volume level of the call with a cursor to indicate the current playback position is displayed. The cursor can be dragged forward or backward to allow rapid selection of the applicable section.

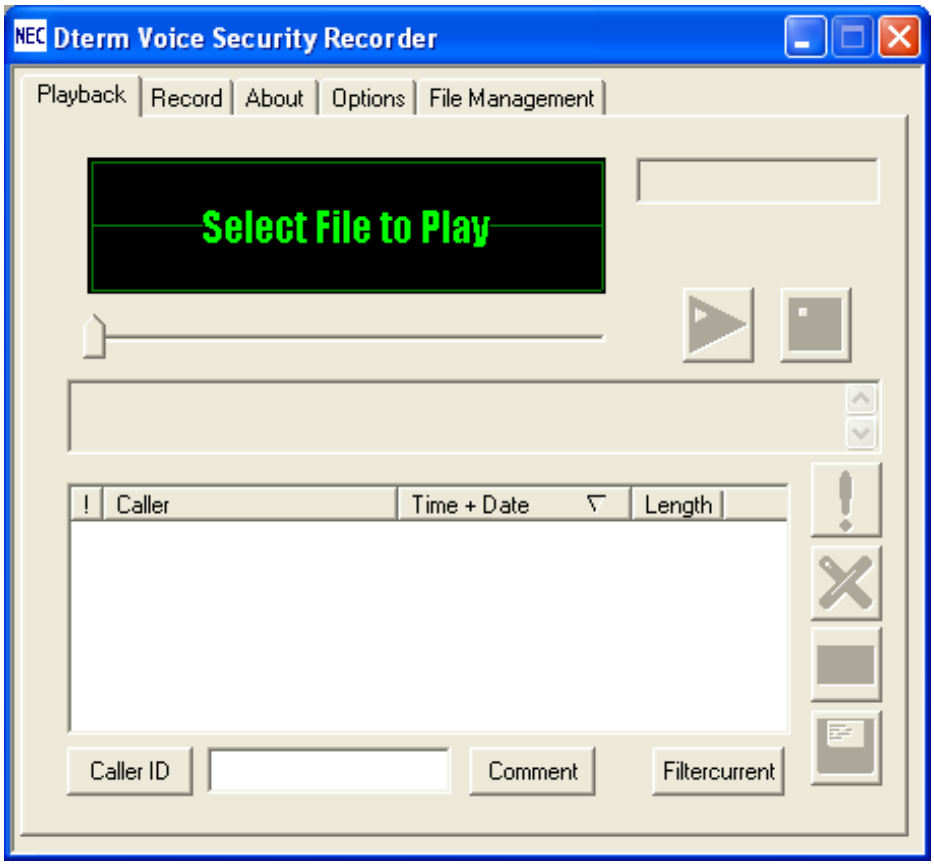


Figure 9-53 VSR Playback Tab

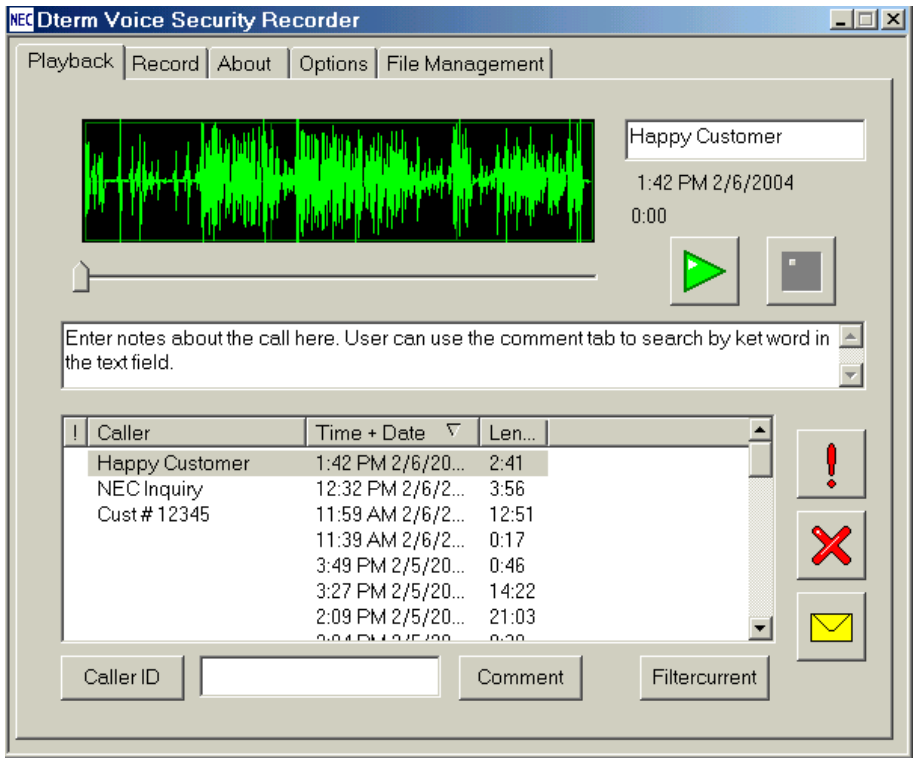


Figure 9-54 Caller ID or Comment Editor

The user can edit the Caller ID or the Comments field when viewing an existing recording.

✎ Caller ID and number dialed are not available on the first release. Check with NEC for release date.

The user can list recordings in order of importance (using exclamation mark) with Caller ID, Time + Date, or duration.

The Caller ID and Comment buttons allow the user to filter out all recordings with the required Caller ID or text in the Comments field.

Playback, pause and stop buttons allow the user to control the Playback.

The Red exclamation mark allows recording to be identified as important for future listing or ensures that the recording cannot be overwritten.

The Red X allows recordings to be manually deleted.

The envelope button generates an e-mail with the recording inserted for mailing to a colleague.

3.9.10 VSR Record Tab

This Tab allows the user to view recording levels and control the recording.

Figure 9-55 View Levels and Control Recording

The Oscilloscope shows the local and remote levels on the line separately (Microphone is the user level and speaker is the distant party level.

The Caller ID field is for future versions, but information can be entered or overwritten by the user.

Manual Start, Stop, and Pause buttons control the recording status.

The user can add notes and mark important recordings with an exclamation point to avoid deleting the conversation.

The camera button allows a user to snapshot record conversation to the current point while continuing to record the entire conversation. This feature is important for emergency centers to allow an operator to quickly reply to an important part while continuing to record.

3.9.11 About Tab

This tab provides version and manufacturer information.

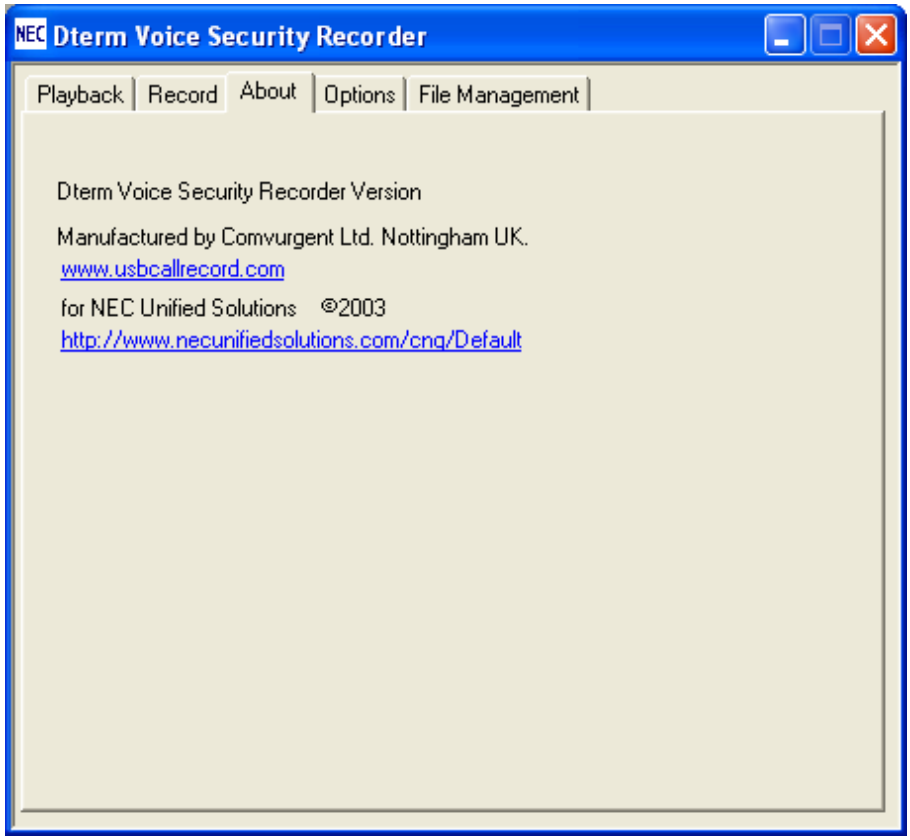


Figure 9-56 VSR About Tab

3.9.12 Options Tab

This Tab allows the user to select various setup options of the VSR.

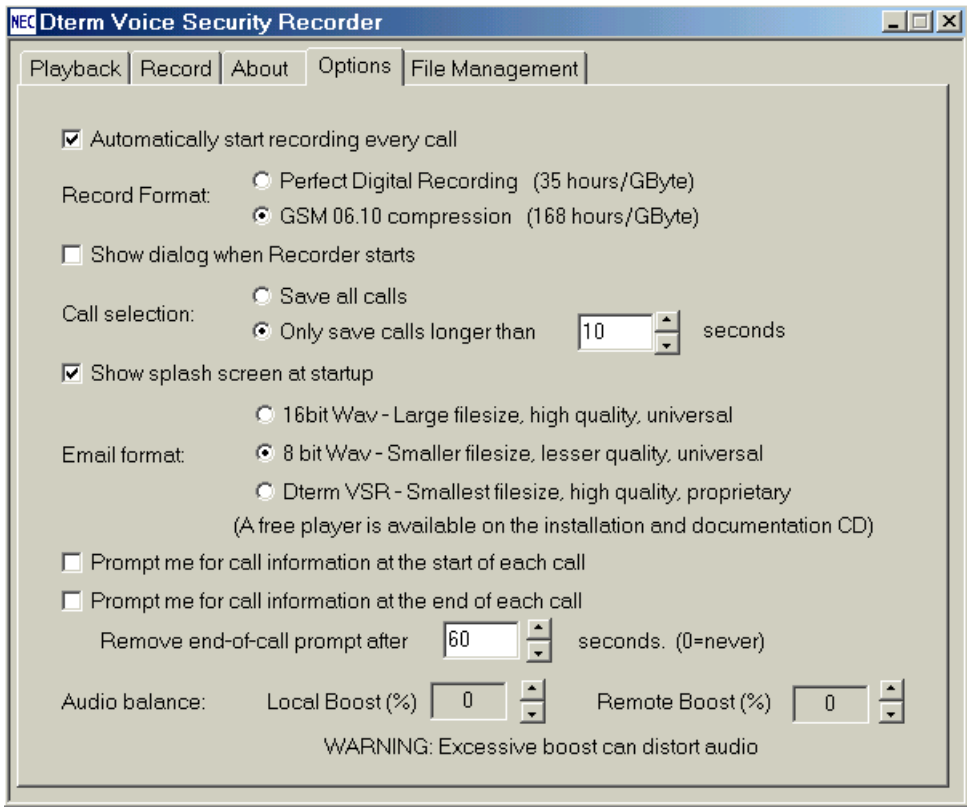


Figure 9-57 Select VSR Setup Options

- Automatically start recording every call

  Starts the recording when a call, including internal extension calls, is made.

- Recorded format

  Perfect Digital Recording stores the recording in PCM format taken directly from the digital line. But the highest quality requires significant space (35 hours per Gbyte) on the PC disk.

  GSM 06.10 uses a compression technique to store 168 Hours per Gbyte. The quality difference is negligible so this becomes the default selection.

- Show dialog when recorder starts

  Selecting this default option brings the Record Tab to the front of the user screen when record is activated.

- Call Selection

  Saves all calls or only those that exceed an established limit.

- Show splash screen at startup

  When selected, the VSR logo is shown for five seconds when the application is started.

- Email format

  Allows the user to select the type of file inserted in an e-mail when the user selects the e-mail button on the Playback Tab to send the VSR format to other users that have this application or to convert it to a .wav format for replay by any PC.

  D^{term} VSR selection automatically adds the Caller ID, time, date and comments fields to any e-mail.

- Prompt for call information at the start of each call

  When selected, the Record screen is displayed when a call is made to allow the user to enter information.

- Prompt for call information at the end of each call

  When selected, the screen shown below is displayed to allow the user to manage calls at the point of completion. The user can save or erase the call, add notes, or mark important calls using the red key shown below.

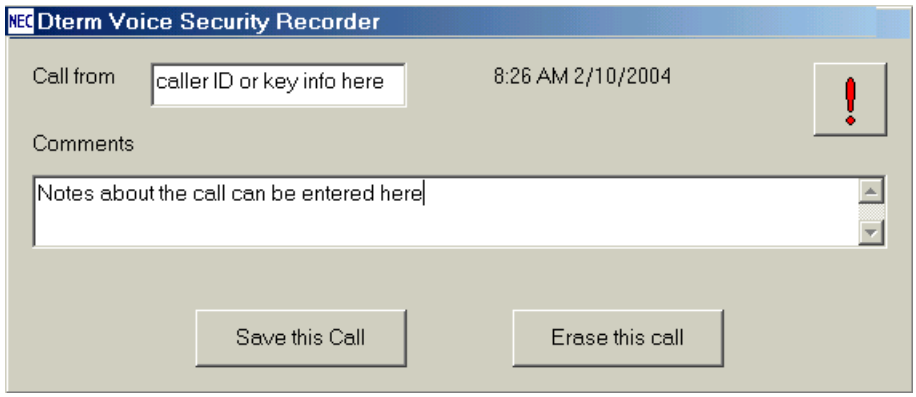


Figure 9-58 Manage Calls at Completion

3.9.13 File Management Tab

File management is necessary when the user makes many telephone calls and stores each conversation. The selections are self-explanatory.

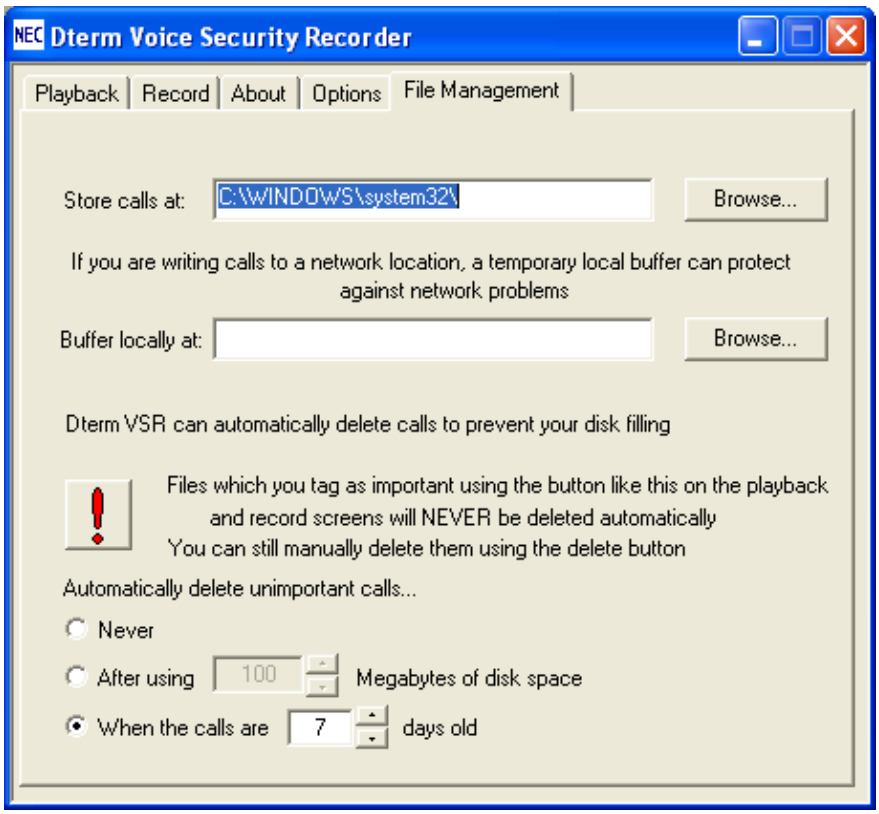


Figure 9-59 File Management Tab

3.9.14 Custom Program Settings

Comvurgent provides the dealer or user the option of making additional adjustments.

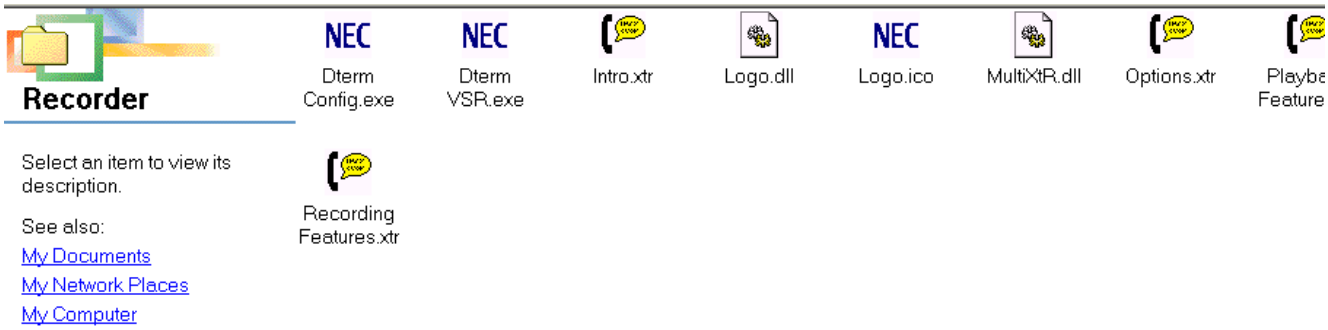


Figure 9-60 Comvurgent Options for Additional Adjustments

This special configuration program can only be accessed by browsing to the installation location (default C:\Program Files\Comvurgent\XtRecorder), and then click on the NEC Dterm Config.exe.

✎ The customer takes all responsibility to ensure they meet legal requirements Comvurgent provides the user option settings to meet customer demands and cannot be responsible for misapplication of the product.

Several settings can be customized to meet requirements of the application as shown in Figure 9-61 Customizing Application to Meet Requirements.

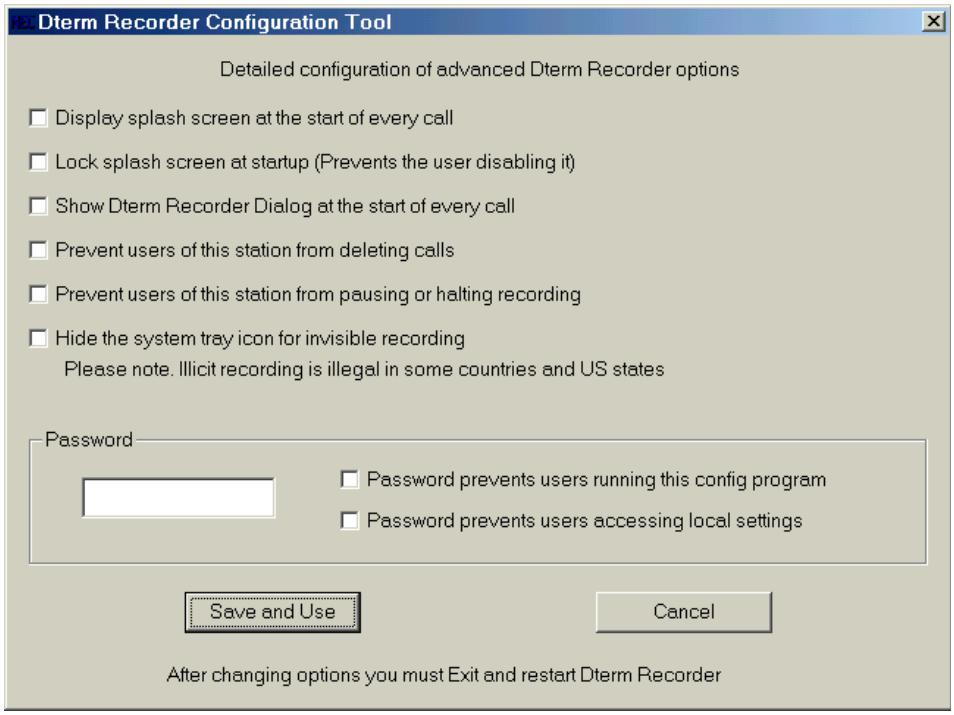


Figure 9-61 Customizing Application to Meet Requirements

- Display splash screen at the start of every call

  Reminds user that recording is taking place by splashing a screen with every call.

- Show Dterm Recorder dialog at the start of every call

  Displays application record screen anytime a call is being recorded.

- Prevent users of this station from deleting calls

  Disables the delete key.

- Prevent users of this station from pausing or halting recording

  Disables pause and stop controls.

- Hide the system tray icon for invisible recording

  Hides the small icon that appears in the system tray and flashes red when recording.

- Password

  Locks access to these settings and those at the user level.

✎ When making changes, the application must be closed and started again to become effective.

3.10 Installing Add on Module (ADM)

The D16(LD)-R ADM creates a 16 button Phonebook directory. The interface for this unit shown in Figure 9-62 ADM Interface Unit is connected in the right adapter connector for the applicable multiline terminal. When another adapter needs to be added, this interface must be moved to the left adapter connector to preserve the cable integrity.

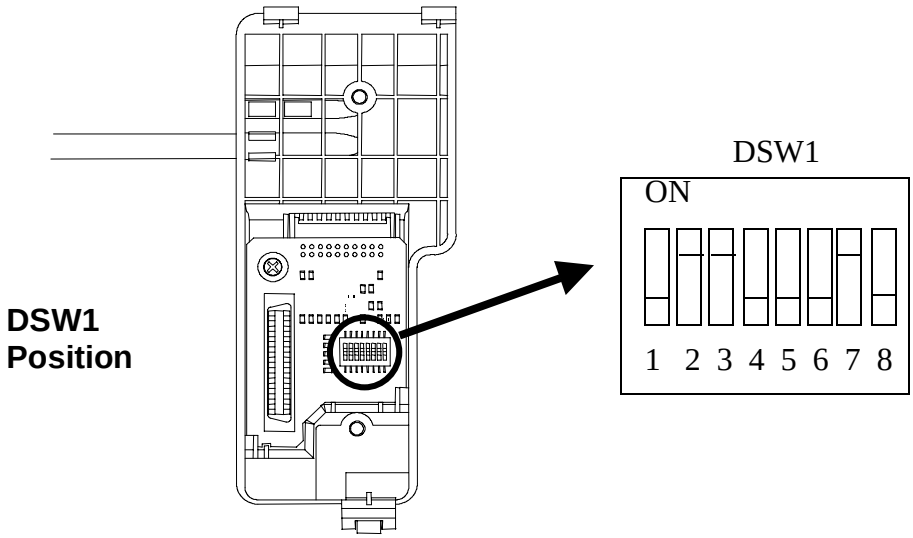


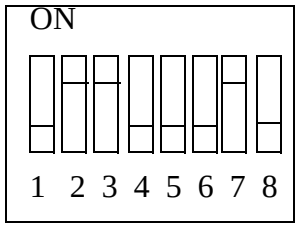
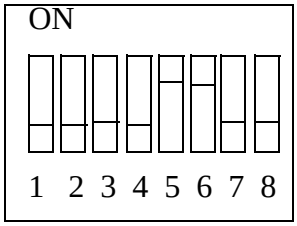
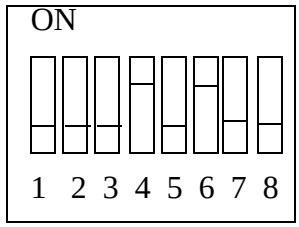
Figure 9-62 ADM Interface Unit

3.10.1 Connecting the Interface Unit:

1. Set DSW1 to the pattern for the applicable multiline terminal as shown in Table 9-11 DSW1 Switch Positions on the next page.

2. Place the ADM and multiline terminal upside down and remove the Base Units.

Table 9-11 DSW1 Switch Positions

Series	Keyset Name	DSW1 Switch Positions
D^{term} Series i	DTR/H-(8)/(16)D-2( ) TEL DTR/H -16LD-2( ) TEL DTR/H-16D(BL)-2( ) TEL	
D^{term} IP	ITR/H-(*8)/(16)-2( ) TEL	
	ITR/H(8)/(16)-3 ( ) TEL ITR/H-16LD-3( ) TEL	

3. Plug the interface unit into the right adapter connection as shown on Figure 9-63 ADM and Multiline Terminal with Base Covers Removed on the next page.

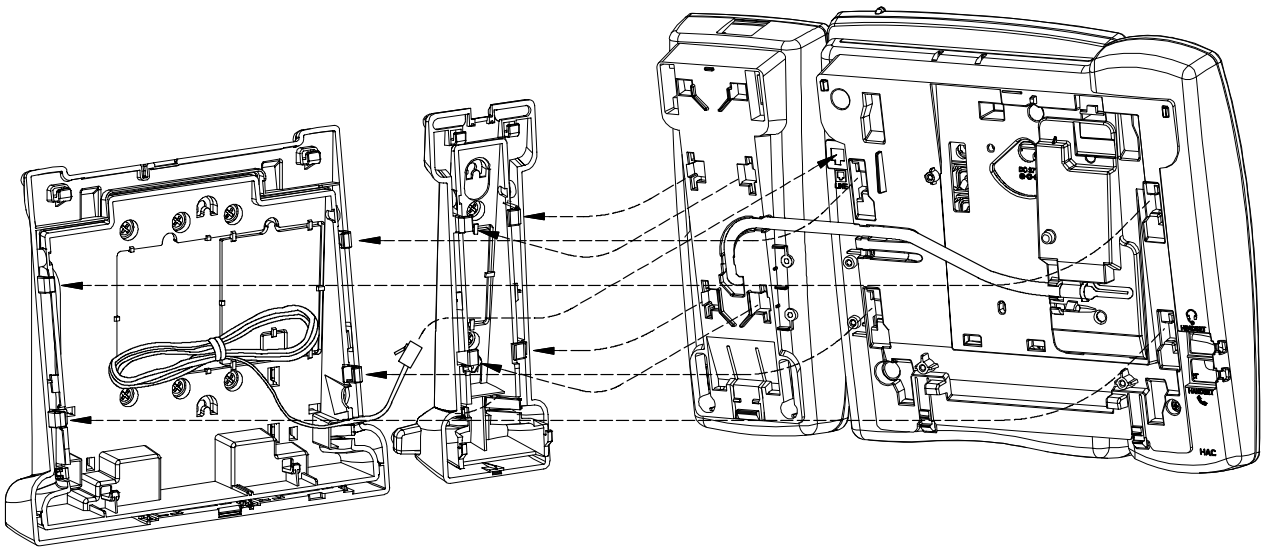


Figure 9-63 ADM and Multiline Terminal with Base Covers Removed

4. Place the interface unit cable in the cable channels on the ADM and multiline terminal.

5. Install the connector plate provided with the ADM as shown in Figure 9-64 Installing the Connector Plate on the next page.

   ✎ The connector plate cannot be used with Inaset terminals.

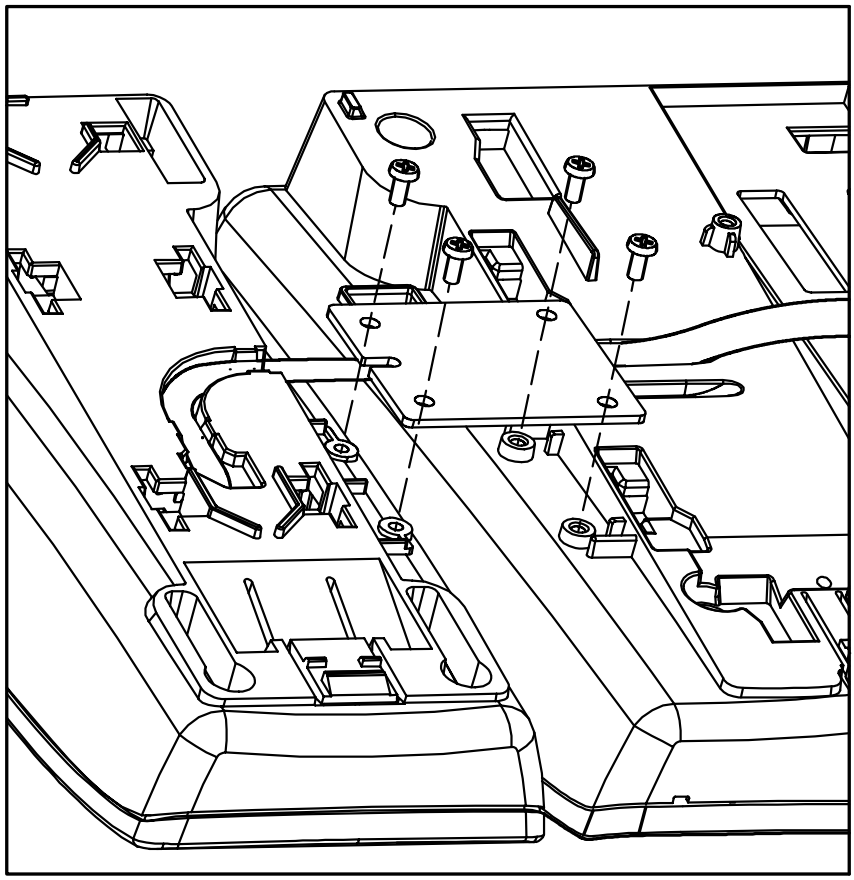


Figure 9-64 Installing the Connector Plate

6. Replace the base units as shown in Figure 9-63 ADM and Multiline Terminal with Base Covers Removed.

3.10.2 Wall Mounting ADM and Multiline Terminal

1. Remove both Base Units.

2. Remove the Multiline Terminal Base Unit cutout shown in Figure 9-65 Installing Base Units on the Wall.

3. Install the base units on the wall using the eight screws.

4. Install the ADM and Multiline Terminal as shown on Figure 9-63 ADM and Multiline Terminal with Base Covers Removed.

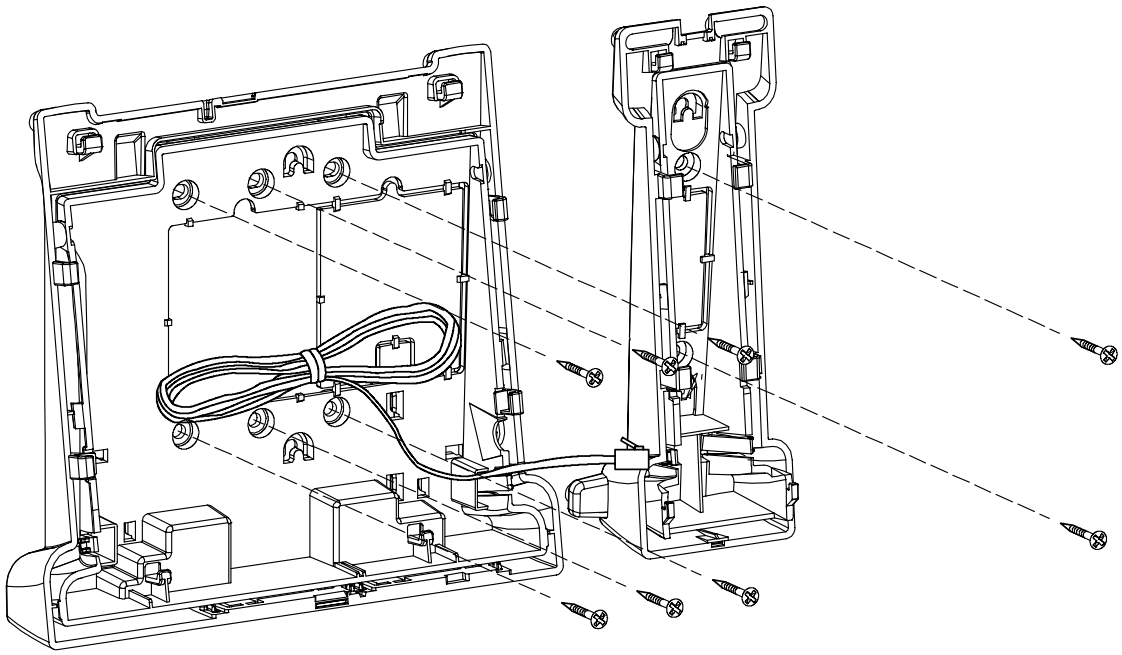


Figure 9-65 Installing Base Units on the Wall

3.11 NEC Conference Max™

3.11.1 Description

This expandable conferencing telephone provides premium, full-duplex audio to small conference rooms as a single unit or to larger rooms when expanded by up to three units that also expand microphone access and loudspeaker coverage with even distribution of sound.

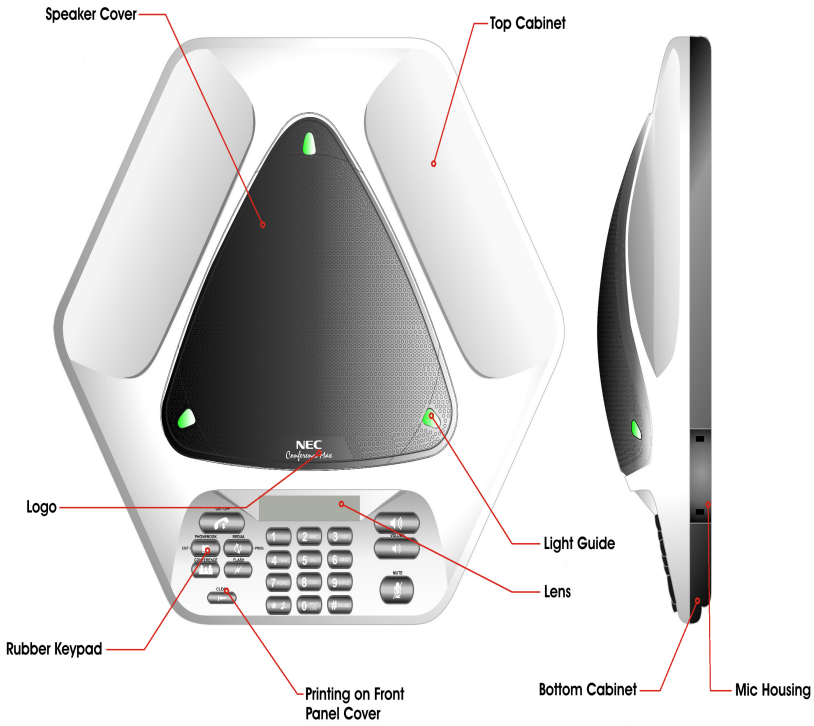


Figure 9-66 NEC Conference Max™

3.11.2 Installation

1. Connect the provided 25’ Cat. 5 cable between the LINK OUT jack of the base unit and the LINK IN jack of the conferencing pod.

2. Connect the provided RJ-11 cable between the base unit and the telephone jack.

3. Connect the power cord to the base unit and plug it in an electrical outlet.

4. To connect additional units, connect a 12’ Cat. 5 cable between the LINK OUT jack of the unit connected to the base unit and the LINK IN jack of the second unit and repeat the connection of another 12’ Cat. 5 cable between the LINK OUT jack of each unit to the LINK IN of the next unit in sequence.

3.11.3 Keypad Functions

Refer to Table 9-12 Keypad Functions.

Table 9-12 Keypad Functions

Key	Function
ON/OFF key (telephone icon)	Press to activate the telephone and access dial tone. Press again to hang up and return to standby mode.
PHONEBOOK (book icon)	Press to dial stored numbers. Press and hold two seconds to enter Phonebook Edit mode.
REDIAL (circular arrow icon)	Press once to dial the last number called. Press and hold two seconds to enter Program mode.
CONFERENCE (three person icon)	Press to dial the conferencing service provider. This feature must be programmed.
FLASH (lightning flash icon)	Press to enable call forwarding, call waiting, or three-way calling when supported by telephone service.
CLEAR (vertical line and left arrow icon)	Press to clear the last digit entered or press and hold to clear all numbers. Press to exit programming mode.
VOLUME (loud and dim speaker icons)	Press during call to adjust call volume or press while telephone is ringing or in standby mode to adjust ringer volume.
MUTE (mike with diagonal line icon)	

3.11.4 Programming Options

To enter Programming mode, press and hold REDIAL until a diamond arrow is displayed on the LCD. Then press the applicable key and follow the instruction in Table 9-13 Programming Options.

Table 9-13 Programming Options

Menu Option	Key	Programming
Ringer Melody	1	Press REDIAL. The current melody selection flashes. Press 1~5 to change melody. Press REDIAL to save the selection.
Dialing Mode	2	Press REDIAL. The current dialing selection flashes. Press 1 for tone or 2 for pulse. Press REDIAL to save the selection.
Flash Duration	3	Press REDIAL. The current duration flashes. Press 1~5 to select duration as follows: 1 = 600 ms 2 = 300 ms 3 = 150 ms 4 = 100 ms 5 = 80 ms Press REDIAL to save the selection.
Local Number✱	4	Press REDIAL. Enter the telephone number that you want displayed on the LCD in standby mode. Press REDIAL to save the number.
Conference✱	5	Press REDIAL. Enter the telephone number you want the conference key to dial. Press REDIAL to save the number.
Service✱	6	Press REDIAL. Enter the telephone number you want the O key to dial. Press REDIAL to save the number.
Country	7	Press REDIAL. Press number key for country as follows: 1 US/Canada/China/Japan/Mexico/Singapore 2 Europe CTR 21 3 Australia 4 S. Africa 5 Brazil 6 New Zealand 7 South Korea Press REDIAL to save the country setting.

CLEAR Press to return the previous menu.
Press and hold to exit programming without saving changes.

✱ Press and hold 1 to enter hyphen or ✱ to enter a space in the number.
Press CLEAR before entering a new number.

3.11.5 Compliance

This product is in compliance with the following regulations and requirements:

- FCC Part 15/ICES-003

  This product has been tested and complies with the limits for a Class A digital device

- FCC Part 68

  US:FBIMT01B910158015 Ringer Equivalence Number (REN):0.1B(ac)

- Industry of Canada (IC)

  IC: 1970A-158015: REN:0.1B(ac)

- European

  Council Directive 1999/5/EC

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TABLE OF CONTENTS
CHAPTER 10

Section 1 General Information 10-1

Section 2 Multiline Terminals 10-1

2.1 DTP-2DT-1 TEL 10-1

2.2 DTU-8-1 TEL 10-3

2.3 DTU-8D-2 TEL 10-4

2.4 DTU-16-1 TEL 10-5

2.5 DTU-16D-2 TEL 10-6

2.6 DTU-32-1 TEL 10-7

2.7 DTU-32D-2 TEL 10-8

2.8 DCU-60-1 CONSOLE 10-9

Section 3 Connecting a DTU/DTP Terminal to the System 10-10

Section 4 Connecting Attendant Console to a Multiline Terminal 10-11

Section 5 Adjusting the DTU/DTP LCD 10-12

Section 6 Installing DTU/DTP Line Cards and Plastic Panels 10-13

6.1 Line Card and Plastic Panel Installation 10-13

6.2 Plastic Panel Removal 10-14

Section 7 Removing DTU/DTP Softkeys 10-15

Section 8 Adjusting DTU/DTP Multiline Terminal Height 10-15

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LIST OF FIGURES
CHAPTER 10

Figure 10-1 DTP-2DT-1 TEL 10-2

Figure 10-2 DTU-8-1 TEL Multiline Terminal 10-3

Figure 10-3 DTU-8D-2 TEL Multiline Terminal 10-4

Figure 10-4 DTU-16-1 TEL Multiline Terminal 10-5

Figure 10-5 DTU-16D-2 TEL Multiline Terminal 10-6

Figure 10-6 DTU-32-1 TEL Multiline Terminal 10-7

Figure 10-7 DTU-32D-2 TEL Multiline Terminal 10-8

Figure 10-8 DCU-60-1 CONSOLE 10-9

Figure 10-9 Connecting a Multiline Terminal to the System 10-10

Figure 10-10 Leading Line Cords on a Multiline Terminal 10-10

Figure 10-11 Connecting the Line Cord and AC Adapter when Installing a DCU Attendant Console 10-11

Figure 10-12 DCU Attendant Console and Multiline Terminal 10-12

Figure 10-13 Adjusting the DTU/DTP LCD 10-12

Figure 10-14 Installing Line Card and Plastic Panel on a DTU/DTP Multiline Terminal 10-13

Figure 10-15 Installing Plastic Panel on a DTU/DTP Multiline Terminal 10-14

Figure 10-16 Removing the Plastic Panel from the DTU/DTP Multiline Terminal 10-14

Figure 10-17 Removing DTU/DTP Softkeys 10-15

Figure 10-18 Locating the Adjustment Tabs on the DTU/DTP Multiline Terminal 10-15

Figure 10-19 Raising the Base Plate on the DTU/DTP Multiline Terminal 10-16

Figure 10-20 Adjusting the Line Cord Length 10-16

Figure 10-21 Lowering the Base Plate on the Multiline Terminal 10-17

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Installing Electra Elite Multiline Terminals

CHAPTER 10

SECTION 1 GENERAL INFORMATION

The Electra Elite IPK II system provides several Electra Elite Multiline Terminals, an Attendant Console, and several adapters that attach peripheral equipment to the Multiline Terminals. The adapters can be used with *D*^{term} Series E Multiline Terminals also. This chapter describes each terminal, console, and adapter and provides applicable installation instructions.

SECTION 2 MULTILINE TERMINALS

2.1 DTP-2DT-1 TEL

This digital nondisplay Multiline Terminal has two programmable line keys (each with a 2-color LED), eight function keys, a built-in speakerphone, headset connection, and a large LED to indicate incoming calls and messages.

Basic Port Package

A maximum of 56 DTP-2DT-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTP-2DT-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

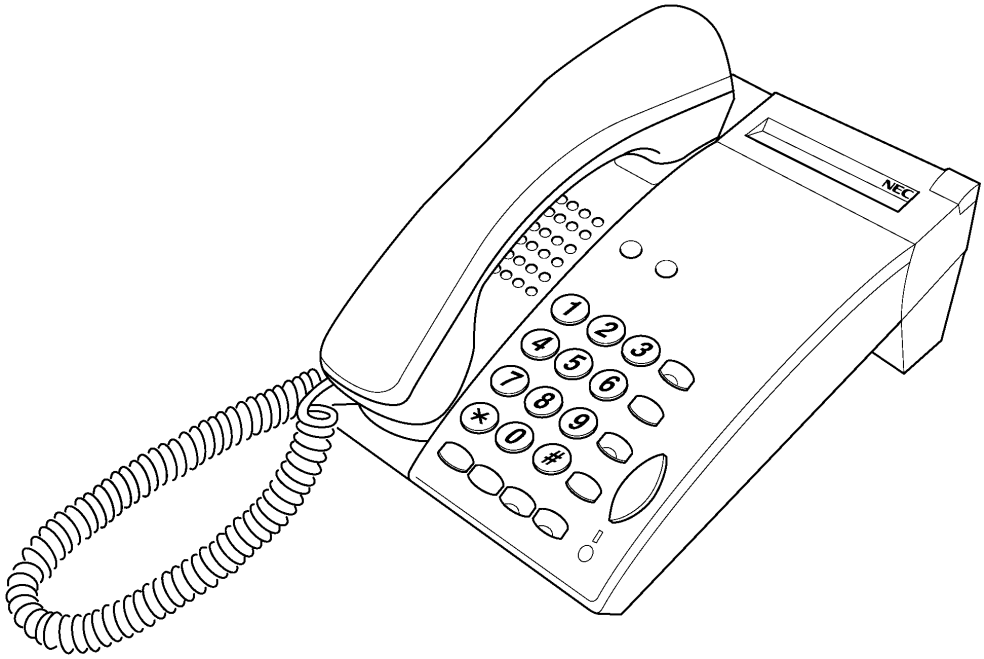

Figure 10-1 DTP-2DT-1 TEL

2.2 DTU-8-1 TEL

This digital nondisplay Multiline Terminal has eight programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S), or HFU-U.

The DTP-8-1 TEL is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-8-1/DTP-8-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-8-1/DTP-8-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

Figure 10-2 DTU-8-1 TEL Multiline Terminal

2.3 DTU-8D-2 TEL

This digital Multiline Terminal has eight programmable line keys (each with the 2-color LED), a built-in speakerphone, headset jack, a Large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S), or HFU-U.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTP-8D-1 TEL is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-8D-2/DTP-8D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-8D-2/DTP-8D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

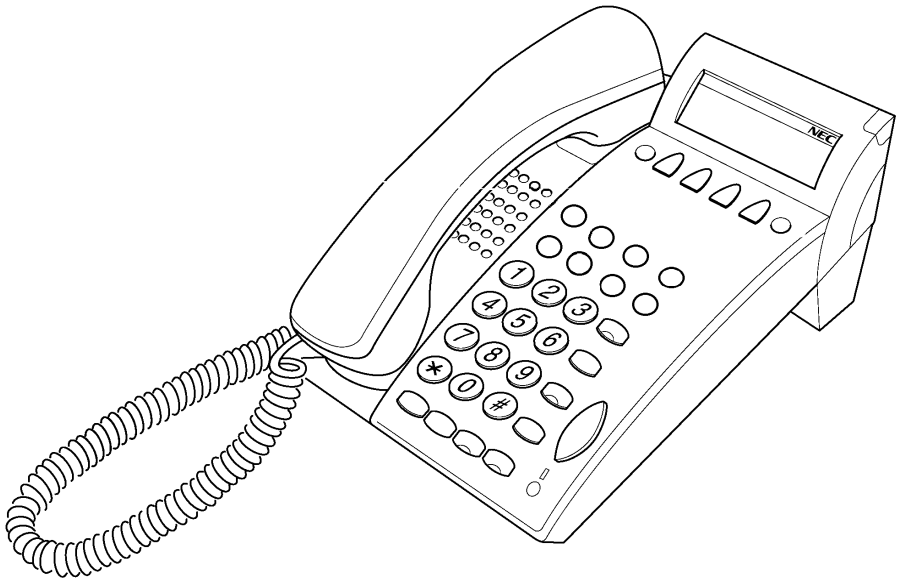

Figure 10-3 DTU-8D-2 TEL Multiline Terminal

2.4 DTU-16-1 TEL

This digital nondisplay Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S) or HFU-U Unit.

The DTP-16-1 TEL is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-16-1/DTP-16-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-16-1/DTP-16-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

Figure 10-4 DTU-16-1 TEL Multiline Terminal

2.5 DTU-16D-2 TEL

This digital Multiline Terminal has 16 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S), or HFU-U.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTP-16D-1 TEL is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-16D-2/DTP-16D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-16D-2/DTP-16D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

Figure 10-5 DTU-16D-2 TEL Multiline Terminal

2.6 DTU-32-1 TEL

This digital nondisplay Multiline Terminal has 32 programmable line keys (each with a 2-color LED), 16 one-touch keys, a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S), or HFU-U.

The DTP-32-1 TEL, is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-32-1/DTP-32-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-32-1/DTP-32-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

Figure 10-6 DTU-32-1 TEL Multiline Terminal

2.7 DTU-32D-2 TEL

This digital Multiline Terminal has 32 programmable line keys (each with a 2-color LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-U, APA-U, APR-U, CTA-U, CTU(S), or HFU-U.

This terminal also has a 3-line, 24-character, adjustable Liquid Crystal Display (LCD) and four softkeys.

The DTP-32D-1 TEL is comparable and can also be used with the Electra Elite IPK II system.

Basic Port Package

A maximum of 56 DTU-32D-2/DTP-32D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 240 DTU-32D-2/DTP-32D-1 TELs can be installed. The combined total of all Electra Elite Multiline Terminals that can be installed is 240.

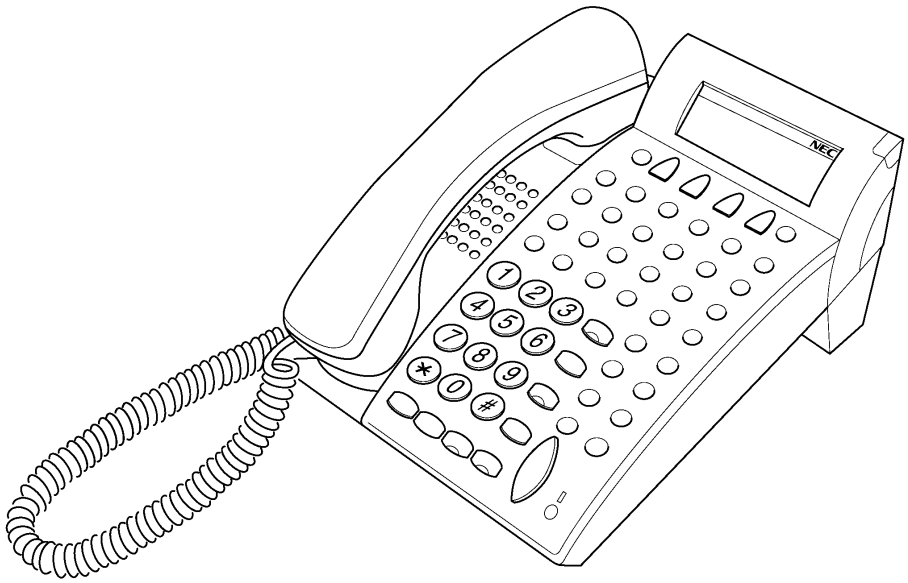

Figure 10-7 DTU-32D-2 TEL Multiline Terminal

2.8 DCU-60-1 CONSOLE

The Attendant Console has 60 programmable line keys (each with a 2-color LED). These 60 line keys can be programmed as Direct Station Selection keys, function keys, or as outside line keys. An external power supply (AC adapter) is provided with the Attendant Console.

Basic Port Package and *Expanded Port Package*

A maximum of 32 DCU-60-1 CONSOLEs can be installed in an Electra Elite IPK II system. An Attendant Position can have all 32 associated DCU-60-1 CONSOLEs.

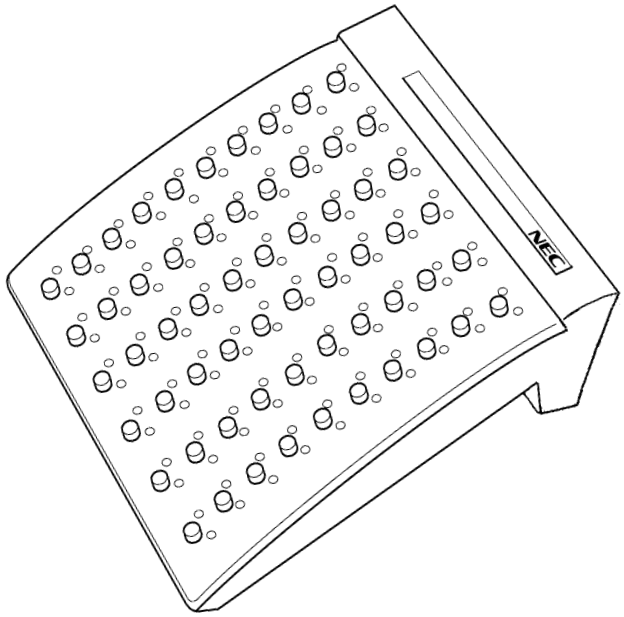

Figure 10-8 DCU-60-1 CONSOLE

SECTION 3 CONNECTING A DTU/DTP TERMINAL TO THE SYSTEM

The instructions for connecting a Multiline Terminal to the system applies to all Multiline Terminals.

1. Plug the telephone cord into the modular jack on the bottom side of the Multiline Terminal. The handset is also attached to the bottom side of the Multiline Terminal.

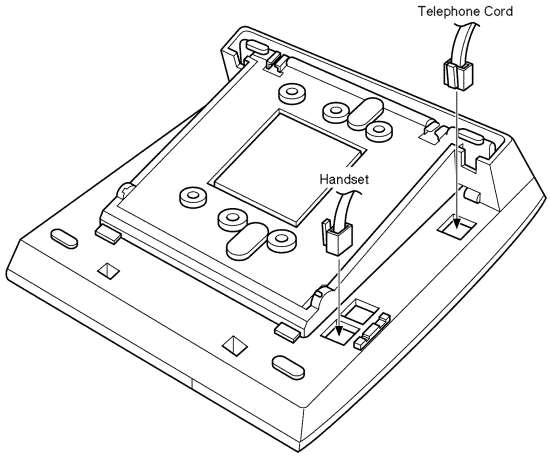

Figure 10-9 Connecting a Multiline Terminal to the System

2. Lead the telephone and handset cords through the appropriate grooves.

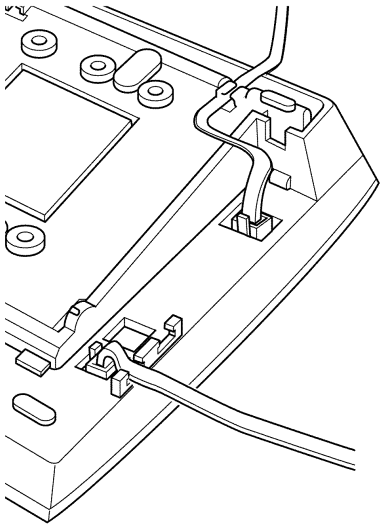

Figure 10-10 Leading Line Cords on a Multiline Terminal

SECTION 4 CONNECTING ATTENDANT CONSOLE TO A MULTILINE TERMINAL

An Attendant Console can be attached to a Multiline Terminal using the following procedures.

1. Turn the Multiline Terminal and the Attendant Console face down.
2. Using the joining plate provided with the Attendant Console, attach the plate to the Multiline Terminal and the Attendant Console.
3. Connect the line cord and the AC adapter to the indicated locations on the bottom of the Attendant Console.

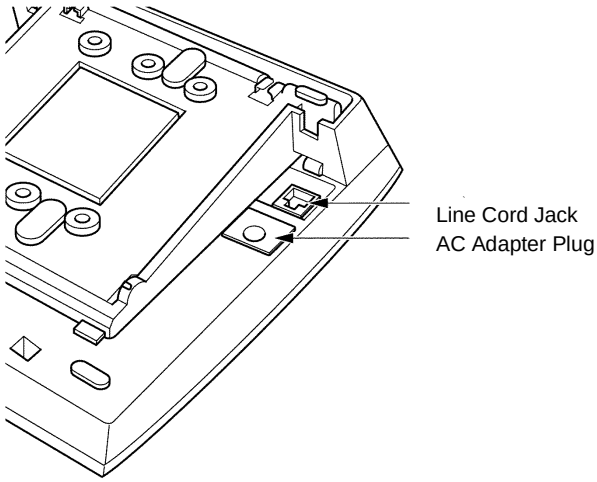

Figure 10-11 Connecting the Line Cord and AC Adapter when Installing a DCU Attendant Console

4. When the Attendant Console and the Multiline Terminal are properly connected, they sit side-by-side as shown in Figure 10-12 DCU Attendant Console and Multiline Terminal.
5. Make sure that the AC adapter, supplied with the Attendant Console, is used. Using a different AC adapter may cause problems. Check that the supplied voltage matches that specified for the adapter and plug it in an outlet.

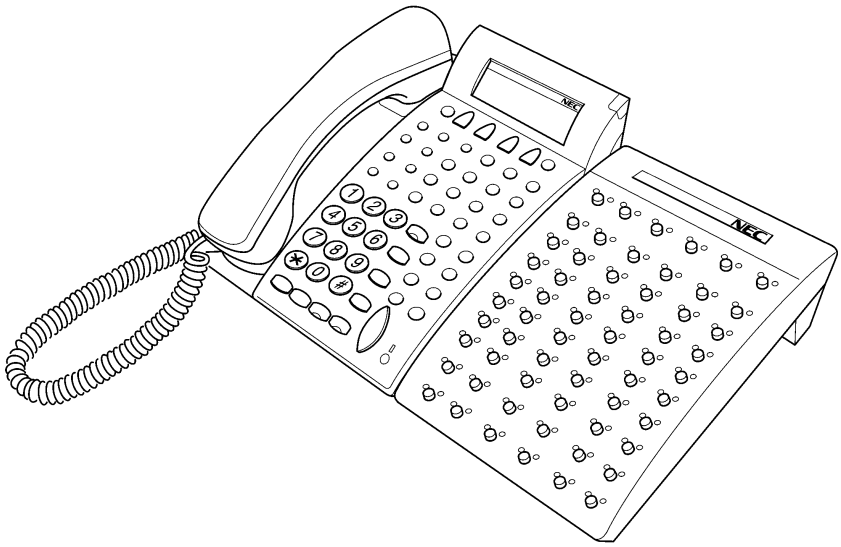

Figure 10-12 DCU Attendant Console and Multiline Terminal

SECTION 5 ADJUSTING THE DTU/DTP LCD

Electra Elite display Multiline Terminals have an adjustable Liquid Crystal Display (LCD). The LCD can be adjusted by pushing down or pulling up as desired.

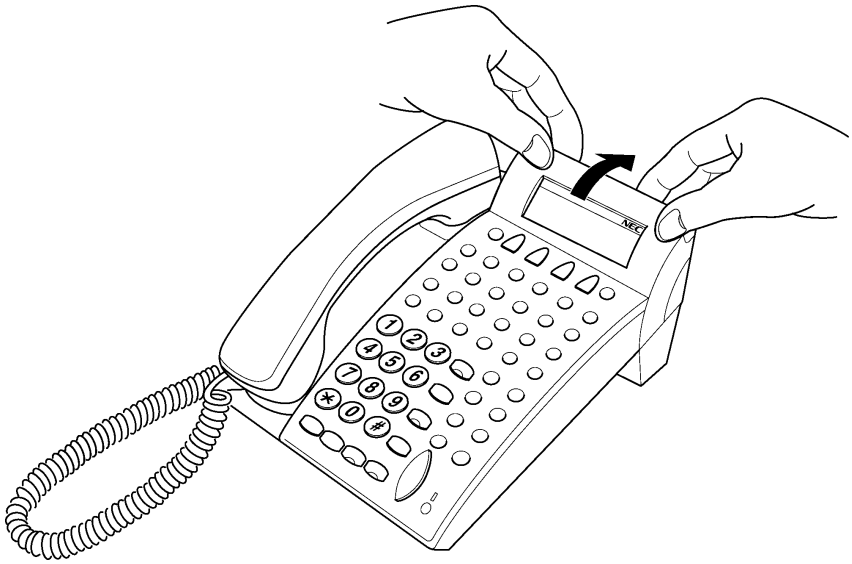

Figure 10-13 Adjusting the DTU/DTP LCD

SECTION 6 INSTALLING DTU/DTP LINE CARDS AND PLASTIC PANELS

6.1 Line Card and Plastic Panel Installation

Line key designations are entered on the Line Card that is then placed on the Multiline Terminal to provide a quick reference of key designations. The Line Cards can be changed as necessary. The Plastic Panel is placed on top of the Line Card to hold it in place.

1. Place the Line Card over the keys on the Multiline Terminal.

2. Place the tabs on the bottom of the plastic panel in the grooves at the terminal bottom, and press top right and left ends to secure plastic panel to the Multiline Terminal. Refer to Figure 10-15 Installing Plastic Panel on a DTU/DTP Multiline Terminal.

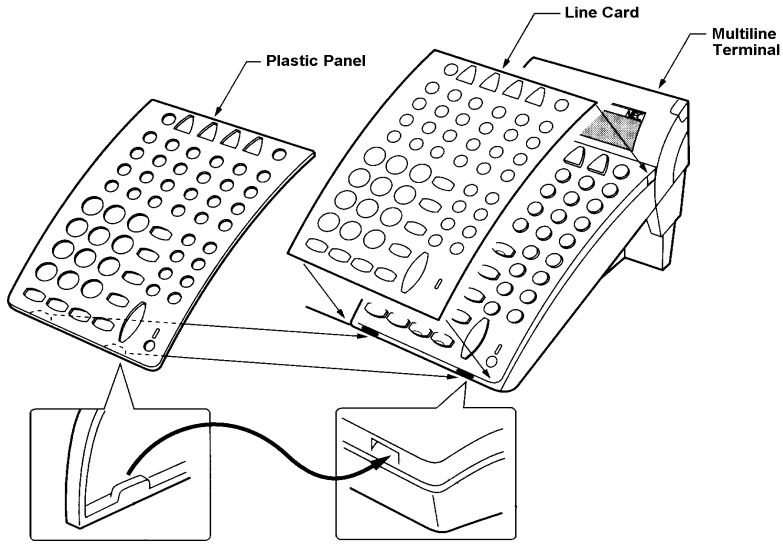

Figure 10-14 Installing Line Card and Plastic Panel on a DTU/DTP Multiline Terminal

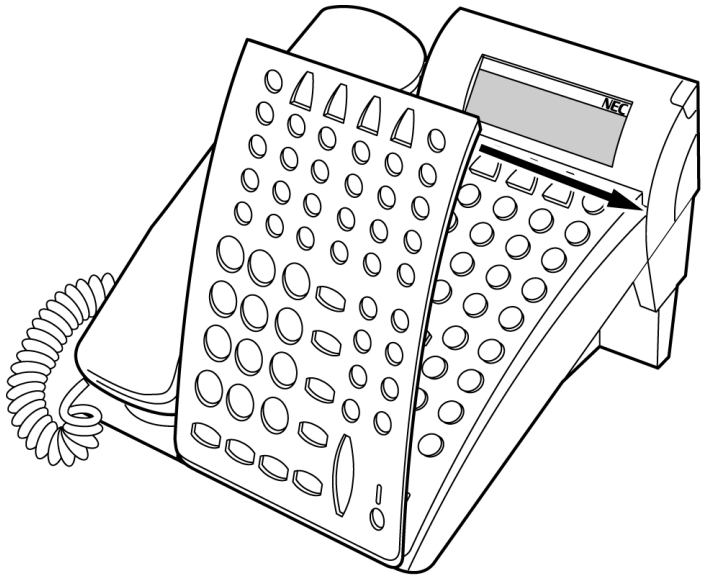

Figure 10-15 Installing Plastic Panel on a DTU/DTP Multiline Terminal

6.2 Plastic Panel Removal

Lift the right corner, raise the panel, and slide the bottom away from the Multiline Terminal.

Never pull on the bottom of the plastic panel to remove it; the plastic panel could be damaged.

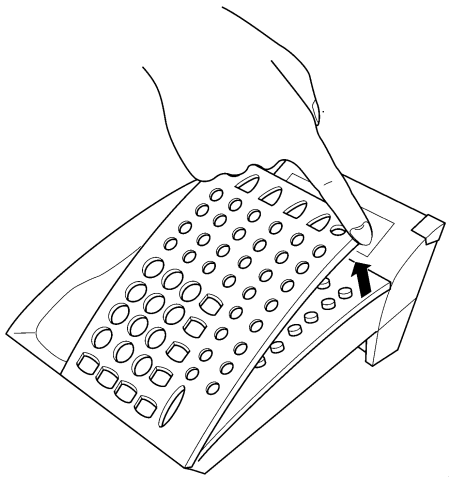

Figure 10-16 Removing the Plastic Panel from the DTU/DTP Multiline Terminal

SECTION 7 REMOVING DTU/DTP SOFTKEYS

When the softkeys on the Multiline Terminal are not used, they can be removed using the following procedure:

1. Remove the softkeys by pulling the softkey plate upward as shown in Figure 10-17 Removing DTU/DTP Softkeys.

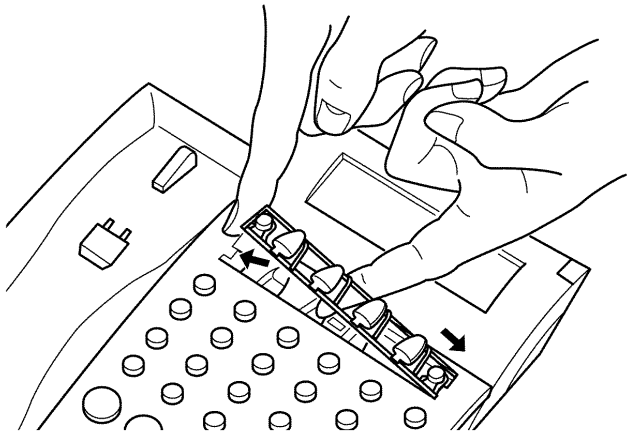

Figure 10-17 Removing DTU/DTP Softkeys

SECTION 8 ADJUSTING DTU/DTP MULTILINE TERMINAL HEIGHT

The base plate on the Electra Elite Multiline Terminal is hinged to allow adjustment to raise or lower the terminal.

1. Turn the Multiline Terminal upside down and locate the tabs as shown in Figure 10-18 Locating the Adjustment Tabs on the DTU/DTP Multiline Terminal.

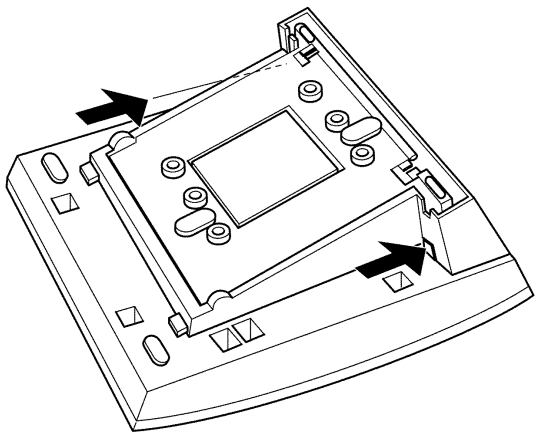

Figure 10-18 Locating the Adjustment Tabs on the DTU/DTP Multiline Terminal

2. Push the adjustment tabs and raise the base plate until it locks.

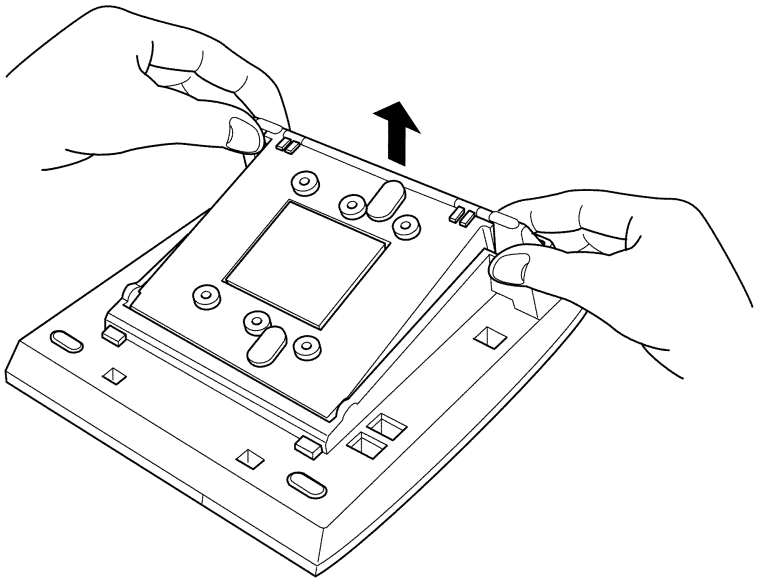

Figure 10-19 Raising the Base Plate on the DTU/DTP Multiline Terminal

3. The length of the cord can be adjusted by pulling the line cord though the groove in the bottom of the Multiline Terminal.

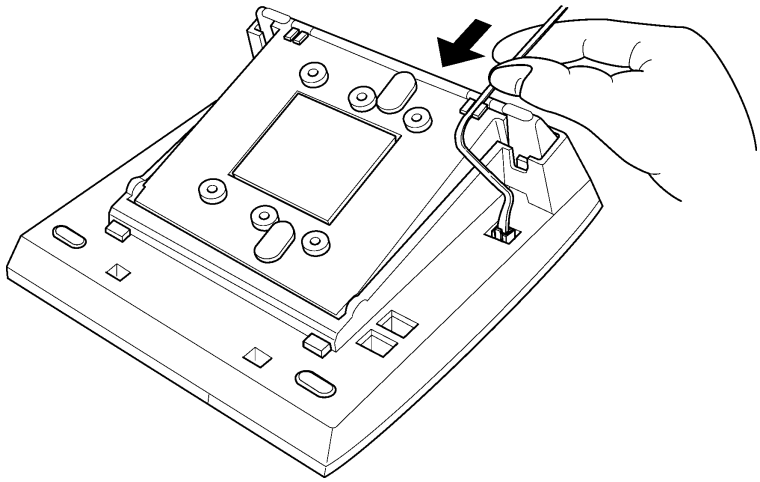

Figure 10-20 Adjusting the Line Cord Length

4. To lower the base plate on the Multiline Terminal, push on the adjustment tabs and push the base plate downward.

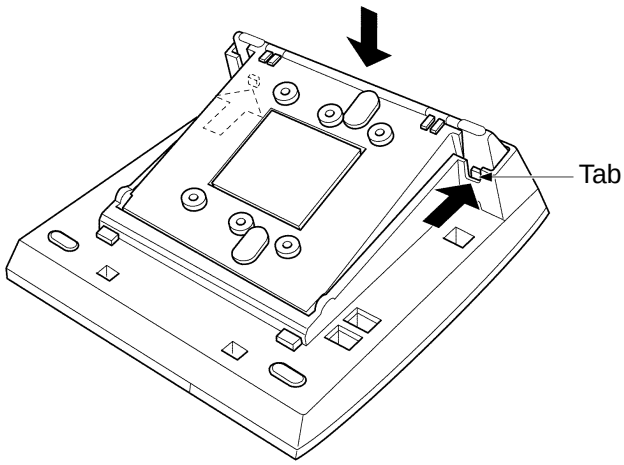

Figure 10-21 Lowering the Base Plate on the Multiline Terminal

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TABLE OF CONTENTS
CHAPTER 11

Section 1 General Information 11-1

Section 2 Preparing Multiline Terminal for Adapter Installation 11-1

Section 3 Installation Procedures 11-6

3.1 ACA-U Unit (AC Adapter) 11-6

3.1.1 Connecting the ACA-U Unit 11-6

3.2 ADA-U Unit (Ancillary Device Adapter) 11-7

3.2.1 Installing an ADA-U Unit on a Multiline Terminal 11-7

3.2.2 Connecting Cables to the ADA-U Unit 11-9

3.2.3 Switch Settings 11-12

3.3 APA-U Unit (Analog Port Adapter) 11-14

3.3.1 Installing APA-U Unit on any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1 11-14

3.3.2 Switch Settings 11-15

3.3.3 Connecting Cables on the APA-U Unit 11-16

3.4 APR-U Unit (Analog Port Ringer) 11-17

3.4.1 Installing an APR-U Unit on any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1 11-17

3.4.2 Switch Settings 11-19

3.4.3 Connecting Cables on the APR-U Unit 11-20

3.5 CTA-U Unit (Computer Telephony Application) 11-21

3.5.1 Installing the CTA-U Unit 11-22

3.5.2 Connecting the Cables on the CTA-U Unit 11-23

3.5.3 Installing the Driver on the PC 11-23

3.6 Computer Telephony Adapter, CTU(8)-U Unit, with USB Interface 11-23

3.6.1 CTU(S) Unit Connections 11-24

3.7 HFU-U Unit (Handsfree Unit) 11-25

3.7.1 Installing an HFU-U Unit on any DTU/DTP Multiline Terminal (except DTP-2DT-1 and DTP-16HC-1) 11-25

3.7.2 Installing the External Microphone 11-26

3.7.3 Switch Settings 11-27

3.8 SLTII(1)-U10 ADP (Single Line Telephone) 11-27

3.8.1 Connecting the SLTII(1)-U10 ADP to the System 11-27

3.8.2 Wall Mounting the SLTII(1)-U( ) ADP 11-30

3.9 Wall Mounting 11-31

3.9.1 Removing and Remounting the Handset Hanger 11-31

3.9.2 Wall Mounting using the Base Unit 11-31

3.9.3 Installing the Wall Mount Unit and Mounting the Multiline Terminal using the WMU-U Unit 11-35

3.9.4 Removing the Multiline Terminal from the Base Plate 11-39

3.9.5 Removing the Multiline Terminal from the WMU-U Unit 11-39

LIST OF FIGURES
CHAPTER 11

Figure 11-1 Raising the Base Plate 11-2
Figure 11-2 Unlocking Tab 11-2
Figure 11-3 Releasing Right Tab 11-3
Figure 11-4 Removing Bottom Cover 11-3
Figure 11-5 Removing Base Plate Dummy End 11-4
Figure 11-6 Cutting Dummy End in Half 11-4
Figure 11-7 Installing Adapter in Connector 1 11-5
Figure 11-8 Installing Dummy End B 11-5
Figure 11-9 ACA-U Unit Connection 11-7
Figure 11-10 Attaching the ADA-U Unit to the Multiline Terminal 11-8
Figure 11-11 Leading the Audio Cable out from the ADA-U Unit 11-8
Figure 11-12 ADA-U Unit 11-9
Figure 11-13 Attaching Cables to the ADA-U Unit 11-10
Figure 11-14 ADA-U Unit Switch Settings 11-12
Figure 11-15 APA-U Unit 11-14
Figure 11-16 Attaching the Unit to the Multiline Terminal 11-15
Figure 11-17 APA-U Unit Switches 11-15
Figure 11-18 Connecting Cables on the APA-U Unit 11-16
Figure 11-19 APR-U Unit 11-17
Figure 11-20 Attaching the Unit to the Multiline Terminal 11-18
Figure 11-21 Leading the Telephone Cord out from the Unit 11-18
Figure 11-22 Closing the Base Plate Cover 11-19

Figure 11-23 APR-U Unit Switches 11-19
Figure 11-24 Connecting Cables on the APR-U Unit 11-20
Figure 11-25 Attaching an Electra Elite Multiline Terminal to a PC 11-21
Figure 11-26 CTA-U Unit 11-22
Figure 11-27 Attaching the Unit to the Multiline Terminal 11-22
Figure 11-28 Connecting the RS-232C Cable to the CTA-U Unit on the Multiline Terminal 11-23
Figure 11-29 CTU (S)-U Unit 11-24
Figure 11-30 HFU-U Unit 11-25
Figure 11-31 Microphone with Mute 11-26
Figure 11-32 Attaching a Microphone to a Multiline Terminal 11-26
Figure 11-33 HFU-U(BK)/(WH) Unit Switches 11-27
Figure 11-34 Connecting a Single Line Telephone to the System using an SLTII(1)-U( ) ADP .. 11-28
Figure 11-35 Connecting the SLTII(1)-U( ) ADP 11-29
Figure 11-36 Removing the Screws from the SLTII(1)-U( ) ADP 11-30
Figure 11-37 Attaching the SLTII(1)-U( ) ADP to the Wall 11-30
Figure 11-38 Positioning the Handset Hanger 11-31
Figure 11-39 Removing the Knockout 11-32
Figure 11-40 Attaching the Base Plate to the Wall 11-32
Figure 11-41 Plugging in the Line Cord using a Wall Jack 11-33
Figure 11-42 Plugging in the Line Cord Using a Modular Jack 11-33
Figure 11-43 Attaching the Bottom Tabs of the Multiline Terminal to the Base Plate 11-34
Figure 11-44 Attaching the Top Tabs of the Multiline Terminal to the Base Plate 11-34
Figure 11-45 Installed Wall Mount Unit 11-35
Figure 11-46 Removing the Tabs from the Adapter 11-36
Figure 11-47 Removing the Tabs from the WMU-U Unit 11-36
Figure 11-48 Leading the Line Cord out of the WMU-U Unit 11-37
Figure 11-49 Attaching the Wall Mount Unit to the Wall 11-37
Figure 11-50 Attaching the Multiline Terminal to the WMU-U Unit 11-38

Figure 11-51 Removing the Multiline Terminal from the Base Plate 11-39

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LIST OF TABLES
CHAPTER 11

Table 11-1 ADA-U Cable Connections 11-10

Table 11-2 ADA-U Unit Switch Settings 11-13

Table 11-3 APA-U Unit Switch Settings for SW3 11-16

Table 11-4 APR-U Unit Switch Settings for SW1 and SW3 11-20

Table 11-5 HFU-U Unit Switch Settings 11-27

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Installing Electra Elite Optional Terminal Equipment CHAPTER 11

SECTION 1 GENERAL INFORMATION

The Electra Elite optional equipment can be purchased separately from the system and added as the customer business grows. Except as noted, these adapters can be installed on Electra Elite Multiline Terminals. The adapters can also be used with *D*^{term} Series E (DTP) Multiline Terminals.

A Multiline Terminal can have up to three adapters installed at the same time. When attaching an APR-U, CTA-U, CTU(S)-U, or HFU-U Unit an external power supply is required. Only **one** power supply is needed even when more than one adapter is installed.

When an adapter is installed for the first time into a terminal, the base cover on the Multiline Terminal may have to be modified. The base cover has two access panels that are removed before the cover can be closed over the adapters to complete the installation.

SECTION 2 PREPARING MULTILINE TERMINAL FOR ADAPTER INSTALLATION

To prepare the Multiline Terminal for adapter installation:

1. Unplug the telephone cord from the terminal.
2. Turn the terminal upside down. Push the tabs indicated in Figure 11-1 Raising the Base Plate, and raise the inner area of the base plate.

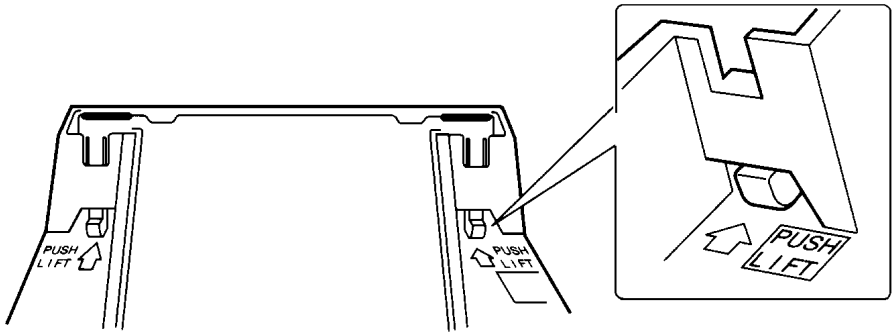


Figure 11-1 Raising the Base Plate

3. Insert a flat head screwdriver into A in Figure 11-2 Unlocking Tab and press straight down until tab unlocks.

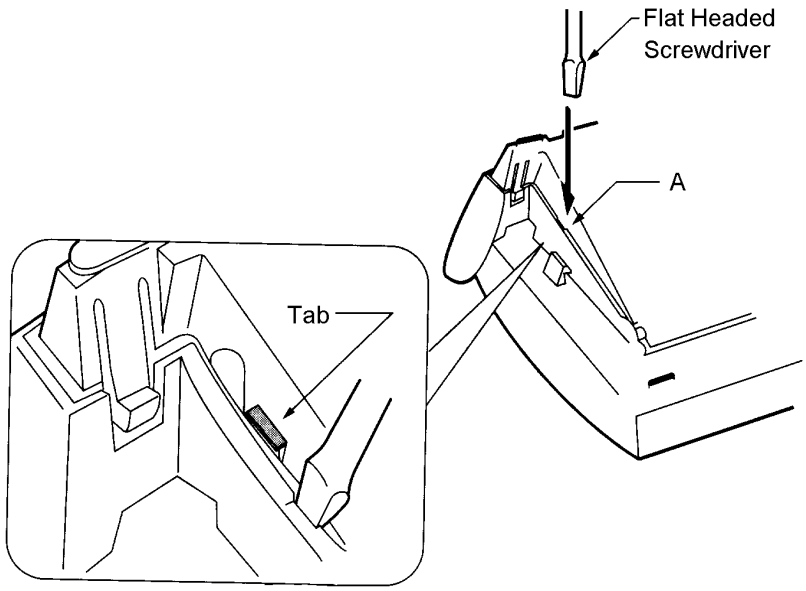


Figure 11-2 Unlocking Tab

4. Lightly press the right side of leg shown as B in Figure 11-3 Releasing Right Tab, insert a flat head screwdriver at C. Press straight down until other tab unlocks.

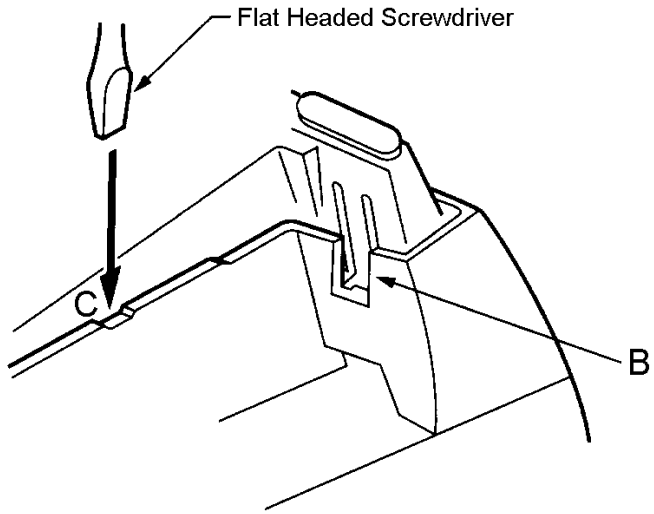


Figure 11-3 Releasing Right Tab

5. Open and remove the bottom cover by rotating counterclockwise as shown in Figure 11-4 Removing Bottom Cover.

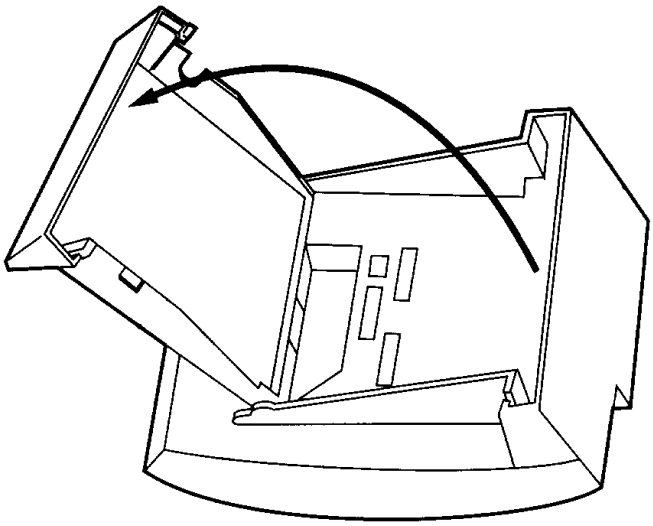


Figure 11-4 Removing Bottom Cover

6. When an adapter is being installed, press tabs A and B to remove the dummy end from the base plate as shown in Figure 11-5 Removing Base Plate Dummy End.

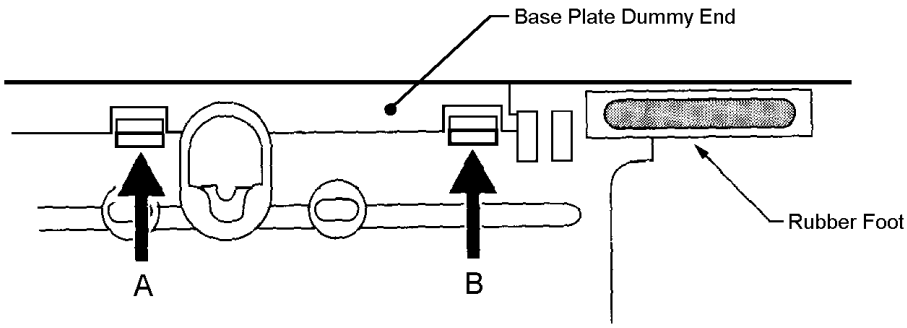


Figure 11-5 Removing Base Plate Dummy End

7. Cut the dummy end in half as shown in Figure 11-6 Cutting Dummy End in Half.

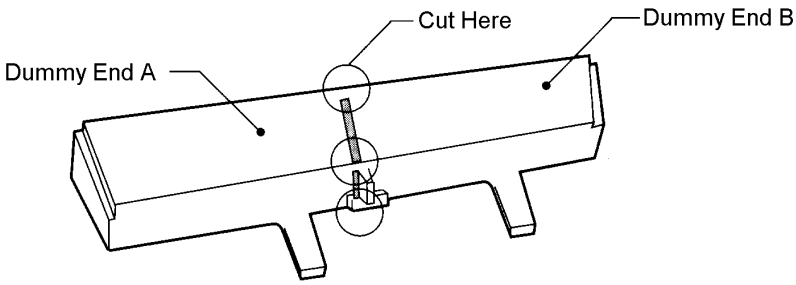


Figure 11-6 Cutting Dummy End in Half

8. When the adapter is installed in connector 1 as shown in Figure 11-7 Installing Adapter in Connector 1, Install the dummy end B as shown in Figure 11-8 Installing Dummy End B.

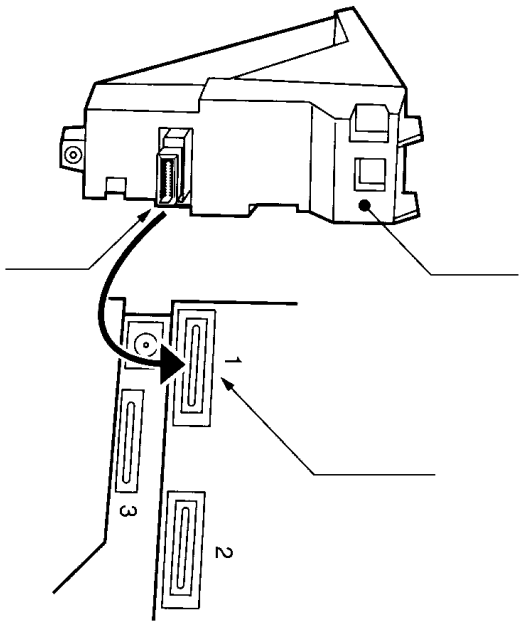


Figure 11-7 Installing Adapter in Connector 1

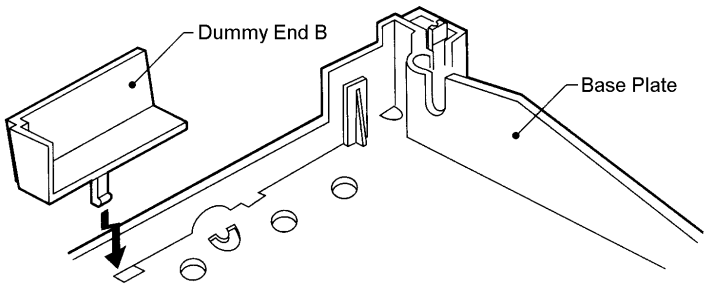


Figure 11-8 Installing Dummy End B

9. When the Adapter is installed in Connector 2, install dummy end A in the other slot.

SECTION 3 INSTALLATION PROCEDURES

3.1 ACA-U Unit (AC Adapter)

This unit provides power to ancillary devices, Attendant Consoles, or the DTP-16HC-1 TEL. Except for the DTP-16HC-1 TEL, the ACA-U Unit connects to one of the following adapters installed on a Multiline Terminal: APR-U Unit, CTA-U Unit, CTU(S)-U Unit or HFU-U Unit. When more than one adapter is installed on a Multiline Terminal, only one ACA-U Unit is necessary.

The power requirements for the ACA-U Unit are:

- ❑ Input: 120 Vac, 60 Hz, 30W
- ❑ Output: 24 Vdc, 750 mA
- ❑ Polarity: ⊖——▷——⊕

3.1.1 Connecting the ACA-U Unit

1. Unplug the line cord from the Multiline Terminal and unplug the ACA-U Unit from the AC outlet.

Failing to do this can damage the unit and/or the Multiline Terminal.

2. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation.

3. Locate the AC Adapter plug on the ancillary device that is connected to the bottom of the Multiline Terminal and plug in the AC Adapter.

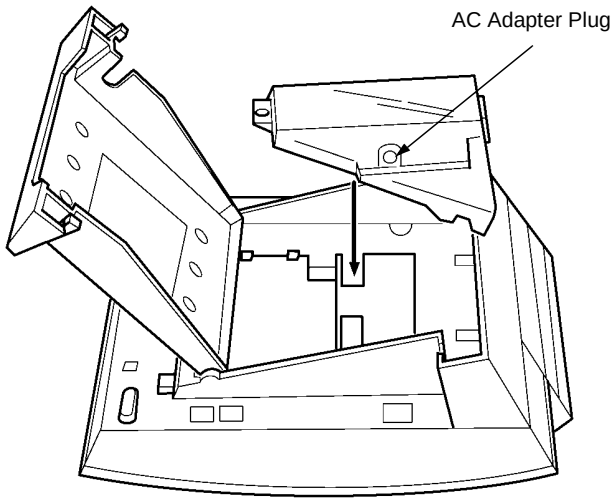


Figure 11-9 ACA-U Unit Connection

3.2 ADA-U Unit (Ancillary Device Adapter)

Ancillary Device Adapters allow connection of a tape recorder to all DTU/DTP Multiline Terminals except DTP-2DT-1 and DTP-16HC-1.

When installing an ADA-U Unit, first connect the cables to the ADA-U Unit, set the dip switches, and then install the ADA-U Unit on the Multiline Terminal.

3.2.1 Installing an ADA-U Unit on a Multiline Terminal

1. Unplug the telephone cord from the Multiline Terminal.

2. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation.

3. Plug the ADA-U Unit connector into the receptacle connector on the back of the Multiline Terminal. Snap the ADA-U Unit into the hooks on the Multiline Terminal to secure it.

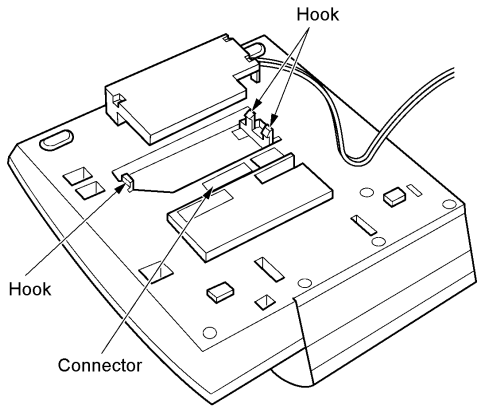


Figure 11-10 Attaching the ADA-U Unit to the Multiline Terminal

4. Replace base plate.

5. Lead the audio cable out through the groove on the base cover. Connect the telephone cord.

6. Connect the Telephone cord.

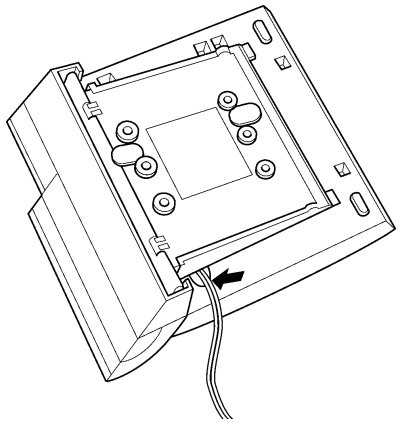


Figure 11-11 Leading the Audio Cable out from the ADA-U Unit

3.2.2 Connecting Cables to the ADA-U Unit

Cable terminal connectors are located on the right side of the ADA-U Unit. Cables should be connected on this unit before installing the unit on the Multiline Terminal.

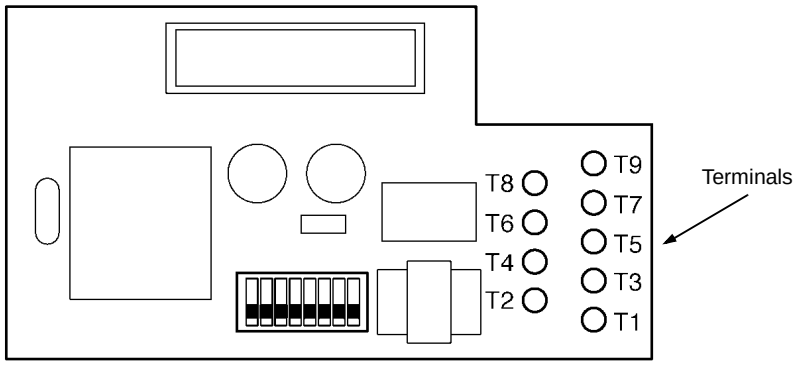


Figure 11-12 ADA-U Unit

1. Cut off the plug on one end of the cable.

2. Locate the adapter terminals on the right side of the unit as illustrated in Figure 11-12 ADA-U Unit.

3. Remove the cap on the adapter terminal to expose the metal receptacle. Push the cable in the applicable receptacle, and replace the cap. Line up the slot on the cap with the slot on the metal receptacle to ensure proper contact. Refer to Figure 11-13 Attaching Cables to the ADA-U Unit.

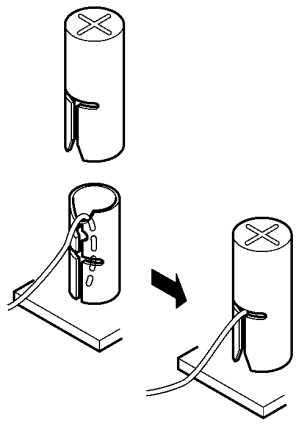


Figure 11-13 Attaching Cables to the ADA-U Unit

4. Insulate the end of the cable that needs to be shielded with insulating tape.

   Table 11-1 ADA-U Cable Connections provides a list of cable connections to ADA-U ADP terminals and describes the specifications for the terminals.

Table 11-1 ADA-U Cable Connections

Terminal Number	Cables to Connect	Terminal Specifications
T1	When warning tone is not being sent from the recorder, connect wire pair input from tone generator to T1:T2. The warning tones from the generator are sent to T1:T2 on a dedicated wire pair while the speech path is sent from the ADA-U on T3:T4 over a separate wire pair to the recorder.	Input Terminal:T1 and T2 are enabled for tone generating device when switches SW1-3 and SW1-4 are OFF. (When switches SW1- 3 and SW1-4 are ON, a humming sound may be recorded due to impedance mismatch.) Input Impedance on T1 and T2: 100K Ω Input Level on T1 and T2: 15 dB ~ 40 dB
T2		

Table 11-1 ADA-U Cable Connections (Continued)

T3:T4	Connect recorder device wire pair speech input to T3:T4. When the recorder used supplies a warning tone, this tone may also be sent over the T3:T4 wire pair back to the terminal.	Input/Output Terminal: Refer to dip switch settings in Table 11-2 ADA-U Unit Switch Settings.
T5	Connect the bare end of the control cable.	When a Multiline Terminal is idle, this contact is closed. When the Multiline Terminal goes off-hook (using the handset, headset, or speakerphone), this contact is open. When recorder owner manual specifies start on open circuit, connect T5 and T6.
T6	Connect the shielded end of the control cable.	Provides common connection for control cable.
T7	Connect the bare end of the control cable.	When the Multiline Terminal is idle, this contact is open. When the Multiline Terminal is busy (using the handset, headset, or speakerphone), this contact is closed. When recorder owner manual specifies start on closed circuit, connect T6 and T7.
T8	Unused	
T9		

Notes:

- When recording in handsfree (half-duplex) mode using the built-in speakerphone, the record warning tone may not be audible to the far-end party.
- The transmit recording level is lower than the receiving voice level for intercom calls; the transmit recording level for CO calls is normal.
- Depending on the recording device(s), separate cables may be required for the warning tone and speech path. In this case, connect the warning tone cables to input terminals T1 and T2 on the ADA-U Unit. (T3 and T4 are used as the tape recorder input.)

Table 11-1 ADA-U Cable Connections (Continued)

Notes:

- When remote control of the recorder is necessary, the record start/stop control is provided by connecting to T5 (or T7) and T6 on the ADA-U Unit. (Connecting to T5 or T7 is determined by the specifications of the recorder.)
- When a warning Tone is provided from the recording equipment, it should be input via T3 and T4 on ADA-U Unit. Do not use T1 and T2 to input Beep Tone.
- Conversations cannot be recorded from terminals connected to an APR/APA-U Unit. Speakerphone calls through the HFU-U Unit cannot be recorded.

3.2.3 Switch Settings

The DIP Switch is located at the bottom center of the ADA-U Unit. The DIP Switch allows a technician to configure the board to specific settings. Figure 11-14 ADA-U Unit Switch Settings shows the default settings.

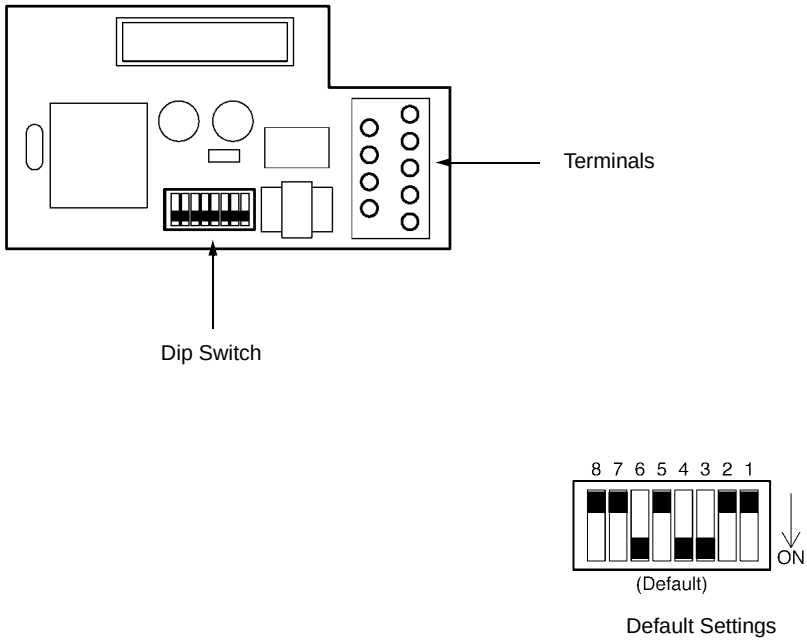


Figure 11-14 ADA-U Unit Switch Settings

The following switch settings should be made on the ADA-U Unit to enable or disable the record start warning tone. Switch settings should be made before installing the ADA-U Unit in the Multiline Terminal. Refer to Table 11-2 ADA-U Unit Switch Settings.

Table 11-2 ADA-U Unit Switch Settings

Switch	Setting		Description
SW1–1	On		When the ADA-U provides control to the recorder, SW1-1 should be set to On, otherwise set it to Off.
SW1–2	Off		Leave Off
SW1–3 and SW1-4	SW1–3 ON	SW1–4 ON	Warning Tone from recording device over same wire pair as speech path.
	SW1–3 OFF	SW1–4 OFF	Warning Tone from recorder or generator equipment on dedicated wire pair to recorder MIC input
SW1–5 and SW1–6	SW1–5 OFF	SW1–6 ON	Input impedance is 600 Ω
	SW1–5 ON	SW1–6 OFF	Input impedance is less than 30Ω
SW1–7	ON		When warning tone from any device is sent to telephone
SW1–8	Off		Leave Off

➢ Do not connect T1 and T2 when switches SW1-3 and SW1-4 are ON.

3.3 APA-U Unit (Analog Port Adapter)

The Analog Port Adapter without Ringer is the interface for installing Single Line Telephones, Modems, Credit Card Readers, Wireless Headsets, NEC VoicePoint/VoicePoint Plus Conferencing unit, and other compatible analog devices. The APA-U Unit does not generate a ringing signal. One user-adjustable switch with two settings is provided on the adapter. Setting 1 allows impedance to be set to 600Ω for devices such as modems. Setting 2 is used for complex impedance devices such as a Single Line Telephone.

This adapter can be installed on any DTP or DTU Multiline Terminal except DTP-2DT-1 TEL, DTP-16HC-1 TEL, or cordless terminals.

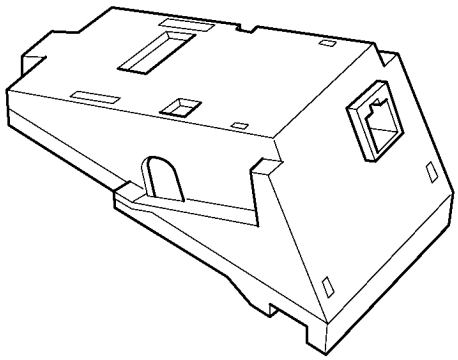


Figure 11-15 APA-U Unit

3.3.1 Installing APA-U Unit on any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation.

2. Plug the unit into the receptacle connector inside the base plate. Refer to Figure 11-16 Attaching the Unit to the Multiline Terminal.

   ✎ The APA-U Unit **does not** require an ACA-U Unit to supply external power.

3. Close the base plate, and snap the cover in place.

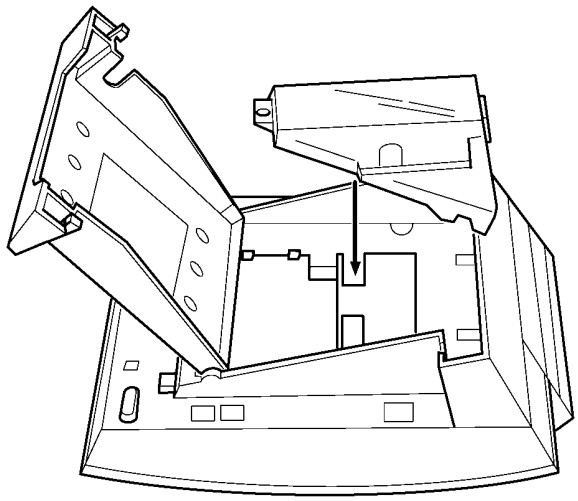


Figure 11-16 Attaching the Unit to the Multiline Terminal

4. Install a ferrite core (provided with the APA-U Unit) by looping line cord through the core between the terminal (1 inch from the terminal) and ESI(8)-U10 ETU. This core is only used with the APA-U Unit.

5. Plug the telephone cord in the jack.

3.3.2 Switch Settings

The APA-U Unit has one switch.

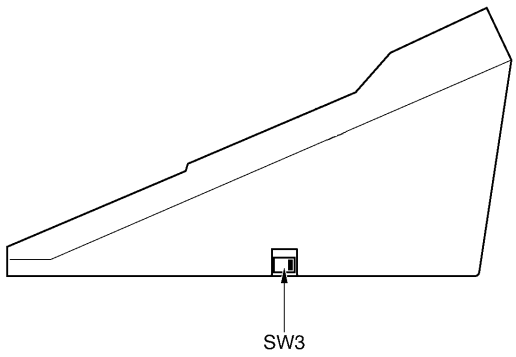


Figure 11-17 APA-U Unit Switches

Refer to Table 11-3 APA-U Unit Switch Settings for SW3.

Table 11-3 APA-U Unit Switch Settings for SW3

Switch	Description
SW3–1	Sets impedance to 600Ω for devices such as modems or facsimile machines
SW3–2	Used for complex impedance devices such as Single Line Telephones.

3.3.3 Connecting Cables on the APA-U Unit

Plug the telephone cord from the Single Line Telephone into the modular jack on the APA-U Unit. Refer to Figure 11-18 Connecting Cables on the APA-U Unit.

Limit the cable length from the APA-U Unit to the Single Line Telephone to a maximum of 50 feet.

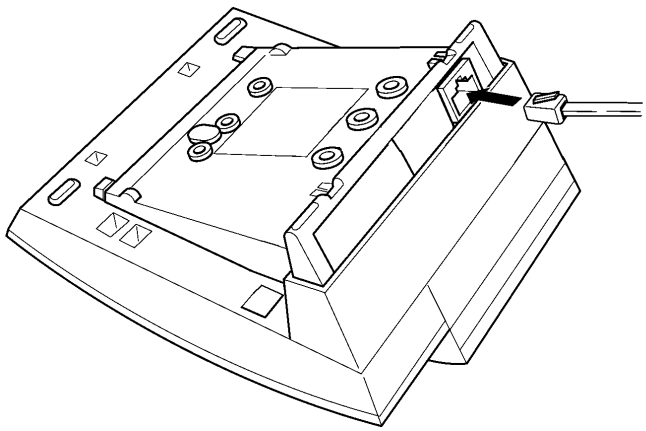


Figure 11-18 Connecting Cables on the APA-U Unit

3.4 APR-U Unit (Analog Port Ringer)

The Analog Port Adapter with Ringing is the interface for installing Single Line Telephones, modems, NEC VoicePoint/VoicePoint Plus Conferencing unit, and other compatible analog devices. The APR-U Unit also generates ringing signals. By providing ring generation, the user can install a personal fax machine or an answering machine for convenience.

Two user-adjustable switches are provided on the adapter; one allows for 600Ω or a complex impedance interface to devices such as a modem or Single Line Telephone, the second switch (SW1) is set to position 2. When this Analog Port Ringer adapter is used, an additional Single Line Telephone or a modem can be connected to a Multiline Terminal.

If a CTA-U, CTU(S)-U, or HFU-U and an APR-U Unit are both installed, only one AC Adapter is required.

This adapter can be installed on any DTP or DTU Multiline Terminal except DTP-2DT-1 TEL, DTP-16HC-1 TEL, or Cordless terminals.

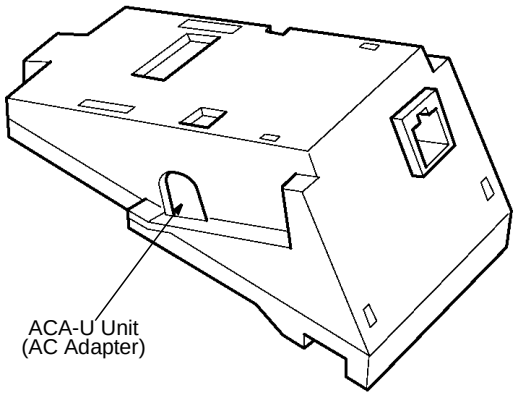


Figure 11-19 APR-U Unit

3.4.1 Installing an APR-U Unit on any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation.

2. Plug the unit into the receptacle connector inside the base plate. Refer to Figure 11-20 Attaching the Unit to the Multiline Terminal.

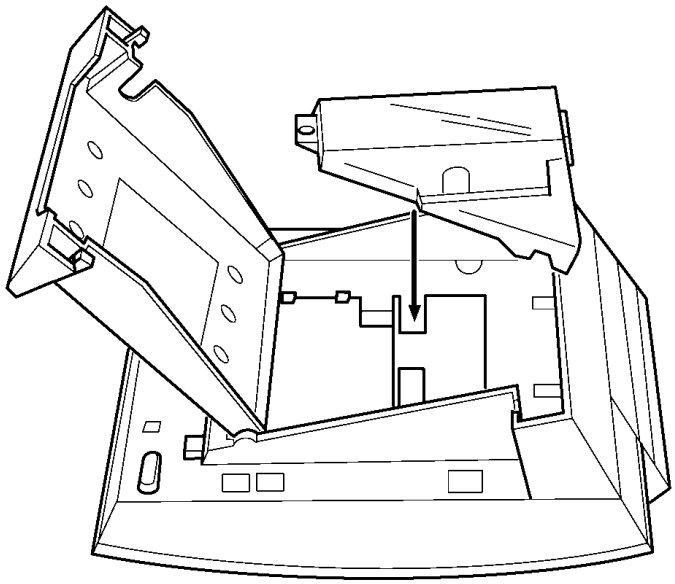


Figure 11-20 Attaching the Unit to the Multiline Terminal

3. Plug the cord of the ACA-U Unit (AC adapter) into the jack on the APR-U Unit. Lead the telephone cord out through the groove in the base as shown in Figure 11-21 Leading the Telephone Cord out from the Unit.

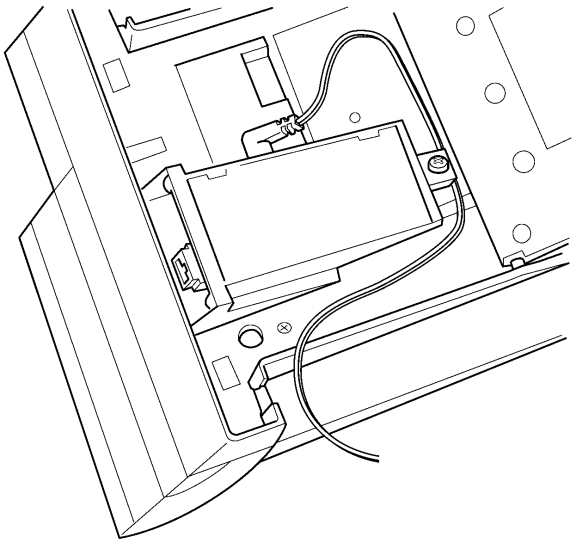


Figure 11-21 Leading the Telephone Cord out from the Unit

4. Close the base plate, lead the AC adapter cord out through the hole, and snap the cover in place.

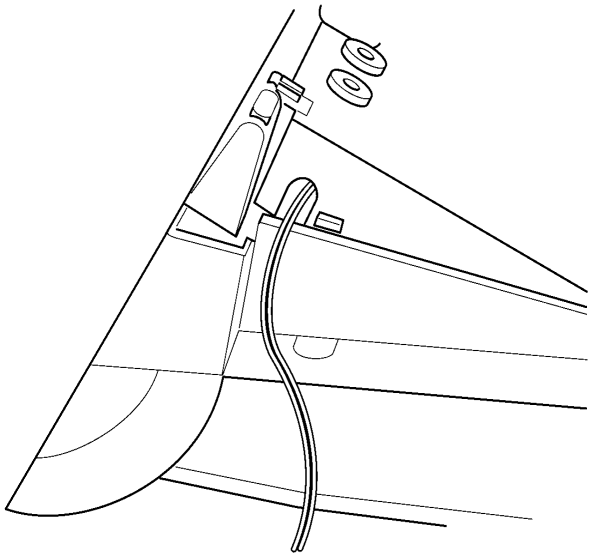


Figure 11-22 Closing the Base Plate Cover

5. Install a ferrite core (provided with the APR-U Unit) by looping line cord through the core between the terminal (1 inch from the terminal) and ESI(8)-U10 ETU. This core is only used with the APR-U Unit.

6. Plug in the power cord on the AC adapter and the telephone cord in the jack.

3.4.2 Switch Settings

The APR-U Unit has two switches.

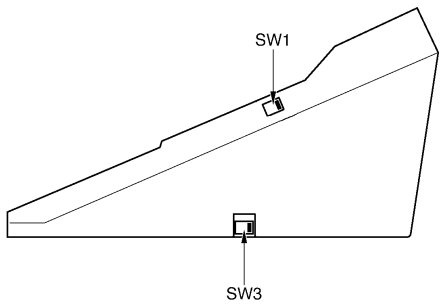


Figure 11-23 APR-U Unit Switches

Refer to Table 11-4 APR-U Unit Switch Settings for SW1 and SW3.

Table 11-4 APR-U Unit Switch Settings for SW1 and SW3

Switch	Description
SW1–1	Do not use
SW1–2	A Single Line Telephone and Multiline Terminal are used alternately. (The Multiline Terminal and the APR-U Unit share the same B1 channel.)
SW3–1	Sets impedance to 600Ω for devices such as modems or facsimile machines.
SW3–2	Used for complex impedance devices such as Single Line Telephones.

3.4.3 Connecting Cables on the APR-U Unit

Plug the telephone cord from the Single Line Telephone in the modular jack on the APR-U Unit.

Limit the cable length from the APR-U Unit to the Single Line Telephone to a maximum of 50 feet.

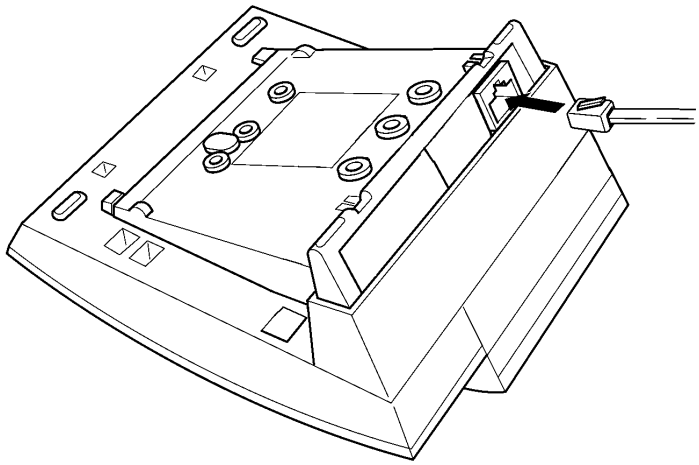


Figure 11-24 Connecting Cables on the APR-U Unit

3.5 CTA-U Unit (Computer Telephony Application)

Computer Telephony Application allows a DTU or DTP Multiline Terminal to be connected to a PC using the TAPI (Microsoft Telephony Application Programming Interface) adapter. The PC can perform all Multiline Terminal functions using a TAPI-compatible application software.

This adapter can be installed on any DTU or DTP Multiline Terminal except DTP-2DT-1 TEL, DTP-16HC-1 TEL, or Cordless Terminals.

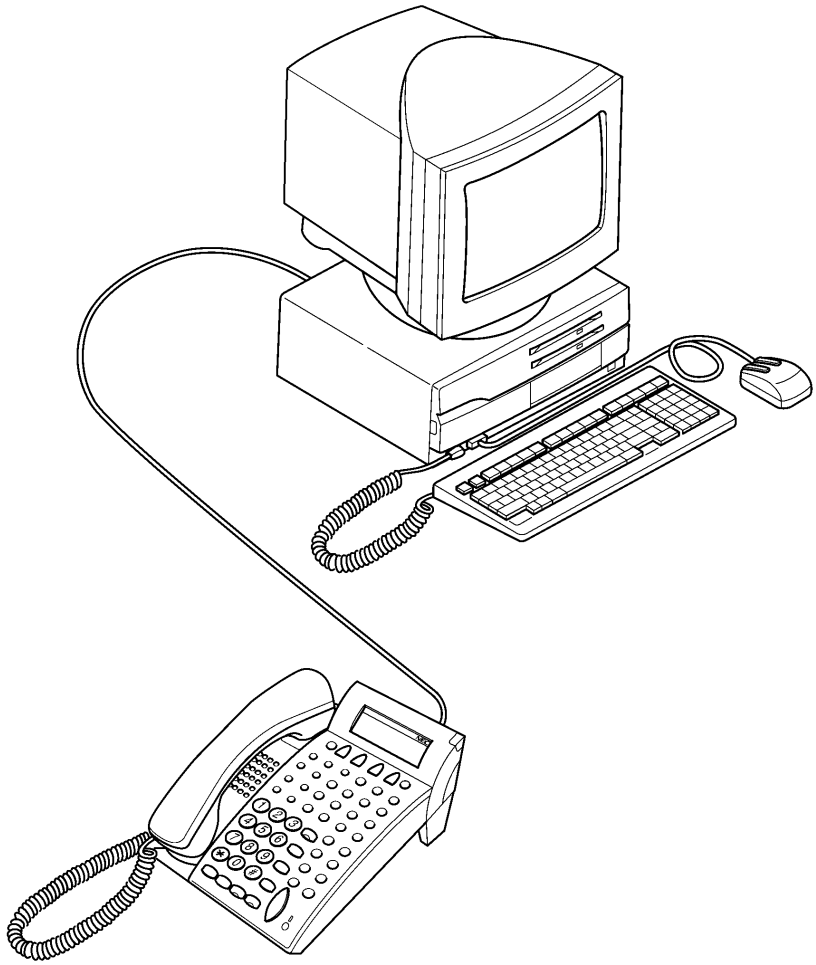


Figure 11-25 Attaching an Electra Elite Multiline Terminal to a PC

The CTA-U Unit is attached to the bottom of any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1.

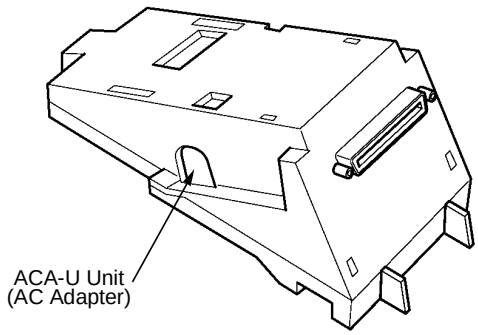


Figure 11-26 CTA-U Unit

3.5.1 Installing the CTA-U Unit

1. Prepare Multiline Terminal for adapter installation. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation.

2. Plug the unit into the receptacle connector inside the base plate on the Multiline Terminal. Refer to Figure 11-27 Attaching the Unit to the Multiline Terminal.

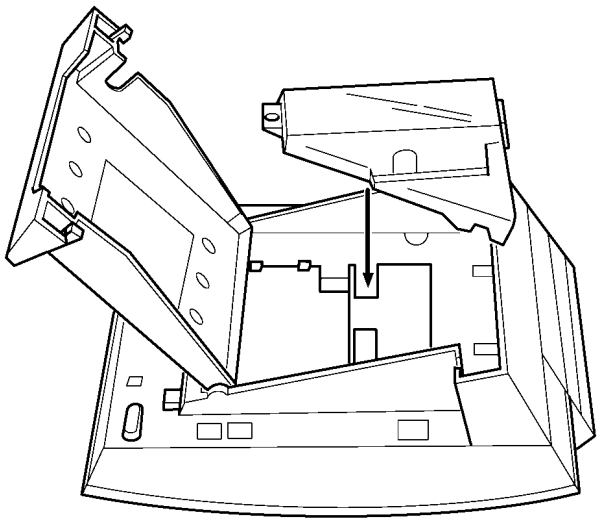


Figure 11-27 Attaching the Unit to the Multiline Terminal

3. Close the base plate.

3.5.2 Connecting the Cables on the CTA-U Unit

Connect the RS-232C cable from the computer to the connector on the CTA-U Unit as shown in Figure 11-28 Connecting the RS-232C Cable to the CTA-U Unit on the Multiline Terminal.

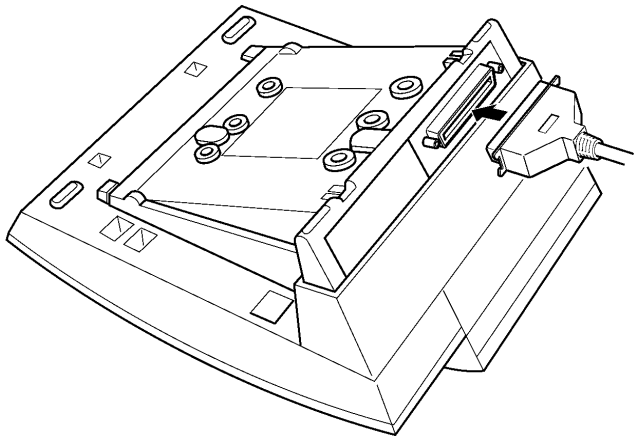


Figure 11-28 Connecting the RS-232C Cable to the CTA-U Unit on the Multiline Terminal

3.5.3 Installing the Driver on the PC

Using the setup disk provided with the CTA-U Unit install the driver on your PC. Refer to the *CTA installation Guide* for instructions on installing CTA setup disks.

3.6 Computer Telephony Adapter, CTU(8)-U Unit, with USB Interface

The CTU adapter connects to a PC USB port to provide telephony and sound device control. The general functions of the CTU include:

- Telephony Control

  The application is based on the Microsoft Telephony Application Programming Interface (TAPI) and provides call handling on the PC (*e.g.*, call, answer, Hold, Transfer, Conference, or Caller ID).

- User Interface to support *D*^{term} Emulation

  This function provides the functions of *D*^{term} such as normal telephone indications, LCD, Line keys, or Hookswitch.

- Sound Support

  Allows voice recording or recording playing on an audio device assigned to the PC. Voice Mail and Live Record are supported on the PC.

- Supports Plug and Play

- Headset Operation

  When user uses CTU and TAPI and sets data for Telephony Service Provider (TSP), the headset button can be controlled by TSP.

- USB Interface

  This adapter uses Full Speed (12Mbps) as defined in the USB Specification.

3.6.1 CTU(S) Unit Connections

This unit is a Computer Telephony Application adapter to connect a Universal Serial Bus to an ESI(8)-U( ) ETU and can be connected to any DTU/DTP Multiline Terminal except DTP-2DT-1, DTP-16HC-1 or Cordless terminals.

A required AC Adapter is provided with the unit.

The following connections are required:

- AC Adapter
- Multiline Terminal jack labeled LINE
- PC USB port
- ESI port to ESI(8)-U( ) ETU

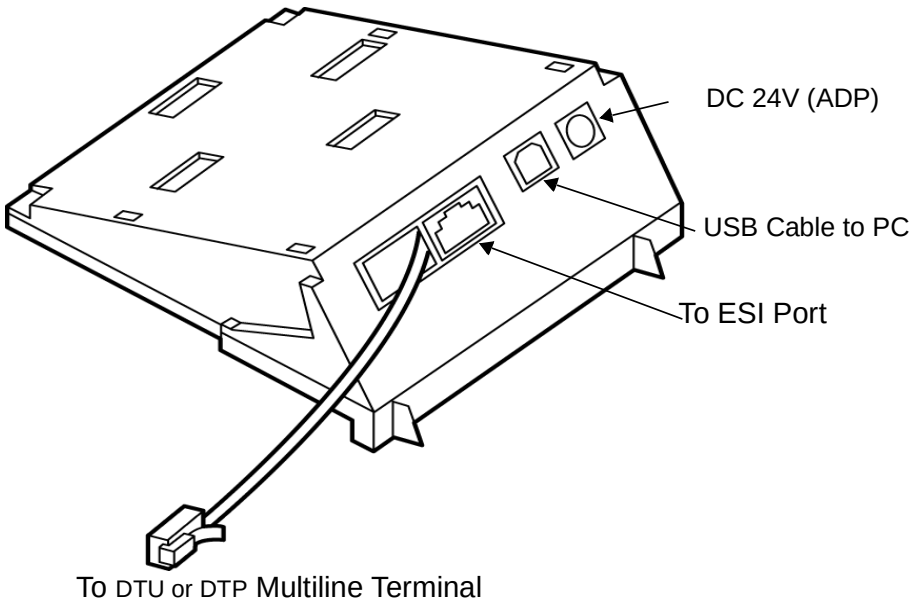


Figure 11-29 CTU (S)-U Unit

3.7 HFU-U Unit (Handsfree Unit)

The Handsfree Unit provides full-duplex handsfree communication. Large areas may cause poor full-duplex operation. This unit comes with the handsfree adapter and an external microphone.

This adapter can be installed on any DTP or DTU Multiline Terminal except DTP-2DT-1 TEL or DTP-16HC-1 TEL.

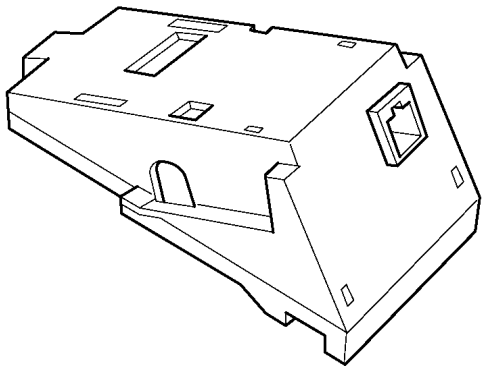


Figure 11-30 HFU-U Unit

3.7.1 Installing an HFU-U Unit on any DTU/DTP Multiline Terminal (except DTP-2DT-1 and DTP-16HC-1)

With terminal upside down, facing from the bottom of the open cover, install this unit in Telephone Slot 1.

Refer to 3.4.1 Installing an APR-U Unit on any DTU/DTP Multiline Terminal except DTP-2DT-1 and DTP-16HC-1 The instructions for installing these units are the same.

3.7.2 Installing the External Microphone

An external microphone can be installed on the HFU-U Unit. These instructions apply to the external microphone obtained from NEC. The microphone is equipped with a mute button.

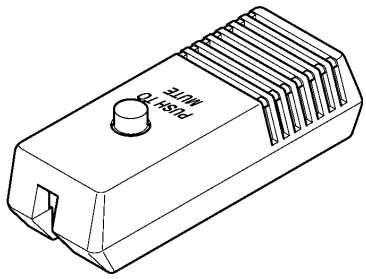


Figure 11-31 Microphone with Mute

1. Plug the microphone cord into the jack on the HFU-U Unit as shown in Figure 11-32 Attaching a Microphone to a Multiline Terminal.

   ✎ The microphone should be between one foot and three feet away from the Multiline Terminal.

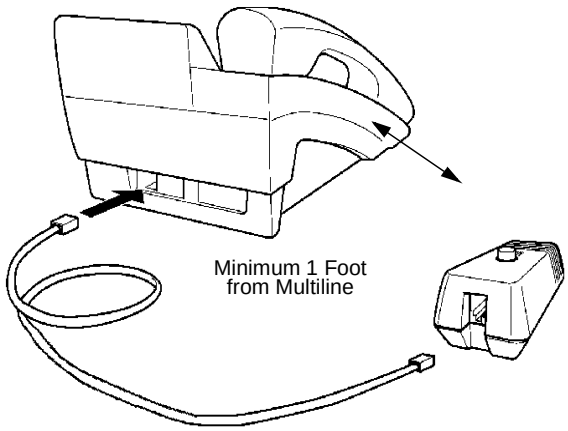


Figure 11-32 Attaching a Microphone to a Multiline Terminal

3.7.3 Switch Settings

The HFU-U Unit uses 2-position switches SW1 and SW2.

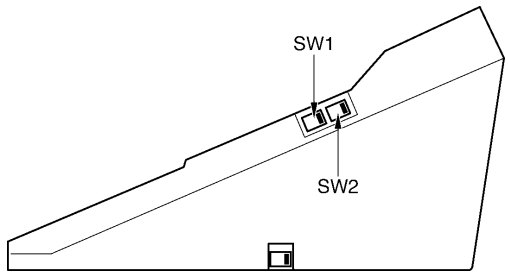


Figure 11-33 HFU-U(BK)/(WH) Unit Switches

Refer to Table 11-5 HFU-U Unit Switch Settings.

Table 11-5 HFU-U Unit Switch Settings

SW1		SW2		Description
Position 1	**Position 2**	**Position 1**	**Position 2**	
OFF	ON	OFF	ON	Full Duplex (Default)
ON	OFF	OFF	ON	Half Duplex (6db mix ratio)
OFF	ON	ON	OFF	Half Duplex (12db mix ratio)
ON	OFF	ON	OFF	Half Duplex (18db mix ratio)

- Full Duplex: In some large areas or noisy locations half duplex should be used. The echo canceling ability of the HFU-U is limited.
- Half Duplex: When voice clipping occurs, use a lower decibel setting.

3.8 SLTII(1)-U10 ADP (Single Line Telephone)

The Single Line Telephone adapter provides an interface for Single Line Telephones and other similar devices from an ESI ETU channel.

This adapter can be connected to any ESI port except 01 and 02.

3.8.1 Connecting the SLTII(1)-U10 ADP to the System

1. Connect one end of the RJ-11 to the ESI port on the KSU and one end to the **ESI** jack on the SLT Adapter.

2. Connect one end of a second RJ-11 to the **TEL** jack on the SLT Adapter and the other end to the Single Line Telephone.

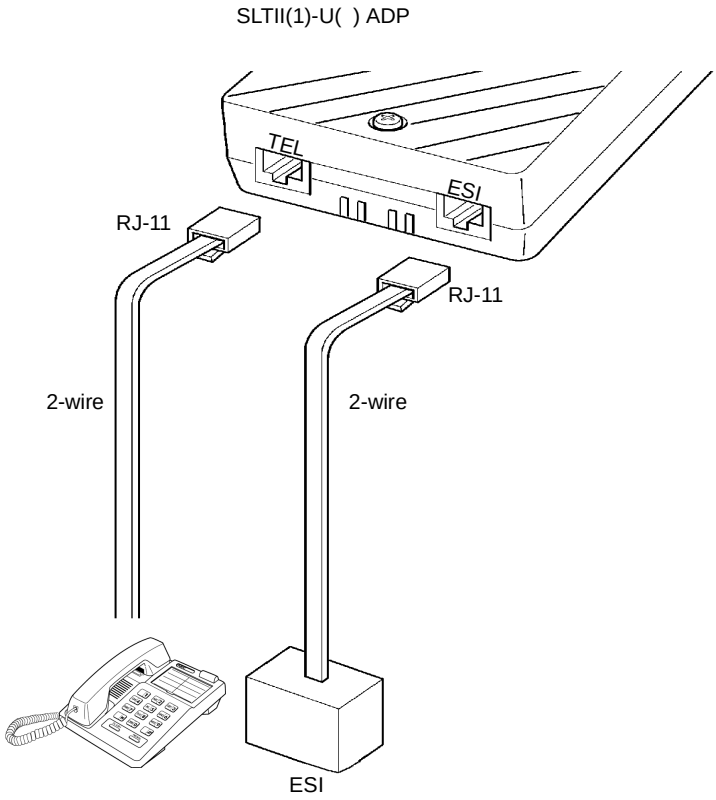
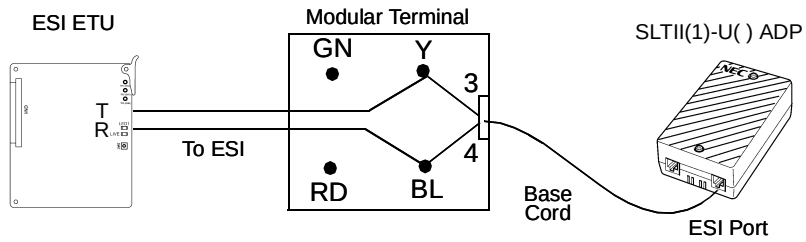
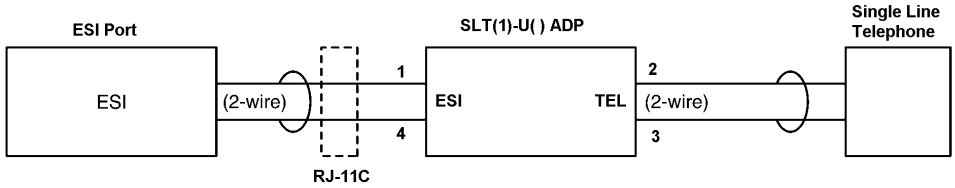


Figure 11-34 Connecting a Single Line Telephone to the System using an SLTII(1)-U( ) ADP



Modular Terminal Connections



Single Line Telephone Connections

Figure 11-35 Connecting the SLTII(1)-U( ) ADP

3.8.2 Wall Mounting the SLTII(1)-U( ) ADP

1. Remove the two screws from the top to open the SLT Adapter as shown in Figure 11-36 Removing the Screws from the SLTII(1)-U( ) ADP.

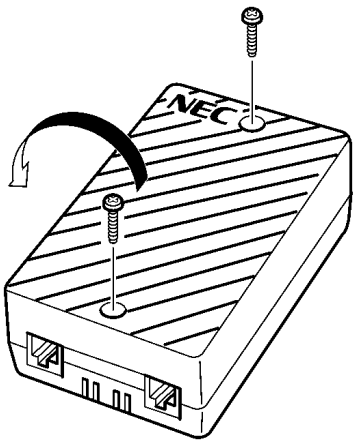


Figure 11-36 Removing the Screws from the SLTII(1)-U( ) ADP

2. Using the two provided wood screws, attach the unit to the wall. Close the unit and secure with the two screws that were previously removed.

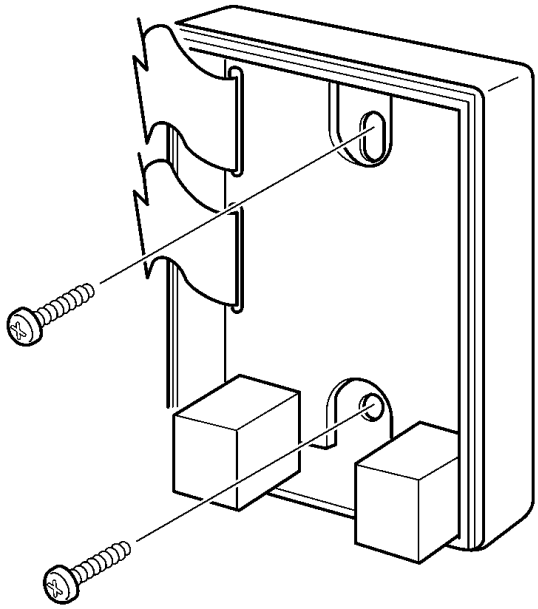


Figure 11-37 Attaching the SLTII(1)-U( ) ADP to the Wall

3.9 Wall Mounting

Any Electra Elite Multiline Terminal can be mounted on a wall. Multiline Terminals can be wall mounted by using the base unit that comes with the Multiline Terminal or by using the WMU-U Unit to accommodate adapters that are installed on the Multiline Terminal.

The Wall Mount Unit is required when an APA-U, APR-U, CTA-U, CTU(S)-U or HFU-U Unit is installed.

3.9.1 Removing and Remounting the Handset Hanger

1. Remove the hanger by sliding it out of the slot. (Refer to Figure 11-38 Positioning the Handset Hanger.)

2. Install it back in its original position so that the hanger protrudes providing a rest for the handset. (This procedure applies when using either the base unit or the WMU-U Unit.) Refer to Figure 11-38 Positioning the Handset Hanger for the steps for removing and remounting the handset hanger.

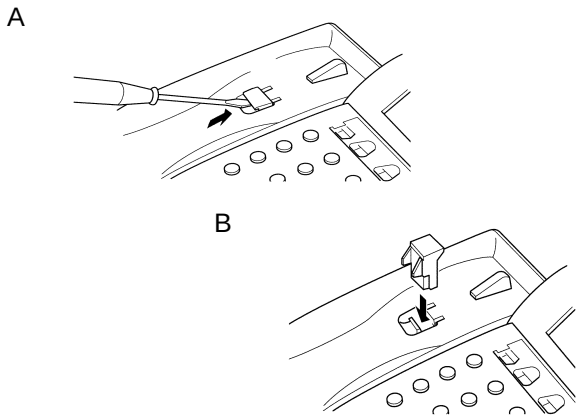


Figure 11-38 Positioning the Handset Hanger

3.9.2 Wall Mounting using the Base Unit

1. Refer to Section 2 Preparing Multiline Terminal for Adapter Installation, and perform Steps 1~5.

2. Press both sides of the base cover and turn it left to remove it.

3. Rotate base cover 180°, and install it again on the Multiline Terminal.

4. Remove the shaded base plate knockout shown on Figure 11-39 Removing the Knockout.

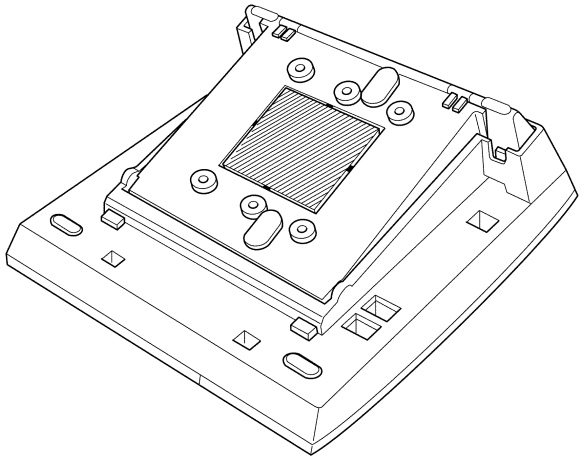


Figure 11-39 Removing the Knockout

5. Assemble the base plate and base cover.

6. As illustrated in Figure 11-40 Attaching the Base Plate to the Wall, attach the base plate and base cover assembly (wide end down) to the posts on the locally provided and installed wall plate. Place locally provided screws in the nodes on the base plate and secure the assembly to the wall.

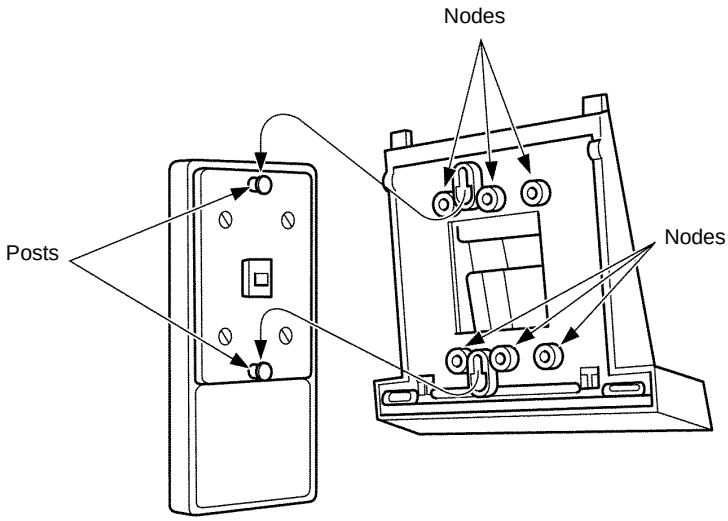


Figure 11-40 Attaching the Base Plate to the Wall

7. Plug the line cord into the jack on the wall plate, wrap the extra cord and secure it with a tie wrap, and lead the line cord out through the groove in the side of the base unit.

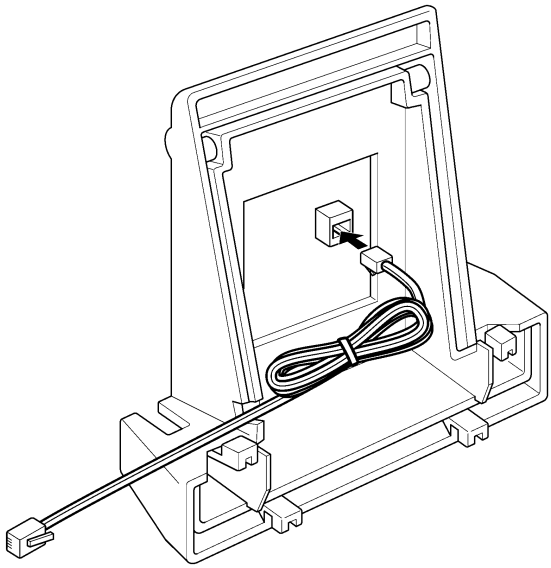


Figure 11-41 Plugging in the Line Cord using a Wall Jack

8. When using a modular jack instead of a wall plate, plug the line cord into the modular jack, wrap the extra cord and secure it with a tie wrap, and lead the line cord out through the groove in the side of the base unit.

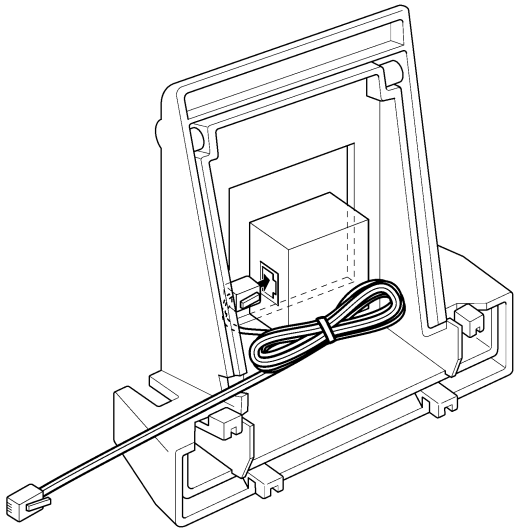


Figure 11-42 Plugging in the Line Cord Using a Modular Jack

9. With the base unit attached to the wall, hook the two bottom tabs in the tab slots on the Multiline Terminal base.

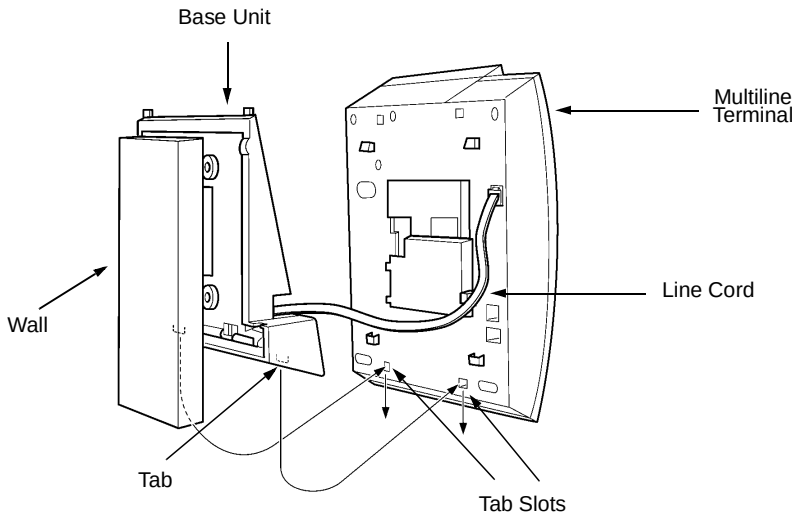


Figure 11-43 Attaching the Bottom Tabs of the Multiline Terminal to the Base Plate

10. Push up on the Terminal and lock the top base unit tabs in the top slots on the terminal . Figure 11-44 Attaching the Top Tabs of the Multiline Terminal to the Base Plate shows how the Multiline Terminal is attached.

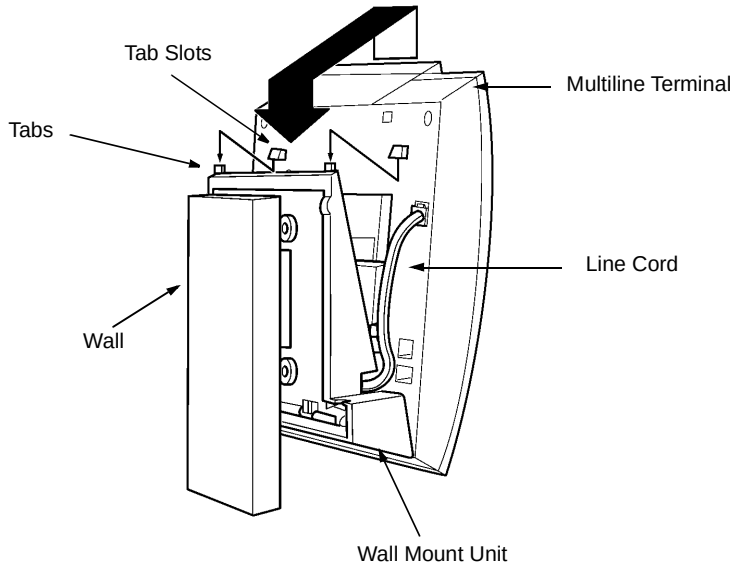


Figure 11-44 Attaching the Top Tabs of the Multiline Terminal to the Base Plate

11. When properly installed, the wall-mounted Multiline Terminal looks similar to the one shown in Figure 11-45 Installed Wall Mount Unit.

    ✎ Do not adjust the tilt panel after the Multiline Terminal is mounted on the wall.

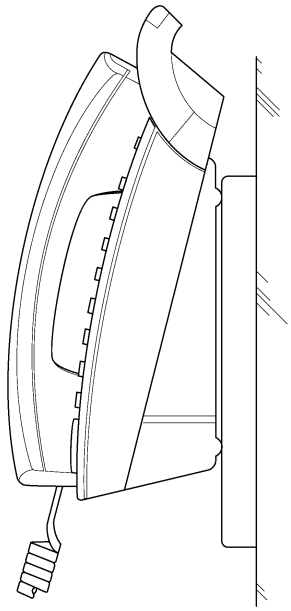


Figure 11-45 Installed Wall Mount Unit

3.9.3 Installing the Wall Mount Unit and Mounting the Multiline Terminal using the WMU-U Unit

When installing any Adapter unit, a separate WMU-U Unit must be purchased to accommodate this unit.

1. Remove the line cord, base plate and base cover from the Multiline Terminal as shown in the previous section.

2. Cut off the tabs on the adapter as shown in Figure 11-46 Removing the Tabs from the Adapter.

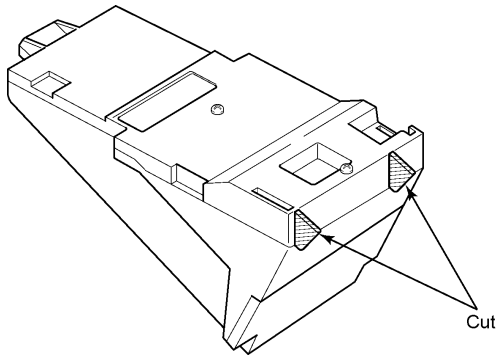
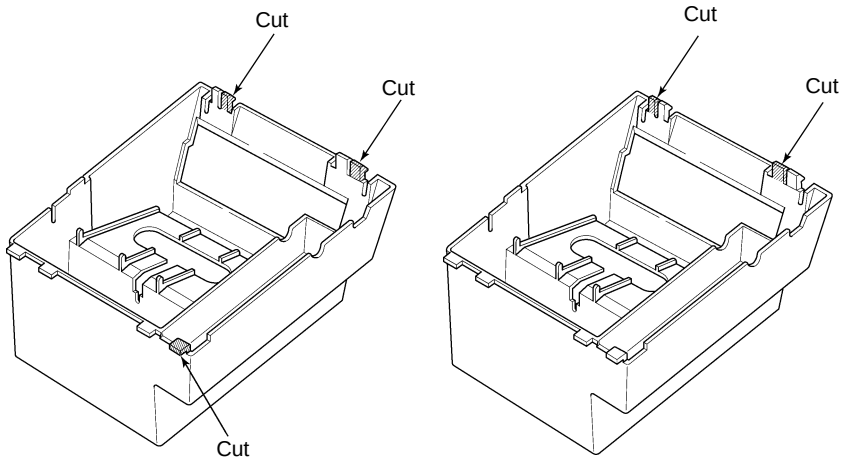


Figure 11-46 Removing the Tabs from the Adapter

3. Remove the tabs from the WMU-U Unit as shown in Figure 11-47 Removing the Tabs from the WMU-U Unit. (The Tabs that are removed depend on the Multiline Terminal type.)



DTU/DTP-8-1 TEL
DTP-8D-1/DTU-8D-2 TEL
DTU/DTP-16-1 TEL
DTP-16D-1/DTU-16D-2TEL
DCU-60-1 CONSOLE

DTU/DTP-32-1 TEL
DTP-32D-1/DTU-32D-2 TEL

Figure 11-47 Removing the Tabs from the WMU-U Unit

4. Bundle the cord from the modular jack leaving about eight inches. Use a tie wrap to secure the bundled cord.

5. Place the bundled line cord between the WMU-U Unit and the wall. Lead the line cord out through the slits as shown in Figure 11-48 Leading the Line Cord out of the WMU-U Unit.

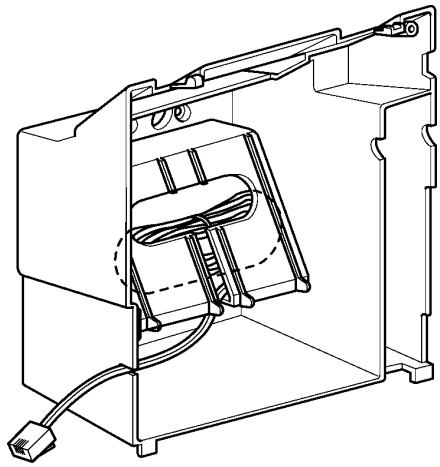


Figure 11-48 Leading the Line Cord out of the WMU-U Unit

6. Attach the WMU-U Unit to the posts on the wall plate (locally provided). Place locally provided screws in the nodes on the WMU-U Unit and secure the WMU-U Unit to the wall.

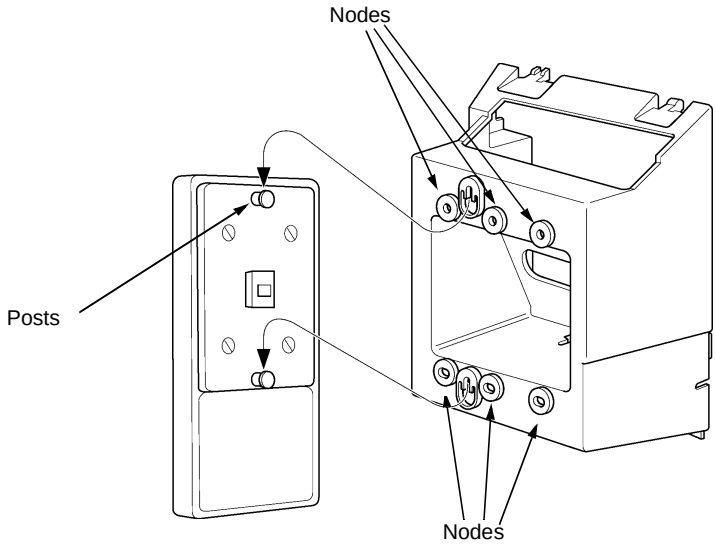


Figure 11-49 Attaching the Wall Mount Unit to the Wall

7. Connect the line cord to the Multiline Terminal.

8. With the WMU-U Unit attached to the wall, hook the two bottom tabs on the WMU-U Mount Unit in the tab slots on the Multiline Terminal. Then push the two top tabs on the WMU-U Unit into the tab slots on the Multiline Terminal. When the adapter has a power supply, lead the AC adapter cord out through the opening at the bottom of the Multiline Terminal. Refer to Figure 11-50 Attaching the Multiline Terminal to the WMU-U Unit.

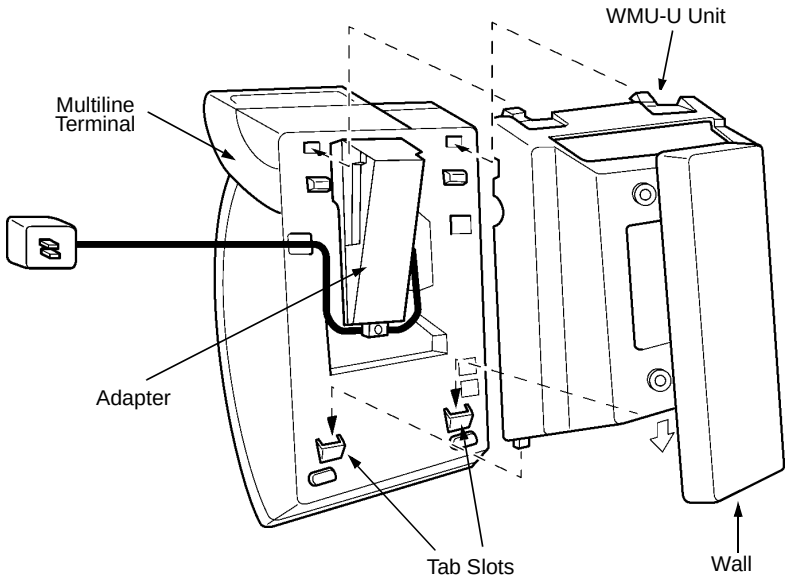


Figure 11-50 Attaching the Multiline Terminal to the WMU-U Unit

3.9.4 Removing the Multiline Terminal from the Base Plate

To remove the Multiline Terminal from the base cover, lift the Multiline Terminal to disengage top tabs, turn it slightly counter clockwise to unlock lower tabs on base cover, and remove it.

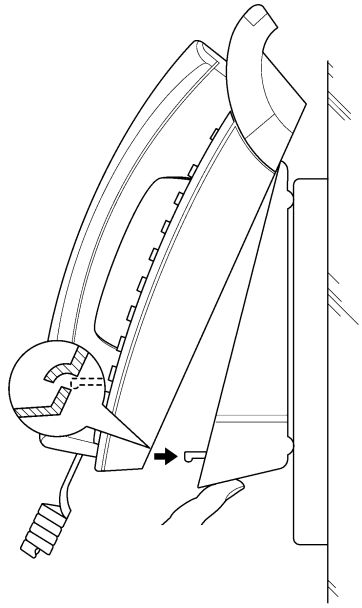


Figure 11-51 Removing the Multiline Terminal from the Base Plate

3.9.5 Removing the Multiline Terminal from the WMU-U Unit

To remove the Multiline Terminal from the WMU-U Unit, lift the Multiline Terminal to disengage top tabs and lower the terminal from the WMU-U Unit.

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TABLE OF CONTENTS
CHAPTER 12

Section 1 General Information 12-1

Section 2 Single Line Telephones 12-1

2.1 DTR-1-1 TEL 12-1

2.2 DTR-1HM-1 TEL 12-3

Section 3 Wall Mounting DTR-1-1 TEL/DTR-1HM-1 TEL Single Line Telephones 12-5

3.1 Adjusting the Hanger Hook 12-5

3.1.1 Wall Mounting the Telephone 12-6

3.2 Using Hanger Hooks on the Single Line Telephone 12-8

3.3 DTP-1-1 TEL/ DTP-1-2 TEL 12-9

3.4 DTP-1HM-1/ DTP-1HM-2 TEL 12-10

Section 4 Wall Mounting the DTP-1-1 or DTP-1-2 TEL and DTP-1HM-1 or DTP-1HM-2 TEL 12-11

4.1 Hanger Hook 12-11

4.2 Using Installed Modular Wall Plate 12-12

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LIST OF FIGURES
CHAPTER 12

Figure 12-1 DTR-1-1 TEL Single Line Telephone 12-2
Figure 12-2 DTR-1HM-1 TEL Single Line Telephone 12-4
Figure 12-3 Removing the Hanger Hook on a Single Line Telephone 12-5
Figure 12-4 Sliding the Hanger Hook on a Single Line Telephone into Position 12-5
Figure 12-5 Removing the Metal Base 12-6
Figure 12-6 Reattaching the Metal Base 12-7
Figure 12-7 Hanger Hooks on the Single Line Telephone 12-8
Figure 12-8 DTP-1-1 TEL Single Line Telephone 12-9
Figure 12-9 DTP-1HM-1 TEL Single Line Telephone 12-10
Figure 12-10 Removing the DTP Telephone Hanger Hook 12-11
Figure 12-11 Turning the Hook Over 12-11
Figure 12-12 Sliding the Hook into Position 12-12
Figure 12-13 Removing the Screws 12-12
Figure 12-14 Replacing the Plate and Screw 12-13
Figure 12-15 Protruding Screws 12-13
Figure 12-16 Mounting the Telephone 12-14

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Installing Single Line Telephones

CHAPTER 12

SECTION 1 GENERAL INFORMATION

The Electra Elite IPK II system supports several different Single Line Telephones.

- ◇ DTR-1-1 TEL/DTR-1HM-1 TEL

  Both of the DTR Single Line Telephones come in black or white.

- ◇ DTP-1-1 TEL/ DTP-1HM-1 TEL

  Both the DTP-1-1 TEL and DTP-1HM-1 TEL come in black or white.

SECTION 2 SINGLE LINE TELEPHONES

2.1 DTR-1-1 TEL

The DTR-1-1TEL is a fully modular terminal that has DTMF and Pulse Dialing compatibilities and offers Flash key, redial key functionality. A Message Waiting Indicator, that also functions as Incoming Call Indication, is a standard feature of this telephone. This telephone comes equipped with a 6-level receive volume control (3 increased levels and 2 decreased levels), a 4-level ring volume control (Off, Soft, Medium, Loud) and three ring patterns (Slow, Medium, Fast). The DTR-1-1 TEL has a data port and a built-in wall mount adapter.

Basic Port Package

A maximum of 56 DTR-1-1 TELs can be installed. The total number of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 184 DTR-1-1 TELs can be installed. The total number of all Multiline Terminals that can be installed is 240.

Each terminal requires an SLTII(1)-U10 ADP or SLI(4)/(8)-U( ) ETU.

✎ The volume up/down setting for the receive volume control should only be used by hearing impaired individuals, otherwise hearing damage may occur. This telephone complies with HAC (Hearing Aid Compatible) volume control defined by section 68.317 of the FCC Rules and Regulations, 1996 edition.

Figure 12-1 DTR-1-1 TEL Single Line Telephone

2.2 DTR-1HM-1 TEL

The DTR-1HM-1 TEL is a fully modular terminal that has DTMF and Pulse Dialing abilities and offers Flash key and Redial key functionality. A Message Waiting Indicator, that also functions as an Incoming Call Indicator, is a standard feature of this telephone. The DTR-1HM-1 TEL has eight programmable speed dial buttons and has Hold and monitor function keys. This telephone comes equipped with a 6-level receive volume control (3 increase levels and 2 decrease levels), a 4-level ring volume control (Off, Soft, Medium, Loud) and three ring patterns (Slow, Medium, Fast). The DTR-1HM-1 TEL has a data port and a built-in wall mount adapter.

Basic Port Package

A maximum of 56 DTR-1HM-1 TELs can be installed. The total number of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 184 DTR-1HM-1 TELs can be installed. The total number of all Multiline Terminals that can be installed is 240.

Each terminal requires an SLTII(1)-U10 ADP or SLI(4)/(8)-U( ) ETU.

✎ The volume up/down setting for the receive volume control should be used only by hearing impaired individuals, otherwise hearing damage may occur. This telephone complies with HAC (Hearing Aid Compatible) volume control defined by section 68.317 of the FCC Rules and Regulations, 1996 edition.

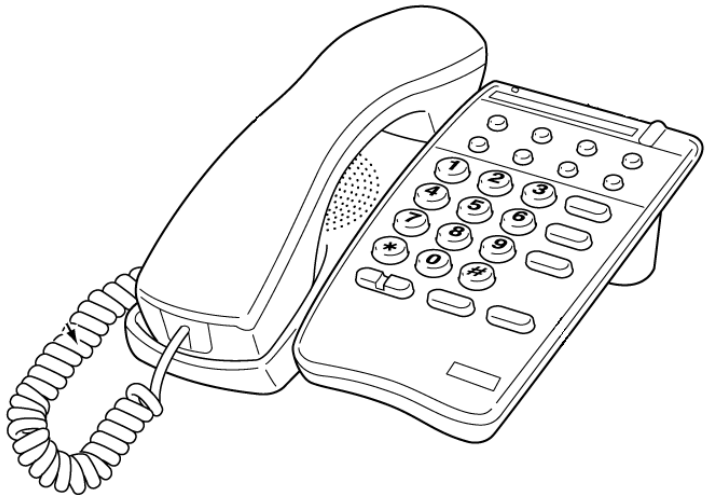

Figure 12-2 DTR-1HM-1 TEL Single Line Telephone

SECTION 3 WALL MOUNTING DTR-1-1 TEL/DTR-1HM-1 TEL SINGLE LINE TELEPHONES

Single Line Telephones are wall mounted using the metal base that comes attached to the telephone.

3.1 Adjusting the Hanger Hook

1. Remove the hook from the unit.

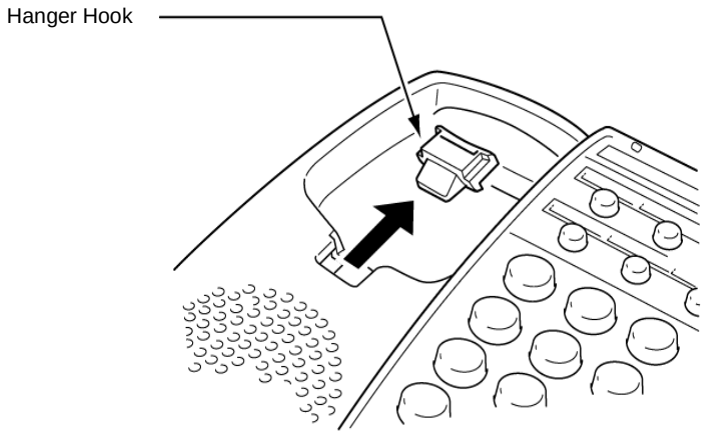

Figure 12-3 Removing the Hanger Hook on a Single Line Telephone

2. Turn the hook with the tab toward the top.

3. Slide the hook in the slot to form the hanger hook for the handset.

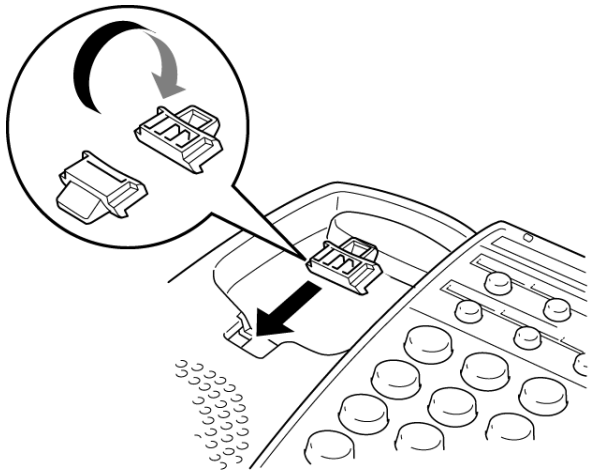

Figure 12-4 Sliding the Hanger Hook on a Single Line Telephone into Position

3.1.1 Wall Mounting the Telephone

1. Remove the metal base from the telephone by removing the two screws as illustrated in Figure 12-5 Removing the Metal Base.

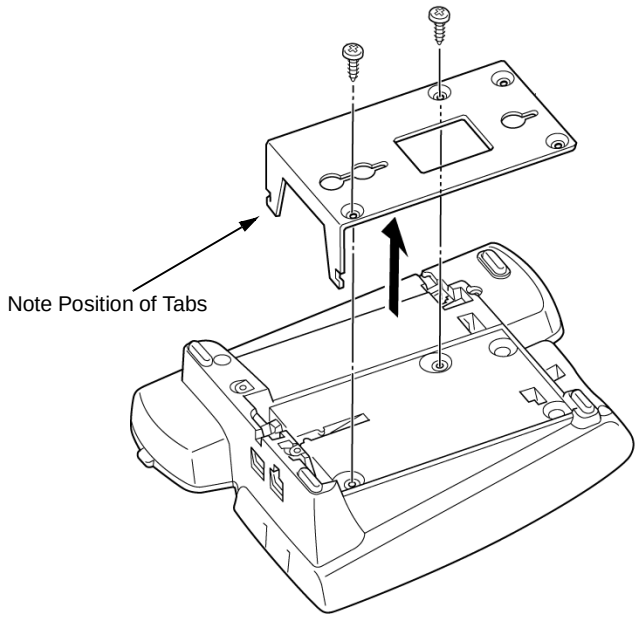

Figure 12-5 Removing the Metal Base

2. Lift the metal plate and note the direction of the tabs so that they can be correctly reversed.

3. Flip the metal base around as illustrated in Figure 12-6 Reattaching the Metal Base. Insert the tabs into the receptacles marked **(A)** and reattach to the telephone using the two screws that were previously removed.

   ✎ Because of manufacturing variations in wall-mount brackets, installing the terminal wall mount with optional screws offers the most reliable fit.

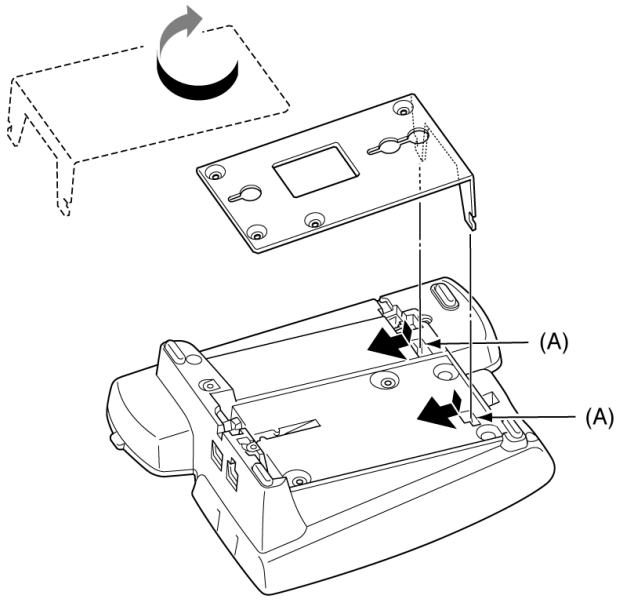

Figure 12-6 Reattaching the Metal Base

4. Hang the telephone on the wall by sliding the holes in the metal base over the wall posts.

3.2 Using Hanger Hooks on the Single Line Telephone

After the Single Line Telephone is wall mounted, the handset can be hung from one of two hanger hooks.

When the handset is placed on the hanger hook, located below the switchook, the telephone is on-hook.

Hanging the handset from the hook located on the top of the telephone (labeled **(C)** in the diagram) allows the telephone to remain off-hook.

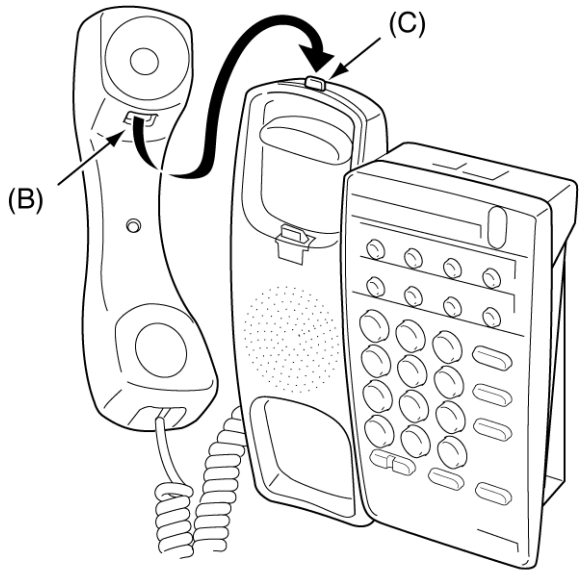

Figure 12-7 Hanger Hooks on the Single Line Telephone

3.3 DTP-1-1 TEL/ DTP-1-2 TEL

The DTP Single Line Telephone is a fully modular terminal with a Flash key, Redial key, 3-level receive volume control, 2-level ring volume control, data jack, and message waiting lamp.

Basic Port Package

A maximum of 56 DTP-1-1 or DTP-1-2 TELs can be installed. The total number of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 184 DTP-1-1 or DTP-1-2 TELs can be installed. The total number of all Multiline Terminals that can be installed is 200.

Each terminal requires an SLTII(1)-U10 ADP or SLI(4)/(8)-U( ) ETU.

Figure 12-8 DTP-1-1 TEL Single Line Telephone

✎ The H switch setting for the receive volume control should only be used by hearing impaired individuals, otherwise hearing damage may occur. This telephone complies with HAC (Hearing Aid Compatible) volume control defined by section 68.317 of the FCC Rules and Regulations, 1996 edition.

3.4 DTP-1HM-1/ DTP-1HM-2 TEL

The Single Line Telephone is a fully modular terminal with a Flash key, Redial key, 3-level receive volume control, 2-level ring volume control, data jack, message waiting lamp, and eight programmable Feature Access/Speed Dial keys.

Basic Port Package

A maximum of 56 DTP-1HM-1 or DTP-1HM-2 TELs can be installed. The total number of all Multiline Terminals that can be installed is 56.

Expanded Port Package

A maximum of 184 DTP-1HM-1 or DTP-1HM-2 TELs can be installed. The total number of all Multiline Terminals that can be installed is 200.

Each terminal requires an SLTII(1)-U10 ADP or SLI(4)/(8)-U( ) ETU.

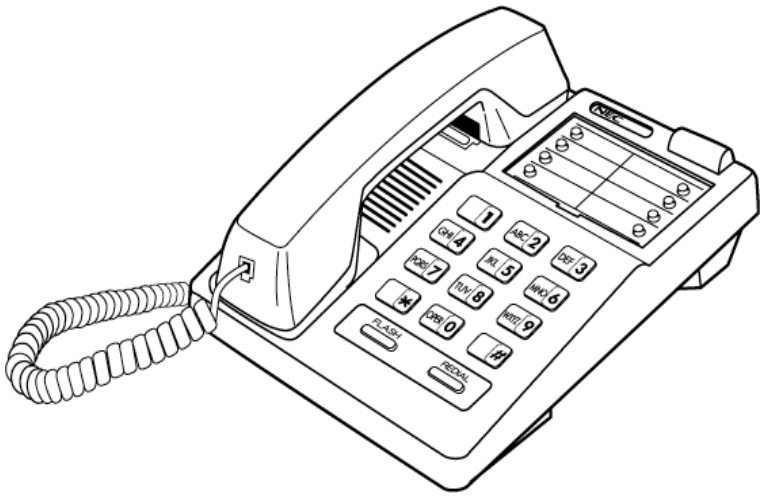

Figure 12-9 DTP-1HM-1 TEL Single Line Telephone

✎ The H switch setting for the receive volume control should only be used by hearing impaired individuals, otherwise hearing damage may occur. This telephone complies with HAC (Hearing Aid Compatible) volume control defined by section 68.317 of the FCC Rules and Regulations, 1996 edition.

SECTION 4 WALL MOUNTING THE DTP-1-1 OR DTP-1-2 TEL AND DTP-1HM-1 OR DTP-1HM-2 TEL

4.1 Hanger Hook

1. Remove the hook from the unit.

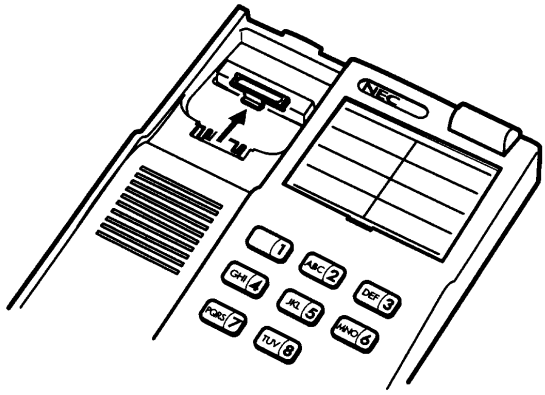

Figure 12-10 Removing the DTP Telephone Hanger Hook

2. Turn the hook over (back to the front) with the tab toward the top.

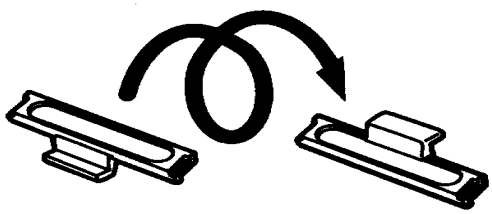

Figure 12-11 Turning the Hook Over

3. Slide the hook on its glides back down into position forming the hanger hook for the handset.

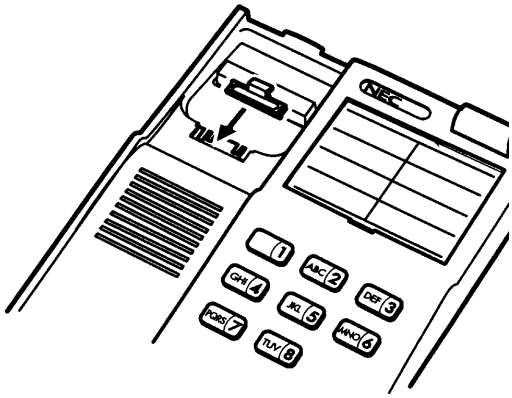

Figure 12-12 Sliding the Hook into Position

4.2 Using Installed Modular Wall Plate

1. Unscrew the three screws on the unit to remove the plate.

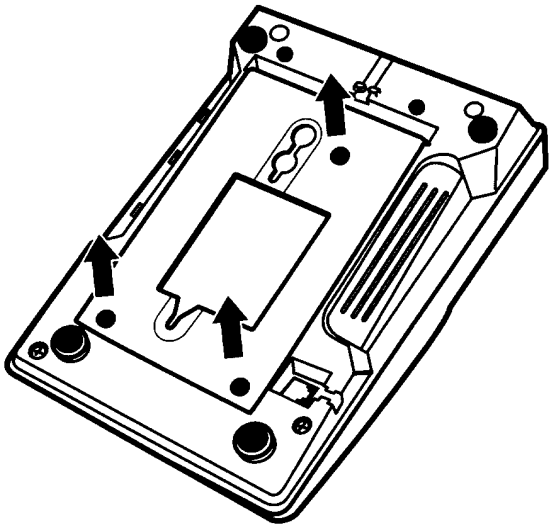

Figure 12-13 Removing the Screws

2. Replace the plate and screw in the two positions. (One remaining screw can be screwed in at the original third position.)

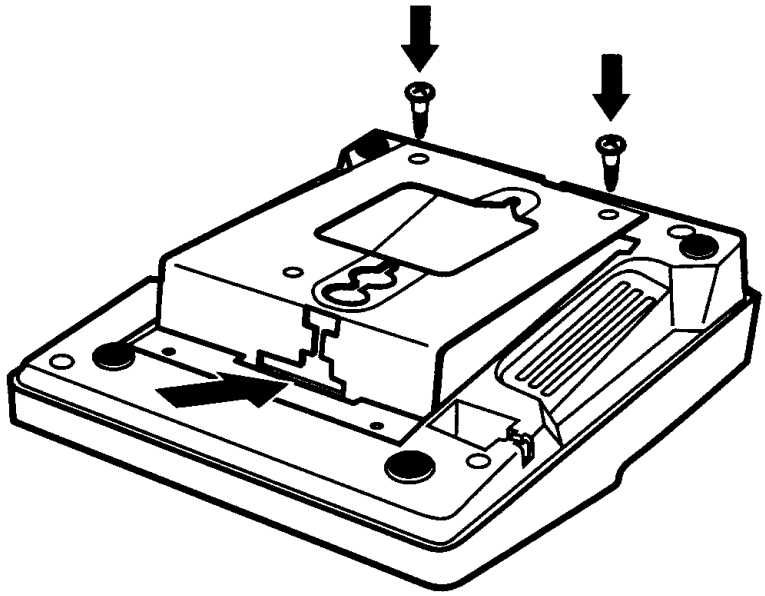

Figure 12-14 Replacing the Plate and Screw

3. Loosen the screws on the wall telephone plate to protrude a bit.

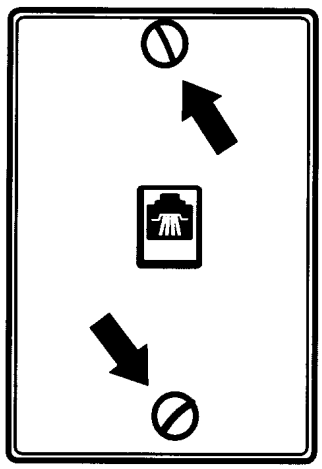

Figure 12-15 Protruding Screws

4. Install the telephone with the plate on the protruding screws.

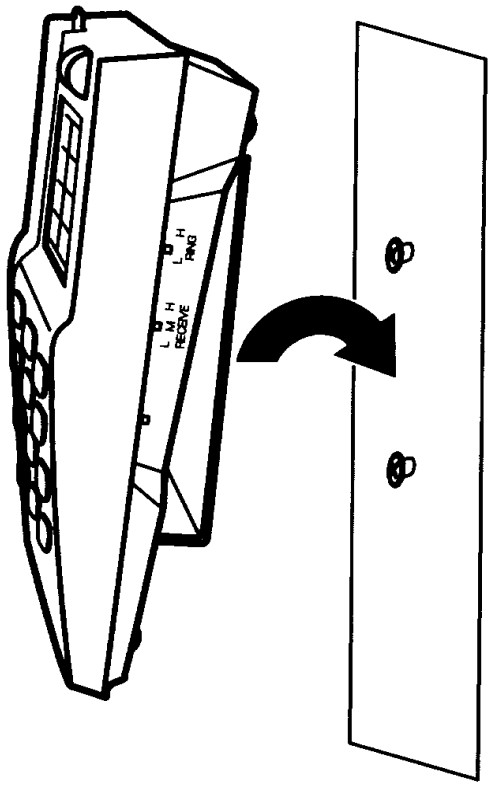

Figure 12-16 Mounting the Telephone

TABLE OF CONTENTS
CHAPTER 13

Section 1 General Information 13-1

Section 2 Radio Frequency Interference 13-1

Section 3 *D*^{term} ® Headset Cordless Terminal 13-1

3.1 Description 13-1

3.2 Selecting an Installation Location 13-2

3.3 Connecting the Base Unit 13-3

Section 4 *D*^{term} ® Headset Cordless II Terminal 13-5

4.1 Description 13-5

4.2 Connecting the Switch 13-6

4.3 Charging the Headset 13-6

4.4 Configuring the Headset to Your Telephone 13-7

4.5 Adjusting the Volume 13-7

4.6 Operation Using the *D*^{term} Headset Cordless II 13-8

4.7 System Reset 13-8

Section 5 *D*^{term} ® Cordless Lite or *D*^{term} ® Cordless II Terminal 13-9

5.1 Description 13-9

5.2 Selecting an Installation Location 13-10

5.3 Connecting the Telephone Cords 13-10

5.4 Applying Power to the Base Unit 13-11

Section 6 Installing *D*^term^ ® Handset Cordless Terminal 13-12

6.1 Description 13-12

6.2 Selecting an Installation Location 13-12

6.3 Connecting the Telephone Cord 13-12

6.4 Applying Power to the Base Unit 13-13

Section 7 Installing a *D*^term^ ® Analog Cordless Terminal 13-14

7.1 Description 13-14

7.2 Selecting an Installation Location 13-14

7.3 Connecting the Telephone Cord 13-15

7.4 Applying Power to the Base Unit 13-15

Section 8 *D*^term^ Cordless Lite II 13-16

8.1 Description 13-16

8.2 Installing the *D*^term^ Cordless Lite II 13-16

8.2.1 Selecting a Location 13-16

8.2.2 Controls and Indicators 13-16

8.3 Installation Precautions 13-19

8.4 Connecting the Telephone Cords 13-19

8.5 Applying Power to the Charging Unit 13-20

8.6 Wall Installation 13-21

8.6.1 Standard Wall Plate Mounting 13-21

8.7 Direct Wall Mounting 13-24

8.8 Charging Unit Wall Mounting 13-26

8.9 Attaching and Removing the Belt Clip 13-27

8.10 Installing the Handset Battery Pack 13-28

8.11 Charging the Handset Battery Pack 13-29

8.12 Battery Hot Swap 13-29

8.13 Low Battery Indications 13-30
8.13.1 Standby Mode 13-30
8.13.2 Talk Mode 13-30
8.14 Cleaning the Battery Charge Contacts 13-31
8.15 Antenna 13-31
Section 9 NEC Conference Max 13-32
9.1 Wireless Conferencing System 13-32
9.1.1 Installing the Base Unit 13-33
9.1.2 Connecting And Charging Batteries 13-33
9.1.3 Keypad Functions 13-34
9.1.4 Programming Options 13-34
9.1.5 Compliance 13-35
Section 10 DECT Wireless Telephone 13-36

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LIST OF FIGURES AND TABLES
CHAPTER 13

Figure 13-1 *D*^term^ Headset Cordless Telephone 13-2

Figure 13-2 Connecting the *D*^term^ Headset Cordless Base Unit to the Adapter 13-3

Figure 13-3 Raising the Antenna on the *D*^term^ Headset Cordless Base Unit 13-3

Figure 13-4 Connecting the *D*^term^ Headset Cordless Telephone Cord to the AP(R)-R Unit 13-4

Figure 13-5 *D*^term^ Headset Cordless II 13-5

Figure 13-6 *D*^term^ Cordless Lite Terminal 13-9

Figure 13-7 *D*^term^ Cordless II 13-10

Figure 13-8 Connecting the Base Unit 13-11

Figure 13-9 *D*^term^ Handset Cordless Terminal 13-13

Figure 13-10 *D*^term^ Analog Cordless Terminal 13-14

Figure 13-11 *D*^term^ Cordless Lite II Controls and Indicators 13-17

Figure 13-12 Connecting Base Unit to the Telephone Jack 13-19

Figure 13-13 Connecting the Base Unit to the Multiline Terminal 13-20

Figure 13-14 Applying Power to the Charging Unit 13-20

Figure 13-15 Polarized Plug 13-21

Figure 13-16 Attaching the Wall Mount Stand to the Base Unit 13-22

Figure 13-17 Placing the AC Adapter Cord In the Wall Mount Stand 13-22

Figure 13-18 Placing the Base Unit on the Posts of the Wall Plate 13-23

Figure 13-19 Plugging the AC Adapter into the AC Wall Outlet 13-23

Figure 13-20 Inserting Screws into the Wall for Wall Mounting the Telephone 13-24

Figure 13-21 Placing the Telephone Cords in the Wall Mount Stand 13-25

Figure 13-22 Attaching the Wall Mount Unit to the Wall 13-25

Figure 13-23 Inserting Screws for Wall Mounting 13-26
Figure 13-24 Wrapping AC Adapter Cord Around the Strain Relief Clip 13-26
Figure 13-25 Attaching the Belt Clip to the Handset 13-27
Figure 13-26 Removing the Belt Clip 13-27
Figure 13-27 Removing the Battery Cover 13-28
Figure 13-28 Replacing the Battery Pack 13-28
Figure 13-29 Replacing the Battery Cover 13-29
Table 13-1 Low Battery 13-30
Figure 13-30 Cleaning Battery Charge Contacts 13-31
Figure 13-31 Raising the Base Unit Antenna 13-31
Figure 13-32 NEC Conference Max Plus 13-32
Table 13-2 Keypad Functions 13-34
Table 13-3 Programming Options 13-34
Figure 13-33 DECT Wireless Telephone 13-36

Installing Cordless and Wireless Telephones

CHAPTER 13

SECTION 1 GENERAL INFORMATION

This chapter provides information regarding cordless telephones which can be used in conjunction with the Electra Elite IPK II system.

SECTION 2 RADIO FREQUENCY INTERFERENCE

When using these cordless RF devices some interference can take place when operating the cordless telephones in the same environment as other wireless devices that operate in the same frequency spectrum.

Depending on your environment, the maximum number of cordless devices used without interference varies.

SECTION 3 *D^term^* ® HEADSET CORDLESS TERMINAL

3.1 Description

The *D^term^* Headset Cordless telephone is a convenient, pocket-sized telephone that allows the user to speak and listen in handsfree mode. This telephone has a 3-line, 16-character backlit handset display. Tone/Pulse dialing, handset ear piece and ringer volume control, up to 100 phonebook locations, one-touch dialing, mute, flash, pause, handset find, are some of the features that this telephone provides. Two headsets, a belt clip and holster are also included with this telephone.

This telephone has a 2.4 GHz frequency range and provides secure conversation and reduces interference from other cordless telephones.

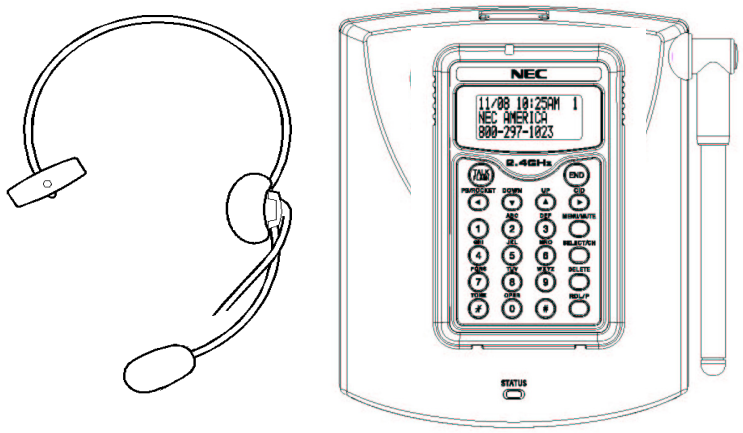


Figure 13-1 *D*^{term} Headset Cordless Telephone

3.2 Selecting an Installation Location

Before choosing a location for your new telephone, consider these important guidelines:

- ❑ The location should be close to both a telephone jack and continuous power outlet. (A continuous power outlet is an AC outlet which does not have a switch to interrupt power.)
- ❑ Keep the base and handset away from sources of electrical noise such as motors or fluorescent lighting.
- ❑ Be sure there is sufficient space to fully extend the base antenna.
- ❑ The base can be placed on a desk or tabletop or mounted on a standard telephone wall plate.

Charge your new telephone for 15~20 hours before completing the installation or using the handset.

3.3 Connecting the Base Unit

1. Connect the AC adapter to the *DC IN 9 V* jack and to a standard 120V AC wall outlet.

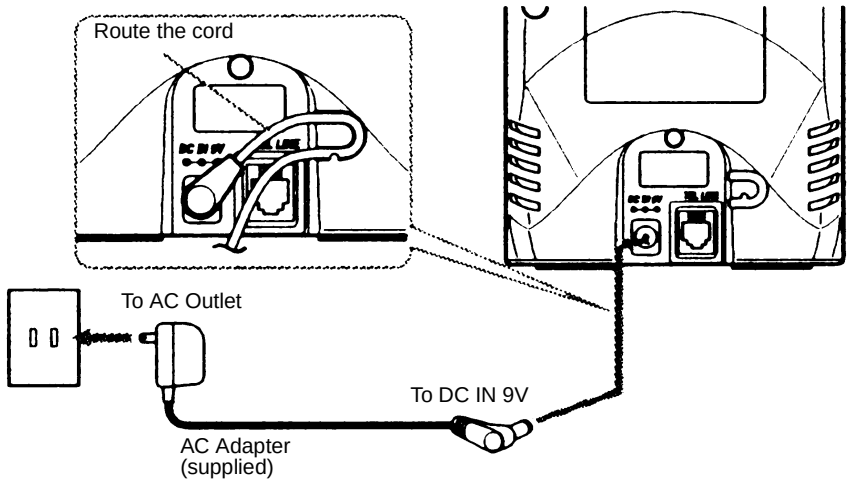


Figure 13-2 Connecting the *D*^{term} Headset Cordless Base Unit to the Adapter

2. Set the base on a desk or tabletop, and place the handset in the base unit as shown.

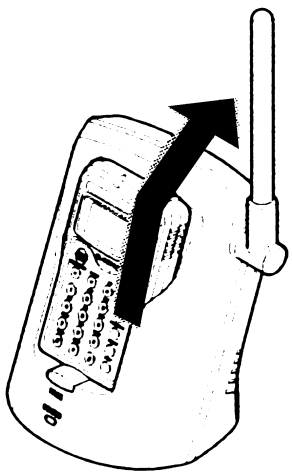


Figure 13-3 Raising the Antenna on the *D*^{term} Headset Cordless Base Unit

3. Raise the antenna to a vertical position.

4. Make sure the status LED is On. When the LED is not On, check to see that the AC adapter is plugged in and that the handset makes good contact with the base charging contacts.

   - ❑ Use only the supplied AC adapter (730627).
   - ❑ Connect the AC adapter to a continuous power supply.
   - ❑ Place the base unit close to the AC outlet so that you can unplug the AC adapter easily.
   - ❑ After installing the battery pack in the handset, charge the handset at least three to five hours before plugging it into the telephone line.

5. Connect the telephone line cord to the *TEL LINE* jack and the other end into the AP(R)-R Unit. Refer to paragraph 3.3 AP(A)-R Unit/AP(R)-R Unit (Port Adapter) on page 9-14 for detailed instructions for installing the AP(R)-R Unit. This unit can also be connected using an SLI(4)/(8)-U( ) ETU.

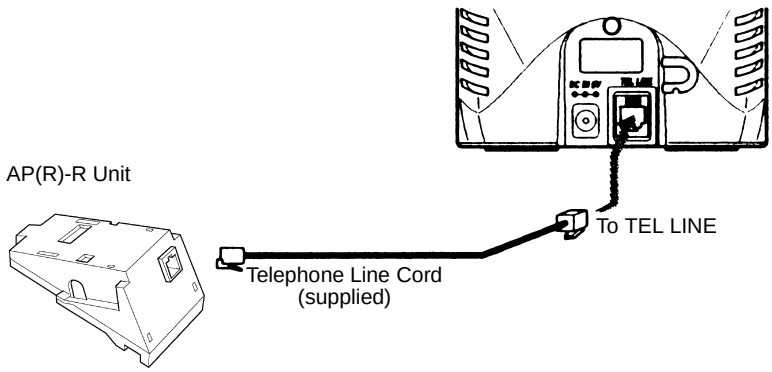


Figure 13-4 Connecting the *D*^{term} Headset Cordless Telephone Cord to the AP(R)-R Unit

Place the power cord so that it does not create a trip hazard or where it could become chafed and create a fire or electrical hazard.

Observe the following warnings during installation:

- ❑ Never install telephone wiring during a lightning storm.
- ❑ Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ❑ Use caution when installing or modifying telephone lines.

SECTION 4 *D*^{term} ® HEADSET CORDLESS II TERMINAL

4.1 Description

The DTR-1C-2 (CS50 Wireless Office Headset System) combines ultimate mobility with excellent sound quality for hands-free conversation. Refer to Figure 13-5 D^{term} Headset Cordless II.

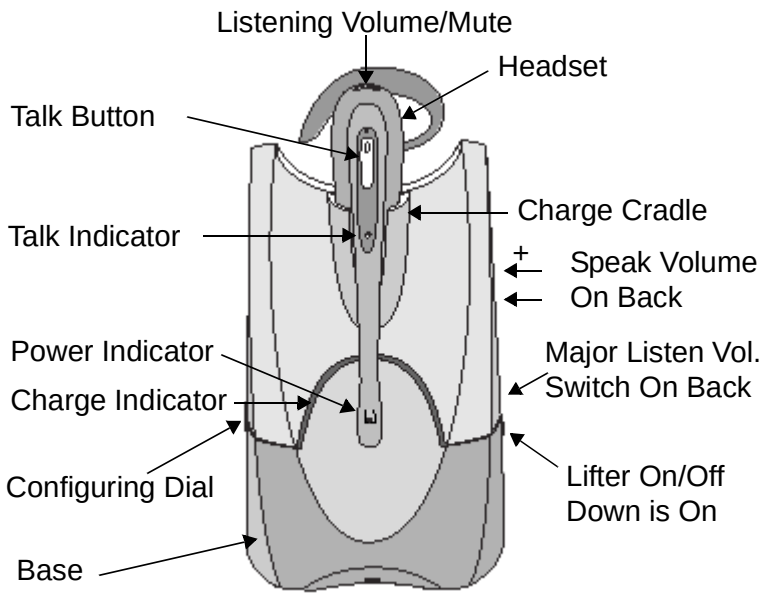


Figure 13-5 *D*^{term} Headset Cordless II

This headset gives you up to eight hours talk time with the convenience of roaming up to 300 feet with secure conversations. It continually charges in the cradle, and when in use, taking or ending a call requires pressing the talk button.

An included automatic handset lifter fits on the associated telephone to lift the handset or return it to the cradle to let you answer calls remotely with the touch of a button by automatically taking your handset off-hook.

An amplifier boosts the signal to the wireless headset and connects to the existing telephone using 64-bit digitally encrypted signals to provide secure communication.

The headset is powered by a LITHIUM ION Polymer (Li-ion) Battery.

4.2 Connecting the Switch

Connection requires installing an AP(R)-R analog adapter (not supplied with this unit) on the multiline terminal.

1. Connect the AC power adapter to the AC Power Adapter Jack (indicated by a 9V icon) on the bottom of the Base, and plug the adapter into a power source.
2. The DTR-1C-2 switch is a small rectangular unit with a line cable on one end and a line cable and fixed cable on the other. Connect the fixed cable to the Lifter jack (located left of the AC Power adapter jack) on the bottom of the Base.
3. Connect the Line cord next to the fixed cable on the switch to the Base connector on the bottom of the Base unit indicated by a telephone icon.
4. Connect the single line on the other end of the DTR-1C-2 switch to the AP(R)-R analog adapter and connect the AP(R)-R adapter to the telephone.

4.3 Charging the Headset

Slide the Headset into the charging cradle on the Base. The Amber charging indicator blinks. When the Headset is charged, the indicator remains on continuously. A complete charge takes 3 hours.

4.4 Configuring the Headset to Your Telephone

When any of the following situations occurs, the Headset must be configured to be compatible with your telephone:

- ❑ Dial tone is not present.
- ❑ The caller is not heard.
- ❑ The caller does not hear you.
- ❑ Hissing or buzzing is heard in the Headset.

To configure the Headset:

1. Lift the telephone handset.
2. Press the Talk Button.
3. Locate the configuration Dial, and rotate it to another of the four positions until a dial tone is heard.

   ✎ Align the number with the seam line on the right side.

4.5 Adjusting the Volume

Listening Volume

1. Adjust listening volume using Listening Volume/Mute control on the headset speaker end.

   ✎ Rock the control up or down for volume changes.

2. When the volume is still too loud or too soft, locate the Listening Volume Major Switch on back of the Base, and move it to another of the four positions.

Speaking Volume

1. Adjust speaking volume using the plus or minus button on back of the Base.
2. When the speaking volume is still too loud or too soft, locate the four position switch on the bottom of the Base, and move it to another of the four positions.

Using the Mute Feature

1. Push in the Listening Volume/Mute Control to mute the headset.

   ✎ A light beep indicates mute is being used.

2. Push the control again to turn off the mute feature.

4.6 Operation Using the *D*^{term} Headset Cordless II

Switch from Headset to Handset

When you are using the headset during a call and want to switch to the handset:

1. Remove the handset from the Base.

2. Press the headset Talk Button, and the handset can be used.

Switch from Handset to Headset

When you are using the handset during a call and want to switch to the headset:

1. Press the headset Talk Button, and the headset can be used.

2. Place the telephone handset on the Multiline Terminal.

3. When finished, press the Headset Talk Button to end the call.

4.7 System Reset

To recover from some faults, system reset may be necessary. To perform system reset:

1. Press both the Talk Button and Mute Control Button on the headset for five seconds.

2. When the Talk Indicator blinks release both buttons.

3. Press the Talk Button again.

4. Disconnect the AC Power Adapter from the jack for 5 seconds and then plug it back in.

SECTION 5 *D*^term^ ® CORDLESS LITE OR *D*^term^ ® CORDLESS II TERMINAL

5.1 Description

D^term^ Cordless Lite

This *D*^term^ Cordless Lite Terminal can be connected to the Electra Elite IPK II System using a tandem connection to a Multiline Terminal. The terminal has a 16-digit, 2-line LCD, dial pad, talk key, chan key, hold key, transfer key, conf key, mute key, vol key, a msg icon, vibrator, and four function keys with red LEDs.

In an ideal state, the cordless terminal can be switched to the Multiline Terminal connected to it by pressing the Desk key on the base unit of the idle *D*^term^ Cordless Lite Terminal.

D^term^ *Cordless II*

The *D*^term^ Cordless II terminal uses 900 MHz Digital Spread Spectrum (DSS) Technology and is connected in tandem to a Multiline Terminal.

In an ideal state, this terminal can be switched between cordless and the Multiline Terminal connected to it using a key on the base unit or handset.

This terminal has a 16-digit by 2-line LCD Display.

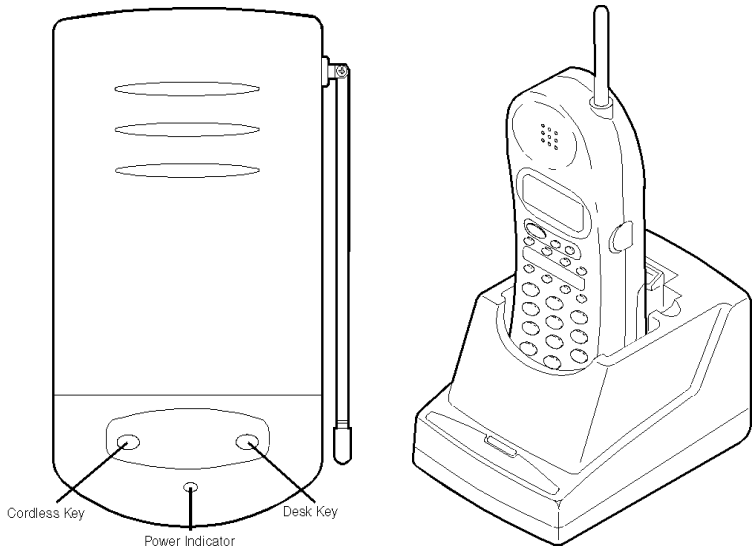


Figure 13-6 *D*^term^ Cordless Lite Terminal

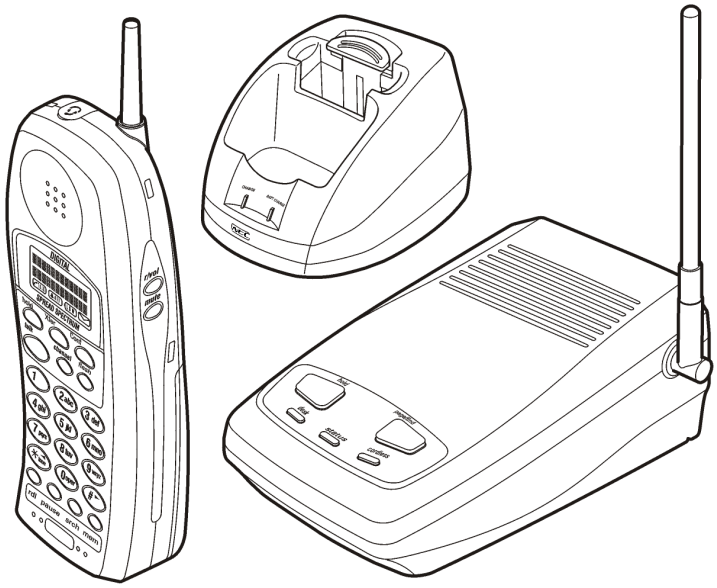


Figure 13-7 *D*^{term} Cordless II

5.2 Selecting an Installation Location

Select a location to avoid excessive heat or humidity. The base unit should be placed on a desk or tabletop near a standard 120 Vac outlet and within reach of the telephone line connection on the Electra Elite IPK Multiline Terminal. Keep the base unit and the handset away from sources of electrical noise (*e.g.* fluorescent lighting).

5.3 Connecting the Telephone Cords

The *D*^{term} Cordless Lite or Cordless II terminal is connected to the telephone line and to the host telephone using two telephone line jacks on the back of the Base Unit: LINE IN and LINE OUT.

Observe the following warnings during installation:

- ❑ Never install telephone wiring during a lightning storm.
- ❑ Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ❑ Use caution when installing or modifying telephone lines.

To connect the *D*^{term} Cordless Terminal to the host telephone:

1. Unplug the telephone line cord from the host telephone, and connect it to the LINE IN jack.

2. Using the telephone line cord supplied with the *D*^{term} Cordless Terminal, connect the LINE OUT jack to the host telephone jack.

5.4 Applying Power to the Base Unit

1. Plug the AC Adapter cord into the AC Adapter input jack on the Base Unit.

   ✎ Use only the AC Adapter supplied with the *D*^{term} Handset Cordless Terminal.

2. Plug the AC Adapter into a standard 120 Vac wall outlet.

3. Route the power cord where it does not create a trip hazard or where it could become chafed and create a fire or other electrical hazards.

   ✎ The AC Adapter furnished with this telephone can be equipped with a polarized line plug (a plug having one blade wider than the other). This plug fits into the power outlet only one way. When you cannot insert the plug fully into the outlet, reverse the plug. When the plug still does not fit, contact your facilities coordinator about replacing the obsolete plug. Do not alter the shape of the blades of the polarized plug.

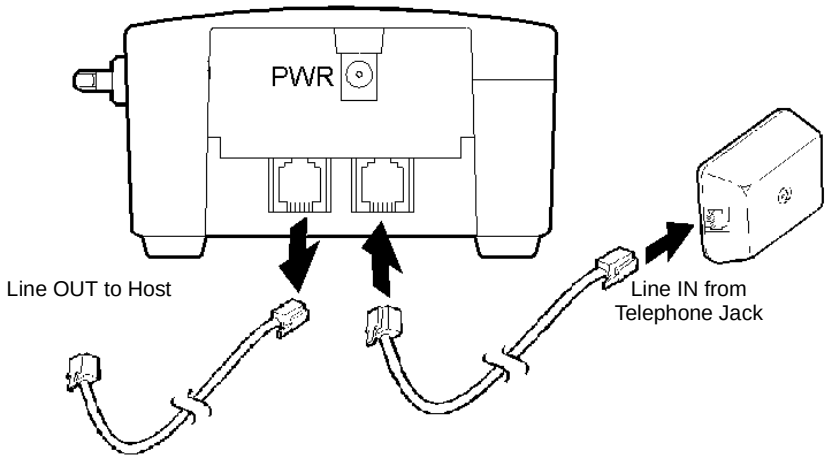


Figure 13-8 Connecting the Base Unit

SECTION 6 INSTALLING *D*^{term} ® HANDSET CORDLESS TERMINAL

6.1 Description

This *D*^{term} Handset Cordless Terminal is a stand-alone telephone with direct connection to a single port on the ESI(8)-U( ) ETU.

An ACA-U Unit adapter is required for this terminal.

Each terminal requires an ESI(8)-U( ) ETU port.

6.2 Selecting an Installation Location

Select a location for the DTP-16HC-1 TEL to avoid excessive heat or humidity. The base unit should be placed on a desk or tabletop near a standard 120 Vac outlet and within reach of the telephone line connection on the Electra Elite IPK Multiline Terminal. Keep the base unit and the handset away from sources of electrical noise (*e.g*., fluorescent lighting).

6.3 Connecting the Telephone Cord

The Base Unit of the DTP-16HC-1 TEL has two jacks on the back: LINE and DC24V.

Observe the following warnings during installation:

- ❑ Never install telephone wiring during a lightning storm.
- ❑ Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ❑ Use caution when installing or modifying telephone lines.

Using the telephone line cord supplied with the terminal, connect the LINE jack to the telephone line.

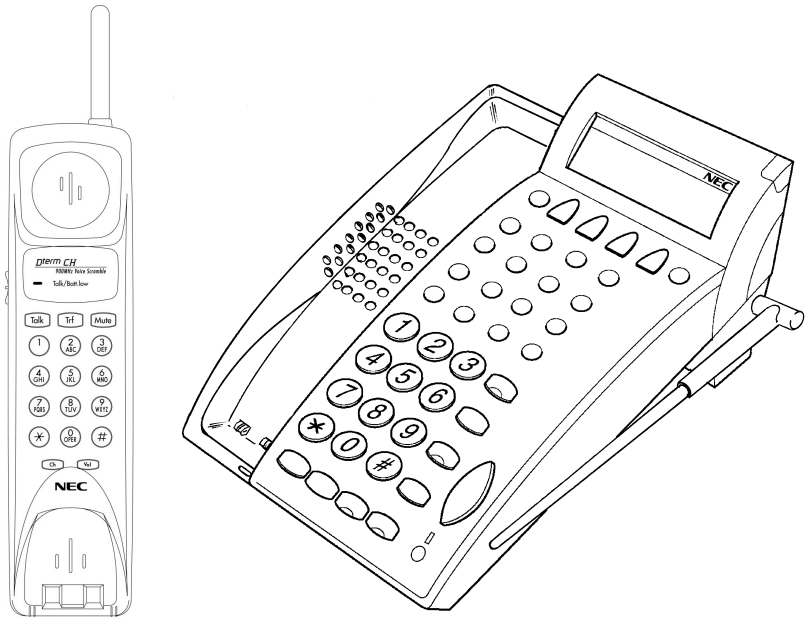


Figure 13-9 *D*^{term} Handset Cordless Terminal

6.4 Applying Power to the Base Unit

1. Power to charge the battery is supplied from the Telephone line.

2. An ACA-U Unit must be installed in the optional DC24V jack on the Base Unit to provide power for the *D*^{term} Handset Cordless Terminal.

3. Plug the ACA-U Unit into a standard 120 Vac wall outlet.

4. The power level between the Handset and the Base is 10mW.

5. When the ACA-U Unit is used, route the power cord where it does not create a trip hazard or where it could become chafed and create a fire or electrical hazard.

SECTION 7 INSTALLING A *D*^{term} ® ANALOG CORDLESS TERMINAL

7.1 Description

The *D*^{term} Analog Cordless terminal uses 2.4 GHz Digital Spread Spectrum (DSS) Technology and is connected to an analog port using SLI(4)/(8)-U( ) ETU or OPX(2)-U( ) ETU, an SLTII(1)-U( ) ADP, or an APR-U/AP(R)-R Unit connected to the Multiline Terminal.

This terminal does not have an LCD display.

7.2 Selecting an Installation Location

Select a location to avoid excessive heat or humidity. The base unit should be placed on a desk or tabletop near a standard 120 Vac outlet and within reach of the telephone line connection on the Electra Elite IPK Multiline Terminal. Keep the base unit and the handset away from sources of electrical noise (*e.g.* fluorescent lighting).

Figure 13-10 *D*^{term} Analog Cordless Terminal

7.3 Connecting the Telephone Cord

The DTR-1R-1 *D*^{term} Analog Cordless terminal is connected to an analog port on the KSU using one of the following: SLI(4)/(8)-U( ) or OPX(2)-U( )ETU, SLTII(1)-U( ) ADP, or APR-U Unit connected to the multiline terminal. A TEL LINE jack is located on back of the base unit of the *D*^{term} Analog Cordless terminal.

Observe the following warnings during installation:

- ❑ Never install telephone wiring during a lightning storm.
- ❑ Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ❑ Use caution when installing or modifying telephone lines.

Using the telephone line cord supplied with the *D*^{term} Analog Cordless terminal, connect the TEL LINE to the telephone line.

7.4 Applying Power to the Base Unit

1. Plug the AC Adapter connector in the DC IN 9V jack.
2. Route the power cord where it does not create a trip hazard or where it could become chafed and create a fire or other electrical hazards.
3. Plug the AC Adapter in a standard 120 Vac wall outlet.

✎ The AC Adapter furnished with this telephone should be equipped with a polarized line plug (a plug having one blade wider than the other). This plug fits into the power outlet only one way. If you cannot insert the plug fully into the outlet, reverse the plug. When the plug still does not fit, contact your facilities coordinator about replacing the obsolete plug. Do not alter the shape of the blades of the polarized plug.

SECTION 8 *D*^{term} CORDLESS LITE II

8.1 Description

This cordless terminal achieves a maximum range of 50~150 feet for transmitting and receiving in accordance with the highest specifications set by the FCC and IC Part 15. Range is limited by environment, and too many variables preclude a standard determination. The range quoted is for reference as a means to compare with other range claims.

Radio interference can be caused by external sources such as TV, fluorescent lighting, electrical storms, or other wireless devices. The base unit should not be plugged into a circuit with a connection to a major appliance, and the antenna should always be fully extended.

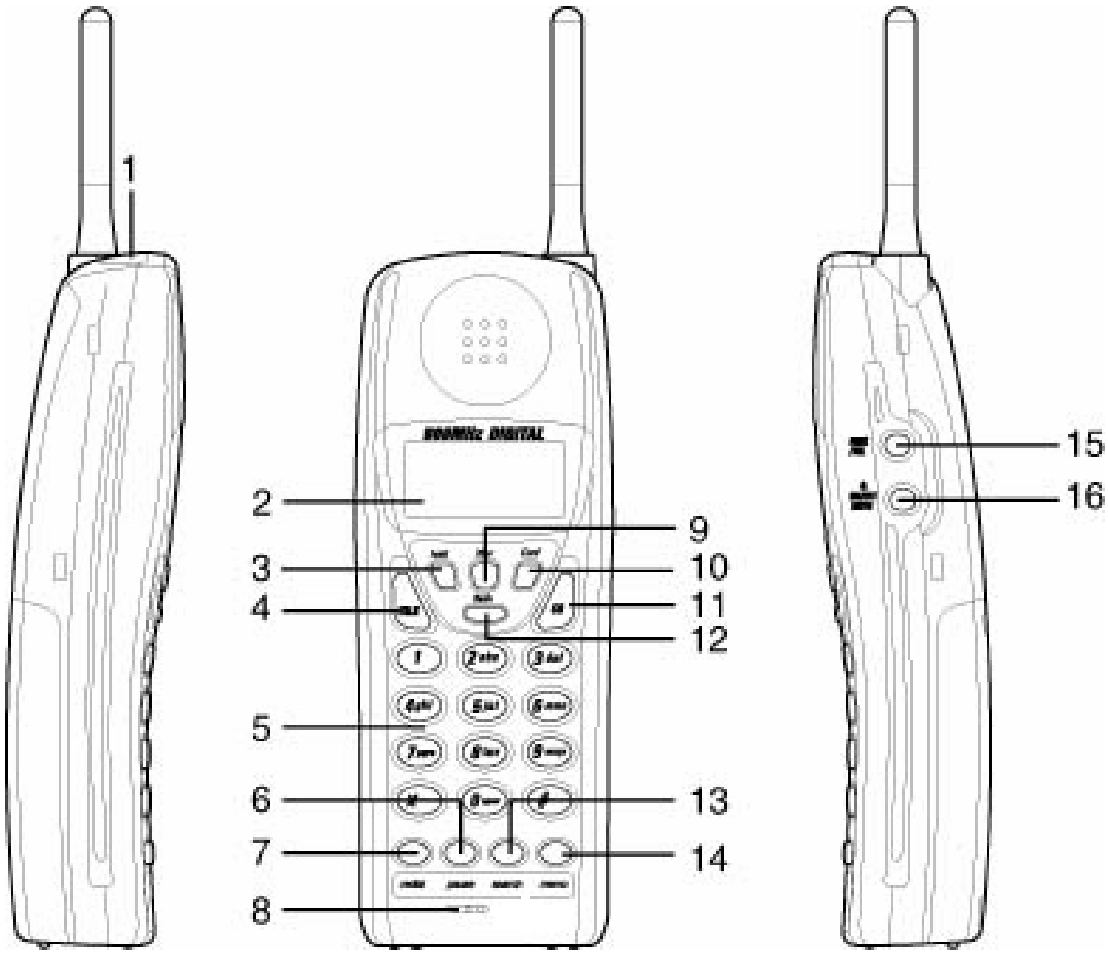
8.2 Installing the *D*^{term} CORDLESS LITE II

8.2.1 Selecting a Location

Select a location for the *D*^{term} CORDLESS LITE II terminal to avoid excessive heat or humidity. The base unit of the terminal can be placed on a desk or tabletop near a standard 120 Vac outlet and telephone line jack. The base unit can also be mounted on a standard wall plate using the wall mount adapter. Keep the base unit and handset away from sources of electrical noise (motors, fluorescent lighting, computers, PC monitor).

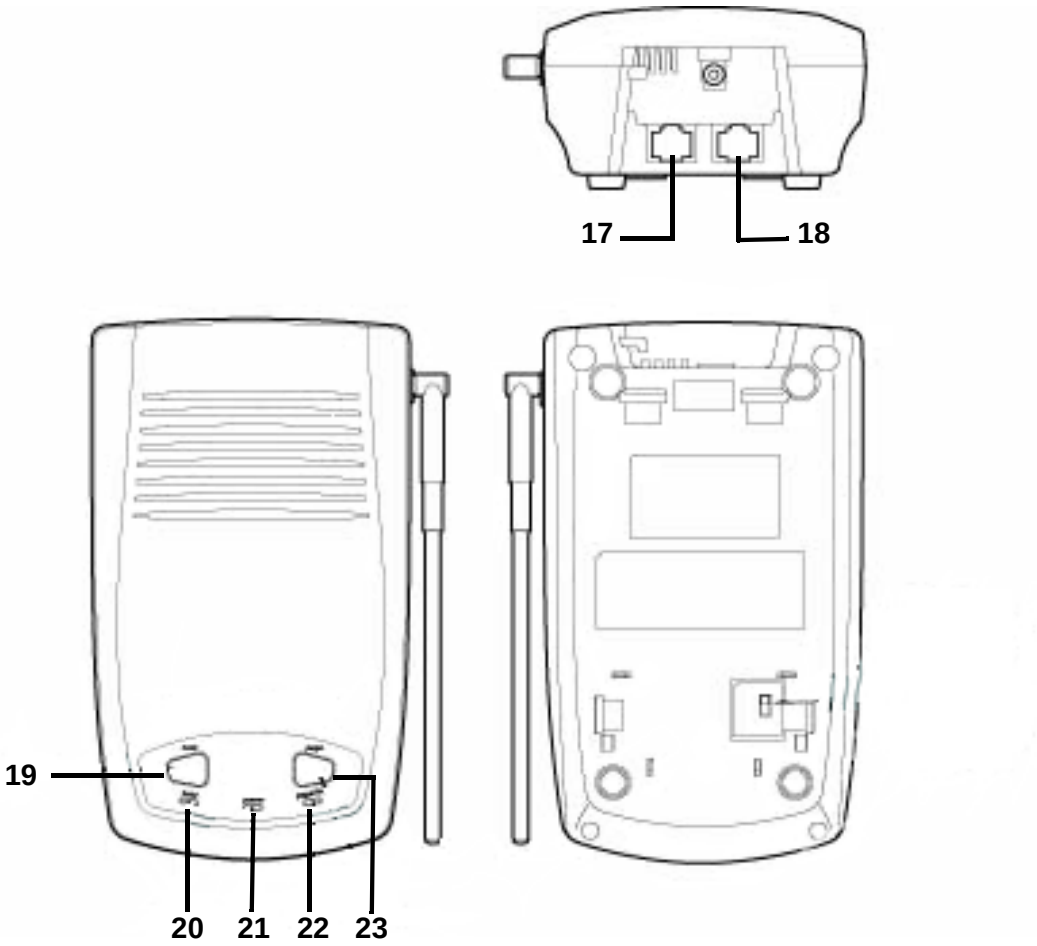
8.2.2 Controls and Indicators

Controls and Indicators are shown in the illustration on the next page.



1	Headset Jack	9.	Conference (***CONF***) Key
2.	LCD Message Display	10.	Transfer (***TRANSFER***) Key
3.	Hold (***HOLD***) Key	11.	Channel (CH) Key
4.	Talk (***TALK***) Key	12.	Redial (***REDIAL***) or Desk/Cordless Softkey Switch Key
5.	Numeric Keypad	13.	F3
6.	F2	14.	F4
7.	F1	15.	Ringer/Volume (***Ring/Vol***) Key
8.	Microphone	16.	Mute (***MUTE***) Key

Figure 13-11 *D*^{term} Cordless Lite II Controls and Indicators



17. Line Out
18. Line In
19. Cordless
20. Cordless LED
21. Power
22. Desk LED
23. Desk

Figure 13-12 *D*^{term} Cordless Lite II Controls and Indicators (Continued)

8.3 Installation Precautions

To ensure optimum performance follow these guidelines:

- ❑ Each base unit must be placed at least 15 feet apart.
- ❑ The base antenna should be raised to the vertical position.
- ❑ Always place the base unit on top of a desk or on higher shelves. Avoid locations surrounded by metal surfaces.
- ❑ Place the base away from any electrical component such as a PC, monitor and other telephone.

8.4 Connecting the Telephone Cords

When connecting the telephone cords, observe the following precautions:

- ❑ Never install telephone wiring during a lightning storm.
- ❑ Never touch bare telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ❑ Use caution when installing or modifying telephone lines.

To connect the telephone cords:

1. Connect the cord from the telephone jack to the Base Unit LINE IN jack.

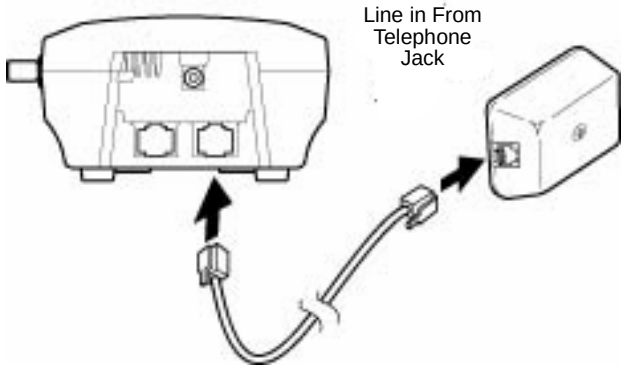


Figure 13-12 Connecting Base Unit to the Telephone Jack

2. Connect a qualified NEC digital Multiline Terminal to the LINE OUT jack.

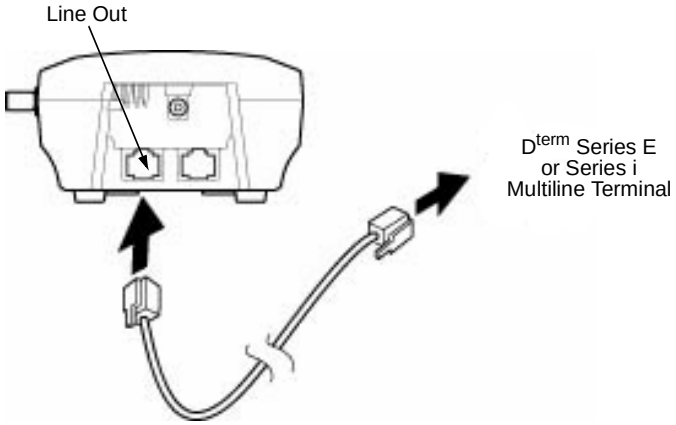


Figure 13-13 Connecting the Base Unit to the Multiline Terminal

8.5 Applying Power to the Charging Unit

The unique design of the telephone allows the user to place the handset in the charging unit with or without the belt clip attached. The battery pack is recharged automatically in the handset unit.

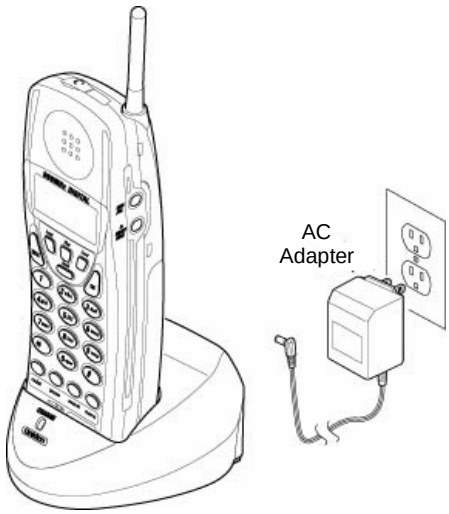


Figure 13-14 Applying Power to the Charging Unit

Use only the supplied AC adapter for the charging unit.

The AC adapter furnished with this telephone may be equipped with a polarized line plug (a plug having one blade wider than the other). This plug fits into the power outlet only one way. When you are unable to insert the plug fully into the outlet, try reversing the plug. Refer to Figure 13-15 Polarized Plug.

When you cannot plug the AC adapter into the outlet, the outlet may need to be replaced.

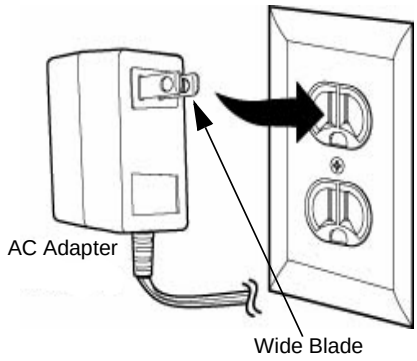


Figure 13-15 Polarized Plug

Route the power cord where it cannot create a trip hazard, or where it could become chafed and create a fire or other electrical hazards.

8.6 Wall Installation

8.6.1 Standard Wall Plate Mounting

The base unit can be mounted on standard wall plate. To attach the wall mount stand to the base unit:

1. Slide the wall mount stand into the notches at the top of the base unit. Rotate the wall mount stand down and snap it into place.

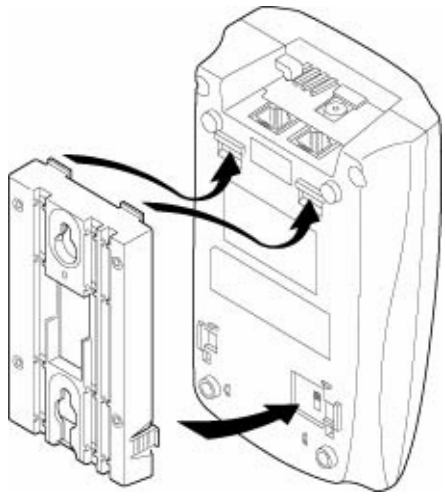


Figure 13-16 Attaching the Wall Mount Stand to the Base Unit

2. Plug the AC adapter into the base unit.

3. Place the AC adapter cord inside the molded channel of the wall mount stand.

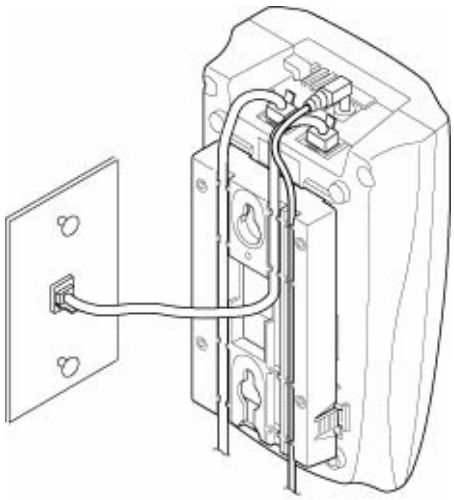


Figure 13-17 Placing the AC Adapter Cord In the Wall Mount Stand

4. Plug one end of the short telephone cord (locally supplied) in the ***LINE IN*** jack on the base unit. Plug one end of the NEC digital multiline telephone into the ***LINE OUT*** jack. Place the telephone cords inside the molded channels on the bottom of the wall mount stand.

5. Plug the other end of the short telephone cord into the modular wall jack in the center of the wall plate.

6. Place the base unit on the posts of the wall plate and push down until it is firmly seated.

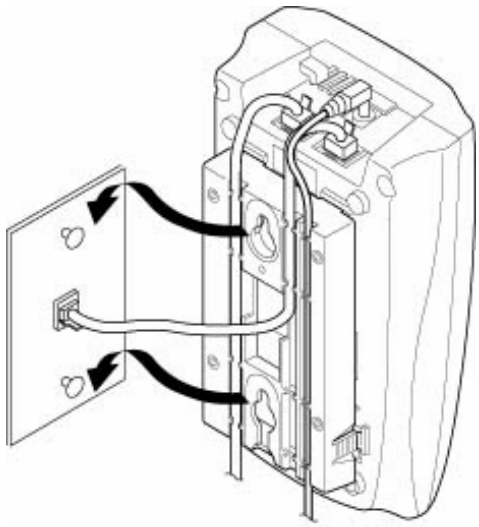


Figure 13-18 Placing the Base Unit on the Posts of the Wall Plate

7. Plug the AC adapter into a standard 120 Vac wall outlet.

   ✎ Do not use an outlet controlled by a wall switch.

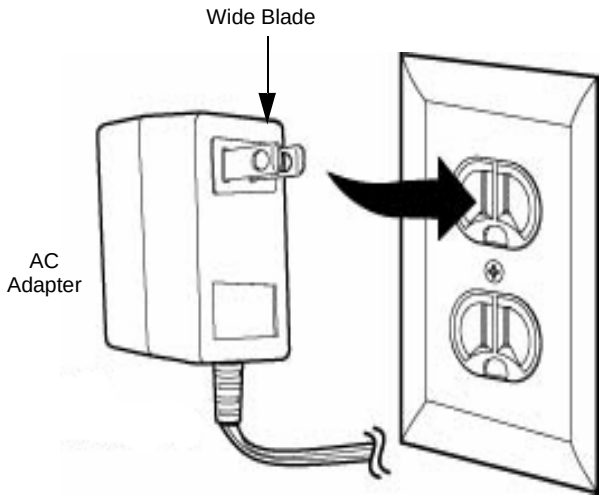


Figure 13-19 Plugging the AC Adapter into the AC Wall Outlet

8.7 Direct Wall Mounting

When a standard wall plate is not available, mount the telephone directly on the wall. Before mounting the telephone, consider the following:

- ❑ Select a location away from electrical cables, pipes, or other items behind the mounting location that could cause a hazard when inserting screws into the wall.
- ❑ Make sure the wall material can support the weight of the base unit.
- ❑ Use #10 screws with anchoring devices suitable for the wall material.

To mount the telephone:

1. Insert two mounting screws 3-15/16 inches apart. Allow about 3/16 of an inch between the wall and screw heads for mounting the telephone.

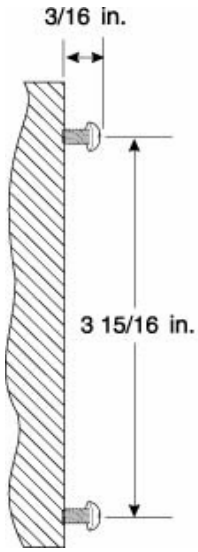


Figure 13-20 Inserting Screws into the Wall for Wall Mounting the Telephone

2. Plug in and secure the AC adapter.
3. Plug the AC adapter into the base unit.
4. Plug one end of the short telephone cord in the ***LINE In*** JACK on the base unit. Then plug an Electra Elite IPK multiline terminal line in the ***LINE OUT*** jack. Place the telephone cords inside the molded channels on the bottom of the wall mount stand.

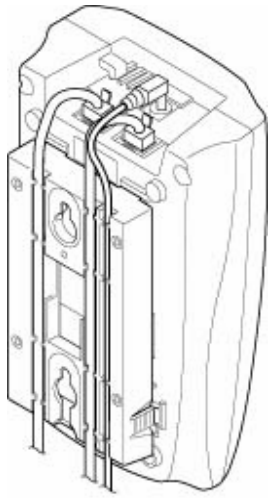


Figure 13-21 Placing the Telephone Cords in the Wall Mount Stand

5. Place the base unit on the posts of the wall screws and push down until it is firmly seated.

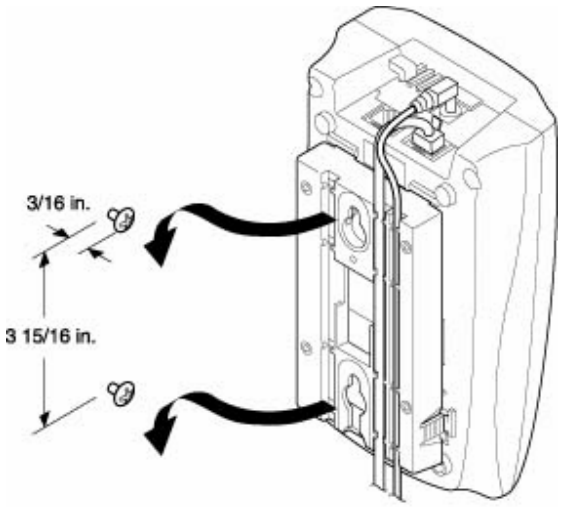


Figure 13-22 Attaching the Wall Mount Unit to the Wall

6. Plug the other end of the short telephone cord into a telephone wall jack.

7. Plug the AC adapter into a standard 120 Vac wall outlet. Refer to Figure 13-19 Plugging the AC Adapter into the AC Wall Outlet on page 13-23.

   ✎ Do not use an outlet controlled by a wall switch.

8.8 Charging Unit Wall Mounting

The charging unit can be wall mounted. Before installing, consider the following:

- ❑ Select a location away from electrical cables, pipes, or items behind the mounting location that could cause a hazard when inserting screws.
- ❑ Make sure the wall material can support the weight of the charging unit.
- ❑ Use #10 screws with anchoring devices suitable for the wall material.

To mount the charging unit:

1. Insert two mounting screws one inch apart. Allow about 3/16 of an inch between the wall and screw heads for mounting the telephone.

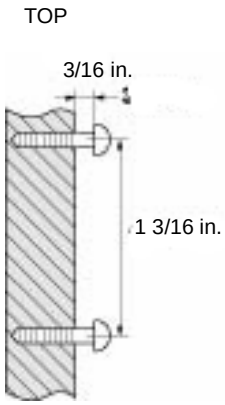


Figure 13-23 Inserting Screws for Wall Mounting

2. Plug the AC adapter into the charging unit. Wrap the AC adapter cord around the strain relief.

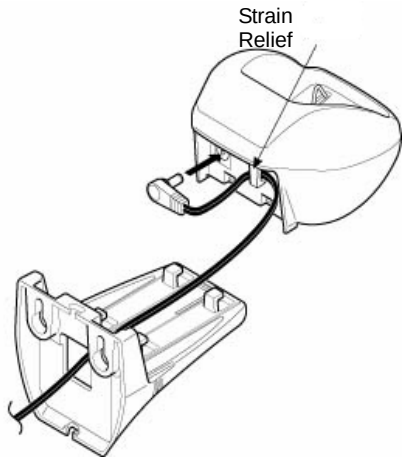


Figure 13-24 Wrapping AC Adapter Cord Around the Strain Relief Clip

3. Plug the AC adapter into a standard 120 Vac wall outlet.

8.9 Attaching and Removing the Belt Clip

A belt clip can be used to attach the handset to a belt or pocket for convenient portability.

1. Slide the clip into the tab slots. Press firmly until it snaps into place. The belt clip fits snugly on the handset.

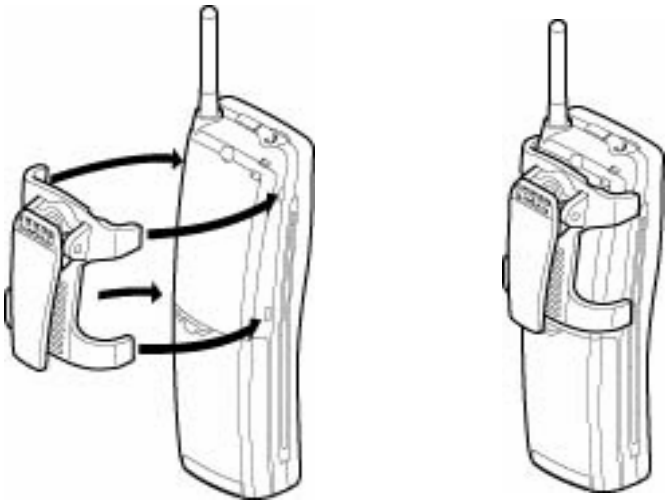


Figure 13-25 Attaching the Belt Clip to the Handset

2. To remove the clip, press the retaining clip in toward the belt clip blade and slide the clip up at the same time.

Figure 13-26 Removing the Belt Clip

8.10 Installing the Handset Battery Pack

Before installing batteries, refer to Chapter 1 Regulatory Information. Follow safety regulations when handling batteries.

1. To remove the battery cover, press the latch and slide the cover down and off the handset.

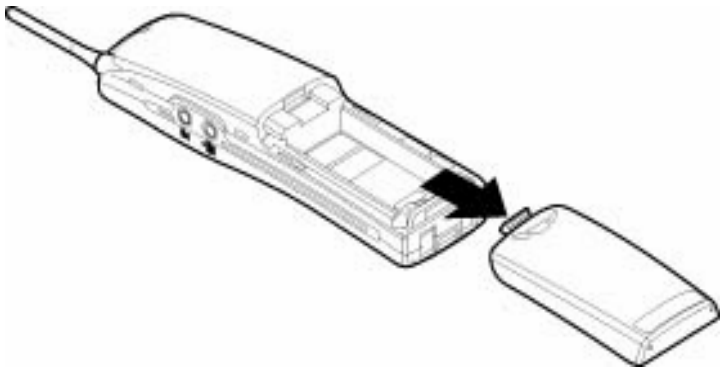


Figure 13-27 Removing the Battery Cover

2. Slide the battery pack down into the handset.

   ✎ It may be necessary to remove the old battery at this time.

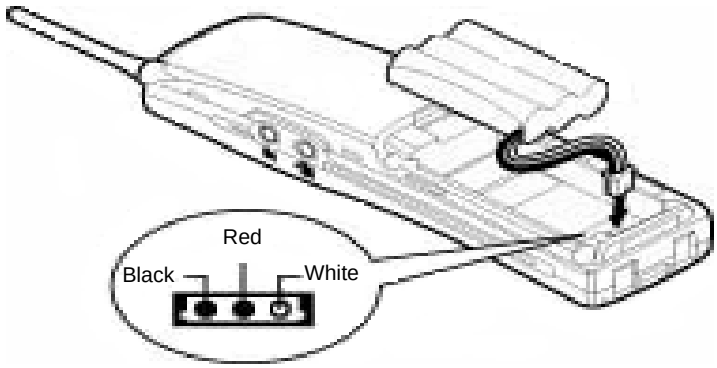


Figure 13-28 Replacing the Battery Pack

3. Replace the cover and slide it forward until it latches.

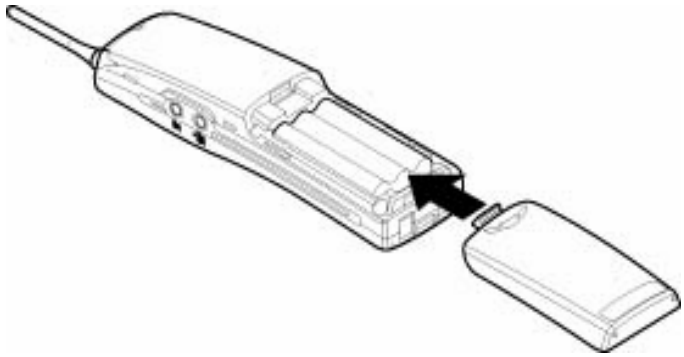


Figure 13-29 Replacing the Battery Cover

8.11 Charging the Handset Battery Pack

The rechargeable battery pack must be fully charged before using the *D*^{term} Cordless Lite II handset for the first time.

✎ Charge the battery pack without interruption for five to eight hours.

1. Place the handset in the slot of the charging unit.

2. Make sure the ***CHARGE*** indicator lights. If the ***CHARGE*** LED does not come on, check to see if the AC adapter is plugged in and that the handset is making good contact with the charging contacts on the charging unit.

   ✎ The ***CHARGE*** LED lights red during and after charging the handset with the battery.

8.12 Battery Hot Swap

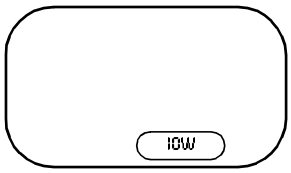
The battery can be hot swapped while a conversation is taking place. The battery must be changed within 20 seconds or connection is lost.

8.13 Low Battery Indications

The handset has visual and audible indicators to warn of a low battery condition. The indicators are different for standby mode and talk mode.

8.13.1 Standby Mode

The handset display turns on the battery low icon. All LEDs are turned off and LCD messages are cleared. A battery low alert tone will be emitted every 15 seconds and lasts for three minutes.



8.13.2 Talk Mode

The handset display turns on the battery low icon. All keys and functions are available. The battery low alert tone will be emitted every three seconds as long as conversation continues. After conversation is completed, the handset returns to the battery low condition in standby mode.

When you receive the low battery indication, return the handset to the base unit for charging or replace the handset battery pack with another charged battery pack.

The following table indicates what occurs and the action to be taken during a call or in standby mode when low battery indication is displayed.

Table 13-1 Low Battery

On a Call	In Standby Mode
When ***batt low*** is displayed:	
Only the ***TALK*** key operates.	None of the keys operate.
Handset beeps once every three seconds.	Handset beeps every 15 seconds for 15 minutes.
Action:	
Complete the call as quickly as possible.	Cannot make a call.
Replace the battery pack within 20 seconds to continue a call.	Replace the battery pack before making another call.

8.14 Cleaning the Battery Charge Contacts

To maintain a good charge, clean all charging contacts on the handset and charging unit about once a month. Use a pencil eraser or other contact cleaner. *Do not use liquids or solvents*.

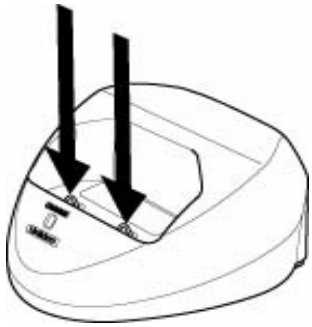


Figure 13-30 Cleaning Battery Charge Contacts

8.15 Antenna

Before using the Cordless II telephone raise the antenna to the vertical position as illustrated in Figure 13-31 Raising the Base Unit Antenna.

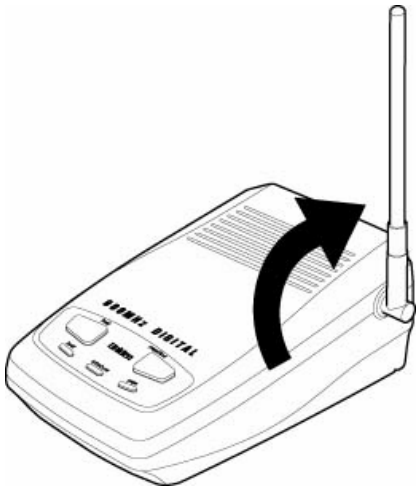


Figure 13-31 Raising the Base Unit Antenna

SECTION 9 NEC CONFERENCE MAX PLUS

9.1 Wireless Conferencing System

This wireless conferencing system is ideal for small conference rooms with up to eight participants. Max Plus provides wireless One-Touch Conferencing convenience without compromising audio quality or call security. Max Plus uses Digital Enhanced Cordless Telecommunication (DECT) wireless standards depending on the model.

Each pod contains a rechargeable battery pack with nickel metal hydride batteries (7.2 Volts, 2200 mAh) that allows 12 hours of continuous talk time. A Base Unit that is connected to a power source and analog telephone service is required for operation of the conferencing pods.

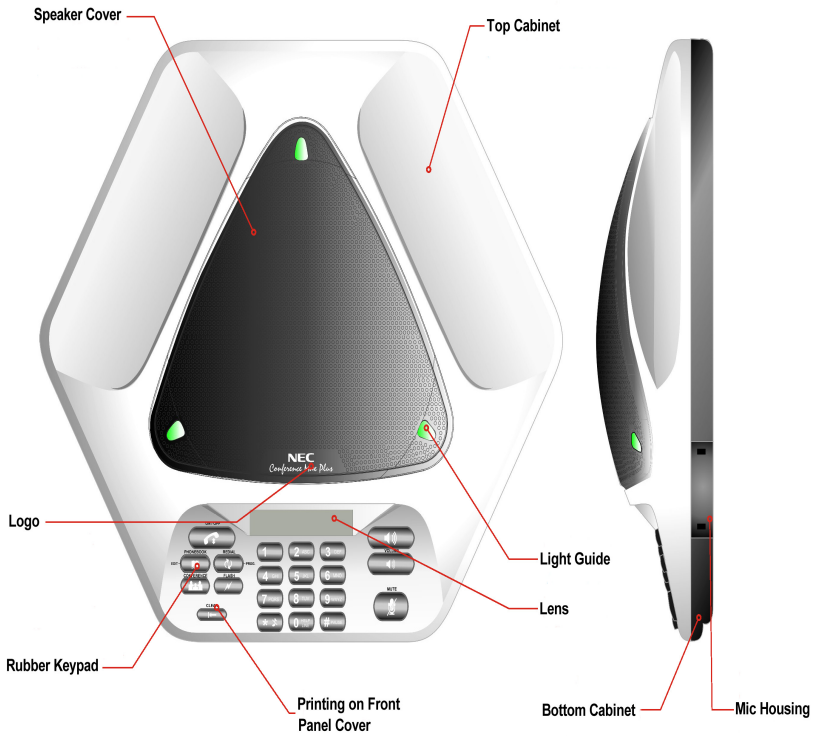


Figure 13-32 NEC Conference Max Plus

9.1.1 Installing the Base Unit

1. Connect the provided RJ-11 cable between the Base Unit and the telephone jack.

2. Connect the power cord to the Base Unit and plug it in an electrical outlet.

3. If desired, Connect a recording device to the 2.5mm audio jack.

9.1.2 Connecting And Charging Batteries

1. Slide the cover off the battery compartment on the bottom of one pod.

2. Connect the battery pack plug in the port in the compartment and install the battery pack.

3. Slide the cover back in place.

4. Connect the power supply/charger to the conferencing pod and plug it in an electrical outlet.

   ✎ Charge batteries for 15 hours prior to first use.

5. Repeat steps 1~4 for the other pod.

9.1.3 Keypad Functions

Refer to Table 13-2 Keypad Functions.

Table 13-2 Keypad Functions

Key	Function
ON/OFF key (telephone icon)	Press to activate the telephone and access dial tone. Press again to hang up and return to standby mode.
PHONEBOOK (book icon)	Press to dial stored numbers. Press and hold two seconds to enter Phonebook Edit mode.
REDIAL (circular arrow icon)	Press once to dial the last number called. Press and hold two seconds to enter Program mode.
CONFERENCE (three person icon)	Press to dial the conferencing service provider. This feature must be programmed.
FLASH (lightning flash icon)	Press to enable call forwarding, call waiting, or three-way calling when supported by telephone service.
CLEAR (vertical line and left arrow icon)	Press to clear the last digit entered or press and hold to clear all numbers. Press to exit programming mode.
VOLUME (loud and dim speaker icons)	Press during call to adjust call volume or press while telephone is ringing or in standby mode to adjust ringer volume.
MUTE (mike with diagonal line icon)	

9.1.4 Programming Options

To enter Programming mode, press and hold REDIAL until a diamond arrow is displayed on the LCD. Then press the applicable key and follow the instruction in Table 13-3 Programming Options.

Table 13-3 Programming Options

Menu Option	Key	Programming
Ringer Melody	1	Press REDIAL. The current melody selection flashes. Press 1~5 to change melody. Press REDIAL to save the selection.
Dialing Mode	2	Press REDIAL. The current dialing selection flashes. Press 1 for tone or 2 for pulse. Press REDIAL to save the selection.

Table 13-3 Programming Options (Continued)

Menu Option	Key	Programming
Flash Duration	3	Press REDIAL. The current duration flashes. Press 1~5 to select duration as follows: 1 = 600 ms 2 = 300 ms 3 = 150 ms 4 = 100 ms 5 = 80 ms Press REDIAL to save the selection.
Local Number✱	4	Press REDIAL. Enter the telephone number that you want displayed on the LCD in standby mode. Press REDIAL to save the number.
Conference✱	5	Press REDIAL. Enter the telephone number you want the conference key to dial. Press REDIAL to save the number.
Service✱	6	Press REDIAL. Enter the telephone number you want the O key to dial. Press REDIAL to save the number.

CLEAR Press to return the previous menu.
Press and hold to exit programming without saving changes.

✱ Press and hold 1 to enter hyphen or ✱ to enter a space in the number.
Press CLEAR before entering a new number.

9.1.5 Compliance

This product is in compliance with the following regulations and requirements:

- FCC Part 15/ICES-003

  This product has been tested and complies with the limits for a Class A digital device.

- FCC Part 68

  US:FBIMT01B910158015 Ringer Equivalence Number (REN):0.1B(ac)

- Industry of Canada (IC)

  IC: 1970A-158015: REN:0.1B(ac)

- European

  Council Directive 1999/5/EC

SECTION 10 DECT WIRELESS TELEPHONE

The Digital Enhanced Cordless Telecommunication (DECT) wireless telephone provides wireless freedom that also allows access to features provided by the Electra Elite IPK II system. A BSU(4M)-U20 ETU interfaces the Electra Elite IPK II KSU with four Base Stations that can be expanded to 16 Base Stations using two BSU(6S)-U20 ETUs. The Electra Elite IPK II expanded system supports 40 DECT Telephones. The Electra Elite IPK II basic system supports 24 DECT Telephones

Figure 13-33 DECT Wireless Telephone

For more detailed information, refer to the User's Guide that is furnished with each telephone.

TABLE OF CONTENTS
CHAPTER 14

Section 1 Introduction 14-1

Section 2 Operational Current and Voltage Checks 14-1

Section 3 Operational Test Procedures 14-2

3.1 General Information 14-2

3.2 Before Initializing 14-2

3.2.1 Cable Connections 14-2

3.2.2 AC/DC Power 14-2

3.2.3 Initialization Check 14-3

3.3 System Initialization 14-3

3.4 After Initialization 14-3

Section 4 Troubleshooting 14-4

4.1 Remote Administration and Maintenance 14-4

4.2 Problem Solving 14-4

4.2.1 System Down 14-4

4.2.2 Partial Operation 14-4

4.2.3 Reset 14-4

4.3 Flowcharts 14-5

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LIST OF TABLES
CHAPTER 14

Table 14-1 Voltage Measurement 14-2

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System Maintenance

CHAPTER 14

SECTION 1 INTRODUCTION

The technician can use this chapter to troubleshoot and diagnose problems during and after system installation. The troubleshooting flow charts and general test procedures aid the technician to identify possible causes of the problem by defining the problem area.

Using the System Data Upload/Download feature, all System Programming and Speed Dial data can be stored on disk for safe keeping. After all System Programming is completed, it should be downloaded to a disk for backup. When system memory fails, this data on the disk can be uploaded and the memory restored.

SECTION 2 OPERATIONAL CURRENT AND VOLTAGE CHECKS

The effectiveness of this maintenance section depends on the technician. Due to external factors, the technician should not make any assumptions. For example, do not assume that a new power supply used to replace another power supply is working properly. Check the output of the power supply with a Volt meter.

The ESI(8)-U( ) ETU allows the measurement of +5V and –24V. This ETU can be used in the expansion KSU for the power output measurements. Refer to Table 14-1 Voltage Measurement. Before the technician can troubleshoot, the correct tools must be available. Some of these are listed below:

- Digital or analog multimeter that can read DC and AC current and voltage and DC resistance.
- Test Set (lineman) that has termination and monitor modes and DTMF and DP dialing.
- Hand tools such as:
  - Screwdrivers (flat and Phillips head)
  - Pliers (long nose and diagonal)
  - Punch down tool

SECTION 3 OPERATIONAL TEST PROCEDURES

3.1 General Information

When an Electra Elite IPK II system is first powered up, an initialization is performed. During this process the CPUII( )-U10 ETU, located in the Basic KSU, scans each interface slot to determine the hardware configuration used. This information is stored in the resident system program memory with the system default values. This section provides test procedures that are used before, during, and after the initialization process.

3.2 Before Initializing

The technician must follow these steps before initializing the system.

3.2.1 Cable Connections

All wiring for power supplies or flat cable connectors should be checked for solid connections.

3.2.2 AC/DC Power

Check all power with an AC/DC multimeter. (Refer to Table 14-1 Voltage Measurement.) Run this test with only the CPUII( )-U10 ETU and the ESI(8)-U( ) ETU installed.

Table 14-1 Voltage Measurement

Voltages	Tolerance	Measuring Points
ESI(8)-U( ) ETU +5V –-24V	 +5 ± 0.25V –24 ± 0.25V	ESI(8)-U( ) ETU TP1 +5V TP2 GND TP3 –24V
AC Voltage (117 Vac) Line to Neutral Line to Conduit Ground Neutral to Conduit Ground	117 Vac ± 15% 117 Vac ± 15% .05 Vac (maximum)	AC Terminal Strip Line L to N Line L to G Line N to G
Ring Generator (SLT)	70 ~ 120 Vac @ 20 Hz (Refer to ➢.)	Across Tip and Ring of Ringing SLT
CO Line Off-hook line current	25 ~ 50 mA	In series with Tip side of the CO line at the MDF

➢ Ring voltage may be lower if the meter measures only 60 Hz signals.

3.2.3 Initialization Check

To determine if the system is initializing correctly, only the Basic KSU, CPUII( )-U10 ETU, one ESI(8)-U( ) ETU, and terminals should be installed on the system. After initialization, all the terminals assigned to the ESI(8)-U( ) ETU can be used for internal calls to one another. (By default, these stations are assigned station numbers 101~108).

3.3 System Initialization

After the steps described in Section 3.2 Before Initializing are performed and verified, the entire system should be initialized.

With power OFF, all interface and option cards can be installed in the basic KSU. The technician can then power up the system to perform a First Initialization. After the initialization, each station display shows default time and date indications.

For example: 12-2 FRI 10:47 AM

3.4 After Initialization

Ensure that the battery is installed in CN6 on the CPUII( )-U10 ETU.

The battery prevents loss of previously programmed data when the system loses power.

Check all ETU slots in software to ensure the initialization process scanned the installed hardware correctly.

A general system operation check should be performed using default values prior to system programming.

After all previous steps are performed and any problems corrected, system programming is complete.

After System Programming is finished, the technician should perform a Second Initialization. Performing the First Initialization a second time causes all programming memory to be lost. Second Initialization refreshes the system RAM without losing any memory.

This completes the installation procedure for the Electra Elite IPK II system. The technician should check the operation of each Multiline Terminal to ensure the system is working properly.

SECTION 4 TROUBLESHOOTING

4.1 Remote Administration and Maintenance

PCPro can remotely access the Electra Elite IPK II system for maintenance and diagnostics. The remote PC and the system are connected using a modem on the CPUII( )-U10 ETU or using IP.

4.2 Problem Solving

To find the cause, consider all problem symptoms carefully. As each aspect of the problem is considered, the technician is guided to a probable solution. The problem must be defined as accurately as possible, so that the most efficient steps to the solution can be taken. Flowcharts in the next section help define the problem.

4.2.1 System Down

This term describes one of the following situations:

- No access to internal dial tone on any Multiline Terminal or Single Line Telephone is installed.
- No LED indication, display indication, or Multiline Terminal is installed.
- No system tones are generated.

4.2.2 Partial Operation

This term refers to any situation that cannot be completely described under the System Down conditions.

4.2.3 Reset

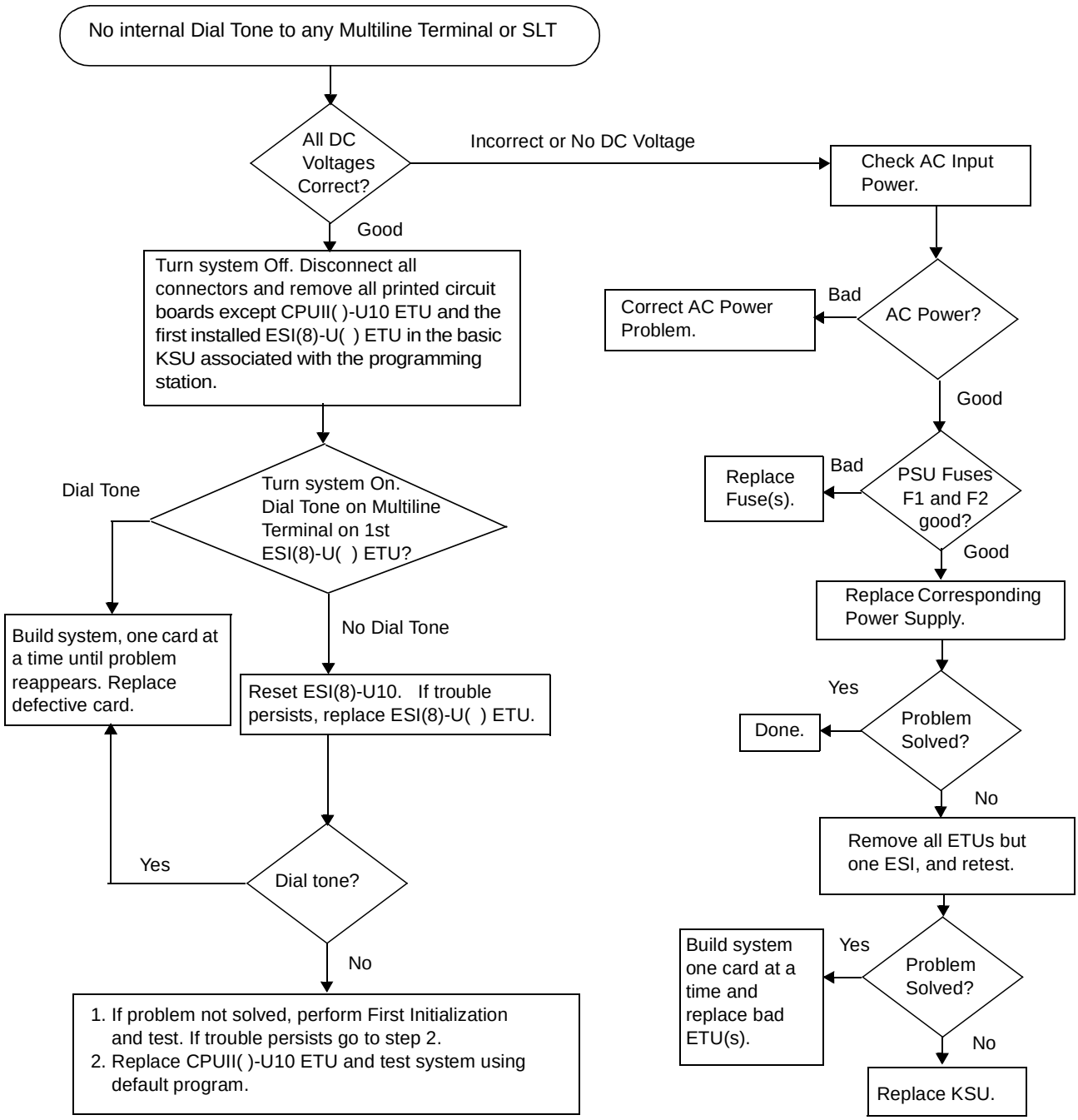
At times, the station and/or the ETU must be reset. The following resets are used in the system:

- Terminal Reset – Unplug the station line cord from the station and then plug it back into the station.
- ETU Reset – Press the RESET switch.

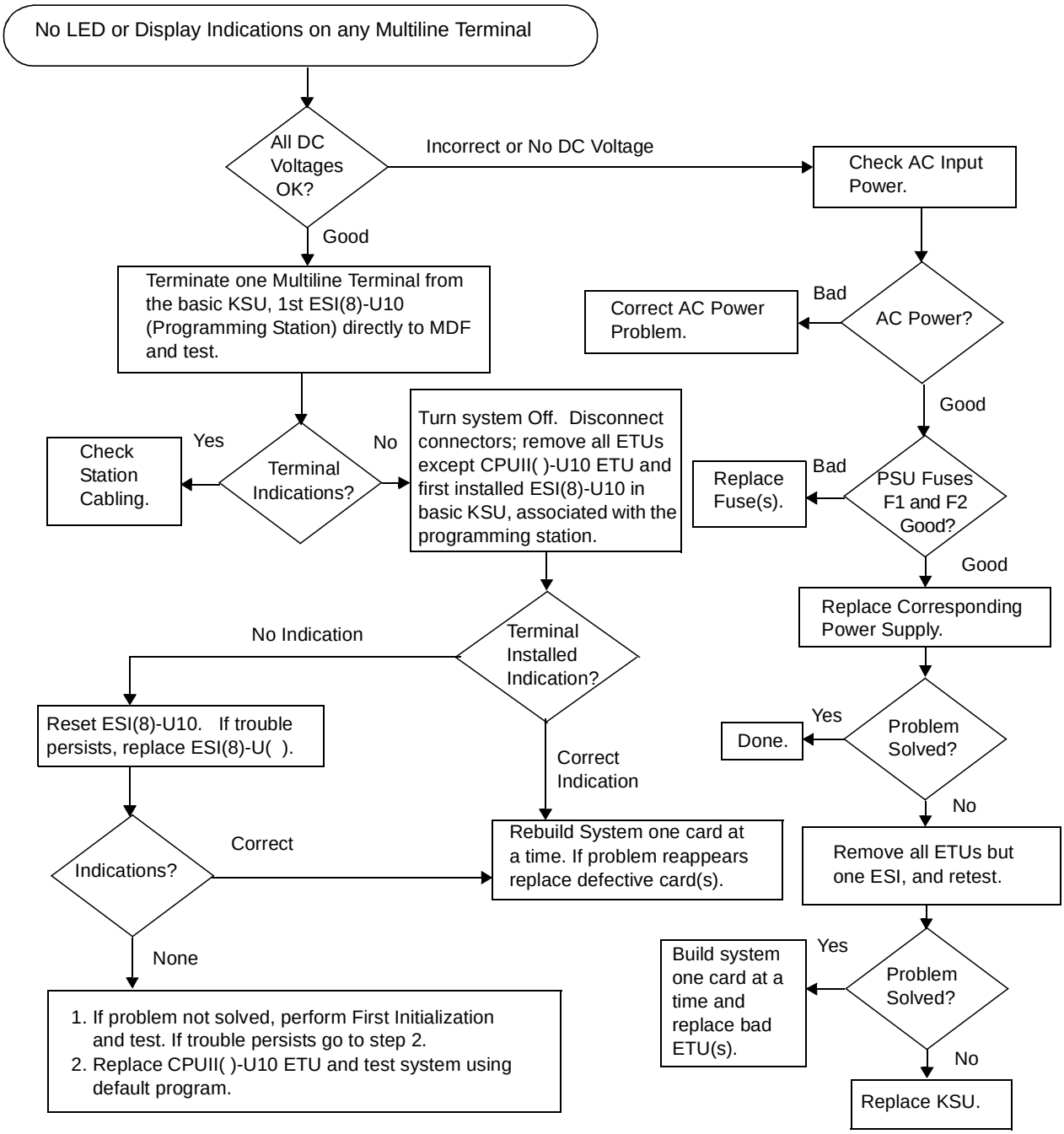
4.3 Flowcharts

Condition	Flowchart	Page
A. System Down		
1. No Internal Dial Tone to any Multiline Terminal or SLT	A1	14-6
2. No LED or Display Indications on any Multiline Terminal	A2	14-7
B. Partial Operations		
1. Radio Frequency Interference	B1	14-8
2. No or Intermittent CO/PBX Ring	C1	14-9
3. Call Dropping	C2	14-10
4. No Outside Dial Tone Access	C3	14-11
5. CO/PBX Dialing Problem: Cannot Dial Out on CO	C4	14-12
C. Multiline Terminal Problems		
1. Multiline Terminal Function	D1	14-13
2. Multiline Terminal Ringing	D2	14-14
3. Multiline Terminal Dial Tone Access	D3	14-15
D. Single Line Telephone Problems		
1. No Dial Tone Access on SLT	E1	14-16
2. No Ringing on SLT	E2	14-17
3. No Dial Access to SLT Features	E3	14-18
E. Low Volume Problems	F1	14-19
F. External Paging Problems	G1	14-20
G. SMDR Output Problems No Call Accounting System	H1	14-21

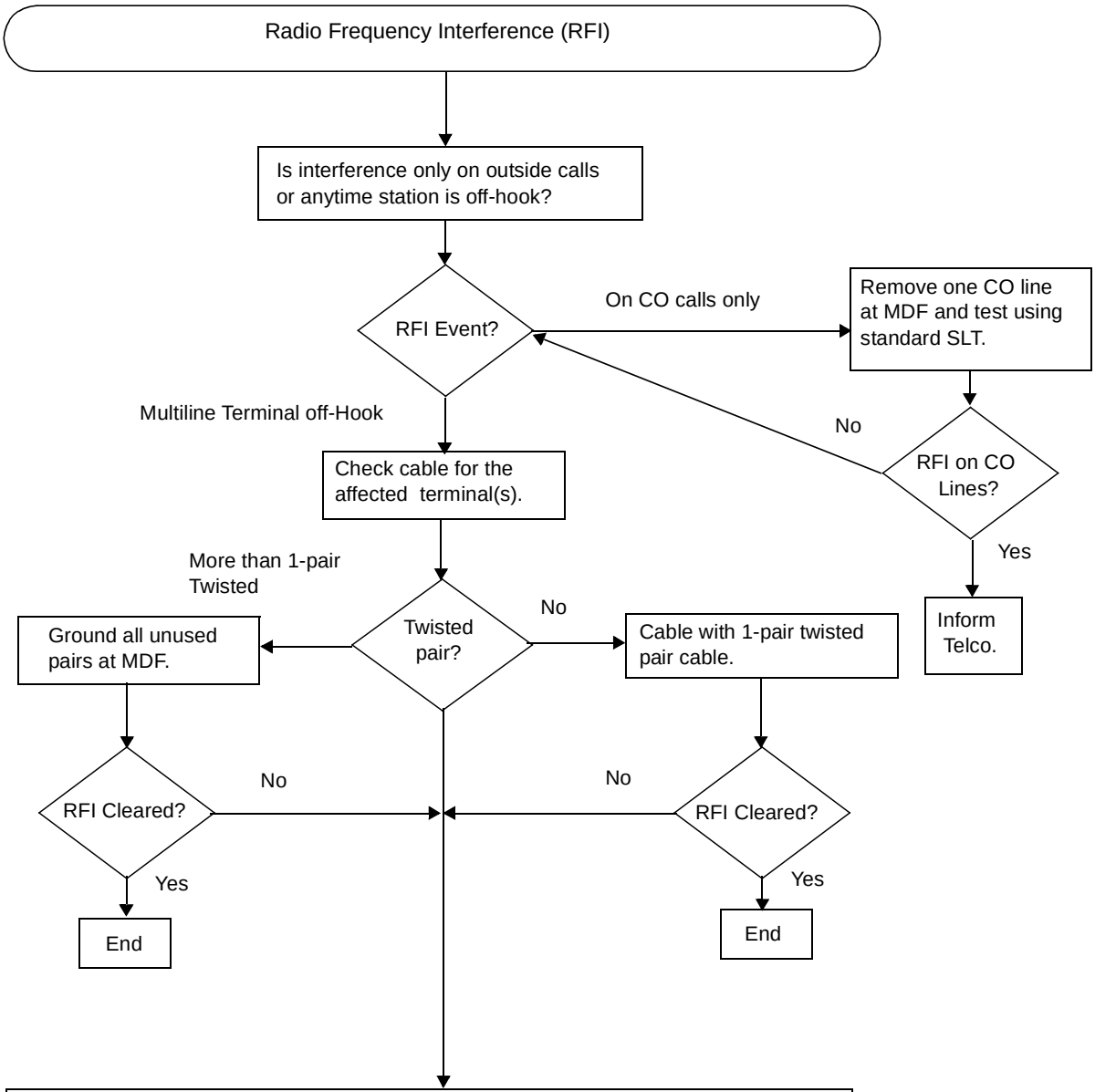
A1


No internal Dial Tone to any Multiline Terminal or SLT
All DC Voltages Correct?
Incorrect or No DC Voltage
Check AC Input Power.
Good
Turn system Off. Disconnect all connectors and remove all printed circuit boards except CPUII( )-U10 ETU and the first installed ESI(8)-U( ) ETU in the basic KSU associated with the programming station.
Correct AC Power Problem.
Bad
AC Power?
Good
Dial Tone
Turn system On. Dial Tone on Multiline Terminal on 1st ESI(8)-U( ) ETU?
Replace Fuse(s).
Bad
PSU Fuses F1 and F2 good?
Good
Replace Corresponding Power Supply.
Build system, one card at a time until problem reappears. Replace defective card.
No Dial Tone
Reset ESI(8)-U10. If trouble persists, replace ESI(8)-U( ) ETU.
Yes
Done.
Problem Solved?
No
Remove all ETUs but one ESI, and retest.
Yes
Dial tone?
Build system one card at a time and replace bad ETU(s).
Yes
Problem Solved?
No
No
1. If problem not solved, perform First Initialization and test. If trouble persists go to step 2.
2. Replace CPUII( )-U10 ETU and test system using default program.
Replace KSU.

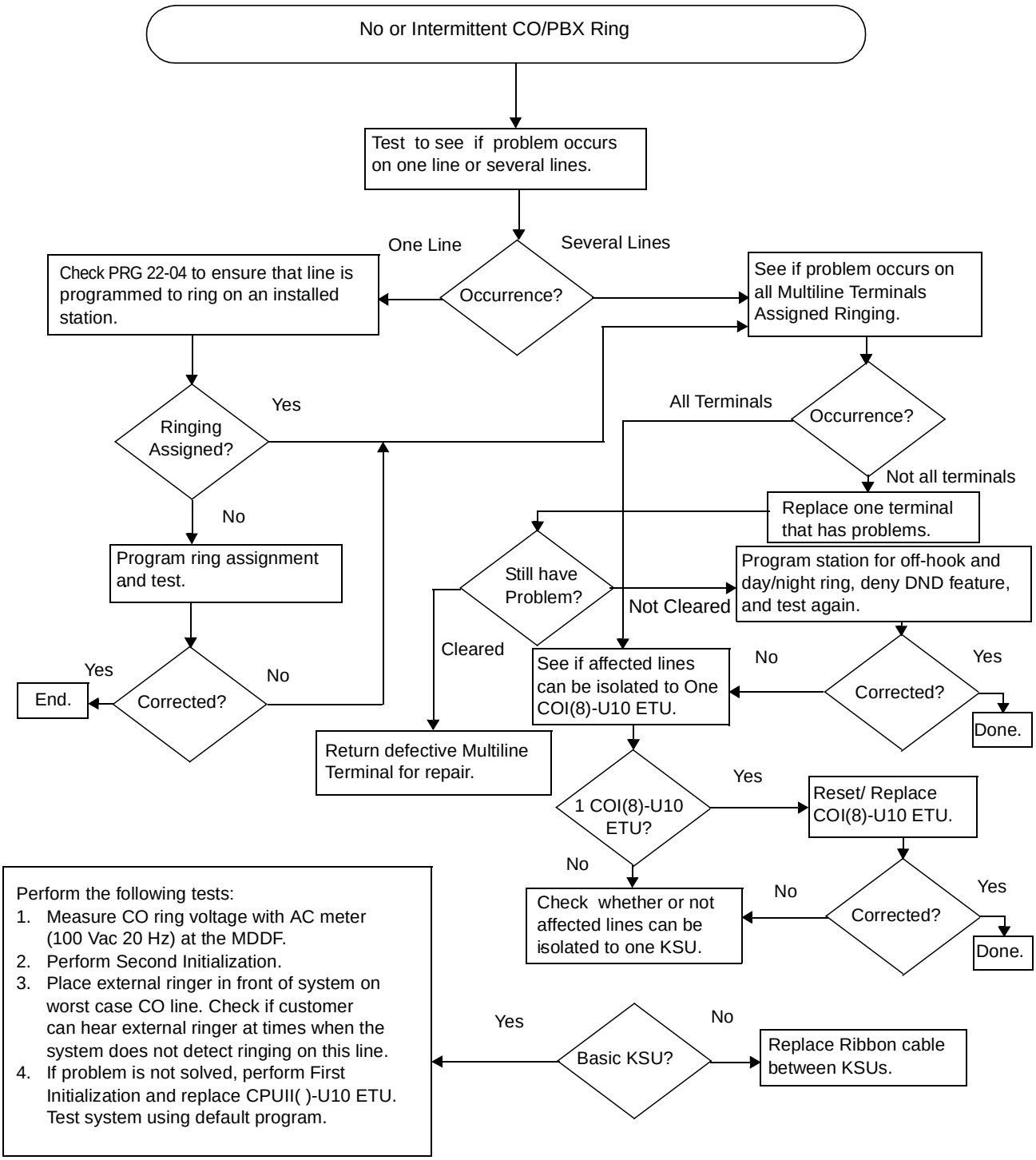
A2


No LED or Display Indications on any Multiline Terminal
All DC Voltages OK?
Incorrect or No DC Voltage
Check AC Input Power.
Good
Terminate one Multiline Terminal from the basic KSU, 1st ESI(8)-U10 (Programming Station) directly to MDF and test.
Correct AC Power Problem.
Bad
AC Power?
Good
Check Station Cabling.
Yes
Terminal Indications?
No
Turn system Off. Disconnect connectors; remove all ETUs except CPUII( )-U10 ETU and first installed ESI(8)-U10 in basic KSU, associated with the programming station.
Replace Fuse(s).
Bad
PSU Fuses F1 and F2 Good?
Good
Replace Corresponding Power Supply.
No Indication
Terminal Installed Indication?
Reset ESI(8)-U10. If trouble persists, replace ESI(8)-U( ).
Done.
Yes
Problem Solved?
Correct Indication
No
Indications?
Correct
Rebuild System one card at a time. If problem reappears replace defective card(s).
Remove all ETUs but one ESI, and retest.
None
1. If problem not solved, perform First Initialization and test. If trouble persists go to step 2.
2. Replace CPUII( )-U10 ETU and test system using default program.
Build system one card at a time and replace bad ETU(s).
Yes
Problem Solved?
No
Replace KSU.

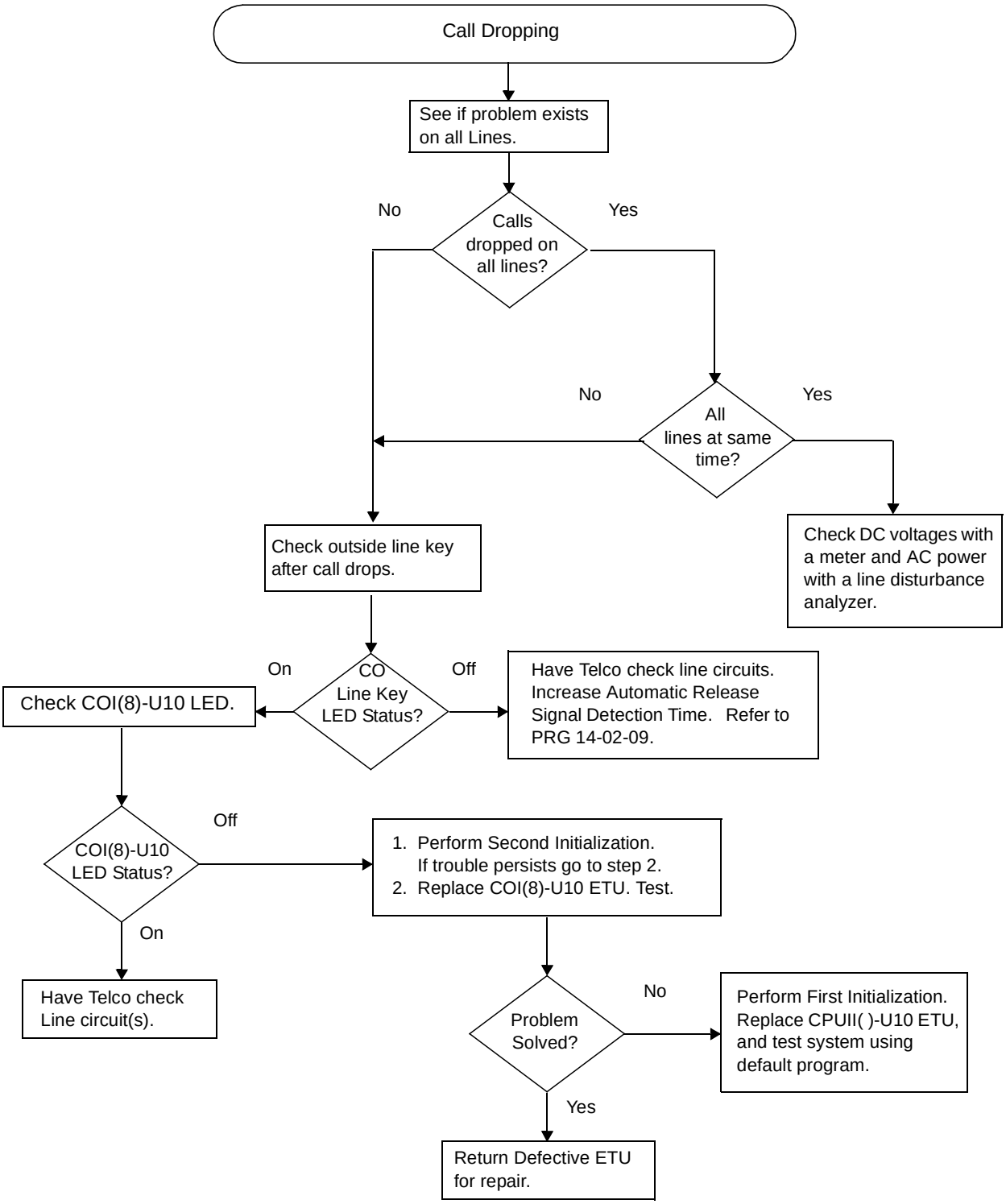
B1


Radio Frequency Interference (RFI)
Is interference only on outside calls or anytime station is off-hook?
RFI Event?
On CO calls only
Remove one CO line at MDF and test using standard SLT.
Multiline Terminal off-Hook
No
RFI on CO Lines?
Yes
Inform Telco.
Check cable for the affected terminal(s).
More than 1-pair Twisted
Twisted pair?
No
Ground all unused pairs at MDF.
Cable with 1-pair twisted pair cable.
RFI Cleared?
No
No
RFI Cleared?
Yes
Yes
End
End
Follow the steps below, one at a time, and test after each step.
1. Place a 0.01 microfarad ceramic capacitor (0.001 microfarad for FM Interference) across receiver and transmitter elements in the Multiline Terminal handset.
2. Add a 0.01 microfarad ceramic capacitor from one transmit lead to one receive lead.

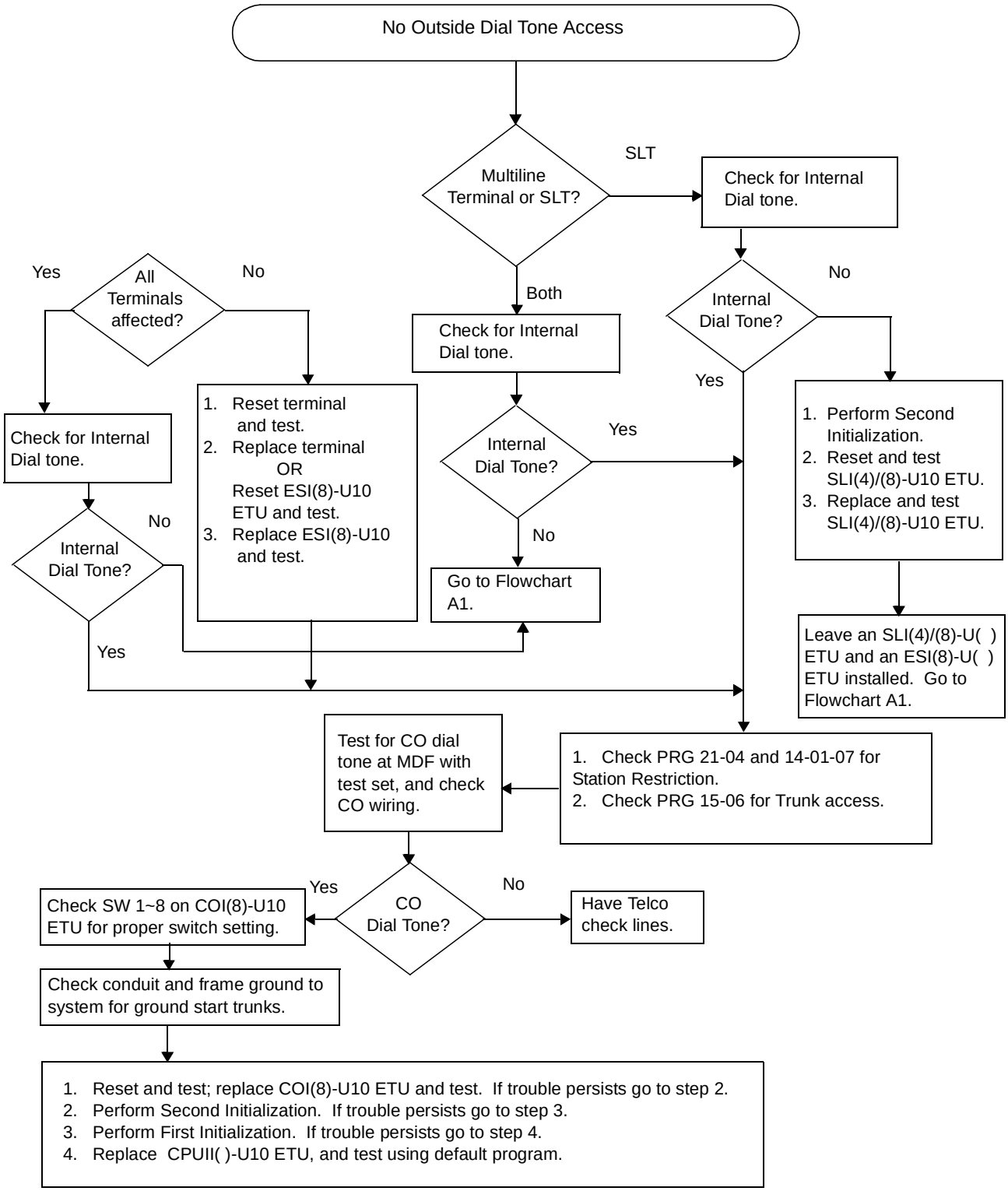
C1


No or Intermittent CO/PBX Ring
Test to see if problem occurs on one line or several lines.
Occurrence?
One Line
Several Lines
Check PRG 22-04 to ensure that line is programmed to ring on an installed station.
See if problem occurs on all Multiline Terminals Assigned Ringing.
Ringing Assigned?
Yes
No
Program ring assignment and test.
Corrected?
Yes
No
End.
Occurrence?
All Terminals
Not all terminals
Replace one terminal that has problems.
Still have Problem?
Not Cleared
Cleared
Program station for off-hook and day/night ring, deny DND feature, and test again.
See if affected lines can be isolated to One COI(8)-U10 ETU.
Corrected?
No
Yes
Done.
Return defective Multiline Terminal for repair.
1 COI(8)-U10 ETU?
Yes
No
Reset/ Replace COI(8)-U10 ETU.
Check whether or not affected lines can be isolated to one KSU.
Corrected?
No
Yes
Done.
Basic KSU?
Yes
No
Replace Ribbon cable between KSUs.
Perform the following tests:
1. Measure CO ring voltage with AC meter (100 Vac 20 Hz) at the MDDF.
2. Perform Second Initialization.
3. Place external ringer in front of system on worst case CO line. Check if customer can hear external ringer at times when the system does not detect ringing on this line.
4. If problem is not solved, perform First Initialization and replace CPUII( )-U10 ETU. Test system using default program.

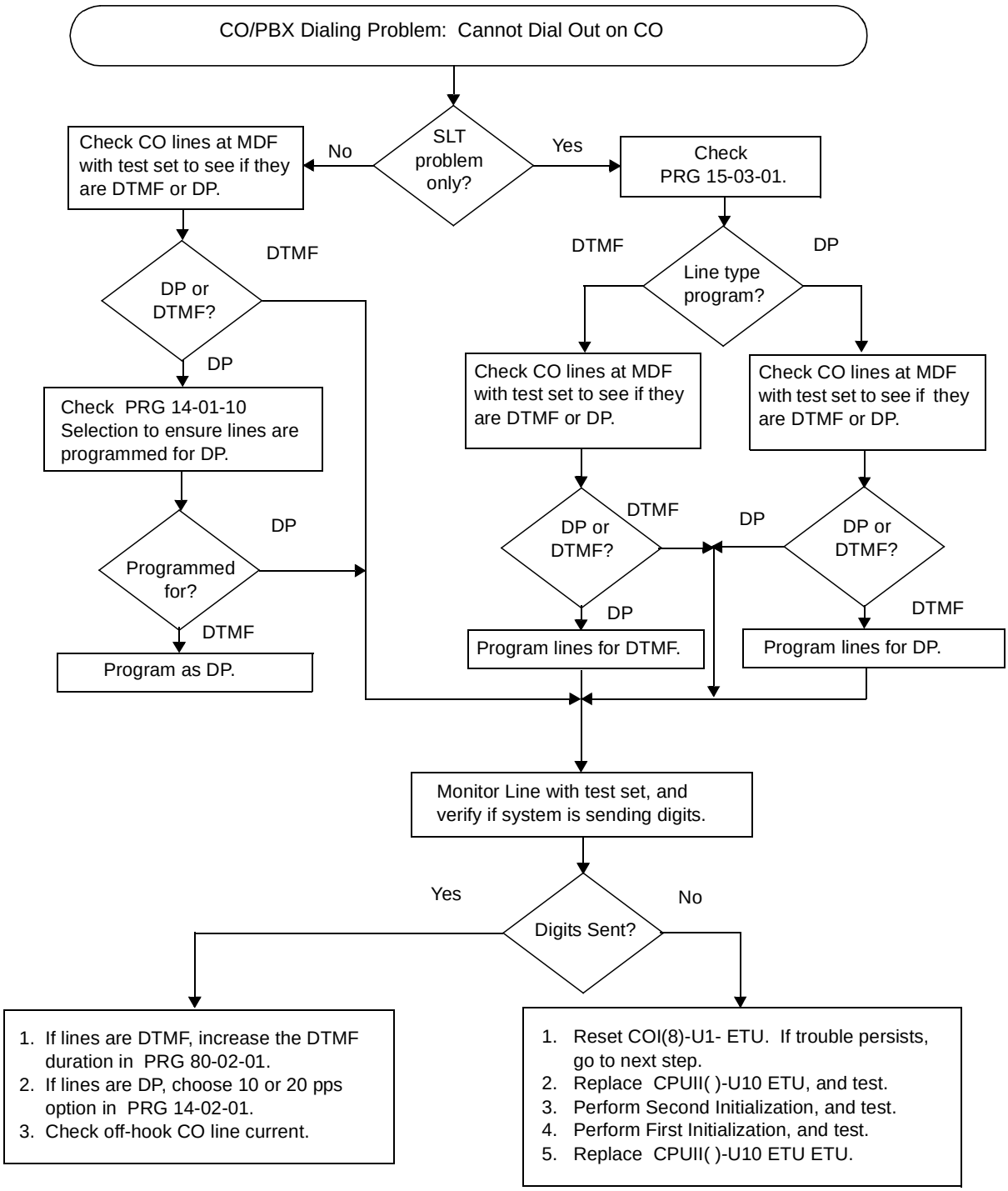
C2


Call Dropping
See if problem exists on all Lines.
Calls dropped on all lines?
No
Yes
All lines at same time?
No
Yes
Check outside line key after call drops.
Check DC voltages with a meter and AC power with a line disturbance analyzer.
CO Line Key LED Status?
On
Off
Check COI(8)-U10 LED.
Have Telco check line circuits. Increase Automatic Release Signal Detection Time. Refer to PRG 14-02-09.
COI(8)-U10 LED Status?
Off
On
1. Perform Second Initialization. If trouble persists go to step 2.
2. Replace COI(8)-U10 ETU. Test.
Have Telco check Line circuit(s).
Problem Solved?
No
Yes
Perform First Initialization. Replace CPUII( )-U10 ETU, and test system using default program.
Return Defective ETU for repair.

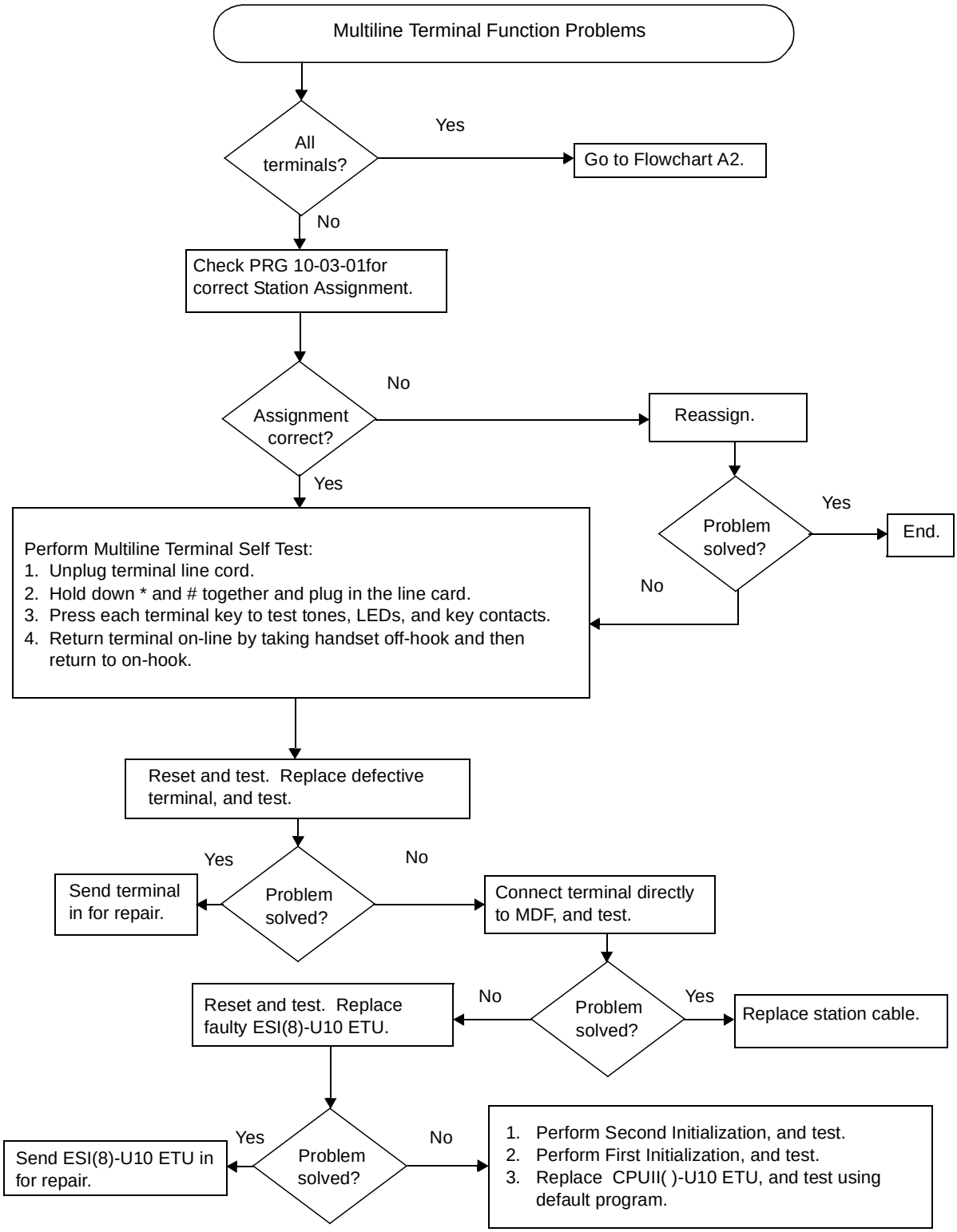
C3


No Outside Dial Tone Access
Multiline Terminal or SLT?
SLT
Check for Internal Dial tone.
Both
Check for Internal Dial tone.
Internal Dial Tone?
No
Yes
1. Perform Second Initialization.
2. Reset and test SLI(4)/(8)-U10 ETU.
3. Replace and test SLI(4)/(8)-U10 ETU.
Leave an SLI(4)/(8)-U( ) ETU and an ESI(8)-U( ) ETU installed. Go to Flowchart A1.
Internal Dial Tone?
Yes
No
Go to Flowchart A1.
All Terminals affected?
Yes
No
1. Reset terminal and test.
2. Replace terminal OR Reset ESI(8)-U10 ETU and test.
3. Replace ESI(8)-U10 and test.
Check for Internal Dial tone.
Internal Dial Tone?
No
Yes
1. Check PRG 21-04 and 14-01-07 for Station Restriction.
2. Check PRG 15-06 for Trunk access.
Test for CO dial tone at MDF with test set, and check CO wiring.
CO Dial Tone?
Yes
No
Check SW 1~8 on COI(8)-U10 ETU for proper switch setting.
Have Telco check lines.
Check conduit and frame ground to system for ground start trunks.
1. Reset and test; replace COI(8)-U10 ETU and test. If trouble persists go to step 2.
2. Perform Second Initialization. If trouble persists go to step 3.
3. Perform First Initialization. If trouble persists go to step 4.
4. Replace CPUII( )-U10 ETU, and test using default program.

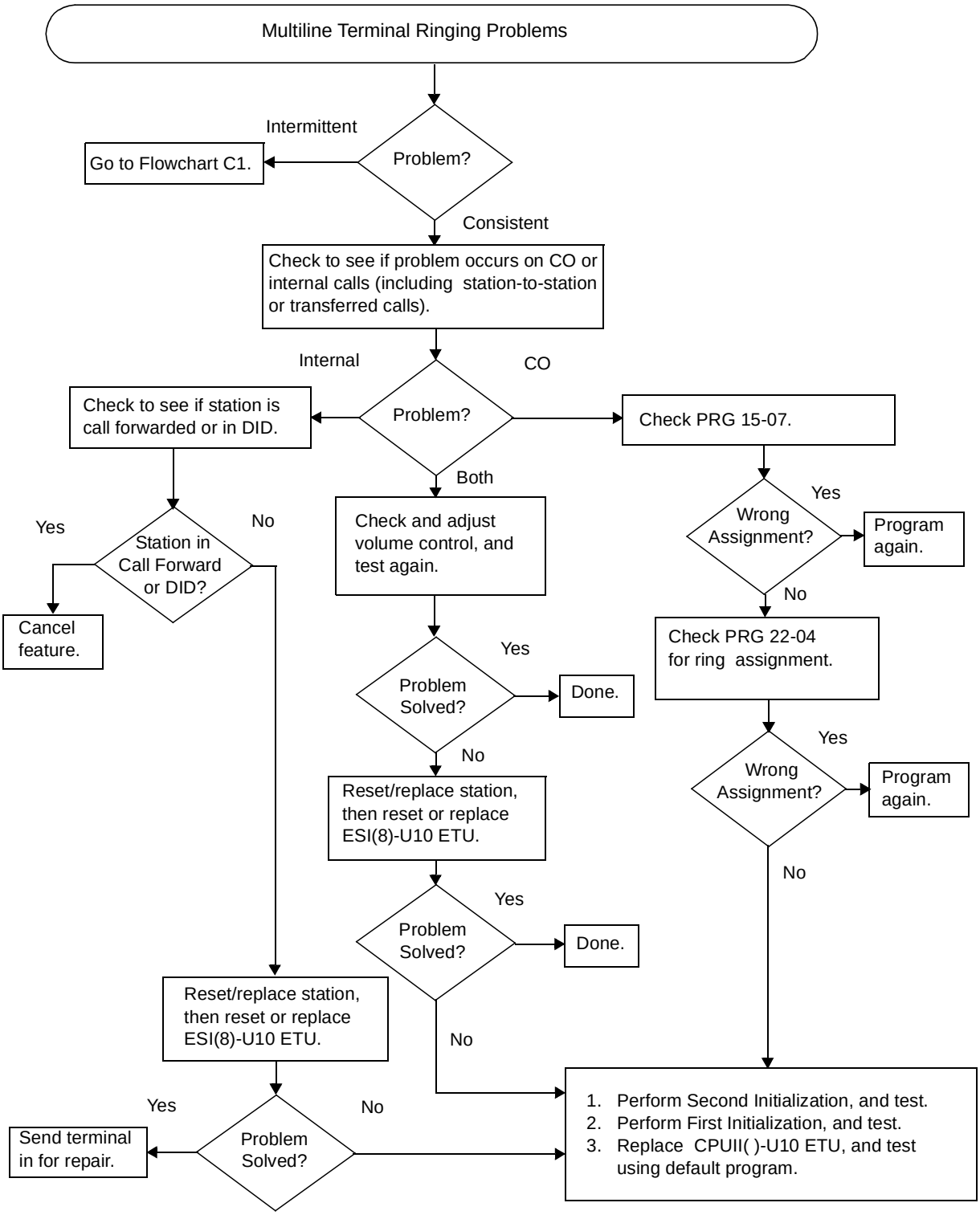
C4


CO/PBX Dialing Problem: Cannot Dial Out on CO
SLT problem only?
No
Yes
Check CO lines at MDF with test set to see if they are DTMF or DP.
Check PRG 15-03-01.
DP or DTMF?
DTMF
DP
Check PRG 14-01-10 Selection to ensure lines are programmed for DP.
Programmed for?
DP
DTMF
Program as DP.
Line type program?
DTMF
DP
Check CO lines at MDF with test set to see if they are DTMF or DP.
Check CO lines at MDF with test set to see if they are DTMF or DP.
DP or DTMF?
DTMF
DP
DP or DTMF?
DP
DTMF
Program lines for DTMF.
Program lines for DP.
Monitor Line with test set, and verify if system is sending digits.
Digits Sent?
Yes
No
1. If lines are DTMF, increase the DTMF duration in PRG 80-02-01.
2. If lines are DP, choose 10 or 20 pps option in PRG 14-02-01.
3. Check off-hook CO line current.
1. Reset COI(8)-U1- ETU. If trouble persists, go to next step.
2. Replace CPUII( )-U10 ETU, and test.
3. Perform Second Initialization, and test.
4. Perform First Initialization, and test.
5. Replace CPUII( )-U10 ETU ETU.

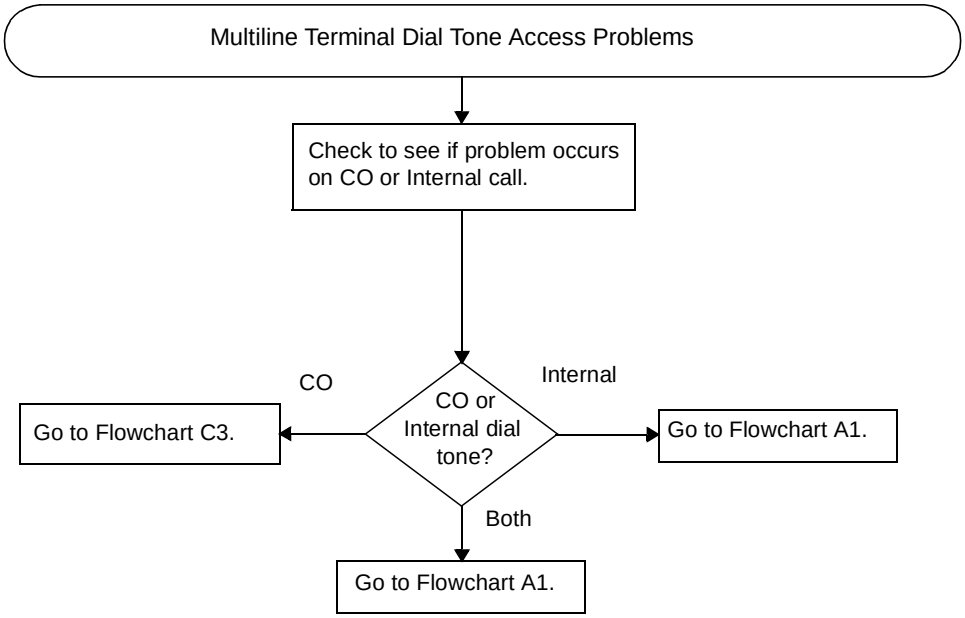
D1


Multiline Terminal Function Problems
All terminals?
Yes
Go to Flowchart A2.
No
Check PRG 10-03-01for correct Station Assignment.
Assignment correct?
No
Reassign.
Problem solved?
Yes
End.
No
Yes
Perform Multiline Terminal Self Test:
1. Unplug terminal line cord.
2. Hold down * and # together and plug in the line card.
3. Press each terminal key to test tones, LEDs, and key contacts.
4. Return terminal on-line by taking handset off-hook and then return to on-hook.
Reset and test. Replace defective terminal, and test.
Problem solved?
Yes
Send terminal in for repair.
No
Connect terminal directly to MDF, and test.
Problem solved?
No
Reset and test. Replace faulty ESI(8)-U10 ETU.
Yes
Replace station cable.
Problem solved?
Yes
Send ESI(8)-U10 ETU in for repair.
No
1. Perform Second Initialization, and test.
2. Perform First Initialization, and test.
3. Replace CPUII( )-U10 ETU, and test using default program.

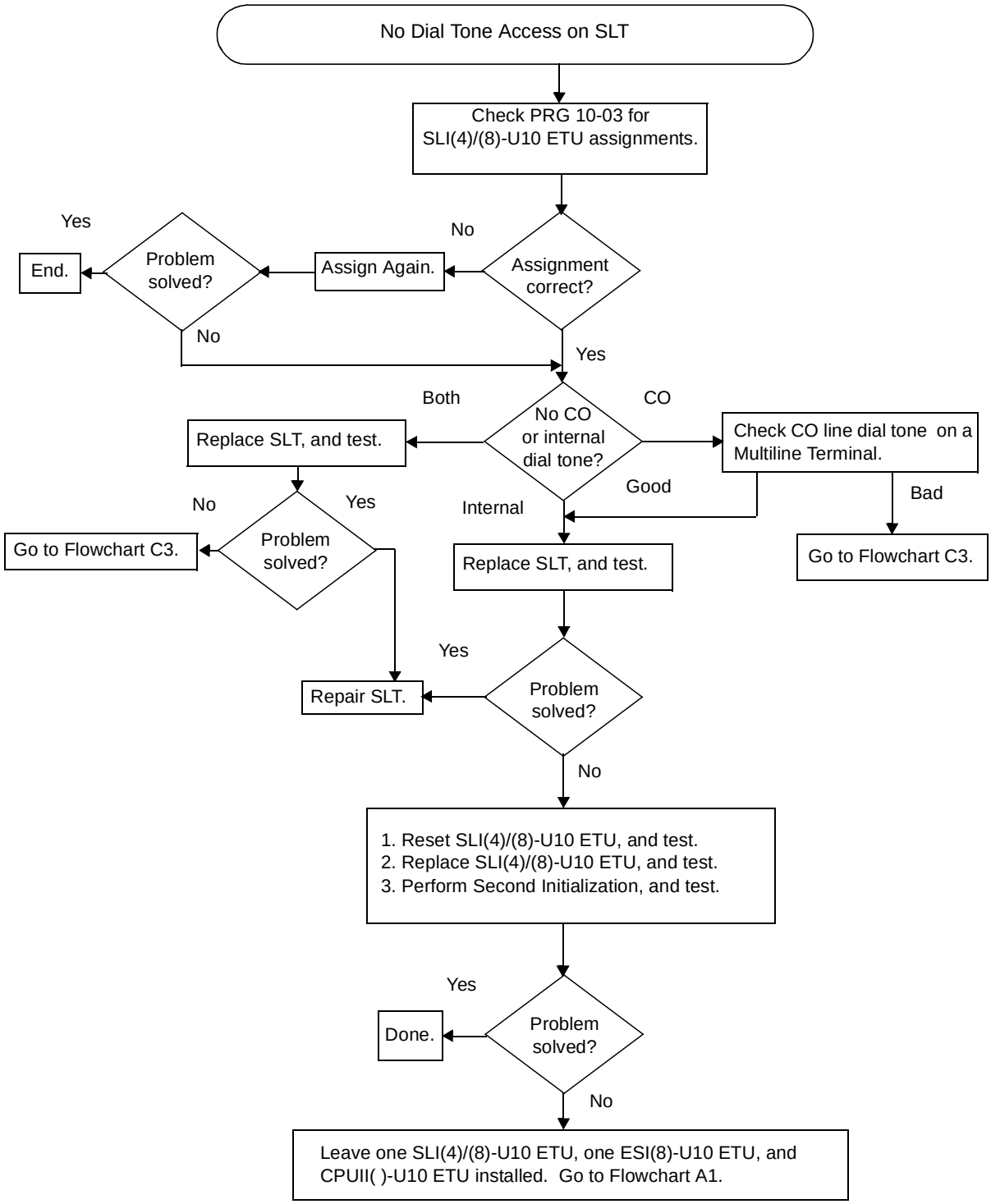
D2


Multiline Terminal Ringing Problems
Problem?
Intermittent
Go to Flowchart C1.
Consistent
Check to see if problem occurs on CO or internal calls (including station-to-station or transferred calls).
Problem?
Internal
CO
Check to see if station is call forwarded or in DID.
Check PRG 15-07.
Station in Call Forward or DID?
Yes
No
Cancel feature.
Both
Check and adjust volume control, and test again.
Wrong Assignment?
Yes
Program again.
No
Check PRG 22-04 for ring assignment.
Problem Solved?
Yes
Done.
No
Reset/replace station, then reset or replace ESI(8)-U10 ETU.
Wrong Assignment?
Yes
Program again.
No
Problem Solved?
Yes
Done.
No
Reset/replace station, then reset or replace ESI(8)-U10 ETU.
Problem Solved?
Yes
Send terminal in for repair.
No
1. Perform Second Initialization, and test.
2. Perform First Initialization, and test.
3. Replace CPUII( )-U10 ETU, and test using default program.

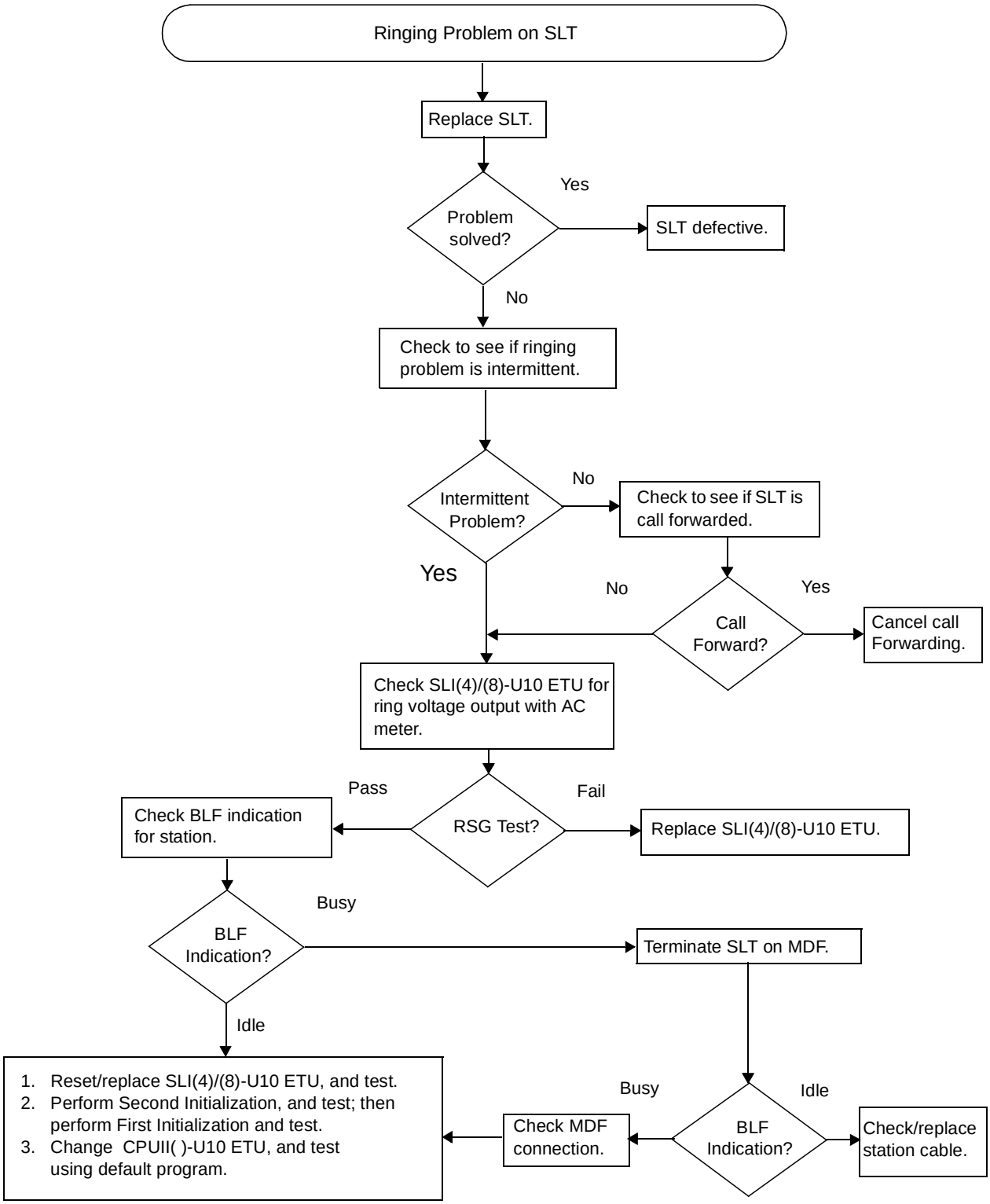
D3


Multiline Terminal Dial Tone Access Problems
Check to see if problem occurs on CO or Internal call.
CO or Internal dial tone?
CO
Internal
Both
Go to Flowchart C3.
Go to Flowchart A1.
Go to Flowchart A1.

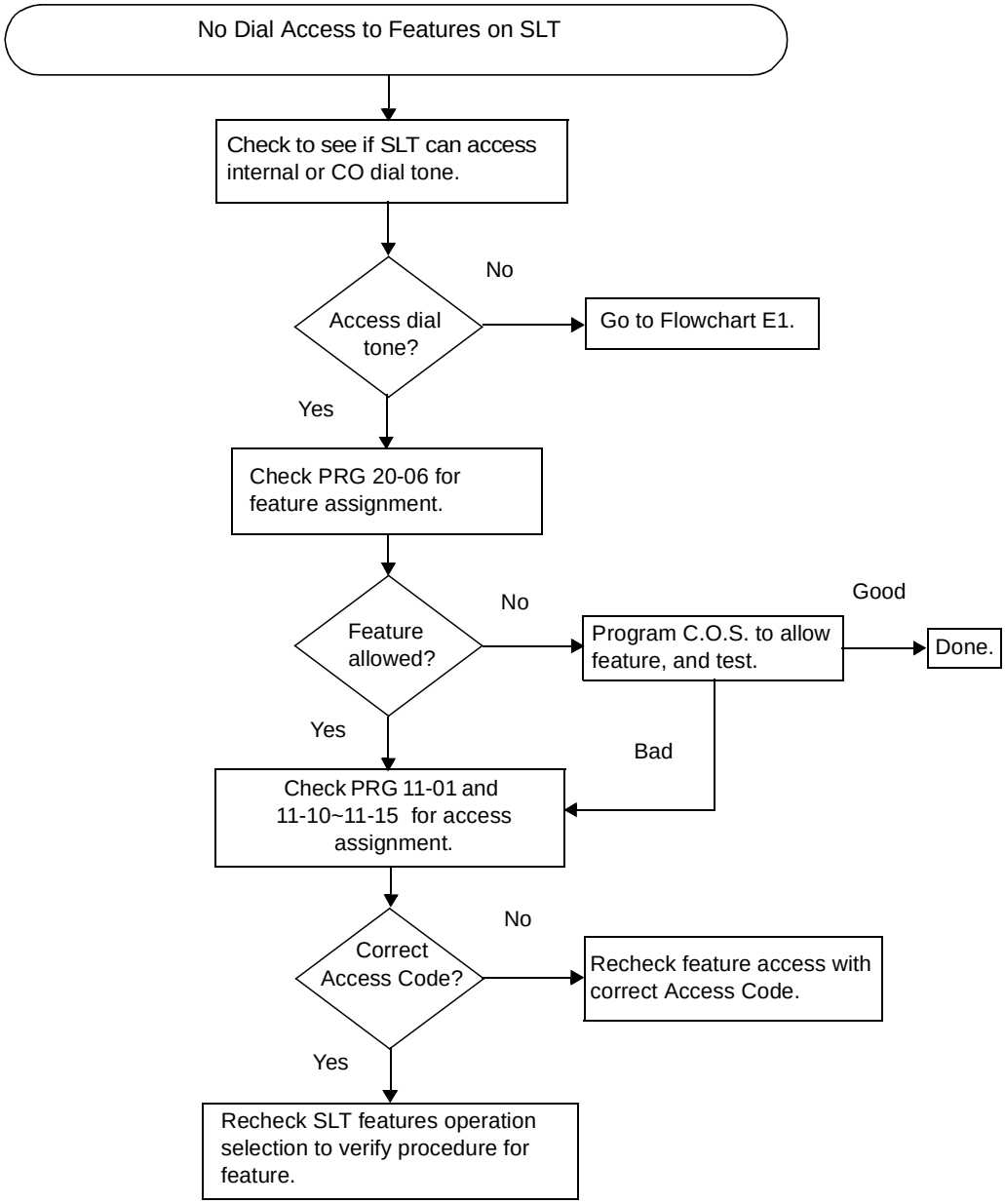
E1


No Dial Tone Access on SLT
Check PRG 10-03 for SLI(4)/(8)-U10 ETU assignments.
Assignment correct?
No
Assign Again.
Yes
Problem solved?
End.
No
Yes
No CO or internal dial tone?
Both
CO
Replace SLT, and test.
Check CO line dial tone on a Multiline Terminal.
Good
Bad
Internal
Problem solved?
No
Yes
Go to Flowchart C3.
Replace SLT, and test.
Go to Flowchart C3.
Problem solved?
Yes
Repair SLT.
No
1. Reset SLI(4)/(8)-U10 ETU, and test.
2. Replace SLI(4)/(8)-U10 ETU, and test.
3. Perform Second Initialization, and test.
Problem solved?
Yes
Done.
No
Leave one SLI(4)/(8)-U10 ETU, one ESI(8)-U10 ETU, and CPUII( )-U10 ETU installed. Go to Flowchart A1.

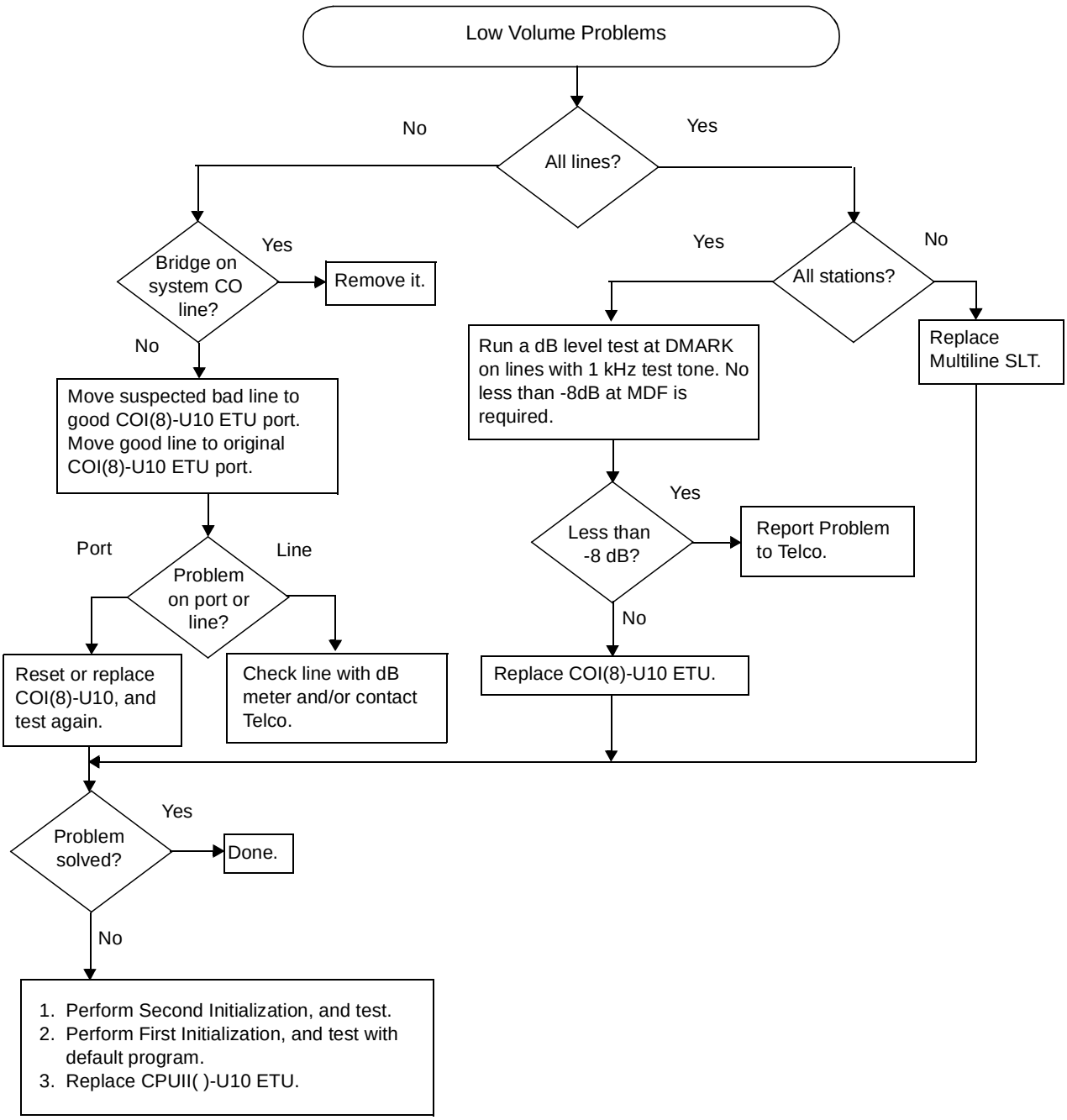
E2


Ringing Problem on SLT
Replace SLT.
Problem solved?
Yes
SLT defective.
No
Check to see if ringing problem is intermittent.
Intermittent Problem?
No
Check to see if SLT is call forwarded.
Yes
No
Call Forward?
Yes
Cancel call Forwarding.
Check SLI(4)/(8)-U10 ETU for ring voltage output with AC meter.
Pass
RSG Test?
Fail
Check BLF indication for station.
Replace SLI(4)/(8)-U10 ETU.
Busy
BLF Indication?
Terminate SLT on MDF.
Idle
1. Reset/replace SLI(4)/(8)-U10 ETU, and test.
2. Perform Second Initialization, and test; then perform First Initialization and test.
3. Change CPUII( )-U10 ETU, and test using default program.
Busy
Idle
Check MDF connection.
BLF Indication?
Check/replace station cable.

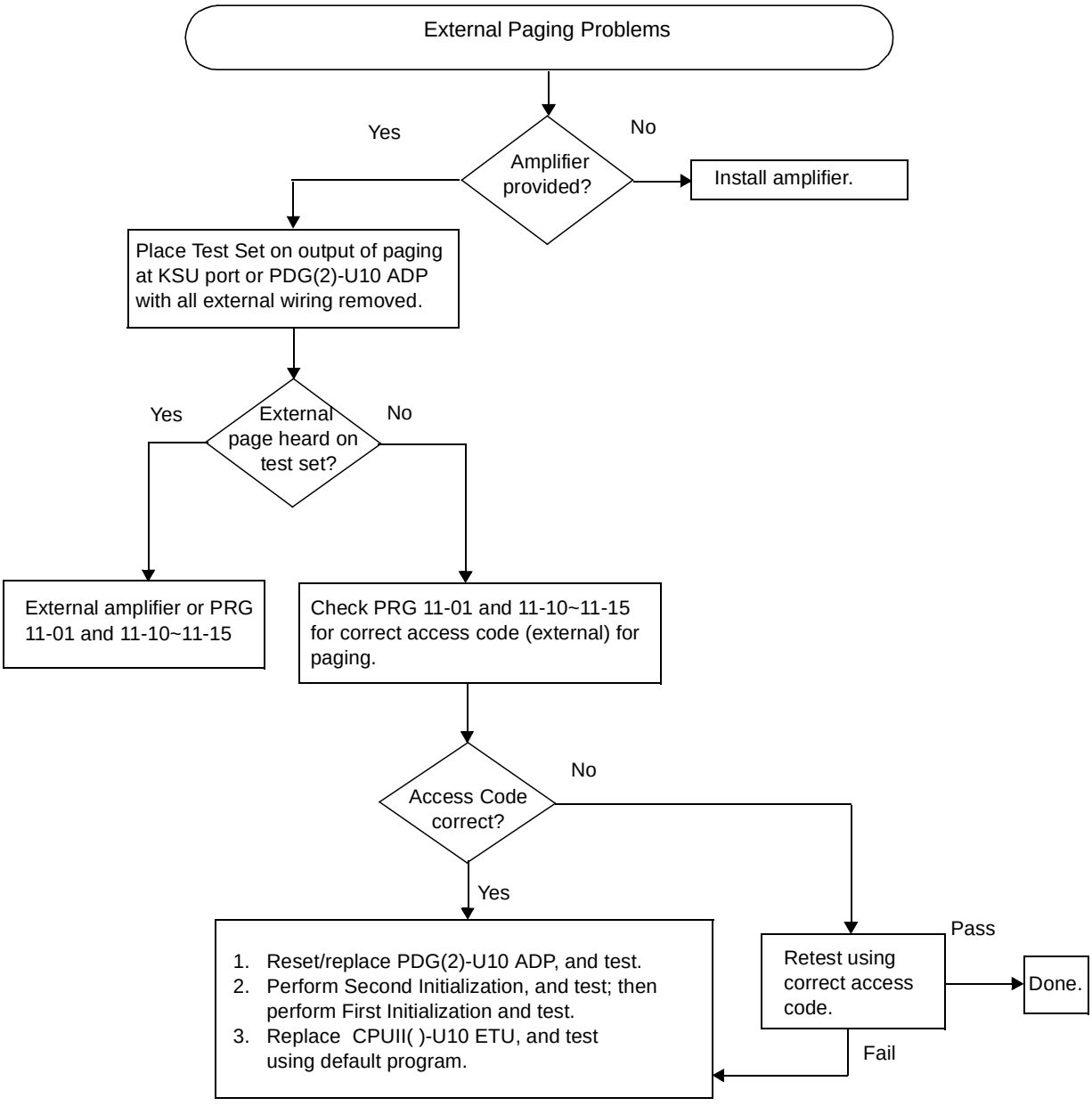
E3


No Dial Access to Features on SLT
Check to see if SLT can access internal or CO dial tone.
Access dial tone?
No
Go to Flowchart E1.
Yes
Check PRG 20-06 for feature assignment.
Feature allowed?
No
Program C.O.S. to allow feature, and test.
Good
Done.
Bad
Yes
Check PRG 11-01 and 11-10~11-15 for access assignment.
Correct Access Code?
No
Recheck feature access with correct Access Code.
Yes
Recheck SLT features operation selection to verify procedure for feature.

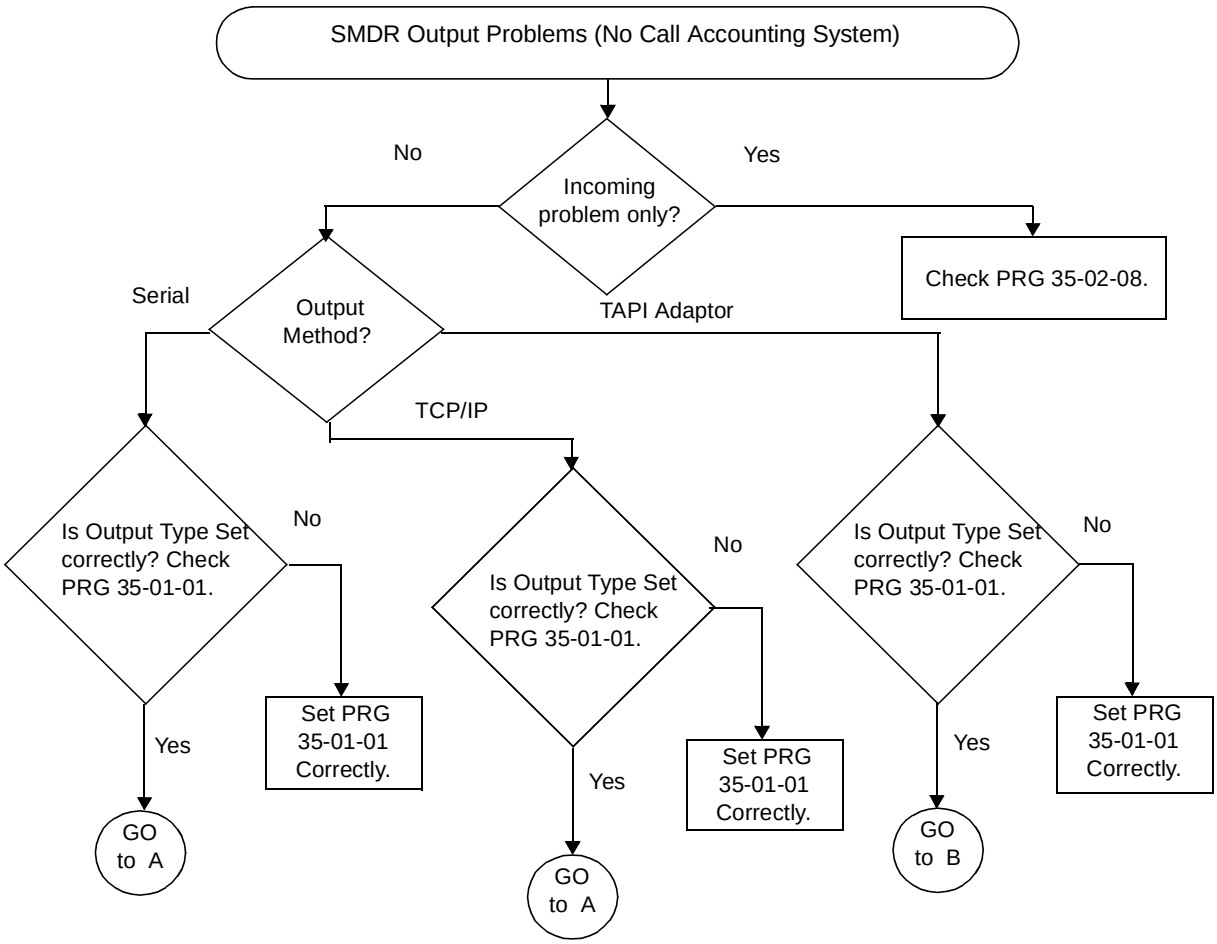
F1

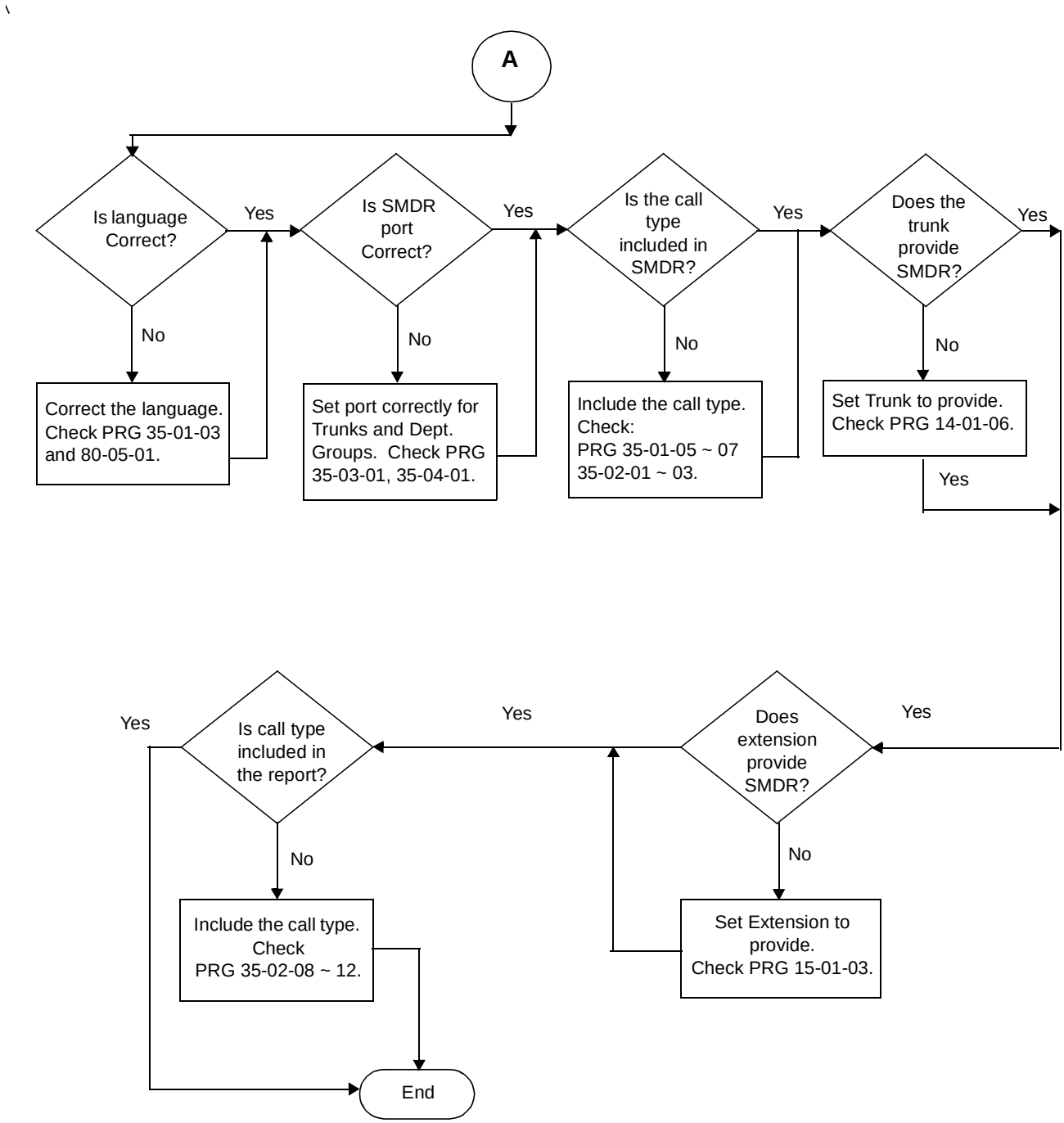

Low Volume Problems
All lines?
No
Yes
Bridge on system CO line?
Yes
Remove it.
No
Move suspected bad line to good COI(8)-U10 ETU port. Move good line to original COI(8)-U10 ETU port.
Port
Line
Problem on port or line?
Reset or replace COI(8)-U10, and test again.
Check line with dB meter and/or contact Telco.
Problem solved?
Yes
Done.
No
1. Perform Second Initialization, and test.
2. Perform First Initialization, and test with default program.
3. Replace CPUII( )-U10 ETU.
All stations?
Yes
No
Run a dB level test at DMARK on lines with 1 kHz test tone. No less than -8dB at MDF is required.
Replace Multiline SLT.
Less than -8 dB?
Yes
Report Problem to Telco.
No
Replace COI(8)-U10 ETU.

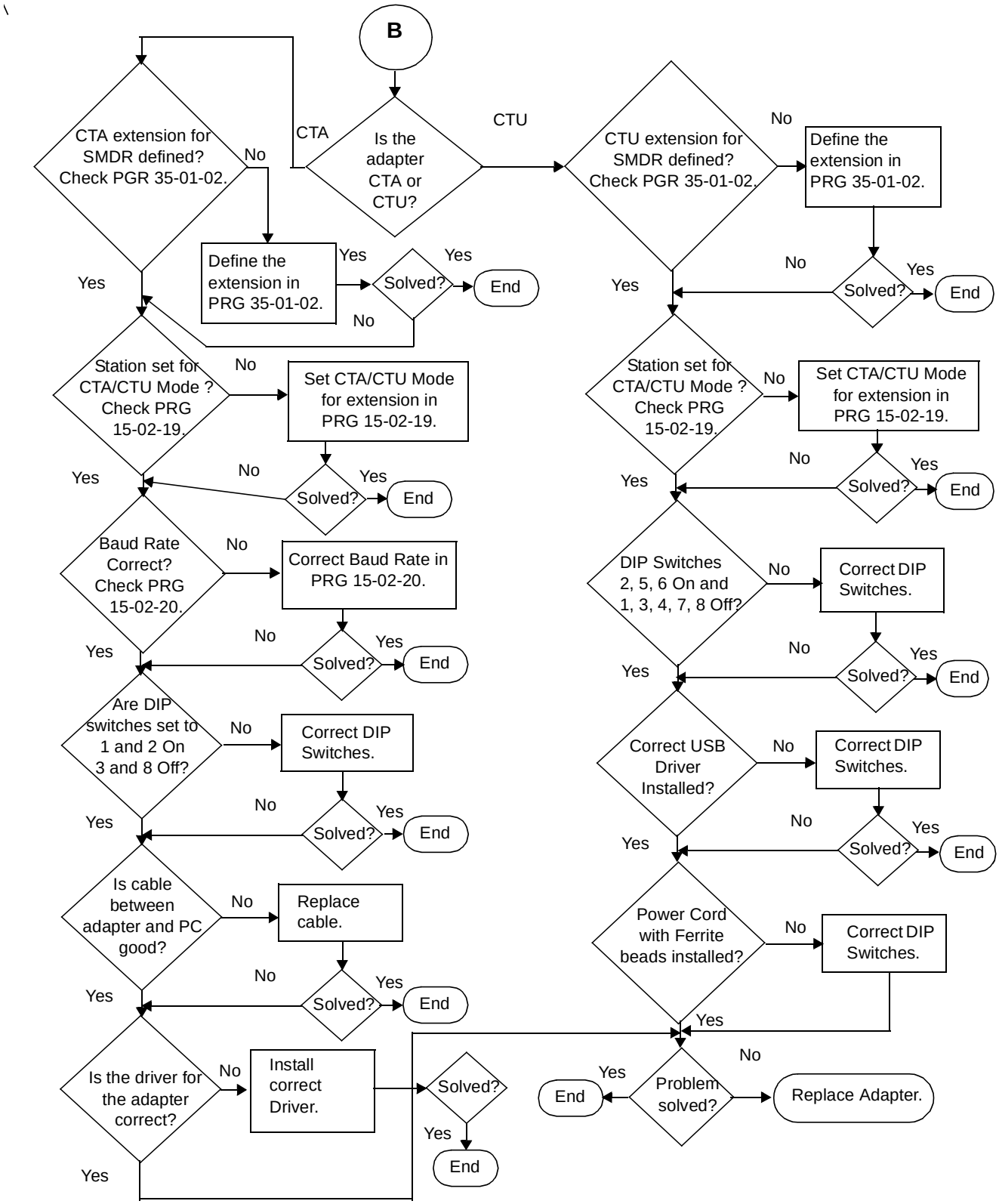
G1


External Paging Problems
Amplifier provided?
Yes
No
Install amplifier.
Place Test Set on output of paging at KSU port or PDG(2)-U10 ADP with all external wiring removed.
External page heard on test set?
Yes
No
External amplifier or PRG 11-01 and 11-10~11-15
Check PRG 11-01 and 11-10~11-15 for correct access code (external) for paging.
Access Code correct?
No
Yes
1. Reset/replace PDG(2)-U10 ADP, and test.
2. Perform Second Initialization, and test; then perform First Initialization and test.
3. Replace CPUII( )-U10 ETU, and test using default program.
Retest using correct access code.
Pass
Done.
Fail

H1


SMDR Output Problems (No Call Accounting System)
Incoming problem only?
No
Yes
Check PRG 35-02-08.
Output Method?
Serial
TAPI Adaptor
TCP/IP
Is Output Type Set correctly? Check PRG 35-01-01.
No
Yes
Set PRG 35-01-01 Correctly.
GO to A
Is Output Type Set correctly? Check PRG 35-01-01.
No
Yes
Set PRG 35-01-01 Correctly.
GO to A
Is Output Type Set correctly? Check PRG 35-01-01.
No
Yes
Set PRG 35-01-01 Correctly.
GO to B


A
Is language Correct?
Yes
No
Correct the language. Check PRG 35-01-03 and 80-05-01.
Is SMDR port Correct?
Yes
No
Set port correctly for Trunks and Dept. Groups. Check PRG 35-03-01, 35-04-01.
Is the call type included in SMDR?
Yes
No
Include the call type. Check: PRG 35-01-05 ~ 07 35-02-01 ~ 03.
Does the trunk provide SMDR?
Yes
No
Set Trunk to provide. Check PRG 14-01-06.
Yes
Does extension provide SMDR?
Yes
No
Set Extension to provide. Check PRG 15-01-03.
Is call type included in the report?
Yes
No
Include the call type. Check PRG 35-02-08 ~ 12.
Yes
End


B
Is the adapter CTA or CTU?
CTA
CTU
CTA extension for SMDR defined? Check PGR 35-01-02.
No
Yes
Define the extension in PRG 35-01-02.
Yes
Solved?
Yes
End
No
Station set for CTA/CTU Mode ? Check PRG 15-02-19.
No
Set CTA/CTU Mode for extension in PRG 15-02-19.
No
Solved?
Yes
End
Yes
Baud Rate Correct? Check PRG 15-02-20.
No
Correct Baud Rate in PRG 15-02-20.
No
Solved?
Yes
End
Yes
Are DIP switches set to 1 and 2 On 3 and 8 Off?
No
Correct DIP Switches.
No
Solved?
Yes
End
Yes
Is cable between adapter and PC good?
No
Replace cable.
No
Solved?
Yes
End
Yes
Is the driver for the adapter correct?
No
Install correct Driver.
Solved?
Yes
End
Yes
CTU extension for SMDR defined? Check PGR 35-01-02.
No
Define the extension in PRG 35-01-02.
No
Solved?
Yes
End
Yes
Station set for CTA/CTU Mode ? Check PRG 15-02-19.
No
Set CTA/CTU Mode for extension in PRG 15-02-19.
No
Solved?
Yes
End
Yes
DIP Switches 2, 5, 6 On and 1, 3, 4, 7, 8 Off?
No
Correct DIP Switches.
No
Solved?
Yes
End
Yes
Correct USB Driver Installed?
No
Correct DIP Switches.
No
Solved?
Yes
End
Yes
Power Cord with Ferrite beads installed?
No
Correct DIP Switches.
Yes
No
Problem solved?
Yes
End
Replace Adapter.

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Glossary of Abbreviations

APPENDIX A

The following table includes common abbreviations used throughout this document that are listed in alphabetical order.

Abbreviations	Definition
ACD	Automatic Call Distribution Provides a cost-effective method for supervising incoming telephone traffic and associated staff activity.
AIS	Alarm Indication Signal Replaces the normal traffic signal when a maintenance alarm indication is activated. An AIS signal is transmitted downstream to indicate an upstream failure was detected.
BHCA	Business-Hour Call Attempts The number of times a telephone call is attempted during the busiest hour of the day.
BNC	Bayonet-Neill-Concelman Connector for slim coaxial cables. This is similar to ones used with Ethernet.
BPV	Bipolar Violation Indicates the presence of two consecutive one bits of the same polarity on a T carrier line.
BRI	Basic Rate Interface ISDN subscriber interface. BRI has two bearer B-channels at 64 Kbps per second and a D-channel at 16 Kbps per second. The bearer B-channels are provided for PCM voice, video conferencing, group 4 facsimile machines, and other similar types of transmissions. The data D-channel is used to bring in information about incoming calls and take out information about outgoing calls. BRI can also be used to access slow-speed data networks such as videotex and packet switched networks. BRI has two standards: U Interface for 2-wire T Interface for 4-wire

Abbreviations	Definition
CRC	Cyclic Redundancy Check CRC is a common method to establish that the data is correctly received in data communications. This process checks the integrity of a data block. A CRC character is generated at the transmission end. Its value depends on the hexadecimal value of the number of ones in the data block. The transmitting device calculates the value and appends it to the data block. The receiving end makes a similar calculation and compares its results with the added character. If there is a difference, the recipient requests retransmission.
DN	Directory Number Unique number (telephone number) assigned to each telephone or data terminal.
ISDN	Integrated Services Digital Network An international plan to migrate the public switched network to the universal implementation of standard digital technology.
LBO-Line Build Out	A combination of induction, capacitance, and resistance is added to a cable pair to increase its electrical length by a desired level of impedance and loss characteristics.
Local Loop Back	An internal process where data goes through the entire chip during Transmit and Receive cycles.
Line Loop Back	Allows the user to check Transmission Line Continuity.
LSA	Line Synchronization Alarm Detection An FT1 trunk looses frame synchronization. Frame synchronization occurs when a given digital channel (time slot) at the receiving end is aligned with the corresponding channel (time slot) of the transmitting end as it occurs in the received signal. Usually extra bits (frame synchronization bits) are inserted at regular intervals to indicate the beginning of a frame and for use in frame synchronization.
LCR	Least Cost Routing A feature that automatically chooses the lowest cost telephone line to the destination.
OOF	Out-of-Frame Condition During FT1 transmission, an Out-of-Frame error occurs when two or more of four consecutive framing bits are in error. When this condition exists for more than 2.5 seconds a Red alarm is sent by the OOF detecting unit. Equipment that receives this Red alarm responds with a Yellow alarm.
OPX	Off-Premise Extension A telephone that is located in a different office or building from the main phone system. The OPX is connected by a dedicated telephone line. This extension has all abilities of the telephone system.

Abbreviations	Definition
PRI	Primary Rate Interface ISDN subscriber interface. PRI has 23 bearer B-channels at 64 Kbps per second and a D-channel at 64 Kbps per second. The bearer B-channels are provided for PCM voice, video conferencing, group 4 facsimile machines, and other similar types of transmissions. The data D-channel is used to bring in information about incoming calls and take out information about outgoing calls. PRI can also be used to access slow-speed data networks such as videotex and packet switched networks. PRI has two standards: U Interface for 2-wire T Interface for 4-wire
SLIP	Serial Line Internet Protocol An Internet protocol is used to run IP over serial lines such as telephone circuits. IP is the most important of all protocols on which the Internet is based. This protocol allows a packet to traverse multiple networks before it reaches its final destination.
SMDR	Station Message Detail Recording A feature that collects and records information on outgoing calls by station.
SPID	Service Profile Identifier ISDN service is ordered with certain parameters. The SPID is an 8- to 12-digit number that uniquely identifies the service ordered. The telephone company assigns an SPID for every phone number. Each ISDN BRI line usually has two telephone numbers. The SPID is a label identifier that points to a particular location on the telephone company central office memory that stores the details of the ISDN services ordered. This number is necessary for the operation of the ISDN telephone, fax, or PC software. Without this number, ISDN services cannot be accessed.
VoIP	Voice over Internet Protocol The ability to carry normal telephone-style voice over an IP-based internet with POTS-like functionality, reliability, and voice quality. The Public Switched Telephone Network (PSTN) connects to the LAN IP network through a VoIP gateway. Digitized speech is transported through IP packets and can include real-time conversation or voice mail. The IP network can be public or private, and voice transport can be telephone-to-telephone, computer-to-telephone, or computer-to-computer.

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SYSTEM HARDWARE MANUAL

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