NEC

System Hardware Manual

NEC Business Solutions Ltd

A6-324000-642-01
Release 6.0

April 2003

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 - Release 6.0
April 2003

Table of Contents

Chapter 1 Introduction 1

Section 1 General Information 1
1.1 Unique Design 1
Section 2 Equipment Description 3
2.1 Equipment List 3

Chapter 2 System Specifications 15

Section 1 General Information 15
Section 2 System Block Diagram 15
Section 3 Maximum System Capacities 18
Section 4 System Requirements and Specifications 20
4.1 Cabling Requirements and Specifications 20
4.2 Cabling Precautions 21
4.3 Power Requirements 22
4.4 Outside Line Types 23
4.5 Transmission, Network, and Control Specifications 23
4.6 Dialling Specifications 25
4.7 Battery Backup 26
4.8 Weights and Dimensions 28
4.9 External Equipment Interface 29
4.10 Audible and Visual Indications 31

Chapter 3 Hardware Requirements 35

Section 1 General Information 35
Section 2 Programming Stations 35
Section 3 Attendant Stations 35
Section 4 Programming from a PC 35
Section 5 Programming from a Multiline Terminal 36
Section 6 Xen Master Remote PC Programming 36
6.1 Remote Programming 36
Section 7 Determining Required Equipment 37
7.1 Station Equipment 37
7.2 Interface ETUs 37

A6-324000-642-01 – Release 6.0
April 2003

Chapter 4 Installing KSUs 43

Section 1 General Information 43

Section 2 Site Preparation and MDF/IDF Construction 43
2.1 Precautionary Information **43**
2.2 Surveying the Customer Site 43
2.3 Selecting the Best Location for Proper Installation 44
2.4 Cabling to the Main Distribution Frame (MDF) 46
2.5 Power Failure Transfer 55
2.6 Fax CO Branch Connection 56

Section 3 Installing The Xen Master KSU 56
3.1 General Information 56
3.2 Removing the KSU Cover 57
3.3 Installing a Front Cover Extender (FCE-U13 Unit) 57
3.4 Securing Cables Using the Velcro Strap 60
3.5 Wall Mounting the Basic KSU 61
3.6 Wall Mounting the Expansion KSU 64
3.7 Floor Mounting the Basic KSU 65
3.8 Cable Routing 66
3.9 Replacing the Power Supply Unit in the KSU 69
3.10 Installing Built-In and External Batteries in the KSU 73

Section 4 Installing the Xen Axis KSU 77
4.1 General Information 77
4.2 Removing the KSU Cover 77
4.3 Wall Mounting the KSU 79
4.4 Replacing the Power Supply Unit in the KSU 81
4.5 Fuse Replacement 83
4.6 Installing Built-in and External Batteries in the KSU 84

Chapter 5 Installing Electronic Telephone Units 89

Section 1 General Information 89

Section 2 Installation 90
2.1 Installation Precautions 90
2.2 Inserting an ETU into the KSU Slots 92
2.3 Removing an ETU from the KSU 93

Section 3 Common Control ETUs 94
3.1 CPUB( )-U13 ETU (Xen Master Only) 94
3.2 EXP-U13 ETU (Xen Master Only) 99
3.3 MBD-U13 Unit for B48-U13 KSU (Xen Axis Only) 101
3.4 CLKG-U13 Unit 106
3.5 MIFM-U13 ETU 107
3.6 MIFA-U13 ETU 110
3.7 KMM(XXX)UA Unit 112
3.8 KML(XXX)UA Unit 112
3.9 KMA(XXX)UA Unit (Xen Master Only) 112

A6-324000-642-01 – Release 6.0
April 2003

Section 4 Interface ETUs 113
4.1 BRT(4)-U13 ETU 113
4.2 PRT(1)-U13 ETU 115
4.3 COI(8)-U( ) ETU 117
4.4 COI(4)-U( ) ETU 119
4.5 COID(8)-U( ) ETU 120
4.6 COID(4)-U( ) ETU 122
4.7 DID(4)-U13 ETU 124
4.8 TLI(2)-U13 ETU 126
4.9 ESI(8)-U13 ETU 128
4.10 SLI(8)-U13 ETU 130
4.11 SLI(4)-U13 ETU 132
4.12 OPX(2)-U13 ETU 134
4.13 IPT(4)/(8)-U13 ETU 136
Section 5 Optional ETUs 140
5.1 ACD(8)-U10 ETU 140
5.2 PBR( )-U13 ETU 142
5.3 VDH2(8)-U13 ETU 143
5.4 VRS(4)-U13 ETU 151
5.5 VMS(2/4/8)-U13 ETU 154
5.6 FMS(2/4)-U13 ETU 158
5.7 ECR-U13 ETU 163
5.8 DPH(4)-U13 ETU 167
5.9 CNF(8)-U13 ETU 169
5.10 BSU(2)-U13 ETU 171

Chapter 6 Installing DTU-Type Multiline Terminals 175

Section 1 General Information 175
Section 2 Multiline Terminals 175
2.1 DTU-8-1A (WH) TEL 175
2.2 DTU-8D-1A (WH) TEL 176
2.3 DTU-16D-1A (WH) TEL 176
2.4 DTU-32D-1A (WH) TEL 177
2.5 DCU-60-1A (WH) CONSOLE 178
Section 3 Connecting a Multiline Terminal to the System 179
Section 4 Connecting an Attendant Console to a Multiline Terminal 180
Section 5 Adjusting the LCD 181
Section 6 Installing Line Cards and Plastic Panels 182
6.1 Line Card and Plastic Panel Installation 182
6.2 Plastic Panel Removal 183
Section 7 Removing Softkeys 183
Section 8 Adjusting the Height of the Multiline Terminal 184

A6-324000-642-01 – Release 6.0
April 2003

Chapter 7 Installing Optional Equipment 187

Section 1 General Information 187
Section 2 Preparing Multiline Terminal for Adapter Installation 187
Section 3 Installation Procedures 190
3.1 ACA-UA Unit (AC adaptor) 190
3.2 ADA-UA Unit (Ancillary Device Adapter) 191
3.3 APR-UA Unit (Analogue Port Ringer) 197
3.4 CTA-UA Unit (Computer Telephony Application) 201
3.5 Computer Telephony Adapter with USB Interface 203
3.6 HFU-UA (WH) Unit (Handsfree Unit) 217
3.7 PCT( )-U13 Unit (PC Telephony Board) 219
3.8 SLT(1)-U13 ADP (Single Line Telephone) 221
3.9 VDD-UA Unit (Voice/Data Unit for Digital Terminals) 223
3.10 Wall Mounting 225
3.11 Music on Hold 233
3.12 Station Background Music 234
3.13 Paging Connections 234
3.14 Connecting a KSU to a Personal Computer 234

Chapter 8 Installing ETW-Type Multiline Telephones. 239

Section 1 General Information 239
Section 2 ETW-type Multiline Terminals 239
Section 3 Connecting an Etw-type Multiline Terminal to the Xen System 240
3.1 Terminal Update 240
3.2 Modular Terminal Connections 240
3.3 Attach a Multiline Terminal to the System 241

Appendix A Glossary of Abbreviations 243

A6-324000-642-01 – Release 6.0
April 2003

List of Figures

Chapter 1 Introduction 1

Figure 1-1 System Configuration Example 2

Chapter 2 System Specifications 15

Figure 2-1 System Block Diagram 17

Chapter 3 Hardware Requirements 35

There are no figures to list for this chapter.

Chapter 4 Installing KSUs 43

Figure 4-1 Xen Master - Power Failure Transfer Connection 55
Figure 4-2 Xen Axis - Power Failure Transfer Connection 55
Figure 4-3 Removing the Front Panel of the KSU 57
Figure 4-4 Front Cover Extender (FCE-U13 Unit) 57
Figure 4-5 Mounting the Cable Clamp on the KSU Frame 58
Figure 4-6 Attaching the Sponge to the Clamp 58
Figure 4-7 Attaching the Front Cover and Front Cover Extender 59
Figure 4-8 Attaching the Front Cover and the Front Cover Extender to the KSU 59
Figure 4-9 Threading the Velcro Strap Through the Hook on the KSU 60
Figure 4-10 Threading the Velcro Strap to Secure One or Two Amphenol Cables 60
Figure 4-11 Threading the Velcro Strap to Secure Three Amphenol Cables 61
Figure 4-12 Attaching the Wall Mount Bracket 61
Figure 4-13 Attaching the Wall Mount Bracket Spacer 62
Figure 4-14 Hanging the Basic KSU on the Bracket 62
Figure 4-15 Securing the Basic KSU to the Wall 63
Figure 4-16 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket 64
Figure 4-17 Floor Mounting the Basic KSU 65
Figure 4-18 Securing the KSU to the Floor Mounting Bracket 65
Figure 4-19 Connecting DC Expansion Cables 66
Figure 4-20 Attaching the Frame Ground Plate 67
Figure 4-21 KSU Grounding 68
Figure 4-22 Connecting Wires to the PSU 69
Figure 4-23 Mounting the PSU onto the KSU 70
Figure 4-24 Connecting the PSU Power Cable to the Basic KSU 70
Figure 4-25 Connecting Battery Expansion Cables to the Expansion KSU 71
Figure 4-26 Removing the PSU from the KSU 72
Figure 4-27 PSU Fuse Replacement 72
Figure 4-28 Connecting Built-In Batteries 73
Figure 4-29 Placing the Batteries into the KSU 73
Figure 4-30 Connecting the Batteries to the Power Supply Unit 74

A6-324000-642-01 – Release 6.0
April 2003

Figure 4-31 Attaching Cables to External Battery 75
Figure 4-32 Connecting the Cable 75
Figure 4-33 Clamping the Cables 76
Figure 4-34 Removing the KSU Cover 77
Figure 4-35 Threading the Velcro Strap Through the Hook on the KSU 78
Figure 4-36 Using the Template 79
Figure 4-37 Hanging the KSU 79
Figure 4-38 Installing Screws 80
Figure 4-39 KSU Grounding 81
Figure 4-40 Disconnecting Cable from the PSU 82
Figure 4-41 Installing the KSU in the PSU 82
Figure 4-42 PSU Fuse Replacement 83
Figure 4-43 Connecting Built-in Batteries 84
Figure 4-44 Installing the Batteries in the KSU 84
Figure 4-45 Connecting the Batteries to the Power Supply Unit 85
Figure 4-46 Connecting Cables for External Batteries 86
Figure 4-47 Connecting the External Power Cables to the PSU 87
Figure 4-48 Reinstalling the KSU Cover 87

Chapter 5 Installing Electronic Telephone Units 89

Figure 5-1 Inserting the ETU into the KSU 90
Figure 5-2 Wrist Strap Grounding 91
Figure 5-3 Handling an ETU 91
Figure 5-4 Safety Precautions when Setting Switches on an ETU 92
Figure 5-5 Sliding the ETU into the KSU Slot 92
Figure 5-6 Lifting the Ejector Tabs on the ETU 93
Figure 5-7 CPUB( )-U13 ETU 95
Figure 5-8 EXP-U13 ETU 99
Figure 5-9 Connecting the Expansion Cable 100
Figure 5-10 KSU MBD-U13 Unit 102
Figure 5-11 KSU Backup Battery Replacement 104
Figure 5-12 CLKG-U13 Unit 106
Figure 5-13 MIFM-U13 ETU 107
Figure 5-14 MIFA-U13 ETU 110
Figure 5-15 BRT(4)-U13 ETU 113
Figure 5-16 PRT(1)-U13 ETU 115
Figure 5-17 COI(8)-U( ) ETU 118
Figure 5-18 COI(4)-U( ) ETU 119
Figure 5-19 COID(8)-U( ) ETU 121
Figure 5-20 COID(4)-U( ) ETU 123
Figure 5-21 DID(4)-U13 ETU 125
Figure 5-22 TLI(2)-U13 ETU 126
Figure 5-23 TLI(2)-U10 ETU Connections 127

A6-324000-642-01 – Release 6.0
April 2003

Figure 5-24 ESI(8)-U13 ETU 128
Figure 5-25 SLI(8)-U13 ETU 130
Figure 5-26 SLI(4)-U13 ETU 132
Figure 5-27 OPX(2)-U13 ETU 134
Figure 5-28 PBR( )-U13 ETU 142
Figure 5-29 VDH2(8)-U13 ETU 145
Figure 5-31 10 Base 2 Cable Connections 146
Figure 5-30 VDH2(8)-U13 ETU Connections 146
Figure 5-32 Front Cover Extender for VDH2(8)-U13 ETUs 147
Figure 5-33 VDH2(8)-U13 LED Indications 149
Figure 5-34 Cable Connection Comparison 151
Figure 5-35 VRS(4)-U13 ETU 152
Figure 5-36 VMS( )-U13 ETU 156
Figure 5-37 FMS( )-U13 ETU 160
Figure 5-38 ECR-U13 Block Diagram - External Paging 163
Figure 5-39 ECR-U13 Block Diagram - External Ringing 164
Figure 5-40 ECR-U13 ETU 166
Figure 5-41 DPH(4)-U13 ETU 168
Figure 5-42 CNF(8)-U13 ETU 169
Figure 5-43 BSU(2)-U13 ETU 171

Chapter 6 Installing DTU-Type Multiline Terminals 175

Figure 6-1 DTU-8-1A (WH) TEL Multiline Terminal 175
Figure 6-2 DTU-8D-1A (WH) TEL Multiline Terminal 176
Figure 6-3 DTU-16D-1A (WH) TEL Multiline Terminal 177
Figure 6-4 DTU-32D-1A (WH) TEL Multiline Terminal 178
Figure 6-5 DCU-60-1A (WH) Console 178
Figure 6-6 Connecting a Multiline Terminal to the System 179
Figure 6-7 Leading Line Cords on a Multiline Terminal 179
Figure 6-8 Connecting an Attendant Console to a Multiline Terminal 180
Figure 6-9 Connecting the Line Cord and AC adaptor when Installing an Attendant Console . . . 180
Figure 6-10 Attendant Console and Multiline Terminal 181
Figure 6-11 Adjusting the LCD 181
Figure 6-12 Installing Line Card and Plastic Panel on a Multiline Terminal 182
Figure 6-13 Installing Plastic Panel 182
Figure 6-14 Removing the Plastic Panel from the Multiline Terminal 183
Figure 6-15 Removing Softkeys 183
Figure 6-16 Locating the Adjustment Tabs on the Multiline Terminal 184
Figure 6-17 Raising the Base Plate on the Multiline Terminal 184
Figure 6-18 Adjusting the Line Cord Length 185
Figure 6-19 Lowering the Base Plate on the Multiline Terminal 185

A6-324000-642-01 – Release 6.0
April 2003

Chapter 7 Installing Optional Equipment 187
Figure 7-1 Raising the Base Plate 187
Figure 7-2 Unlocking Tab 188
Figure 7-3 Releasing Right Tab 188
Figure 7-4 Removing Bottom Cover 188
Figure 7-5 Removing Base Plate Dummy End 189
Figure 7-6 Cutting Dummy End in Half 189
Figure 7-7 Installing Adapter in Connector 1 189
Figure 7-8 Installing Dummy End B 190
Figure 7-9 ACA-UA Unit Connection 191
Figure 7-10 Attaching the ADA-UA Unit to the Multiline Terminal 191
Figure 7-11 Leading the Audio Cable out from the ADA-UA Unit 192
Figure 7-12 ADA-UA Unit 192
Figure 7-13 Attaching Cables to the ADA-UA Unit 193
Figure 7-14 ADA-UA Unit Switch Settings 195
Figure 7-15 APR-UA Unit 197
Figure 7-16 Attaching the Unit to the Multiline Terminal 198
Figure 7-17 Leading the Telephone Cord out from the Unit 198
Figure 7-18 Closing the Base Plate Cover 199
Figure 7-19 APR-UA Unit Switches 199
Figure 7-20 Connecting Cables on the APR-UA Unit 200
Figure 7-21 Attaching an Xen Multiline Terminal to a PC 201
Figure 7-22 CTA-UA Unit 201
Figure 7-23 Attaching the Unit to the Multiline Terminal 202
Figure 7-24 Connecting the RS-232C Cable to the CTA-UA Unit on the Multiline Terminal 202
Figure 7-25 CTU(S)-UA Unit 204
Figure 7-26 CTU(S) Connection 205
Figure 7-27 Base of DTU-type MLT 205
Figure 7-28 Opening the Base of the DTU-type MLT 206
Figure 7-29 Installing the CTU(S)-UA Unit 206
Figure 7-30 Removing the End Cover 207
Figure 7-31 Closing the Base 207
Figure 7-32 Connecting AC Adaptor to CTU(S) 207
Figure 7-33 Connecting the CTU(S) Line Cord 208
Figure 7-34 Securing the Line Cord 208
Figure 7-35 Connecting the Line to the CTU(S) 209
Figure 7-36 Connecting the USB to the CTU(S) 209
Figure 7-37 CTU(C) Unit 210
Figure 7-38 CTU(C) Connection 211
Figure 7-39 Base of DTU-type MLT 212
Figure 7-40 Opening the Base of the DTU-type MLT 212
Figure 7-41 Installing the CTU(C)-UA Unit 213
Figure 7-42 Removing the End Cover 213

A6-324000-642-01 – Release 6.0
April 2003

Figure 7-43 Closing the Base 214
Figure 7-44 Connecting AC Adapter to CTU(C) 214
Figure 7-45 Connecting the CTU(C) Line Cord 215
Figure 7-46 Securing the Line Cord 215
Figure 7-47 Connecting the Line to the CTU(C) 216
Figure 7-48 Connecting the LAN (PC) to the CTU(C) 216
Figure 7-49 Connecting the USB to the CTU(C) 217
Figure 7-50 HFU-UA (WH) Unit 217
Figure 7-51 Microphone with Mute 218
Figure 7-52 Attaching a Microphone to a Multiline Terminal 218
Figure 7-53 HFU-UA (WH) Unit Switches 219
Figure 7-54 Connecting a Single Line Telephone to the System using an SLT(1) U13 ADP 221
Figure 7-55 Connecting the SLT(1)-U13 ADP 222
Figure 7-56 Removing the Screws from the SLT(1)-U13 ADP 222
Figure 7-57 Attaching the SLT(1)-U13 ADP to the Wall 223
Figure 7-58 VDD-UA Unit 223
Figure 7-59 Connecting the Cables on the VDD-UA Unit 224
Figure 7-60 Positioning the Handset Hanger 225
Figure 7-61 Removing the Knockout 226
Figure 7-62 Attaching the Base Plate to the Wall 226
Figure 7-63 Wall Mounting using a Modular Jack 227
Figure 7-64 Plugging in the Line Cord using a Wall Jack 227
Figure 7-65 Plugging in the Line Cord Using a Modular Jack 228
Figure 7-66 Attaching the Bottom Tabs of the Multiline Terminal to the Base Cover 228
Figure 7-67 Attaching the Top Tabs of the Multiline Terminal to the Base Plate 229
Figure 7-68 Installed Wall Mount Unit 229
Figure 7-69 Removing the Tabs from the adaptor 230
Figure 7-70 Removing the Tabs from the WMU-UA Unit 230
Figure 7-71 Leading the Line Cord out of the WMU-UA Unit 231
Figure 7-72 Attaching the Wall Mount Unit to the Wall 231
Figure 7-73 Attaching the Multiline Terminal to the WMU-UA Unit 232
Figure 7-74 Removing the Multiline Terminal from the Base Cover 232
Figure 7-75 Music Source Connections 233
Figure 7-76 Connecting a Music Source via a COI Port 234
Figure 7-77 Connecting a PC to the KSU 236
Figure 7-78 Connecting an External Modem 237

Chapter 8 Installing ETW-Type Multiline Telephones 239

Figure 8-1 Modular Terminal Connections for Multiline Terminals & Attendant Add-On Consoles 240
Figure 8-2 Connect an ETW-type Multiline Terminal to the Xen system 241

Chapter A Glossary of Abbreviations 243

A6-324000-642-01 – Release 6.0
April 2003

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

List of Tables

Chapter 1 Introduction 1

Table 1-1 Equipment List 3

Chapter 2 System Specifications 15

Table 2-1 List of Abbreviations 15
Table 2-2 Maximum System Capacities 18
Table 2-3 Multiline Terminal Loop Resistance and Cable Length 20
Table 2-4 Cable Connection between an Analogue Interface and a Single Line Telephone 21
Table 2-5 Cabling Requirements 21
Table 2-6 Power Consumption 22
Table 2-7 Fuse Replacement 22
Table 2-8 DTMF Specifications 25
Table 2-9 DTMF Address Signalling 26
Table 2-10 Internal Backup Battery Specifications 26
Table 2-11 External Backup Battery Requirements 27
Table 2-12 ETU Battery Backup Specifications 27
Table 2-13 Weights and Dimensions 28
Table 2-14 Music on Hold/Station Background Music 29
Table 2-22 Tone Patterns 31
Table 2-23 Multiline Terminal Flash Patterns 32

Chapter 3 Hardware Requirements 35

Table 3-1 Station Equipment Table 37
Table 3-2 Interface Slot and System Port Numbers for a Xen System 38
Table 3-3 Interface Slot and System Port Numbers for Xen Axis System 39
Table 3-4 Sample Master Configuration 39
Table 3-5 Telephone and CO Port Nos Example 39
Table 3-6 Sample Axis Port Assignment 40
Table 3-7 Number of Required Interface ETUs 40

Chapter 4 Installing KSUs 43

Table 4-1 MDF Cable Connections - Xen Master 46
Table 4-2 Power Fail Transfer Connections - Xen Master 49
Table 4-3 *MDF Cable Connections - Xen Axis* *50*

A6-324000-642-01 – Release 6.0
April 2003

Chapter 5 Installing Electronic Telephone Units 89
Table 5-1 CPUB( )-U13 ETU Default Switch Settings 96
Table 5-2 MIFM-U13 Switch Settings 108
Table 5-3 MIFA-U13 ETU Switch Settings 111
Table 5-4 PRT(1)-U13 ETU Switch Settings 116
Table 5-5 For PRT Firmware 2.13 or Later 116
Table 5-6 LED Indications 117
Table 5-7 TLI(2)-U13 ETU Default Switch Settings 127
Table 5-8 IP Gateway Options 137
Table 5-9 VDH2(8)-U13 ETU Specifications 144
Table 5-10 VDH2(8)-U13 ETU Default Switch Settings 148
Table 5-11 Jumper Settings 148
Table 5-12 Normal 150
Table 5-13 Cascade 150
Table 5-14 Message Length 151
Table 5-15 VRS(4)-U13 ETU Default Switch Settings 153
Table 5-16 Configuration Support Table 155
Table 5-17 VMS(2/4/8)-U13 ETU Switch Settings 157
Table 5-18 Configuration Support Table 159
Table 5-19 FMS(2/4)-U13 ETU Switch Settings 161
Table 5-20 Connector Descriptions (CN2) 165
Table 5-21 DPH(4)-U13 Jumper Settings 167
Table 5-22 CNF(8)-U13 ETU Reset Settings 170
Table 5-23 CNF(8)-U13 ETU Maximum Conference Time Switch 170
Table 5-24 CNF(8)-U13 ETU Party Size Switch 170
Table 5-25 BSU(2)-U13 ETU Switch Settings 172
Table 5-26 Switch Settings 173
Table 5-27 LED Indications 173
Table 5-28 BS Status Table for LEDs 5 and 6 174

Chapter 6 Installing DTU-Type Multiline Terminals 175
There are no tables to list for this chapter.

Chapter 7 Installing Optional Equipment 187
Table 7-1 ADA-UA Cable Connections 194
Table 7-2 ADA-UA Unit Switch Settings 196
Table 7-3 APR-UA Unit Switch Settings for SW1 and SW3 200
Table 7-4 HFU-UA (WH) Unit Switch Settings 219
Table 7-5 Functions and Communication Port Connections 235
Table 7-6 Serial Port Characteristics 235
Table 7-7 Modem Specifications 237

A6-324000-642-01 – Release 6.0
April 2003

Chapter 8 Installing ETW-Type Multiline Telephones 239
There are no tables to list for this chapter.

Chapter A Glossary of Abbreviations 243

A6-324000-642-01 – Release 6.0
April 2003

A6-324000-642-01 – Release 6.0
April 2003

Preface

General Information

Congratulations! You have purchased the NEC Xen System

The Xen system is a feature-rich key system that provides over 200 features including Computer Telephony Integration, Least Cost Routing, Automatic Call Distribution, ISDN-BRI Voice Trunks, and LAN/KTS Cabling Integration.

The Xen system meets the customer needs today, and as business expands the system can be expanded to grow as well.

The Xen system has a set of manuals that provide all the information necessary to install and support the system. The manuals are described in the rest of this preface.

This Manual

This manual is for the system installer. This manual provides detailed instructions for installing the Xen KSUs, ETUs, Multiline Terminals and optional equipment. This manual is divided into the following chapters.

Chapter 1 - Introduction

This chapter contains a brief description of the Xen System and provides a detailed list of each unit of equipment available for the system.

Chapter 2 - System Specifications

This chapter provides the technician with detailed specifications for the Xen system. This chapter should be carefully reviewed by a technician ***before*** installing the system.

Chapter 3 - Hardware Requirements

This chapter provides the technician with the hardware requirements for the Xen system. The technician should read this chapter ***before*** installing the system.

Chapter 4 - Installing KSUs

This chapter provides the information necessary to install the basic and expansion KSUs. The technician should become familiar with this section ***before*** attempting installation.

Chapter 5 - Installing Electronic Telephone Units

This chapter provides instructions for installing the ETUs in the Basic and Expansion KSUs.

A6-324000-642-01 – Release 6.0
April 2003

Chapter 6 - Installing Xen Multiline Terminals

This chapter describes each terminal that is available with the Xen system and provides installation instructions.

Chapter 7 - Installing Optional Equipment

This chapter provides installation instructions for optional equipment that can be added to the system as customer business grows.

Chapter 8 - Installing Xen Professional Telephones

This chapter provides instructions for installing Xen Professional terminals on the Xen system.

Chapter 9 - System Maintenance

This chapter provides the technician with a guide to troubleshooting and diagnosing problems during and after system installation.

SUPPORTING - DOCUMENTS

The Xen system has a set of manuals to provide all the information necessary to install and support the system. The remaining manuals that comprise the set are described below.

Xen Features and Specifications Manual

This manual provides details related to every feature available in the system.

Xen Programming Manual

This manual provides instructions for programming the Xen system.

Xen Lease Cost Routing Manual

This manual provides instructions to the service technician for programming the customer site for least cost routing.

Xen Automatic Call Distribution Manual

This manual provides the service technician with instructions for programming the ACD. This manual can also be used by the ACD supervisor, at the customer site, to use to become familiar with the ACD/MIS feature.

A6-324000-642-01 – Release 6.0
April 2003

Disclaimer

NEC shall not be liable for any direct, indirect, consequential or incidental damages about the use of this equipment, manual or any related materials.

The information in this technical manual is advisory in nature and is subject to change. NEC may make improvements and changes in the products described in this manual without notice.

Changes will be periodically made to the information in the new editions. Efforts have been made to ensure that the contents of this manual are correct. Should you find any error, NEC welcomes your comments to improve our communications. Please contact NEC on 1800 036 136.

Contents of this manual are subject to change without prior notice at the discretion of NEC Business Solutions Ltd.

NEC Business Solutions Ltd
635 Ferntree Gully Road
Glen Waverley, VIC 3150

Integrated Communication Products Group

A6-324000-642-01 – Release 6.0
April 2003

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Introduction

CHAPTER 1

SECTION 1
GENERAL
INFORMATION

1.1 Unique Design

The Xen Series of Key Telephone Systems have the power to meet the ever-changing demands of today's business communications. The unique, compact design allows the system to be easily and quickly installed.

The Xen systems can grow with your business. You can easily and economically increase port size whenever necessary. The Xen Master can accommodate one basic and two expansion KSUs to provide a total of 192 ports. The Xen Axis can be expanded up to 48 ports with one single KSU, or can be transformed into a Xen system with minimum effort and expense. Most cards and telephones are compatible with both the Xen Master and Xen Axis systems.

Xen is a feature-rich system that provides telephone functions and supports advanced features such as:

- Computer Telephony Integration (CTI)
- Least Cost Routing (LCR)
- Automatic Call Distribution (ACD) (Xen Master only)
- ISDN-BRI and ISDN-PRI Voice Trunks
- LAN/KTS Cabling Integration
- Caller ID
- Live Recording and Live Monitoring
- PC Attendant Console
- Integrated Digital Voice Mail
- Multilingual LCD Indication
- Multiline Conference Bridge

The Xen systems offer a variety of Multiline Terminals which are compatible with both the Master and Axis systems. These Multiline Terminals are available in 8-button, 16-button and 32-button capacities and are offered as display and non-display models. A 60-button Attendant Console is also available.

A customer with existing ETW terminals can easily connect them to the Xen system, providing inexpensive migration from the NEC Ranger NDK/DK systems. Most Xen system features are available with the ETW-type Multiline Terminals.

A6-324000-642-01 – Release 6.0
April 2003

ETW-type terminals are not available in New Zealand.

The Xen systems support a wide range of additional equipment that can be connected to the system to accommodate individual customer needs.

Equipment such as Single Line Telephones, external speakers, facsimile machines, external microphones, and headsets can be connected. The diagram in *Figure 1-1 System Configuration Example* shows a Xen system with standard and optional equipment (some locally provided).

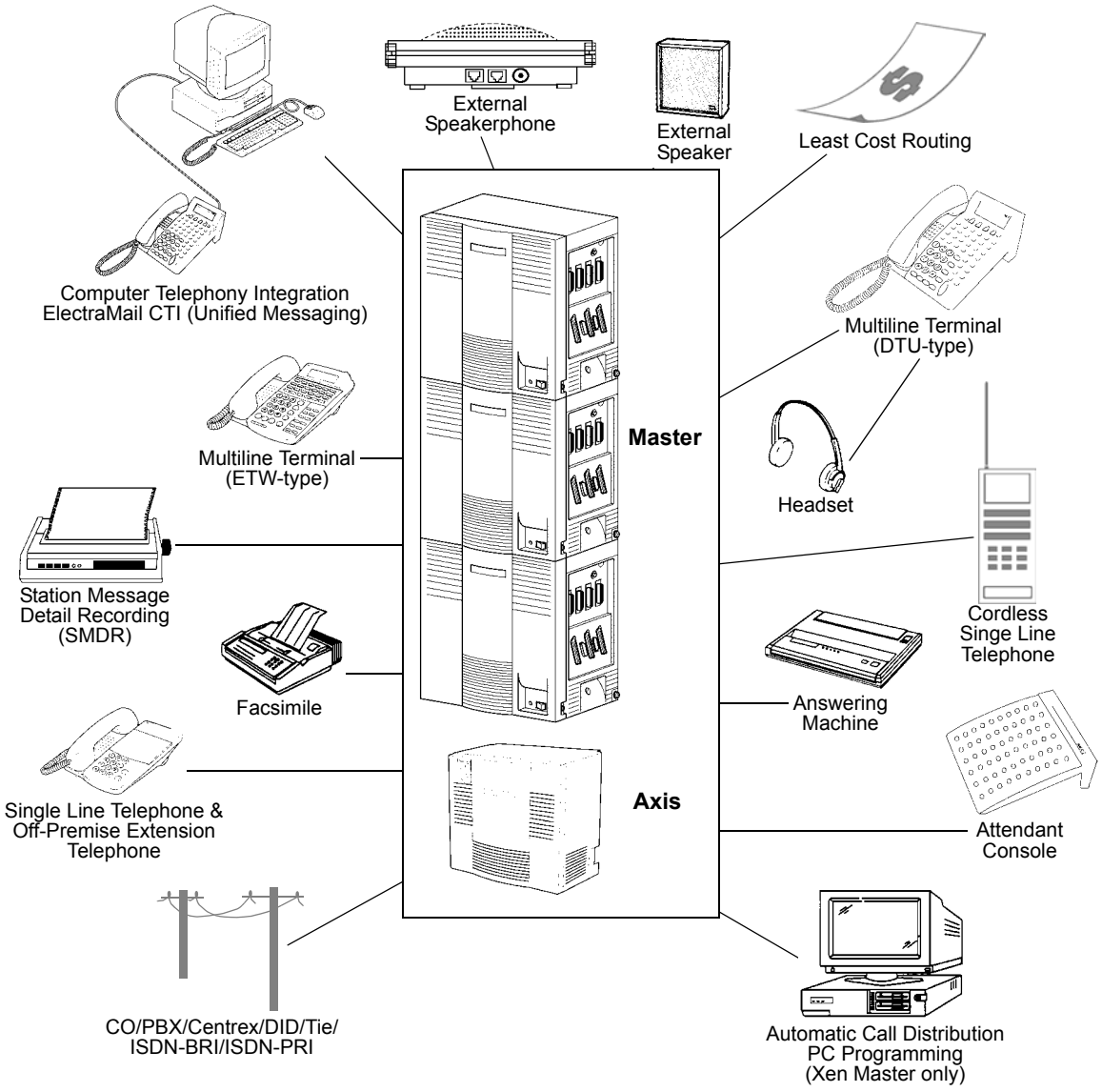


Figure 1-1 System Configuration Example

A6-324000-642-01 – Release 6.0
April 2003

SECTION 2
EQUIPMENT
DESCRIPTION

2.1 Equipment List

The following table lists all equipment used with the Xen system. The equipment name, a description of the equipment, and the maximum quantities that are allowed when a Basic KSU, a Basic KSU with one Expansion KSU, and a Basic KSU with two Expansion KSUs are included in the table.

Table 1-1 Equipment List

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
Key Service Units, Power Supply Units, and Adaptors					
B64-U13 KSU	The Basic Key Service Unit (KSU) for the Xen Master System provides service for outside lines, Attendant Consoles, and interconnection of the station terminals. The basic KSU provides 64 ports and can be expanded to a maximum of 192 ports with the addition of two expansion KSUs. System software allows a maximum of 184 ports to be used for stations and trunks. There are two fixed slots and eight flexible slots. The P64-U13 PSU (power supply unit), backup batteries, and two PFT relays are included with this KSU.	1 Basic KSU per system			N/A
E64-U13 KSU	The Expansion Key Service Unit (KSU) of the Xen Master System provides an additional 64-port capacity. Two expansion units can be added to the Basic KSU to provide 128 ports with one expansion unit and 192 port capacity with two expansion units. The Expansion KSU provides to fixed slots eight flexible slots and accommodates any interface card. The P64-U13 PSU (power supply unit), backup batteries, and two PFT relays are included with this KSU.	2 expansion KSUs per system			N/A
B48-U13 KSU	The Key Service Unit of the Xen Axis system accommodates the full 48 ports of the system. Built onto the main board is the CPU, eight Station Ports, one Music On Hold source input, one External Paging Relay circuit and one Power Fail Transfer (PFT) relay. The P64-U13 PSU (Power Supply Unit) and backup batteries are also included.	N/A			1 per system
P64-U13 PSU	The Power Supply Unit is included with the B64-U13 KSU, E64-U13 KSU and the B48-U13 KSU.	1 per KSU			
FCE-U13 Unit	The Front Cover Extender Unit is required when a VDH2(8)-U13 ETU is installed into a B64-U13 KSU or E64-U13 KSU.	1 per KSU			N/A

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
Common Electronic Telephone Units					
MIFM-U13 ETU	This Unit provides additional memory for processing and backup for PC programming and SMDR, 512Kb of Static Random Access Memory (SRAM), and 512Kb of Flash ROM memory. If the LCR and/or Caller ID features are desired, the following kit is required: KMM(XXX)UA.	1 per system			
MIFA-U13 ETU	This unit provides additional memory for processing and backup for UCD, 512Kb of Static Random Access Memory (SRAM), and 512Kb of Flash ROM memory. If ACD feature is desired, the KMA(XXX)UA is required. (Xen Master only)	1 per system			
KMM(XXX)UA	This unit is mounted on the MIFM-U13 ETU and adds LCR and Caller ID.	1 per MIFM-U13 ETU			
KMA(XXX)UA	This unit is mounted on the MIFA-U13 ETU and adds ACD.	1 per MIFA-U13 ETU			
CPUB( )-U13 ETU	The Central Processing Unit contains a 32-bit microprocessor that has overall control of the system. This ETU communicates with the interface boards and supports up to 192 ports (24 interface cards).	1 CPU per system			N/A
		4 PBR circuits			
		16 voice mail ports (analogue) 8 voice mail ports (digital)			
		64 ports	128 ports	192 ports	
		8 slots	16 slots	24 slots	
		64 Station Ports	120 Station Ports	120 Station Ports	
		56 Trunks	64 Trunks	64 Trunks	
		32 PC Telephony Boards			
		16 Conference Circuits			

A6-324000-642-01 – Release 6.0
April 2003

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
EXP-U13 ETU	The Expansion KSU Controller controls data transmission between the CPUB( ) -U13 ETU and other ETUs installed in the E64-U13 KSU where it is installed.	N/A	1 ETU	2 ETUs	N/A
MDM-U13 Unit	The modem unit is mounted on the PCT (M)-U13 Unit and is an option for the PCT(S)-U13 ETU and the MIFM-U13 ETU.	1 per PCT(S)-U13 ETU 1 per PCT(M)-U13 ETU 1 per MIFM-U13 ETU			
Interface Trunk Units					
BRT(4)-U13 ETU	This Basic Rate Interface unit provides four circuits (eight voice channels) for ISDN Basic Rate Interface, complying to the ETSI standard. The maximum quantity allowed depends on whether a PRT(1)-U13 ETU, COI( )-U13 ETU, COID( )-U13 ETU, DID(4)-U13 ETU and/or TLI(2)-U13 ETU are installed. These units share the total number of trunk lines.	4 ETUs (32B)	8 ETUs (64B)	8 ETUs (64B)	2 ETUs (16B)
IPT(4)-U13 ETU	This IP Gateway ETU is an optional Interface that can combine various trunk and Tie Line calls into Gateway trunks. This ETU can be assigned as a two-port TLI(2)-U13 or four-port DID(4)/COI(4)/COID(4)-U13 ETU. This ETU can be installed in KSU slots that support the applicable assigned ETU.	Variable IP Gateway Trunks			
IPT(8)-U13 ETU	This IP Gateway ETU is an optional Interface that can combine various trunk and Tie Line calls into Gateway trunks. This ETU can be assigned as a two-port TLI(2)-U13, four-port DID(4)/COI(4)/COID(4)-U13 or eight-port COI(8)/COID(8)-U13 ETU. This ETU can be installed in KSU slots that support the applicable assigned ETU.				
PRT(1)-U13 ETU	This Primary Rate Interface Unit provides connection for one Primary Rate ISDN circuit, providing up to 30 channels for use as trunks in the system. The maximum quantity allowed depends on the number of COI( )-U13 ETU, COID( )-U13 ETU, DID(4)-U13 ETU, TLI(2)-U13 ETU and BRT(4)-U13 ETU installed. These units share the total number of trunk lines.	2 ETUs 60 Trunks	2 ETUs 60 Trunks	2 ETUs 60 Trunks	1 ETU 10 Trunks

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
CLKG-U13 UNIT	The Clock Unit provides synchronization for ISDN Basic Rate and Primary Rate connections and for the PHS system. The unit is piggybacked on the CPUB( ) -U13 ETU or B48-U13 KSU.	1 per system with a BRT(4)-U13 ETU, PRT(1)-U13 ETU, BSC-U13 ETU or BSU(2)-U13 ETU			
COI(8)-U13 ETU COI(8)-U19 ETU	This unit supports eight outside (CO/PBX) lines and provides circuitry for ring detection, holding, and dialling. Electrical fuses (posistors) are built into this ETU. Only loop start, DTMF Trunks are supported. The maximum quantity allowed depends on the number of BRT(4)-U13 ETU, PRT(1)-U13 ETU, COID( )-U13 ETU, DID(4)-U13 ETU and/or TLI(2)-U13 ETU installed. These units share the total number of trunk lines.	7 ETUs 56 CO/PBX lines	8 ETUs 64 CO/PBX lines	8 ETUs 64 CO/PBX lines	2 ETUs 16 CO/PBX lines
COI(4)-U13 ETU COI(4)-U19 ETU	As per the COI (8)-U13 ETU, however only supports the connection of four outside trunk lines.	7 ETUs 28 CO/PBX lines	15 ETUs 60 CO/PBX lines	16 ETUs 64 CO/PBX lines	4 ETUs 16 CO/PBX lines
COID(8)-U13 ETU COID(8)-U19 ETU	The Central Office Caller ID ETU detects Caller ID signals from the central office and sends caller identification to the CPU ETU. This Unit supports eight outside (CO/PBX) lines and provides circuitry for ring detection, holding, and dialling. Electrical fuses (posistors) are built into this ETU. The maximum quantity allowed depends on whether a BRT(4)-U13 ETU, PRI(1)-U13 ETU, COI( )-U13 ETU, DID(4)-U13 ETU and/or TLI(2)-U13 ETU are installed. These units share the total number of trunk lines. This ETU provides loop start service only.	4 ETUs 32 CO lines	8 ETUs 64 CO lines	8 ETUs 64 CO lines	2 ETUs 16 CO lines
COID(4)-U13 ETU COID(4)-U19 ETU	As per the COID(8)-U13 ETU, however only supports the connection of four outside trunk lines.	4 ETUs 16 CO Lines	8 ETUs 32 CO Lines	8 ETUs 32 CO Lines	2 ETUs 8 CO Lines

A6-324000-642-01 – Release 6.0
April 2003

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
DID(4)-U13 ETU	The Direct Inward Dialling Interface Unit supports four DID lines. Each DID(4)-U13 ETU requires one interface slot position in the KSU. ☛ Immediate, wink start, second dial tone, and delay dial signalling can be combined on this ETU. The maximum quantity allowed depends on whether a BRT(4)-U13 ETU, PRT(1)-U13 ETU, COI( )-U13 ETU, COID( )-U13 ETU, and/or TLI(2)-U13 ETU are installed. These units share the total number of trunk lines.	7 ETUs 28 DID Trunks	15 ETUs 60 DID Trunks	16 ETUs 64 DID Trunks	4 ETUs 16 DID Trunks
TLI(2)-U13 ETU	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 or wink start, delay start, or second dial tone signalling is accommodated. The maximum quantity allowed depends on whether a BRT(4)-U13 ETU, PRT(1)-U13 ETU, COI( )-U13 ETU, COID( )-U13 ETU, DID(4)-U13 ETU are installed. These units share the total number of trunk lines.	7 ETUs 14 TLI Circuits	15 ETUs 30 TLI Circuits	16 ETUs 32 TLI Circuits	4 ETUs 8 TLI Circuits
Station Interface Units					
ESI(8)-U13 ETU	The Electronic Station Interface ETU contains eight circuits. Each circuit can support any type of Attendant Console, Multiline Terminal, or Single Line Telephone Adaptor. The maximum quantity allowed depends on how many SLI( )-U13 ETUs, OPX(2)-U13 ETUs, CNF(8)-U13 ETUs and VDH2(8)-U13 ETUs are installed. This unit shares the total number of extension ports.	8 ETUs 64 extensions	15 ETUs 120 extensions	15 ETUs 120 extensions	3 ETUs 32 extensions
SLI(8)-U13 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. The maximum quantity allowed depends on how many ESI( )-U13 ETUs, OPX(2)-U13 ETUs, CNF(8)-U13 ETUs and VDH2(8)-U13 ETUs are installed. This unit shares the total number of extension ports.	7 ETUs 56 extensions	14 ETUs 112 extensions	14 ETUs 112 extensions	3 ETUs 24 extensions

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
SLI(4)-U13 ETU	As per the SLI(8)-U13 ETU, however supports the connection of just four analogue devices.	7 ETUs 28 extensions	15 ETUs 60 extensions	23 ETUs 92 extensions	5 ETUs 20 extensions
OPX(2)U13 ETU	The Off- Premise Extension ETU provides for the termination and operation of a maximum of two analogue off-premise extensions. Each ETU has a built-in ringer unit. Up to 1600 ohms of loop resistance (including the internal resistance of the analogue device) is acceptable between the OPX(2)-U13 ETU and the Single Line Telephone or other analogue device (release 2 or higher). The maximum quantity allowed depends on how many ESI(8)-U13 ETUs, SLI( )-U13 ETUs, CNF(8)-U13 ETUs and VDH2(8)-U13 ETUs are installed. This unit shares the total number of extension ports.	7 ETUs 14 extensions	15 ETUs 30 extensions	23 ETUs 46 extensions	5 ETUs 10 extensions
Optional Electronic Telephone Units					
ACD(8)-U13 ETU	The Automatic Call Distribution ETU is installed in one of the S2~S7 interface slots. It interfaces the Elite ACD Plus Server with the Electra Elite KSU. Slot S6 is recommended for installation. Compatible with Release 4.0 Software or higher.	1 ETU			
VMS(2)-U13 ETU	This ETU is installed in one of the interface slots. It has 2-channels of built-in Voice Mail.	4 ETUs	4 ETUs	4 ETUs	4 ETUs
VMS(4)-U13 ETU	This ETU is installed in one of the interface slots. It has 4-channels of built-in Voice Mail.	4 ETUs	4 ETUs	4 ETUs	4 ETUs
VMS(8)-U13 ETU	This ETU is installed in one of the interface slots. It has 8-channels of built-in Voice Mail.	2 ETUs	2 ETUs	2 ETUs	2 ETUs
FMS(2)-U13 ETU	This ETU is a two-port voice mail card which installs inside the KSU. It utilises Flash ROM memory to store around four hours of messages.	4 ETUs	4 ETUs	4 ETUs	4 ETUs
FMS(4)-U13 ETU	This ETU is a four-port voice mail card which installs inside the KSU. It utilises Flash ROM memory to store around four hours of messages.	4 ETUs	4 ETUs	4 ETUs	4 ETUs

A6-324000-642-01 – Release 6.0
April 2003

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
PBR( )-U13 ETU	The Push Button Receiver ETU detects and translates DTMF tones generated by Single Line Telephones, modems, or facsimile machines. The PBR provides four circuits. ☛ Four PBR circuits are built into the CPUB( )-U13 ETU and MBD-U13 ETU.	1 ETU			
BSC-U13 ETU	This Base Station Controller Unit forms part of the PHS Cordless Phone system and controls and processes the call information which flows between the CPU and the BIU(2)-U13 ETU	1 ETU per System			
BIU(2)-U13 ETU	This Base Station Interface Unit forms part of the PHS Cordless Phone system and provides connection for two PHS Base Stations (BS-ID or BS-ND).	3 ETUs 6 BS	3 ETUs 6 BS	3 ETUs 6 BS	2 ETUs 4 BS
BSU(2)-U13 ETU	This ETU combines the functions of the BSC-U13 ETU and BIU(2)-U13 ETU onto one option card i.e. it provides both PHS base station control and an interface for two PHS base stations. The BSU(2)-U13 ETU provides greater flexibility in the system configuration and an increase in the maximum number of base stations which can be installed (release 2 or higher).	7 ETUs 14 BS	8 ETUs 16 BS	8 ETUs 16 BS	5 ETUs 10 BS
ECR-U13 ETU	The External Control Relay ETU provides common audible tone signalling using relay contacts for external ringing equipment and an audible output for external paging systems. Ten relays are provided: four for External Tone Ringer Control, one for Night Chime, three for External Paging, and two for General Purpose uses.	1 ETU			
VDH2(8)-U13 ETU	The Voice Data Hub ETU allows integration of both Terminal and 10Base-T cables for local area network (LAN) into the same cable (10Base-T and 10Base-2 are supported). When this ETU is installed, the FCE-U13 Unit is required.	3 ETUs 24 extensions	6 ETUs 48 extensions	9 ETUs 72 extensions	3 ETUs 24 extensions
CAD-F(8)-13 ADP	8 Port Core-line Hub Adaptor mounted externally tot he KSU. This unit integrates both ESI points and external LAN points onto a common cable, which will then terminate onto either a PCT(C)-U13 unit or VDD-UA unit.	8 ETUs 64 extensions	15 ETUs 120 extensions	15 ETUs 120 extensions	4 ETUs 32 extensions

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
VRS(4)-U13 ETU	The Voice Recording Service ETU provides voice recording messages for internal stations, automatic answering on incoming outside calls, Delay Announcement messages for ACD/UCD by a voice recorded message, and receives DTMF tones.	2 ETUs			
DPH(4)-U13 ETU	The Doorphone interface ETU allows four DP-D-1D Doorphones to be connected. Two simultaneous calls are allowed, and four Door Lock Release relays are provided.	1 ETU			
CNF(8)-U13 ETU	The Multiline Conference Card allows up to eight parties to participate in a conference call, made up of any combination of internal and external parties. The card may also be set up to provide two four-party conferences. DSP based amplification provides a higher quality conference call (release 2 or higher). This card shares the total number of extension ports.	2 ETUs			
Terminals					
DTU-8-1A (WH) TEL	This digital Multiline Terminal has eight programmable line keys (each with a two-color LED), built-in speakerphone, a Large LED to indicate incoming calls and messages, headset jack, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units.	63	119	119	31
DTU-8D-1A (WH)/(BK) TEL	These digital Multiline Terminal has 8 programmable line keys (each with a two-color LED), a built-in speakerphone, a Large LED to indicate incoming calls and messages, headset jack, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units. This terminal also has a 24-character, 3-line adjustable Liquid Crystal Display (LCD), and provides four softkeys.	64	120	120	32

A6-324000-642-01 – Release 6.0
April 2003

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
DTU-16D-1A (WH)/(BK) TEL	These digital Multiline Terminals are equipped with 16 programmable line keys (each with a two-colour LED), a built-in speakerphone, a Large LED to indicate incoming calls and messages, headset jack, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units. This terminal also has a 24-character, 3-line, adjustable Liquid Crystal Display (LCD). The DTU-16D-1 (WH) TEL provides four softkeys.	64	120	120	32
DTU-32D-1A (WH)/(BK) TEL	This digital Multiline Terminal is equipped with 32 programmable line keys (each with a two-color LED), a built-in speakerphone, a Large LED to indicate incoming calls and messages, headset jack, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units. This terminal has a 24-character, 3-line, adjustable Liquid Crystal Display (LCD). The DTU-32D-1 (WH) TEL provides four softkeys.	64	120	120	32
DCU-60-1A (WH)/(BK) CONSOLE	This Attendant Console is equipped with 60 programmable line keys (each with two LEDs). Twelve keys can be programmed as Feature Access keys and 48 keys can be programmed as Direct Station Selection or outside line keys.	4			
DP-D-1D	This Doorphone may be used when DPH(4)-U13 ETU is installed.	4			
ETW-8E-1A (SW) TEL	This terminal is a fully modular instrument with tilt stand, eight Flexible Line keys (each with two-colour LED), eight function keys, built-in speakerphone, ADA compatibility, and a large LED to indicate incoming calls and messages.	63	119	119	31
ETW-16C-1A (SW) TEL	This terminal is a fully modular instrument with tilt stand, 16 Flexible Line keys (each with two-colour LED), eight function keys, built-in speakerphone, ADA compatibility, and a large LED to indicate incoming calls and messages. This terminal has a 16-character by 2-line Liquid Crystal Display (LCD).	64	120	120	32

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
ETW-16D-1A (SW) TEL	This terminal is a fully modular instrument with tilt stand, 16 Flexible Line keys (each with two-color LED), eight function keys, 20 programmable One-Touch keys with red LEDs, built-in speakerphone, ADA compatibility, and a large LED to indicate incoming calls and messages. This terminal has a 16-character by 2-line Liquid Crystal Display (LCD).	64	120	120	32
ETW-24S-1A (SW) TEL	This terminal is a fully modular instrument with tilt stand, 24 Flexible Line keys (each with two-color LED), eight function keys, 12 programmable One-Touch keys, dual-path ability, built-in speakerphone, ADA compatibility, and a large LED to indicate incoming calls and messages. This terminal has a 16-character by 2-line Liquid Crystal Display (LCD).	64	120	120	32
EDW-48-2A (SW) CONSOLE	This console has a tilt stand, 48 programmable keys with dual LEDs (green and red) and 12 function keys with red LED. All 48 keys can be assigned as DSS keys, outside line keys, or function keys.	4			
Adapters and Optional Units					
ACA-UA Unit	This 24 volt, 400 mA AC Adaptor unit connects to one of the following units: APR-UA Unit, CTA-UA Unit, or HFU-UA Unit.	One per Multiline Terminal as required			
ADA-UA Unit	This Ancillary Device Adaptor provides the DTU-type Multiline Terminal with connection for a recording device.	64	120	120	32
ADA(1)-WA (SW) Unit	This Ancillary Device Adaptor provides the ETW-type Multiline Terminal with connection for headset, or audio recorder.	64	120	120	32
APR-UA Unit	When this analogue Port Ringer Adaptor is used, an additional Single Line Telephone or a modem can be connected to a DTU-type Multiline Terminal.	64	120	120	32
CTA-UA Unit	TAPI (Microsoft Telephony Application Programming Interface) Adaptor allows an DTU-type Multiline Terminal to be connected to a PC.	32 Units (1 per MLT)			
CTU(S)-UA Unit	This TAPI Adaptor allows a DTU-type Multiline Terminal to be connected to a PC via a high performance USB interface (Universal Serial Bus). The MLT connects to an ESI port in the KSU.	32 Units Max. (1 per MLT)			

A6-324000-642-01 – Release 6.0
April 2003

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
CTU(C)-UA Unit	This TAPI Adaptor allows a DTU-type Multiline Terminal to be connected to a PC via a high performance USB interface (Universal Serial Bus) and a 10 Base-T LAN port. The MLT connects to a Telamux port (VDH2(8)-U13 ETU) in the KSU.	32 Units Max. (1 per MLT)			
HFU-UA (WH) Unit	This Handsfree Unit is an optional unit that provides full-duplex handsfree communication on any DTU-type Multiline Terminal. This unit comes with the handsfree Adaptor and an external microphone.	64	120	120	32
PCT(C)-U13 Unit	The NEC PC Telephony Board (TAPI) with a Telamux interface. The VDD-UA Unit is built into the PCT(C)-U13 unit so that this unit can connect directly to the VDH2(8)-U13 ETU.	32			
PCT(S)-U13 Unit	The NEC PC Telephony Board (TAPI) without a modem. This board can be installed on the ISA bus on any IBM-compatible PC.	32			
PCT(M)-U13 Unit	The NEC PC Telephony Board (TAPI) without a modem. This board can be installed on the ISA bus on any IBM-compatible PC.	32			
SLT(1)-U13 ADP	The Single Line Telephone Adaptor provides an interface for Single Line Telephones and other similar devices from an ESI ETU channel. This Adaptor can be connected to any ESI port.	7			
VDD-UA Unit	The Telamux Interface Adaptor provides LAN split for digital terminals when the VDH2(8)-U13 ETU is used. This unit is used to incorporate LAN and telephone lines into one cable. This Adaptor can be installed on any DTU-type Multiline Terminal.	24	48	72	24
WMU-UA Unit	This Wall Mount Unit is used to mount any DTU-type Multiline Terminal to the wall. This unit connects to the back side of the Multiline Terminal. This unit is required when an APR-UA Unit, CTA-UA Unit, HFU-UA (WH) Unit, or a VDD-UA Unit is installed.	64	120	120	32
WMU-W Unit	This universal Wall Mount Unit is used to mount any ETW-type Multiline Terminal to the wall.	64	120	120	32

Table 1-1 Equipment List (Continued)

Equipment Name	Description	Xen Master			Xen Axis
		Basic KSU	Basic + 1 Expansion KSU	Basic + 2 Expansion KSUs	
Software					
MAT S/W (Technician)	Maintenance Access Terminal Software for Technician.	N/A			
CAT S/W (End User)	Client Administration Terminal Software for End User.	N/A			

A6-324000-642-01 – Release 6.0
April 2003

System Specifications

CHAPTER 2

SECTION 1 GENERAL INFORMATION

This chapter provides the technician with detailed specifications for the Xen Master and Xen Axis systems. The technician should review this information carefully ***before*** installing the systems.

SECTION 2 SYSTEM BLOCK DIAGRAM

Figure 2-1 System Block Diagram represents an installed system. This diagram shows the ETUs that can be installed in the KSU and the number of channels that are supported when the ETU is installed. *Table 2-1 List of Abbreviations* lists abbreviations that are used in the diagram.

Table 2-1 List of Abbreviations

Abbreviation	Description
AMP	Amplifier
APR	Analogue Port Ringer
BSC	Base Station Controller (PHS)
BIU	Base Station Interface Unit (PHS)
BSU	Base Station Controller and Interface (PHS)
BRT	Basic Rate Trunk Interface (ISDN)
CNF	Conference
COI	Central Office Interface
COID	Central Office Caller ID
COM	Communication
CPU	Central Processing Unit
CTA	Computer Telephony Adapter
CTI	Computer Telephony Integration
CTU	Computer Telephony Adapter with USB port
DID	Direct Inward Dialling
DPH	Door Phone
DTI	Digital Trunk Interface
ECR	External Control Relay
ESI	Electronic Station Interface
HDLC	High Level Data Link Control

A6-324000-642-01 – Release 6.0
April 2003

Table 2-1 List of Abbreviations (Continued)

Abbreviation	Description
HFU	Handsfree Unit
ISDN	Integrated Services Digital Network
LAN	Local Area Network
MIC	Microphone
MIF	Multipurpose Interface
MOH	Music On Hold
OPX	Off-Premise Extension
PBR	Push Button Receiver
PC	Personal Computer
PCM	Pulse Code Modulation
PCT (C)	PC Telephony Board (Coreline Interface)
PCT (S)	PC Telephony Board (without Modem)
PKG	Package
PRI	Primary Rate Trunk Interface (ISDN)
SLI	Single Line interface
SLT	Single Line Telephone
SMDR	Station Message Detail Recording
SPK	Speaker
TLI	Tie Line Interface
VDD	Voice Data Digital Adapter
VDH	Voice Data Hub
VM	Voice Mail
VMS	Built-In Voice Mail System Interface
VRS	Voice Recording Service

A6-324000-642-01 – Release 6.0
April 2003

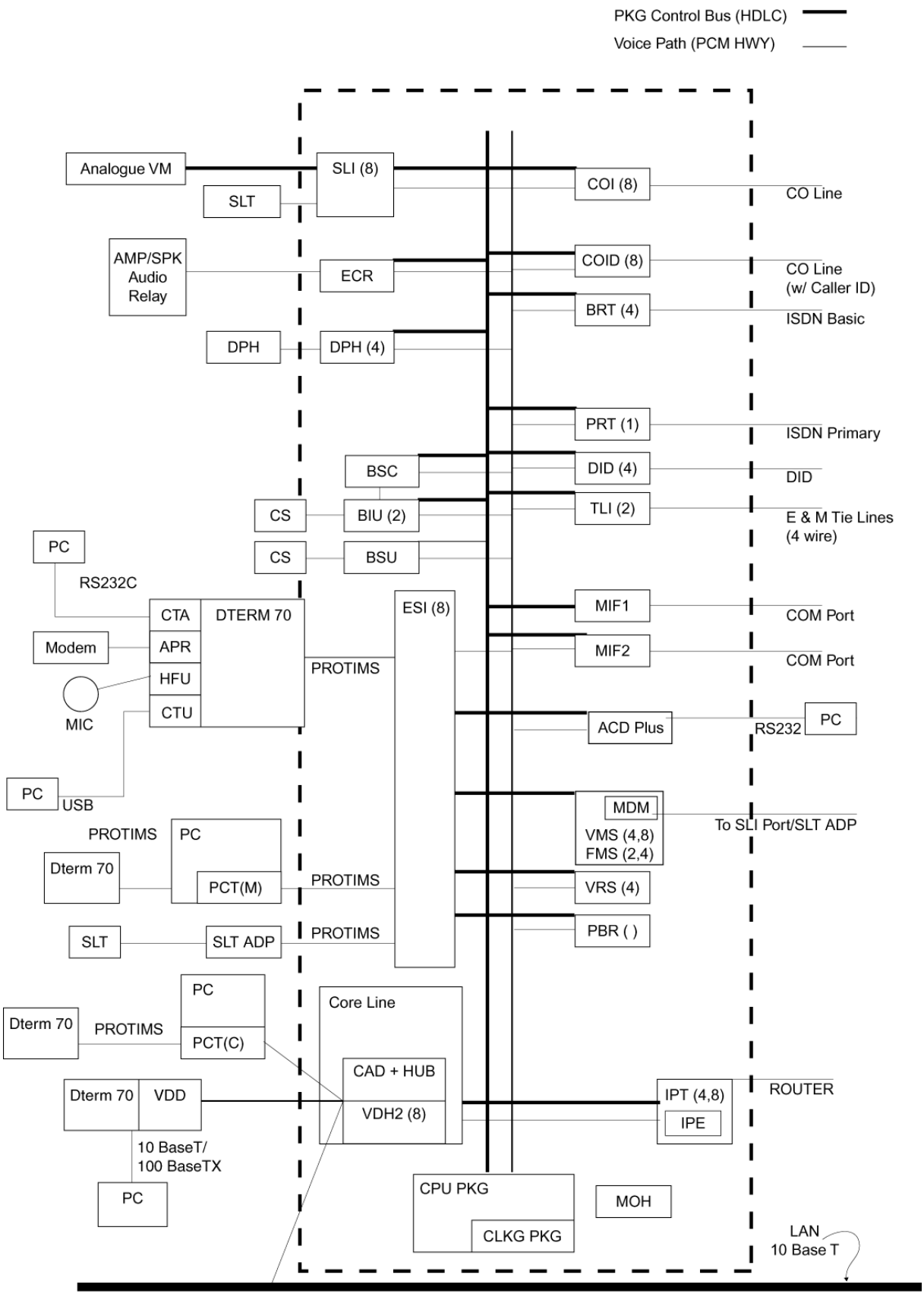


Figure 2-1 System Block Diagram

SECTION 3 MAXIMUM SYSTEM CAPACITIES

The maximum capacities available in the Xen System are shown in *Table 2-2 Maximum System Capacities*.

Table 2-2 Maximum System Capacities

Item	Xen Master			Xen Axis
	Basic KSU	Basic +1 Expansion KSU	Basic +2 Expansion KSUs	
ADA-UA Unit	64	120	120	32
APR-UA Unit	64	120	120	32
BIU(2)-U13 ETU	3	3	3	2
BRT(4)-U13 ETU	4	8	8	2
BSC-U13 ETU	1	1	1	1
BSU(2)-U13 ETU	7	8	8	5
CAD-F(8)-13 ADP	8	15	15	4
CNF(8)-U13 ETU	2	2	2	2
COI(4)-U13 ETU	7	15	16	4
COI(8)-U13 ETU	7	8	8	2
COID(4)-U13 ETU	7	15	16	2
COID(8)-U13 ETU	4	8	8	2
CPUB( )-U13 ETU	1	1	1	N/A
CTA-UA Unit	32	32	32	32
CTU( )-UA ETU	32	32	32	32
DID(4)-U13 ETU	7	15	16	4
DPH(4)-U13 ETU	1	1	1	1
ECR-U13 ETU	1	1	1	1
ESI(8)-U13 ETU	8	15	15	3
EXP-U13 ETU	0	1	2	N/A
FMS(2)-U13 ETU	4	4	4	4
FMS(4)-U13 ETU	4	4	4	4
HFU-UA Unit	64	120	120	32
IPT(4)-U13 ETU	Variable	Variable	Variable	Variable
IPT(8)-U13 ETU	Variable	Variable	Variable	Variable
MIFA-U13 Unit	1	1	1	N/A
MIFM-U13 Unit	1	1	1	1
OPX(2)-U13 ETU	7	15	23	5
PBR( )-U13 ETU	1	1	1	1

A6-324000-642-01 – Release 6.0
April 2003

Table 2-2 Maximum System Capacities (Continued)

Item	Xen Master			Xen Axis
	Basic KSU	Basic +1 Expansion KSU	Basic +2 Expansion KSUs	
PCT(C) -U13 Unit	32	32	32	32
PCT(M)-U13 Unit	32	32	32	2
PCT(S) -U13 Unit	32	32	32	32
PRI(1)-U13 ETU	2	2	2	3
SLI(4)-U13 ETU	7	15	23	5
SLI(8)-U13 ETU	7	14	14	24
SLT(1)-U13 ADP	7	7	7	7
TLI(2)-U13 ETU	7	15	16	4
VDD-UA Unit	64	120	120	32
VDH2(8)-U13 ETU	3	6	9	3
VMS(2)-U13 ETU	4	4	4	4
VMS(4)-U13 ETU	4	4	4	4
VMS(8)-U13 ETU	2	2	2	2
VRS(4)-U13 ETU	2	2	2	32

A6-324000-642-01 – Release 6.0
April 2003

SECTION 4
SYSTEM
REQUIREMENTS AND
SPECIFICATIONS

4.1 Cabling Requirements and Specifications

The KSU is connected with each of the Multiline Terminals and Single Line Telephones by a separate twisted 1-pair cable or 2-pair cable (only for Multiline Terminals). Refer to *Table 2-3 Multiline Terminal Loop Resistance and Cable Length*, *Table 2-4 Cable Connection between an Analogue Interface and a Single Line Telephone*, and *Table 2-5 Cabling Requirements*.

Table 2-3 Multiline Terminal Loop Resistance and Cable Length

Terminal or Adapter	Maximum Loop Resistance (Ohms)	Maximum Metres by Twisted 1-Pair Cable 24 AWG	Maximum Metres by Twisted 2-Pair Cable 24 AWG
DTU-8-1A (WH/BK) TEL	35	180	300
DTU-8D-1A(WH/BK) TEL	35	180	300
DTU-16D-1A (WH/BK) TEL	26	135	270
DTU-32D-1A (WH/BK) TEL	21	110	215
DCU-60-1A (WH/BK) Console	N/A	300	300
SLT(1)-U13 ADP	35	180	300
ETW-8-1A (SW) TEL	36	180	300
ETW-16C-1A (SW) TEL	26	135	270
ETW-16D-1A (SW) TEL	21	110	215
ETW-24S-1A (SW) TEL	26	135	270
EDW-48-2 (SW) Console with AC Adapter	N/A	300	300

Note 1: When installing an Attendant Console, an AC Adapter is required.

Note 2: The length for the specified SLT Adapter is the length between the SLT Adapter and the ESI.

Note 3: ETW and EDW-type terminals are not available in New Zealand.

A6-324000-642-01 – Release 6.0
April 2003

Table 2-4 Cable Connection between an Analogue Interface and a Single Line Telephone

Interface Equipment	Cable	Maximum Loop Resistance (ohms)	Typical Distance using Twisted 1-Pair 24AWG
APR-UA ADP	Twisted Pair	600	200m
SLT(1)-U13 ADP	Twisted Pair	600	200m
SLI( )-U13 ETU	Twisted Pair	950	300m
OPX(2)-U13 ETU	Twisted Pair	1800	6km

Note 1: Mixing digital and analogue ports though the same 25-pair cable runs is not recommended.

Note 2: The Maximum Loop Resistance includes the internal resistance of the SLT device.

Table 2-5 Cabling Requirements

Connected Equipment	Cable
Music on Hold and Background Music Sources	Hi-Fi Shielded Audio Cable
External Amplifier	Hi-Fi Shielded Audio Cable

4.2 Cabling Precautions

4.2.1 Cable Placement

When selecting cables and Main Distribution Frame (MDF), future expansion or assignment changes should be given due consideration. 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.
- Environmental Conditions Temperatures:

  Operating: 0°C ~ 40°C

  Recommended Long Term: 10°C ~ 32.2°C

  Humidity Operating: 10% ~ 90% noncondensing

4.3 Power Requirements

4.3.1 Power Supply Inputs

The AC input requirements for the Xen system are listed below.

✆ AC Input (P64-U13 PSU):

240 Vac +10% / -15%

50 Hz ± 2 Hz

Single Phase

10A circuit

☞ A dedicated outlet, separately fused and grounded, is required.

4.3.2 Power Supply Consumption

The power consumption for the Xen system is listed in *Table 2-6 Power Consumption*.

Table 2-6 Power Consumption

System	KSU	Maximum RMS Current	Watts Used (Idle)	Watts Used (Maximum)
Xen Master	B64-U13 KSU	1.3 A	120	320
	B64-U13 KSU + 1 x E64-U13 KSU	2.0 A	240	460
	B64-U13 KSU + 2 x E64-U13 KSU	2.9 A	360	690
Xen Axis	B48( )-U13 KSU	1.0 A	120	230

4.3.3 Fuse Replacement

When replacing fuses, refer to the specifications in *Table 2-7 Fuse Replacement*.

Table 2-7 Fuse Replacement

Unit	Fuse Number	Specifications	Description	Dimensions
P64-U13 PSU	F1	250V, 2.5A	AC Input	5 x 20 mm
	F101	125V, 10A	Battery Input	5 x 20 mm

All fuses are normal blow glass tube.

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

A6-324000-642-01 – Release 6.0
April 2003

4.4 Outside Line Types

The following outside lines can be used with the Xen system.

- 2-wire, Ring In, Loop Out Trunks (Dial Pulse or DTMF). (Dial Pulse not available in New Zealand)
- 2-wire, DID Lines (Dial Pulse or DTMF). (Analogue DID is not available in New Zealand)
- 4-wire, E&M Tie Lines (Type I or V, Dial Pulse, or DTMF)
- ISDN Basic Rate Trunks (ETSI)
- ISDN Primary Rate Trunks (ETSI)

4.5 Transmission, Network, and Control Specifications

4.5.1 Transmission

- Data Length:

  From Multiline Terminal to ESI(8)-U13 Unit: 23 bits

  From ESI(8)-U13 Unit to Multiline Terminal: 23 bits

- Data Transmission Rates:

  Between ESI(8)-U13 ETU and Multiline Terminal: 84K bps (voice and signalling)

  Scanning Time for each Multiline Terminal: 32 ms

4.5.2 Network

Time Division Multiplexing allows transmission of a number of separate data, voice and/or video simultaneously over one communications medium. The information below indicates the specifications the Xen system uses for switching, clock, data bus, timeframe:

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

A6-324000-642-01 – Release 6.0
April 2003

4.5.3 Control

This section indicates the speed and capacities of the control.

- 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-bit or 32-bit microprocessor
- Multiline Terminal: 8-bit microprocessor
- Attendant Console: 4-bit microprocessor
- SLT Adapter: 4-bit microprocessor

4.5.4 Telephone

The voltage, current and ring signal information for the Xen Multiline Terminals, Single Line Telephone equipment, and APR units are listed below.

- Multiline Terminal
  - Voltage: -11 ~ -26 Vdc
  - Maximum Current: 250 mA
- Single Line Telephone
- Standard 2500 Set: 500 type network
- Nominal Current: 35 mA
- Ring Signal: 56 Vac RMS @ 20 Hz SLT(1)-U13 ADP
- Standard 2500 Set: 500 type network
- Nominal Current: 30 mA
- Ring Signal: 56 Vac RMS @ 20 Hz APR-UA Unit
- Standard 2500 Set: 500 type network
- Nominal Current: 30 mA
- Ring Signal: 56 Vac RMS @ 20 Hz

A6-324000-642-01 – Release 6.0
April 2003

4.6 Dialling Specifications

4.6.1 Dial Pulse Address Signalling

Dial Pulse Signalling is a type of address signalling that uses dial pulses (regular momentary interruptions) to signal the equipment. In the Xen system, the following Dial Pulse specifications are used.

- ✆ Pulse Rate: 10 ± 0.5 pps/20 ± 1.0 pps
- ✆ Percent Break: 60 ±ms. ~ 830 ms.
- ✆ Interdigit Interval: 10 pps/20 pps 770 ms. ~ 830 ms.

☞ Dial Pulse is not allowed in New Zealand.

4.6.2 Dual-Tone Multifrequency (DTMF) Address Signalling

DTMF signalling describes push button or Touchtone Dialling. When a key on a telephone is pushed, two tones (one high frequency and one low frequency) are provided. In the Xen system, the following DTMF specifications are used.

Table 2-8 DTMF Specifications

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

A6-324000-642-01 – Release 6.0
April 2003

Table 2-9 DTMF Address Signalling

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

4.7 Battery Backup

The Xen Master system has two battery backup functions: one for system backup and one for memory backup.

4.7.1 System Backup

The system operation is backed up by rechargeable batteries in the event that the mains power fails. Two levels of backup are provided.

1. Internal Batteries: These comes as standard with the B64-U13 KSU, E64-U13 KSU and B48-U13 KSU and will support all of the system functions for approximately 30 minutes.

Table 2-10 Internal Backup Battery Specifications

Cabinet	Battery Specifications	Dimensions (mm)	Quantity	Replacement Time
B64-U13 KSU E64-U13 KSU B48-U13 KSU	12V, 2.6AH Sealed Lead Acid	178(L)x34(W)x60(H) 5mm Spade Terminals	2	2.5 Years

2. External Batteries: These optional batteries will support all of the system functions for an extended period of time. Refer to table *Table 2-11 External Backup Battery Requirements on page -27*.

☞ External devices connected to the Xen System that require an AC Adapter to operate will cease to function during a mains power failure unless they are connected to their own backup power source.

A6-324000-642-01 – Release 6.0
April 2003

Table 2-11 External Backup Battery Requirements

Battery Capacity (Ah) Backup Duration	Xen Axis (Max. 3.0A)	Xen Master 1 Cabinet (Max. 4.0A)	Xen Master 2 CabinetS (Max. 8.0A)	Xen Master 3 Cabinets (Max. 9.5A)
1 hour	24V, 7Ah	24V, 7Ah	24V, 18Ah	24V, 18Ah
2 hours	24V, 7Ah	24V, 18Ah	24V, 18Ah	24V, 38Ah
4 hours	24V, 18Ah	24V, 18Ah	24V, 38Ah	24V, 38Ah
6 hours	24V, 18Ah	24V, 38Ah	24V, 38Ah (@ 70%)	24V, 38Ah (@ 60%)
8 hours	24V, 38Ah	24V, 38Ah	24V, 38Ah (@ 50%)	24V, 38Ah (@ 40%)

Note 1: The figures are based on an 80% loaded system (unless otherwise stated).

Note 2: Internal batteries should be removed when external batteries are installed.

Note 3: 18Ah and 38Ah units require an external battery charger.

4.7.2 Memory Backup

A backup battery is equipped on several of the ETU's. This battery retains the system's memory in the event of an extended mains power failure where the system backup batteries have also expired or where the ETU has been removed from the system.

Table 2-12 ETU Battery Backup Specifications

ETU	Battery Specifications	Quantity	Approx. Backup Time	Replacement Time
CPUB( )-U13 ETU	3.7V, 60mAH Ni-Cd	1	21 days	2 Years
MBD-U13 UNIT	3.7V, 60mAH Ni-Cd	1	21 days	2 Years
MIFM-U13 ETU	3.7V, 60mAH Ni-Cd	1	21 days	2 Years
MIFA-U13 ETU	3.7V, 60mAH Ni-Cd	1	21 days	2 Years

A6-324000-642-01 – Release 6.0
April 2003

4.8 Weights and Dimensions

Table 2-13 Weights and Dimensions indicates the shipping weight, height, width, and depth of each of the Xen KSUs, ETUs, Multiline Terminals and Adapters.

Table 2-13 Weights and Dimensions

Unit	Shipping Weight	Height	Width	Depth
ACA-UA Unit	638 g	86 mm	107 mm	133 mm
ADA-UA Unit	65 g	29 mm	59 mm	99 mm
APR-UA Unit	122 g	66 mm	59 mm	121 mm
B48-U13 KSU	13063 g	340 mm	350 mm	228 mm
B64-U13 KSU	13063 g	333 mm	348 mm	213 mm
BIU(2)-13 ETU	414 g	48 mm	290 mm	214 mm
BRT(4)-U13 ETU	414 g	48 mm	290 mm	214 mm
BSC-U13 ETU	414 g	48 mm	290 mm	214 mm
BSU(2)-U13 ETU	370 g	48 mm	290 mm	214 mm
CAD-F(8)-13 ADP	414 g	110 mm	320 mm	155 mm
CNF(8)-U13 ETU	325 g	48 mm	290 mm	214 mm
COI(8)-U13/U19 ETU	471 g	48 mm	290 mm	214 mm
COID(8)-U13/U19 ETU	490 g	48 mm	290 mm	214 mm
CPUB( )-U13 ETU	380 g	48 mm	290 mm	214 mm
CTA-UA Unit	122 g	66 mm	59 mm	121 mm
DCU-60-1(WH) Console	1503 g	92 mm	223 mm	270 mm
DID(4)-U13 ETU	439 g	48 mm	290 mm	214 mm
DPH(4)-U13 ETU	343 g	48 mm	290 mm	214 mm
DTU-16D-1A (WH) TEL	1233 g	123 mm	197 mm	235 mm
DTU-32D-1A (WH) TEL	1361 g	123 mm	220 mm	235 mm
DTU-8-1A (WH) TEL	1163 g	123 mm	197 mm	235 mm
DTU-8D-1A(WH) TEL	1163 g	123 mm	197 mm	235 mm
E64-U13 KSU	13063 g	333 mm	348 mm	213 mm
ECR-U13 ETU	344 g	40 mm	140 mm	180 mm
EDW-48-2A (SW) TEL	1389 g	69 mm	175 mm	223 mm
ESI(8)-U13 ETU	411 g	48 mm	290 mm	214 mm
ETW-16C-1A (SW) TEL	992 g	101mm	175 mm	223 mm
ETW-16D-1A (SW) TEL	1106 g	101mm	205 mm	223 mm
ETW-24S-1A (SW) TEL	1106 g	101mm	205 mm	223 mm
ETW-8E-1A (SW) TEL	907 g	101mm	175 mm	223 mm

A6-324000-642-01 – Release 6.0
April 2003

Table 2-13 Weights and Dimensions (Continued)

Unit	Shipping Weight	Height	Width	Depth
EXP-UA 13 ETU	414 g	48 mm	290 mm	214 mm
HFU-UA (WH) Unit	201 g	86 mm	107 mm	133 mm
MIFA-U13 ETU	343 g	48 mm	290 mm	214 mm
MIFM-U13 ETU	349 g	48 mm	290 mm	214 mm
OPX(2)-U13 ETU	410 g	48 mm	290 mm	214 mm
PBR( )-U13 ETU	303 g	48 mm	290 mm	214 mm
PRI(1)-U13 ETU	303 g	48 mm	290 mm	214 mm
SLI(4)-U13 ETU	360 g	48 mm	290 mm	214 mm
SLI(8)-U13 ETU	400 g	48 mm	290 mm	214 mm
SLT(1)-U13 ADP	255 g	45 mm	70 mm	120 mm
TLI(2)-U13 ETU	391 g	48 mm	290 mm	214 mm
VDD-UA Unit	352 g	63 mm	224mm	275 mm
VDH2(8)-U13 ETU	522 g	48 mm	290 mm	214 mm
VMS(2/4/8)-U13 ETU	2903 g	48 mm	290 mm	214 mm
VRS(4)-U13 ETU	340 g	48 mm	290 mm	214 mm
WMU-UA Unit	301 g	104 mm	151 mm	180 mm

Note : Shipping weight includes the shipping carton and documentation.

4.9 External Equipment Interface

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

4.9.1 Music on Hold/Station Background Music

Table 2-14 Music on Hold/Station Background Music

Auxiliary Input	0.6V PPS Signal Level
Input Impedance	600 Ω

4.9.2 Music for Station BGM and MOH via COI( )-U13/U19 ETU

Table 5-15 Music for Station BGM and MOH via COI( )-U13/U19 ETU

Auxiliary Input	0.6 V PPS Signal Level
Input Impedance	600 Ω

4.9.3 External Paging (Audio)

Table 5-16 External Paging (Audio)

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

4.9.4 External Tone Ringer/Night Chime Output

Table 5-17 External Tone Ringer/Night Chime Output

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

4.9.5 SMDR Output

Table 5-18 SMDR Output

Female Connector (System Output)	Standard RS-232C (straight)

4.9.6 PC Connection

Table 5-19 PC Connection

Female Connector (System Output)	Standard RS-232C (straight)

4.9.7 ACD/MIS Connector

Table 5-20 ACD/MIS Connector

Female Connector (System Output)	Standard RS-232C (straight)

4.9.8 Relay Contact

Table 5-21 Relay Contact

All Relay Contact Ratings	500 mA, 24 Vdc

A6-324000-642-01 – Release 6.0
April 2003

4.10 Audible and Visual Indications

The tables in this section provide the audible and visual indications used in the Xen systems.

4.10.1 Tone Patterns

Tones are used in the Xen systems to inform the station user of various functions of the systems such as, dial tone, busy tone, or ringback tone. *Table 2-22 Tone Patterns* lists the frequency and the pattern for the tones used in the Xen system.

4.10.2 LED Flash Patterns

The Xen system provides 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 2-22 Tone Patterns

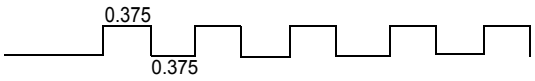
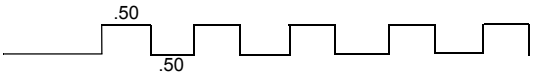
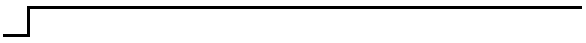
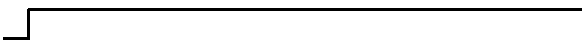
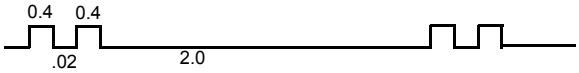
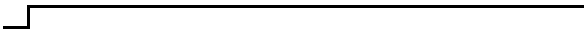
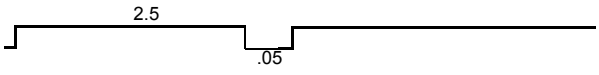
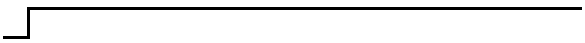
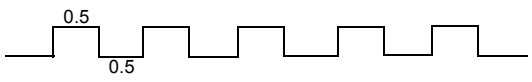
System Tone (Fixed)	Frequency (Hz) (Fixed)	Cadence (Default)	Cycle
Busy Tone (Aust.)	425	80 IPM	
Call Waiting Tone	440 20 Hz Mod.	60 IPM	
Second Dial Tone	440	0.25 sec On 0.25 sec Off 0.25 sec On 1.25 sec Off	
Howler Tone	2400 16 Hz Mod.	Continuous	
Internal Dial Tone	450/350	Continuous	
Internal Ringback Tone	425 25 Hz Mod.	0.4 sec On 0.2 sec Off 0.4 sec On 2.0 sec Off	
LCR Dial Tone	400	Continuous	
Reorder Tone	425	2.5 sec On 0.5 sec Off	
Service Set Tone	800	Continuous	
Busy Tone (NZ)	400	60 IPM	

Table 2-22 Tone Patterns (Continued)

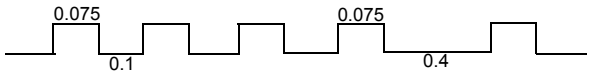
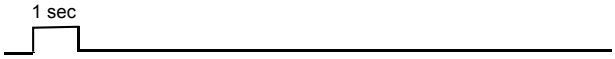
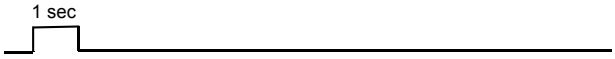
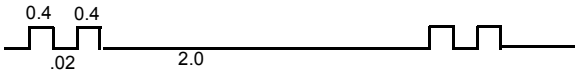
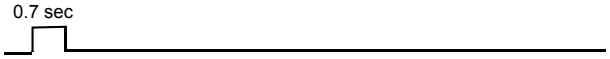
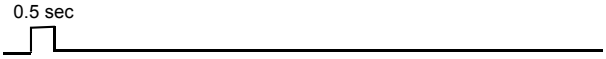
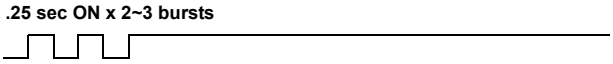
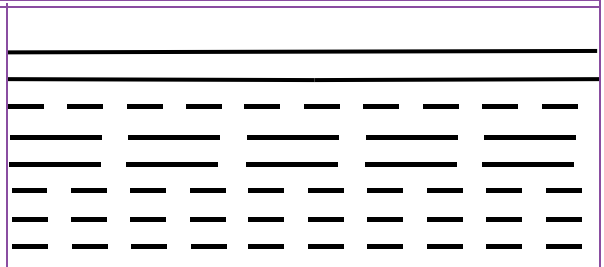
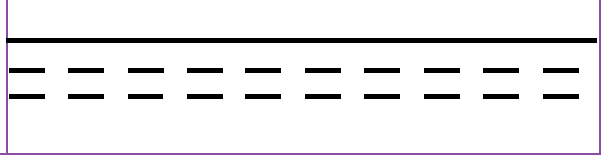
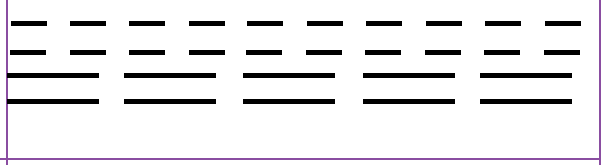
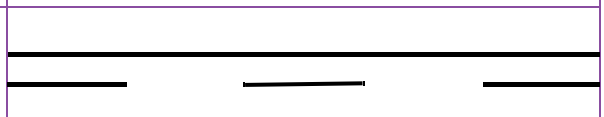
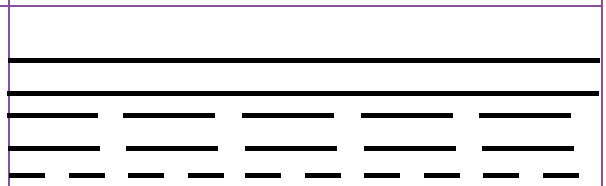
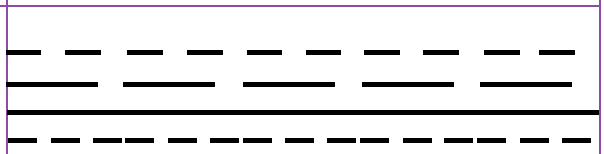
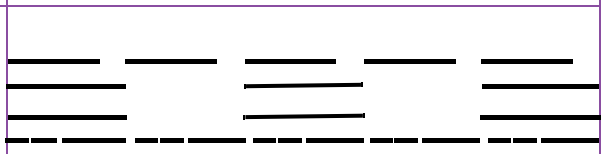
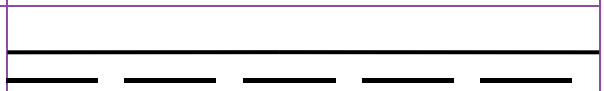
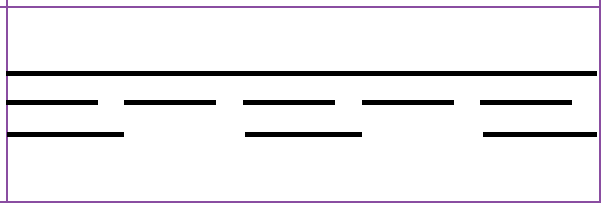
System Tone (Fixed)	Frequency (Hz) (Fixed)	Cadence (Default)	Cycle
NV Tone (NZ)	400	0.075/0.1 0.075/0.1 0.075/0.1 0.075/0.4	
Special Dial Tone	440	240 IPM	
Tone Burst 1 Tone	800	Continuous	
Tone Burst 2 Tone	400	Continuous	
Tie/DID Ringback Tone	425 25 Hz Mod	0.4 sec On 0.2 sec Off 0.4 sec On 2.0 sec 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		

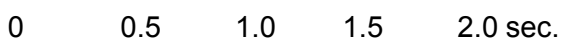
Table 2-23 Multiline Terminal Flash Patterns

LED	Condition	Colour	Flash Patterns
Linekey	I-Use Busy Incoming Call I-Hold Call Hold Hold Recall Transfer Recall Live Monitoring Mode	Green Red Red Green Red Green Green Green	
Microphone	ON	Red	
Linekey ICM	I-Use ICM Incoming Call Voice Over Broker	Red Red Red	

A6-324000-642-01 – Release 6.0
April 2003

Table 2-23 Multiline Terminal Flash Patterns (Continued)

Large LED	Incoming Internal Call Incoming Outside Call Message from Attendant Voice Mail Message	Red Green Green Red	
Speaker	ON System Data Entry	Red Red	
Conf	Conference in Progress/Barge In All Conference Circuits Used Hold Conference Call ICM Call Hold SPD Confirmation	Red Red Red Red Red	
Answer	Incoming Trunk Exclusive Hold User Ringing Line Preference Voice Over with Broker's Call	Red Green Red Green	
Feature	Callback Set Auto Repeat Set ON (to set function) Call FWD - All Calls Set	Red Red Red Red	
Redial	Other Tenant CO Line Key Seized Exclusive Hold	Green Green	
Linekey BLF or DSS Key	Use, Hold DND, Call FWD-All Calls Set Special Mode (while pressing Feature or going off-line)	Red Red Red	



THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Hardware Requirements

CHAPTER 3

SECTION 1 GENERAL INFORMATION

The technician should be familiar with the Xen System ***before*** attempting to install it. Review this chapter carefully.

SECTION 2 PROGRAMMING STATIONS

Two programming positions are available in the Xen System. Station equipment that is connected to the first ESI(8)-U13 ETU is automatically set as programming positions and must be a display Multiline Terminal.

SECTION 3 ATTENDANT STATIONS

An unlimited number of Attendant positions can be assigned in the Xen System. An Attendant Position can have one to four DCU-60-1A (WH) Consoles attached. Each Attendant Console must be supported by an ESI(8)-U13 ETU. A maximum of ***four*** Attendant Consoles can be installed in each Xen System.

SECTION 4 PROGRAMMING FROM A PC

Xen Systems can be programmed from a personal computer. The Menu Programming option available with PC Programming allows the technician/ end-user easy access to all information that can be programmed on the Xen System. The PC must be a Pentium or higher and have Windows 95 or higher to be compatible with the Maintenance Access Terminal (MAT) Software.

A6-324000-642-01 – Release 6.0
April 2003

SECTION 5 PROGRAMMING FROM A MULTILINE TERMINAL

Programming for the Xen System is accomplished through PC Programming. As an added convenience, programming for the system can be accomplished using Multiline Terminals with LCD. Multiline Terminal programming should be used after the system is installed and any initial assignments are made. Using the Multiline Terminal provides a quick way to access system data and make changes to data items. To program from a Multiline Terminal one of the following terminals is required.

- ✆ DTU-8D-1A(WH) TEL
- ✆ DTU-16D-1A(WH) TEL
- ✆ DTU-32D-1A(WH) TEL
- ✆ ETW-16C-1A(SW) TEL
- ✆ ETW-16D-1A(SW) TEL
- ✆ ETW-24S-1A(SW) TEL
- ☞ ETW-type TEL are not available in New Zealand.

SECTION 6 XEN MASTER REMOTE PC PROGRAMMING

The Xen 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:

- ✆ Analogue CO Trunk or system SLT Port (not needed if the optional internal modem is used)
- ✆ A straight RS-232C cable and adaptor (provided with the MIFM-U13 ETU) cable to connect a locally provided modem (not needed if the optional internal modem is used)
- ✆ MIFM-U13 ETU installed in the Xen System

A6-324000-642-01 – Release 6.0
April 2003

SECTION 7 DETERMINING REQUIRED EQUIPMENT

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

7.1 Station Equipment

The station equipment that can be installed with the Xen System is listed below:

Table 3-1 Station Equipment Table

Equipment	Description
DTU-8-1A(WH) TEL	8-line digital Multiline Terminal without LCD
DTU-8D-1A(WH) TEL	8-line digital Multiline Terminal with LCD and softkeys
DTU-16D-1A(WH) TEL	16-line digital Multiline Terminal with LCD and softkeys
DTU-32D-1A(WH) TEL	32-line digital Multiline Terminal with LCD and softkeys
DCU-60-1A(WH) CONSOLE	Attendant Console with 60 programmable line keys
ETW-8E-1A(SW) TEL	8-line Multiline Terminal without LCD
ETW-16C-1A(SW) TEL	16-line Multiline Terminal with LCD
ETW-24S-1A(SW) TEL	24-line Multiline Terminal with LCD
EDW-48-2A(SW) Console	48-button DSS/BLF Console with 12 additional function buttons

☞ ETW-type TEL are not available in New Zealand.

7.2 Interface ETUs

The slots in the Xen Master KSUs are completely flexible except for the first slot in each KSU that is reserved for the CPUB( )-U13 ETU or EXP-U13 ETU. *Table 3-2 Interface Slot and System Port Numbers for a Xen System* shows the slot and port numbers.

The MIFA-U13 ETU must be installed in the ISA slot for MIS (part of the ACD feature) to work.

MIFM-U13 ETU must be installed in slots S1 or S2 for the internal socket modem to work. It can be installed in the ISA slot or S1/S2 if a locally provided external modem is used.

The slots in the Xen Axis KSU are also flexible in their cord assignments, except for some specific cases which will be detailed later in this manual. Slot 1 is dedicated to the first eight ESI ports and is actually built in to the mainboard along with the system's CPU.

The MIFM-U13 ETU must be installed in slot S2 for the internal socket modem to work.

A6-324000-642-01 – Release 6.0
April 2003

Basic and Expansion KSUs for CPUB-U13 ETU

Table 3-1

2nd EXP KSU		136	144	152	160	168	176	184	192
		135	143	151	159	167	175	183	191
		134	142	150	158	166	174	182	190
		133	141	149	157	165	173	181	189
		132	140	148	156	164	172	180	188
		131	139	147	155	163	171	179	187
		130	138	146	154	162	170	178	186
		129	137	145	153	161	169	177	185
		S1	S2	S3	S4	S5	S6	S7	S8

Table 3-2

1st EXP KSU		72	80	88	96	104	112	120	128
		71	79	87	95	103	111	119	127
		70	78	86	94	102	110	118	126
		69	77	85	93	101	109	117	125
		68	76	84	92	100	108	116	124
		67	75	83	91	99	107	115	123
		66	74	82	90	98	106	114	122
		65	73	81	89	97	105	113	121
		S1	S2	S3	S4	S5	S6	S7	S8

Table 3-3

Basic KSU	ISA BUS SLOT	8	16	24	32	40	48	56	64
		7	15	23	31	39	47	55	63
		6	14	22	30	38	46	54	62
		5	13	21	29	37	45	53	61
		4	12	20	28	36	44	52	60
		3	11	19	27	35	43	51	59
		2	10	18	26	34	42	50	58
		1	9	17	25	33	41	49	57
		S1	S2	S3	S4	S5	S6	S7	S8

Table 3-2 Interface Slot and System Port Numbers for a Xen System

A6-324000-642-01 – Release 6.0
April 2003

Table 3-3 Interface Slot and System Port Numbers for Xen Axis System

Mainboard	8		16	24	32	40	48
	7		15	23	31	39	47
	6		14	22	30	38	46
	5		13	21	29	37	45
	4		12	20	28	36	44
	3		11	19	27	35	43
	2		10	18	26	34	42
	1		9	17	25	33	41
	S1	S2	S3	S4	S5	S6	S7

7.2.1 Determining Telephone and CO Port Numbers

Telephone and CO Ports numbers are provided with the Xen System. Port numbers are used to count the station numbers and trunk numbers when programming System Data. The examples below indicates how the station and trunk numbers can be used.

Xen Master:

Table 3-4 Sample Master Configuration

Slot	ETU
ISA	MIFM-U13
S1	ESI(8)-U13
S2	TLI(2)-U13
S3	CO1(8)-U13
S4	PRI(1)-U13 (10ch.)
S5	Open
S6	VMS(8)-U13
S7	CNF(8)-U13
S8	SLI(4)-U13

Table 3-5 Telephone and CO Port Nos Example

MIF 01	Telephone Ports 1 ~ 8	Trunk Ports 1 ~ 4	Trunk Ports 5 ~ 12	Trunk Ports 13 ~ 20	Trunk Ports 21 ~ 30	Telephone Ports 9 ~ 16	Telephone Ports 17 ~ 24	Telephone Ports 25 ~ 28
ISA	S1	S2	S3	S4	S5	S6	S7	S8

Xen Axis:

Slot	ETU
S1	ESI(8)-U13 (Built-in)
S2/ISA	MIFM-U13
S3	COI(8)-U13
S4	TLI(2)-U13
S5	ESI(8)-U13
S6	SLI(8)-U13
S7	VMS(8)-U13

Table 3-6 Sample Axis Port Assignment

Telephone Ports 1 ~ 8	MIF 01	Ports 1~8	Telephone Ports 9~10	Telephone Ports 9~16	Telephone Ports 17~24	Telephone Ports 25~32
S1	S2	S3	S4	S5	S6	S7

7.2.2 Determining the Number of Required Interface ETUs

Table 3-7 Number of Required Interface ETUs indicates each feature and the associated hardware necessary for the operation of the feature.

Table 3-7 Number of Required Interface ETUs

Feature	Required ETU or Unit	Required Feature Key	Maximum ETUs per System
Least Cost Routing	MIFM-U13	KMM(XXX)UA or KML(XXX)UA	1
SMDR	MIFM-U13	None	1
PC Programming	MIFM-U13	None	1
Caller ID (Refer to Note)	MIFM-U13	KMM(XXX)UA	1
Uniform Call Distribution	MIFA-U13	None	1
Automatic Call Distribution (Xen Master Only)	MIFA-U13	KMA(XXX)UA	1

Note: The Caller ID feature works without the MIFM-U13 ETU. However, the Caller ID scrolling and dialling functions both require the MIFM-U13 ETU.

A6-324000-642-01 – Release 6.0
April 2003

7.2.3 PBR Requirements

The Xen Master and Xen Axis systems have four built-in Push Button Receiver (PBR) circuits on the CPUB ( )-U13 ETUs and B48( )-U13 KSU mainboard respectively. The PBR circuit detects and translates DTMF tones generated by Single Line Telephones, facsimile machines, modems, and analogue voice mail ports. Incoming DTMF signals can also be detected from a CO trunk using the DISA features. The system Auto Attendant feature and DISA feature must use the PBR circuits built in to the CPU card/ mainboard.

An optional PBR( )-U13 ETU can be installed providing an additional four circuits. The number of PBR circuits needed depends on the number of Single Line Telephones, facsimile machines, modems, and analogue voice mail ports needed. If Automated Attendant and DISA trunks are connected to the system, these must also be taken into consideration.

A6-324000-642-01 – Release 6.0
April 2003

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Installing KSUs

CHAPTER 4

SECTION 1 GENERAL INFORMATION

This chapter provides the information necessary to install the KSUs for the Xen system. The technician should be familiar with this section before installing any equipment.

SECTION 2 SITE PREPARATION AND MDF/IDF CONSTRUCTION

Planning the installation before actually installing the system is advisable. Advanced planning minimizes installation time, cost and disruption of the customer business activities.

2.1 Precautionary Information

Observe the following warnings during installation.

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- 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 installing at the customer premise. This can help reduce the time spent installing at the customer site to reduce their downtime.

A6-324000-642-01 – Release 6.0
April 2003

2.3 Selecting the Best Location for Proper Installation

2.3.1 Selecting the KSU Installation Site

When a site is selected for the installation of the KSU the following conditions should be considered to ensure proper installation.

- KSUs are normally wall mounted to protect against accident or flooding.
- The KSU should not be located directly beneath pipes. Should leaks or condensation occur, damage could be caused to the Xen 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 4.2.2 Environmental Conditions in Chapter 2 System Specifications.
- The operation of the system is virtually noiseless and allows wide selection of installation sites. Care should be taken to ensure the KSUs do not present a hazard to office traffic. To minimize cabling costs, a centralized location should be chosen.
- The KSU must be located at a site where it can easily be connected to a dedicated AC power source.
- Connect the KSU **only** to a dedicated AC receptacle that is not being used for any other devices such as computers, copiers, or facsimile machines. Ensure that the AC outlet is properly grounded.
- Avoid installing the KSU in the vicinity of a radio receiver.

A6-324000-642-01 – Release 6.0
April 2003

2.3.2 Selecting a Permanent MDF Location

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

- Limited space is available for installation, 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.

When the technician encounters these situations, he 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 selected for the installation of the telephones, the following conditions should be considered to ensure proper installation.

- Ensure that the cable length and line resistance (loop), between the KSU and the telephones, comply with the specifications show in Chapter 2, *Table 2-3 Multiline Terminal Loop Resistance and Cable Length*.
- Some devices require an external power supply. Select a place where they can be easily connected to an AC outlet.

A6-324000-642-01 – Release 6.0
April 2003

2.4 Cabling to the Main Distribution Frame (MDF)

The Xen KSU is connected to each of the Multiline Terminals, Single Line Telephones, optional equipment, CO/PBX, DID, ISDN, on a 4-wire E&M Tie lines (Types I and V) by separate twisted-pair cable through the MDF. The 4-wire E&M Tie lines and ISDN lines require multiple twisted-pair cabling. *Refer to Table 4-1 MDF Cable Connections - Xen Master* and *Refer to Table 4-3 MDF Cable Connections - Xen Axis* which provide the necessary cabling information.

Table 4-1 MDF Cable Connections - Xen Master

MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI/ COID(8)	COI/ COID(4)	DID(4)	BRT(4)	PRT(1)	ECR	DPH	TLI(2)
First ETU																	
26	1	WH	BK	T	T	T	T	-Rx-1	-Rx-1	T	T	T	+Rx-1	+Rx	EP Zone 3	DP1	GND
1		BL	YL	R	R	R	R	+Rx-1	+Rx-1	R	R	R	-Rx-1	-Rx			
27	2	WH	BK	T	T	T	T	-Tx-1	-Tx-1	T	T	T	+Tx-1	+Tx	EP Zone 2	DP2	E-1
2		OR	YL	R	R	R	R	+Tx-1	+Tx-1	R	R	R	-Tx-1	-Tx			M-1
28	3	WH	BK	T	T	T			-Rx-2	T	T	T	+Rx-2		EP Zone 1	DP3	T-1
3		GR	YL	R	R	R			+Rx-2	R	R	R	-Rx-2				R-1
29	4	WH	BK	T	T	T			-Tx-2	T	T	T	+Tx-2		Night Chime	DP4	T1-1
4		BR	YL	R	R	R			+Tx-2	R	R	R	-Tx-2				R1-1
30	5	WH	BK	T	T			-Rx-2		T			+Rx-3		External Tone Ringer 4	DLR 1	GND
5		SL	YL	R	R			+Rx-2		R			-Rx-3				
31	6	WH	BK	T	T			-Tx-2		T			+Tx-3		External Tone Ringer 3	DLR 2	E-2
6		BL–WH	YL	R	R			+Tx-2		R			-Tx-3				M-2
32	7	WH	BK	T	T					T			-Rx-4		External Tone Ringer 2	DLR 3	T-2
7		BL–OR	YL	R	R					R			-Rx-4				R-2
33	8	WH	BK	T	T					T			+Tx-r		External Tone Ringer 1	DLR 4	T1-2
8		BL–GR	YL	R	R					R			-Tx-4				R1-2

A6-324000-642-01 – Release 6.0
April 2003

MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI/ COID(8)	COI/ COID(4)	DID(4)	BRT(4)	PRT(1)	ECR	DPH	TLI(2)
Second ETU																	
34	1	WH	BK	T	T	T	T	-Rx-1	-Rx-1	T	T	T	+Rx-1		EP Zone 3	DP1	GND
9		BL–BR	YL	R	R	R	R	+Rx-1	+Rx-1	R	R	R	-Rx-1				
35	2	WH	BK	T	T	T	T	-Tx-1	-Tx-1	T	T	T	+Tx-1		EP Zone 2	DP2	E-1
10		BL–SL	YL	R	R	R	R	+Tx-1	+Tx-1	R	R	R	-Tx-1				M-1
36	3	WH	BK	T	T	T			-Rx-2	T	T	T	+Rx-2		EP Zone 1	DP3	T-1
11		OR–WH	YL	R	R	R			+Rx-2	R	R	R	-Rx-2				R-1
37	4	WH	BK	T	T	T			-Tx-2	T	T	T	+Tx-2		Night Chime	DP4	T1-1
12		OR–GR	YL	R	R	R			+Tx-2	R	R	R	-Tx-2				R1-1
38	5	WH	BK	T	T			-Rx-2		T			+Rx-3		External Tone Ringer 4	DLR 1	GND
13		OR–BR	YL	R	R			+Rx-2		R			-Rx-3				
39	6	WH	BK	T	T			-Tx-2		T			+Tx-3		External Tone Ringer 3	DLR 2	E-2
14		OR–SL	YL	R	R			+Tx-2		R			-Tx-3				M-2
40	7	WH	BK	T	T					T			-Rx-4		External Tone Ringer 2	DLR 3	T-2
15		GR–WH	YL	R	R					R			-Rx-4				R-2
41	8	WH	BK	T	T					T			+Tx-4		External Tone Ringer 1	DLR 4	T1-2
16		GR–BR	YL	R	R					R			-Tx-4				R1-2

MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI/ COID(8)	COI/ COID(4)	DID(4)	BRT(4)	PRT(1)	ECR	DPH	TLI(2)
Third ETU																	
42	1	WH	BK	T	T	T	T	-Rx-1	-Rx-1	T	T	T	+Rx-1		EP Zone 3	DP1	GND
17		GR-SL	YL	R	R	R	R	+Rx-1	+Rx-1	R	R	R	-Rx-1				
43	2	WH	BK	T	T	T	T	-Tx-1	-Tx-1	T	T	T	+Tx-1		EP Zone 2	DP2	E-1
18		BR-WH	YL	R	R	R	R	+Tx-1	+Tx-1	R	R	R	-Tx-1				M-1
44	3	WH	BK	T	T	T			-Rx-2	T	T	T	+Rx-2		EP Zone 1	DP3	T-1
19		BR-SL	YL	R	R	R			+Rx-2	R	R	R	-Rx-2				R-1
45	4	WH	BK	T	T	T			-Tx-2	T	T	T	+Tx-2		Night Chime	DP4	T1-1
20		SL-WH	YL	R	R	R			+Tx-2	R	R	R	-Tx-2				R1-1
46	5	Y	Bk	T	T			-Rx-2		T			+Rx-3		External Tone Ringer 4	DLR 1	GND
21		BL	YL	R	R			+Rx-2		R			-Rx-3				
47	6	Y	BK	T	T			-Tx-2		T			+Tx-3		External Tone Ringer 3	DLR 2	E-2
22		OR	YL	R	R			+Tx-2		R			-Tx-3				M-2
48	7	Y	BK	T	T					T			-Rx-4		External Tone Ringer 2	DLR 3	T-2
23		GR	YL	R	R					R			-Rx-4				R-2
49	8	Y	BK	T	T					T			+Tx-4		External Tone Ringer 1	DLR 4	T1-2
24		BR	YL	R	R					R			-Tx-4				R1-2
50	–	Y															
25		SL															

- 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, S8 and PFT.

A6-324000-642-01 – Release 6.0
April 2003

Table 4-2 Power Fail Transfer Connections - Xen Master

MDF Pin Number	PFT Connection	
42 17 43 18 44 19		Not used.
45 20 46 21 47 22	PFT2 - CO (Tip) PFT2 - CO (Ring) PFT2 - SLI (Tip) PFT2 - SLI (Ring) PFT2 - SLT (Tip) PFT2 - SLT (Ring)	Power Failure Transfer Relay 2
48 23 49 24 50 25	PFT3 - CO (Tip) PFT3 - CO (Ring) PFT3 - SLI (Tip) PFT3 - SLI (Tip) PFT3 - SLT (Tip) PFT3 - SLT (Tip)	Power Failure Transfer Relay 3

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

Table 4-3 MDF Cable Connections - Xen Axis

	MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI(8)	COID(8)	COI(4)	COID(4)	DID(4)	TLI(2)	BRT(4)	PRI(1)	ECR	DPH
	Amphenol 1																			
SLOT 1	26	1	WH	BK	T															
	1		BL	YL	R															
	27	2	WH	BK	T															
	2		OR	YL	R															
	28	3	WH	BK	T															
	3		GR	YL	R															
	29	4	WH	BK	T															
	4		BR	YL	R															
	30	5	WH	BK	T															
	5		SL	YL	R															
	31	6	WH	BK	T															
	6		BL–WH	YL	R															
	32	7	WH	BK	T															
	7		BL–OR	YL	R															
	33	8	WH	BK	T															
	8		BL–GR	YL	R															
SLOT 3	34	1	WH	BK	T	T	T	T		-RX-1	T	T	T	T	T	GND	+Rx1		EP Zone 3	DP1
	9		BL–BR	YL	R	R	R	R		+RX-1	R	R	R	R	R		-Rx1			
	35	2	WH	BK	T	T	T	T		-TX-1	T	T	T	T	T	E-1	+Tx1		EP Zone 2	DP2
	10		BL–SL	YL	R	R	R	R		+TX-1	R	R	R	R	R	M-1	-Tx1			
	36	3	WH	BK	T	T	T			-RX-2	T	T	T	T	T	T-1	+Rx2		EP Zone 1	DP3
	11		OR–WH	YL	R	R	R			+RX-2	R	R	R	R	R	R-1	-Rx2			
	37	4	WH	BK	T	T	T			-TX-2	T	T	T	T	T	T1-1	+Tx2		Night Chime	DP4
	12		OR–GR	YL	R	R	R			+TX-2	R	R	R	R	R	R1-1	-Tx2			
	38	5	WH	BK	T	T					T	T				GND	+Rx3		External Tone Ringer 4	DLR 1
	13		OR–BR	YL	R	R					R	R					-Rx3			
	39	6	WH	BK	T	T					T	T				E-2	+Tx3		External Tone Ringer 3	DLR 2
	14		OR–SL	YL	R	R					R	R				M-2	-Tx3			
	40	7	WH	BK	T	T					T	T				T-2	-Rx4		External Tone Ringer 2	DLR 3
	15		GR–WH	YL	R	R					R	R				R-2	-Rx4			
	41	8	WH	BK	T	T					T	T				T1-2	+Tx4		External Tone Ringer 1	DLR 4
	16		GR–BR	YL	R	R					R	R				R1-2	-Tx4			

A6-324000-642-01 – Release 6.0
April 2003

	MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI(8)	COID(8)	COI(4)	COID(4)	DID(4)	TLI(2)	BRT(4)	PRI(1)	ECR	DPH
SLOT 4	42	1	WH	BK	T	T	T	T		-RX-1	T	T	T	T	T	GND	+Rx1	+Rx	EP Zone 3	DP 1
	17		GR–SL	YL	R	R	R	R		+RX-1	R	R	R	R	R		-Rx1	-Rx		
	43	2	WH	BK	T	T	T	T		-TX-1	T	T	T	T	T	E-1	+Tx1	+Tx	EP Zone 2	DP 2
	18		BR-WH	YL	R	R	R	R		+TX-1	R	R	R	R	R	M-1	-Tx1	-Tx		
	44	3	WH	BK	T	T	T			-RX-2	T	T	T	T	T	T-1	+Rx2		EP Zone 1	DP 3
	19		BR–SL	YL	R	R	R			+RX-2	R	R	R	R	R	R-1	-Rx2			
	45	4	WH	BK	T	T	T			-TX-2	T	T	T	T	T	T1-1	+Tx2		Night Chime	DP 4
	20		SL–WH	YL	R	R	R			+TX-2	R	R	R	R	R	R1-1	-Tx2			
	46	5	Y	Bk	T	T					T	T				GND	+Rx-3		External Tone Ringer 4	DLR 1
	21		BL	YL	R	R					R	R					-Rx-3			
	47	6	Y	BK	T	T					T	T				E-2	+Tx-3		External Tone Ringer 3	DLR 2
	22		OR	YL	R	R					R	R				M-2	-Tx-3			
	48	7	Y	BK	T	T					T	T				T-2	-Rx-4		External Tone Ringer 2	DLR 3
	23		GR	YL	R	R					R	R				R-2	-Rx-4			
	49	8	Y	BK	T	T					T	T				T1-2	+Tx-4		External Tone Ringer 1	DLR 4
	24		BR	YL	R	R					R	R				R1-2	-Tx-4			
	50	TO CO MDF FOR PFT																		
	25																			

	MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI(8)	COID(8)	COI(4)	COID(4)	DID(4)	TLI(2)	BRT(4)	PRI(1)	ECR	DPH
	Amphenol 2																			
SLOT 5	26	1	WH	BK	T	T	T	T		+TX-1	T		T		T	GND				
	1		BL	YL	R	R	R	R		+RX-1	R		R		R					
	27	2	WH	BK	T	T	T	T		-TX-1	T		T		T	E-1			EP Zone 2	DP2
	2		OR	YL	R	R	R	R		+TX-1	R		R		R	M-1				
	28	3	WH	BK	T	T	T			-RX-2	T		T		T	T-1			EP Zone 1	DP3
	3		GR	YL	R	R	R			+RX-2	R		R		R	R-1				
	29	4	WH	BK	T	T	T			-TX-2	T		T		T	T1-1			Night Chime	DP4
	4		BR	YL	R	R	R			+TX-2	R		R		R	R1-1				
	30	5	WH	BK	T	T					T					GND			External Tone Ringer 4	DLR 1
	5		SL	YL	R	R					R									
	31	6	WH	BK	T	T					T					E-2			External Tone Ringer 3	DLR 2
	6		BL–WH	YL	R	R					R					M-2				
	32	7	WH	BK	T	T					T					T-2			External Tone Ringer 2	DLR 3
	7		BL–OR	YL	R	R					R					R-2				
	33	9	WH	BK	T	T					T					T1-2			External Tone Ringer 1	DLR 4
	8		BL–GR	YL	R	R					R					R1-2				

	MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI(8)	COID(8)	COI(4)	COID(4)	DID(4)	TLI(2)	BRT(4)	PRI(1)	ECR	DPH
SLOT 6	34	1	WH	BK	T	T	T	T	-Rx-1	-RX-1	T		T		T	GND			EP Zone 3	DP1
	9		BL–BR	YL	R	R	R	R	+Rx-1	+RX-1	R		R		R					
	35	2	WH	BK	T	T	T	T	-Tx-1	-TX-1	T		T		T	E-1			EP Zone 2	DP2
	10		BL–SL	YL	R	R	R	R	+Tx-1	+TX-1	R		R		R	M-1				
	36	3	WH	BK	T	T	T			-RX-2	T		T		T	T-1			EP Zone 1	DP3
	11		OR–H	YL	R	R	R			+RX-2	R		R		R	R-1				
	37	4	WH	BK	T	T	T			-TX-2	T		T		T	T1-1			Night Chime	DP4
	12		OR–R	YL	R	R	R			+TX-2	R		R		R	R1-1				
	38	5	WH	BK	T	T			-Rx-2		T					GND			External Tone Ringer 4	DLR 1
	13		OR–BR	YL	R	R			+Rx-2		R									
	39	6	WH	BK	T	T			-Tx-2		T					E-2			External Tone Ringer 3	DLR 2
	14		OR–SL	YL	R	R			+Tx-2		R					M-2				
	40	7	WH	BK	T	T					T					T-2			External Tone Ringer 2	DLR 3
	15		GR–WH	YL	R	R					R					R-2				
	41	8	WH	BK	T	T					T					T1-2			External Tone Ringer 1	DLR 4
	16		GR–BR	YL	R	R					R					R1-2				

	MDF Pin No.	Circuit No.	Running Cable	Station Cable	ESI(8)	SLI(8)	SLI(4)	OPX(2)	BIU(2)	BSU(2)	COI(8)	COID(8)	COI(4)	COID(4)	DID(4)	TLI(2)	BRT(4)	PRI(1)	ECR	DPH
SLOT 7	42	1	WH	BK	T	T	T	T	-Rx-1	-RX-1	T		T		T	GND			EP Zone 3	DP
	17		GR–SL	YL	R	R	R	R	+Rx-1	+RX-1	R		R		R					
	43	2	WH	BK	T	T	T	T	-Tx-1	-TX-1	T		T		T	E-1			EP Zone 2	DP2
	18		BR-WH	YL	R	R	R	R	+Tx-1	+TX-1	R		R		R	M-1				
	44	3	WH	BK	T	T	T			-RX-2	T		T		T	T-1			EP Zone 1	DP3
	19		BR–SL	YL	R	R	R			+RX-2	R		R		R	R-1				
	45	4	WH	BK	T	T	T			-TX-2	T		T		T	T1-1			Night Chime	DP4
	20		SL–WH	YL	R	R	R			+TX-2	R		R		R	R1-1				
	46	5	Y	BK	T	T			-Rx-2		T					GND			External Tone Ringer 4	DLR 1
	21		BL	YL	R	R			+Rx-2		R									
	47	6	Y	BK	T	T			-Tx-2		T					E-2			External Tone Ringer 3	DLR 2
	22		OR	YL	R	R			+Tx-2		R					M-2				
	48	7	Y	BK	T	T					T					T-2			External Tone Ringer 2	DLR 3
	23		GR	YL	R	R					R					R-2				
	49	8	Y	BK	T	T					T					T1-2			External Tone Ringer 1	DLR 4
	24			YL	R	R					R					R1-2				
	50	EXTERNAL PAGE OUTPUT																		
	25																			

☞ Slot 1 is ESI(8)-U13 built-in on the MBD-U13 Unit.

☞ Slot 2 does not have MDF connections. This slot can only be used for VRS, PBR, VDH, MIFM, CNF, VMS and FMS.

A6-324000-642-01 – Release 6.0
April 2003

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 dialling type (10 pps, 20 pps, or DTMF) where it is connected. *Refer to Figure 4-1 Xen Master - Power Failure Transfer Connection*, Section 2 - *2.6 Fax CO Branch Connection*, *Table 4-2 Power Fail Transfer Connections - Xen Master* and *Figure 4-2 Xen Axis - Power Failure Transfer Connection*.

Note: The relay is shown with the power ON.

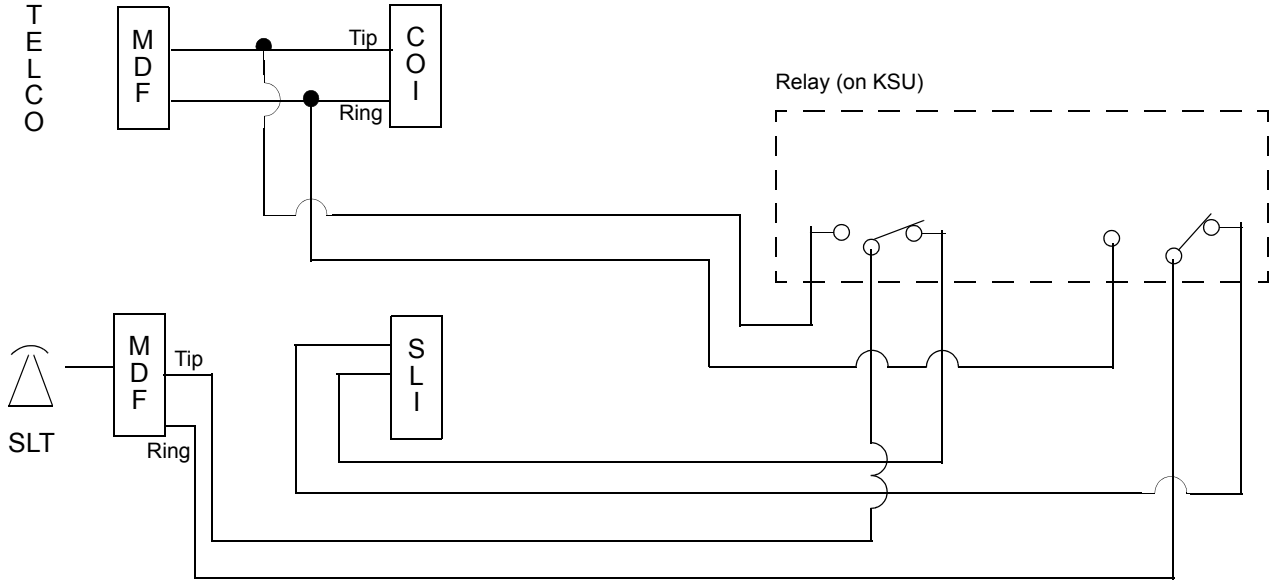


Figure 4-1 Xen Master - Power Failure Transfer Connection

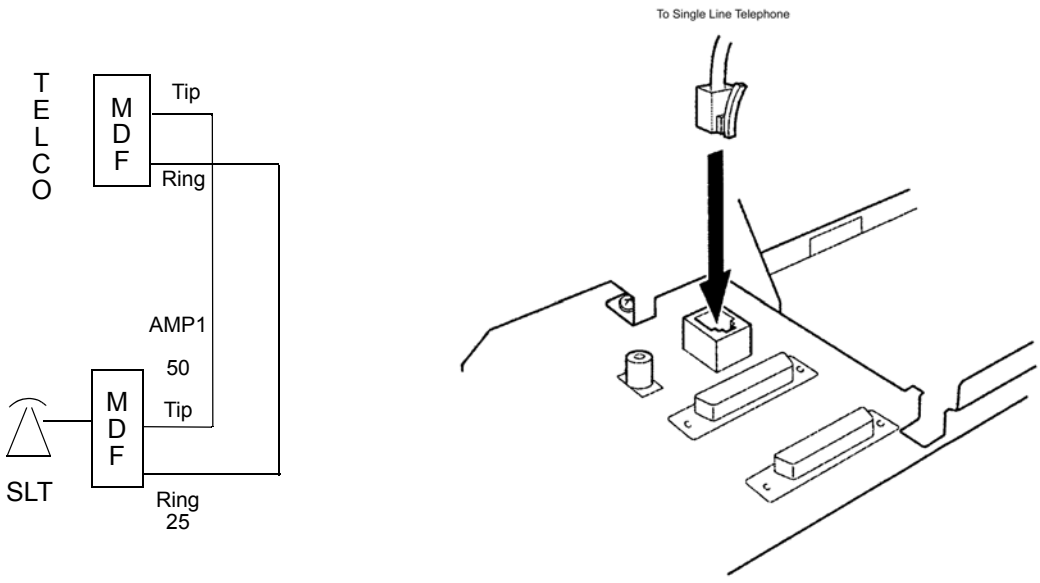


Figure 4-2 Xen Axis - Power Failure Transfer Connection

2.6 Fax CO Branch Connection

This connection is made via the fourth port on any COI(4)-U13 or COID(4)-U13 ETU. Refer to Figure 4-1 Typical Full MDF Layout. The facsimile machine is connected to the eighth port for the specified slot where the COI(4)-U13 ETU is installed.

SECTION 3 INSTALLING THE XEN MASTER KSU

The compact design of the Xen Master KSUs provide easy installation. The information in this section provides detailed instructions for installing the KSUs.

Before installing the system; observe the following precautions

- Before beginning installation, be sure 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 with your hands.

3.1 General Information

3.1.1 Basic KSU

The B64-U13 KSU provides service for outside lines, Attendant Consoles, and interconnection of the station terminals. The B64-U13 KSU provides 64 ports and has two fixed and eight flexible slots. The fixed slots are reserved for the CPUB( )-U13 ETU and the MIF( )-U13 ETU. A Power Supply Unit (P64-U13 PSU) and backup batteries are provided with the basic KSU.

3.1.2 Expansion KSUs

The E64-U13 KSU is the expansion unit that can be attached to the basic KSU to provide an additional 64 ports. Two expansion units can be added to the Xen Master system, providing a maximum of 192 ports. Each expansion KSU provides eight flexible slots and accommodates 8-channel interface cards. A Power Supply Unit (P64-U13 PSU) and backup batteries are included with each expansion unit.

The installation instructions provided in this chapter apply to both the basic B64-U13 KSU and the expansion E64-U13 KSUs unless otherwise specified.

A6-324000-642-01 – Release 6.0
April 2003

3.2 Removing the KSU Cover

The front cover must be removed to access the battery, cables and ETU slots:

1. Loosen the screw that is located near the on/off switch, on the right side of the KSU. Do not remove screw from the unit.
2. Remove the front panel by sliding it to the right and pulling it outward.

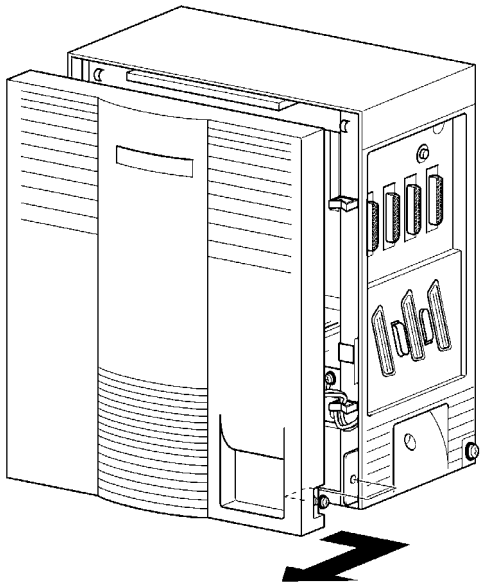


Figure 4-3 Removing the Front Panel of the KSU

3.3 Installing a Front Cover Extender (FCE-U13 Unit)

When installing a VDH2(8)-U13 ETU, a Front Cover Extender is required to allow for the cabling.

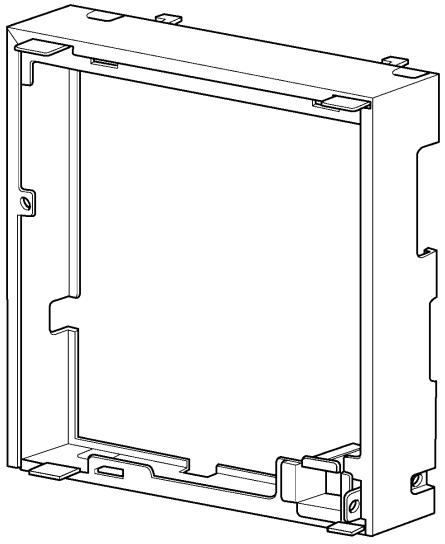


Figure 4-4 Front Cover Extender (FCE-U13 Unit)

1. Install the ETU in the KSU and connect the applicable cables.

   When installing a VDH2(8)-U13 ETU, mount the cable clamp on the KSU frame as shown in *Figure 4-5 Mounting the Cable Clamp on the KSU Frame*.

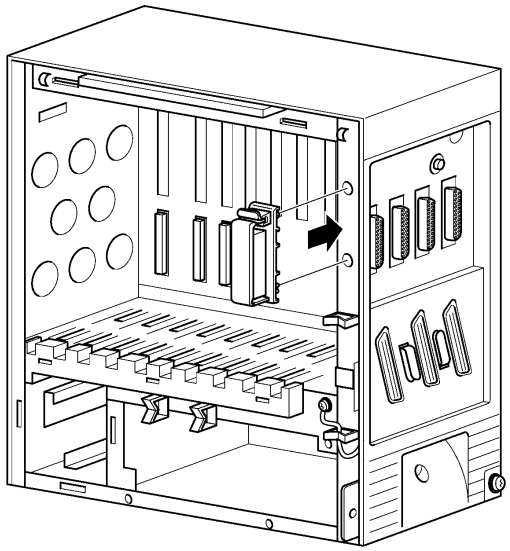


Figure 4-5 Mounting the Cable Clamp on the KSU Frame

2. Attach the sponge (provided) to the inner surface of the clamp lining and close the clamp over the cables as shown in *Figure 4-6 Attaching the Sponge to the Clamp*.

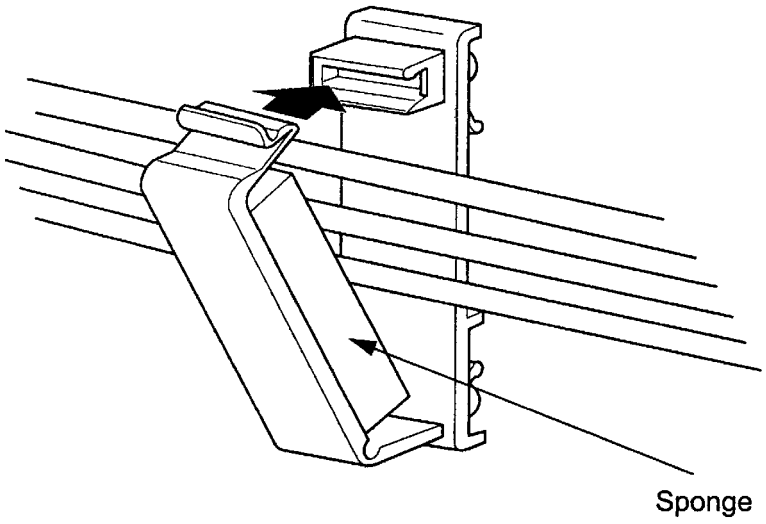


Figure 4-6 Attaching the Sponge to the Clamp

A6-324000-642-01 – Release 6.0
April 2003

3. Attach the front cover (previously removed) to the front cover extender using the two screws. Refer to *Figure 4-7 Attaching the Front Cover and Front Cover Extender*.

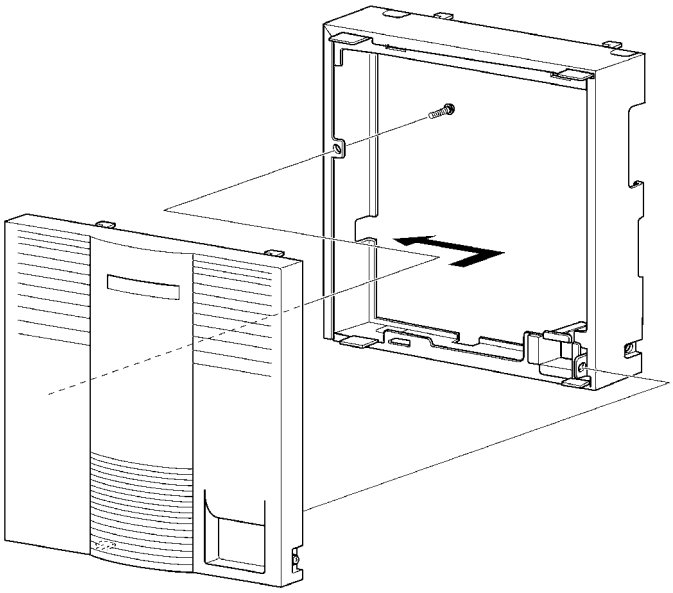


Figure 4-7 Attaching the Front Cover and Front Cover Extender

4. Attach the front cover and the front cover extender to the KSU by sliding the hooks (located on the top of the front extender cover) into the slots and fasten using the provided screw. Refer to *Figure 4-8 Attaching the Front Cover and the Front Cover Extender to the KSU*.

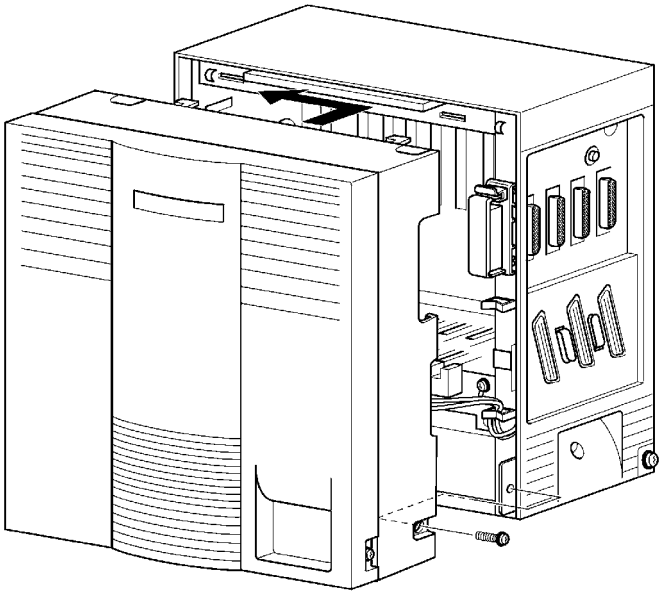


Figure 4-8 Attaching the Front Cover and the Front Cover Extender to the KSU

3.4 Securing Cables Using the Velcro Strap

When attaching the amphenol cables to the side of the KSU, they 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. Thread the velcro strap through the hook on the back side of the KSU.

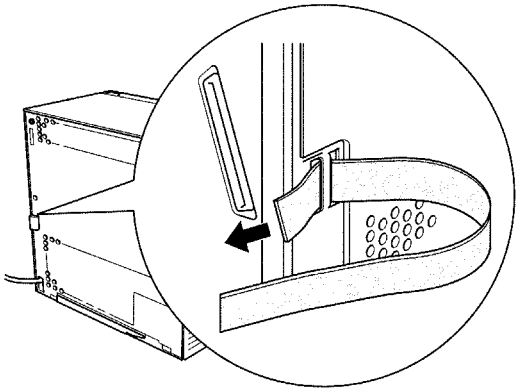


Figure 4-9 Threading the Velcro Strap Through the Hook on the KSU

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

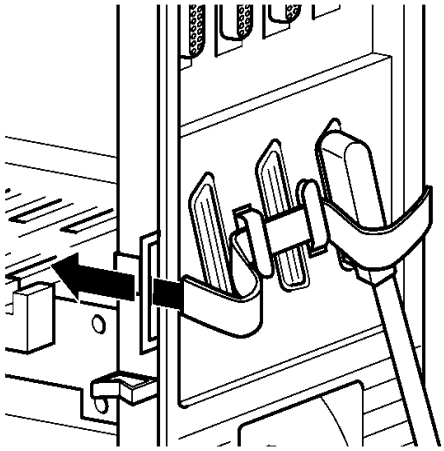


Figure 4-10 Threading the Velcro Strap to Secure One or Two Amphenol Cables

A6-324000-642-01 – Release 6.0
April 2003

3. When all three amphenol cables are used, the velcro strap is threaded around the cables and attached to the KSU.

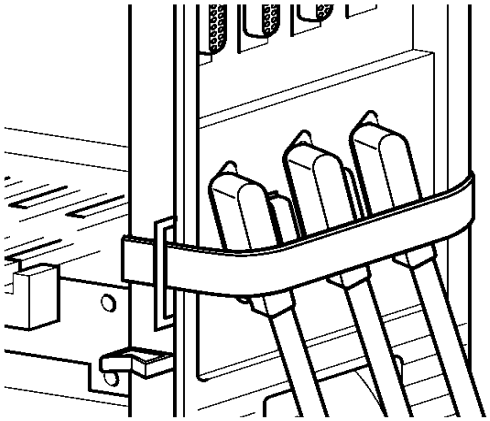


Figure 4-11 Threading the Velcro Strap to Secure Three Amphenol Cables

3.5 Wall Mounting the Basic KSU

1. Before wall mounting the KSU, the wall mount bracket should be attached to fire retardant plywood. Using the four (locally provided) screws, attach the wall mount bracket to the wall as shown in *Figure 4-12 Attaching the Wall Mount Bracket*.

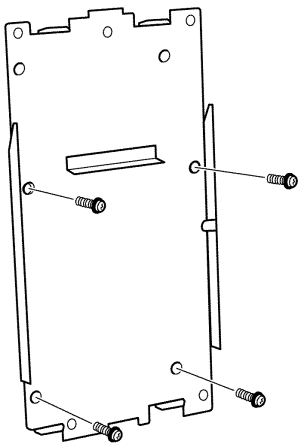


Figure 4-12 Attaching the Wall Mount Bracket

A6-324000-642-01 – Release 6.0
April 2003

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 4-14 Attaching the Wall Mount Bracket With Spacer.

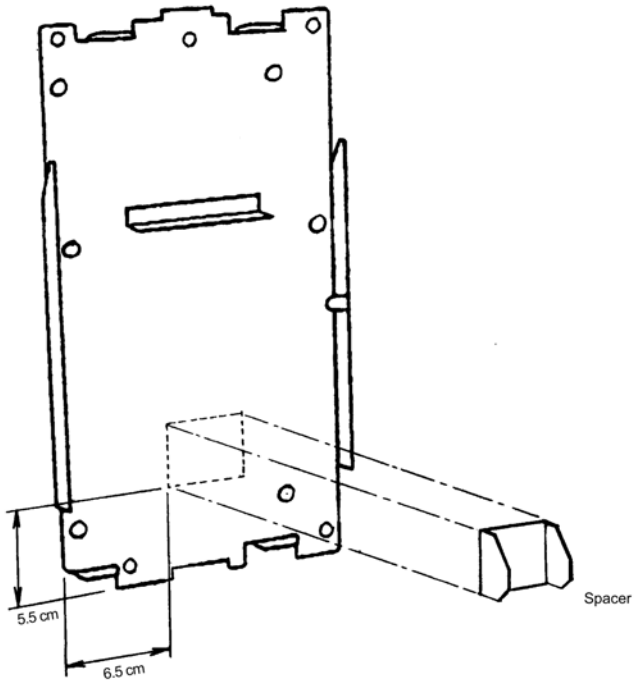


Figure 4-13 Attaching the Wall Mount Bracket Spacer

3. Hang the KSU on the two hooks protruding from the wall mount bracket as shown in *Figure 4-14 Hanging the Basic KSU on the Bracket*.

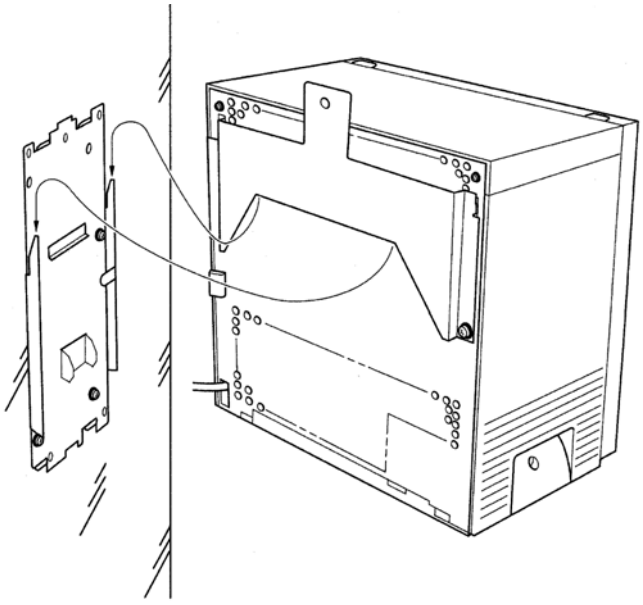


Figure 4-14 Hanging the Basic KSU on the Bracket

A6-324000-642-01 – Release 6.0
April 2003

4. Secure the KSU to the wall by placing a screw and washer (locally provided) into the hole in the centre of the wall mount bracket as shown in *Figure 4-15 Securing the Basic KSU to the Wall*.

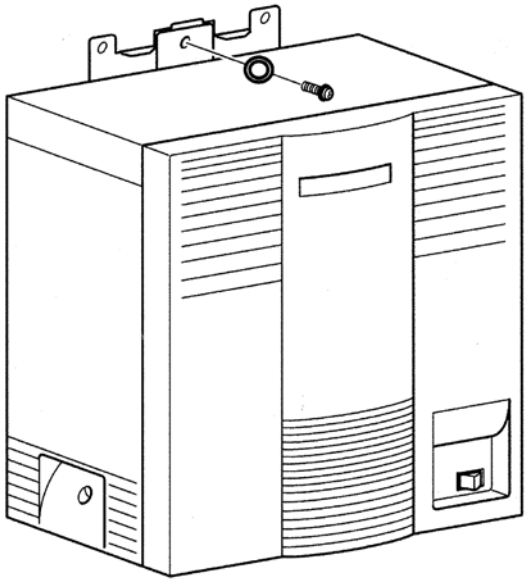


Figure 4-15 Securing the Basic KSU to the Wall

3.6 Wall Mounting the Expansion KSU

1. Position the bottom of the Expansion Wall Mount Bracket on to the top of the Basic Wall Mount Bracket and fasten with four (locally provided) screws. Refer to Figure 4-13 Attaching the Wall Mount Bracket and *Figure 4-16 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket*.

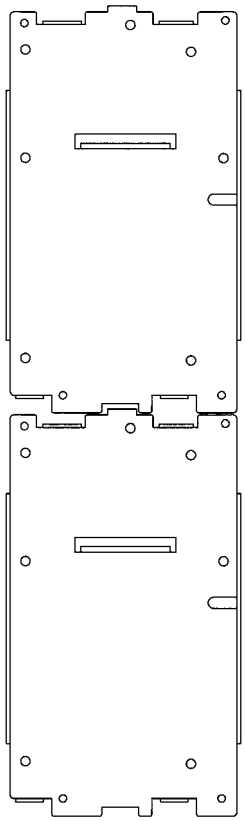


Figure 4-16 Attaching the Expansion Wall Mount Bracket to the Basic Wall Mount Bracket

2. Hang the KSU on the two hooks protruding from the expansion wall mount bracket as shown in *Figure 4-14 Hanging the Basic KSU on the Bracket*.
3. Secure the KSU to the wall by placing a screw (locally provided) into the hole in the centre of the wall mount bracket as shown in *Figure 4-15 Securing the Basic KSU to the Wall*.

A6-324000-642-01 – Release 6.0
April 2003

3.7 Floor Mounting the Basic KSU

A system may be floor mounted if a suitable wall is not available. The three KSUs of the system mount on top of each other in the following manner:

1. Using the four (locally provided) screws, 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 4-17 Floor Mounting the Basic KSU*.

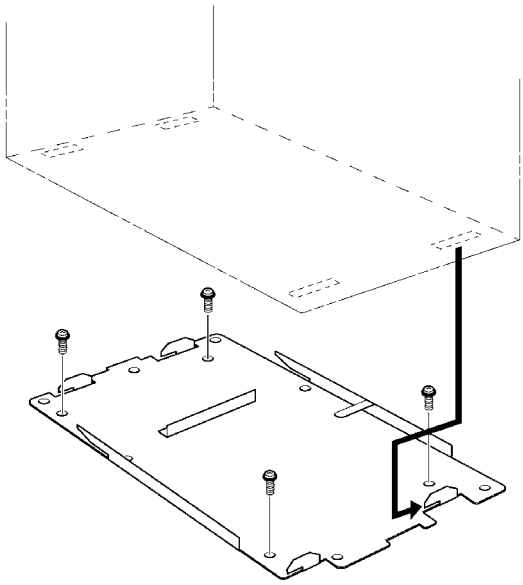


Figure 4-17 Floor Mounting the Basic KSU

3. Secure the KSU to the floor mounting bracket using the two screws as indicated in *Figure 4-18 Securing the KSU to the Floor Mounting Bracket*.

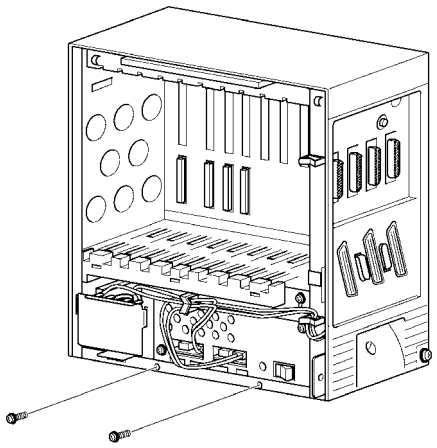


Figure 4-18 Securing the KSU to the Floor Mounting Bracket

3.8 Cable Routing

3.8.1 Connecting the Battery Expansion Cables on the KSU

1. Using the DC Expansion Cable (included with the EXP-U13 ETU) connect the **BATTERY EXT** on the Basic KSU to the **BATTERY EXT** of the Expansion KSU.

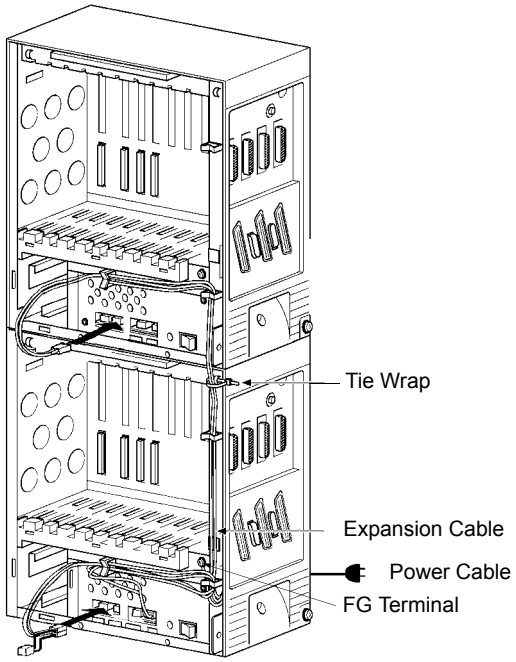


Figure 4-19 Connecting DC Expansion Cables

A6-324000-642-01 – Release 6.0
April 2003

2. When connecting an Expansion KSU, use the two screws to attach the FG plate to the Basic and Expansion KSUs. Refer to *Figure 4-20 Attaching the Frame Ground Plate*. (When installing a second Expansion KSU, another FG plate is required).

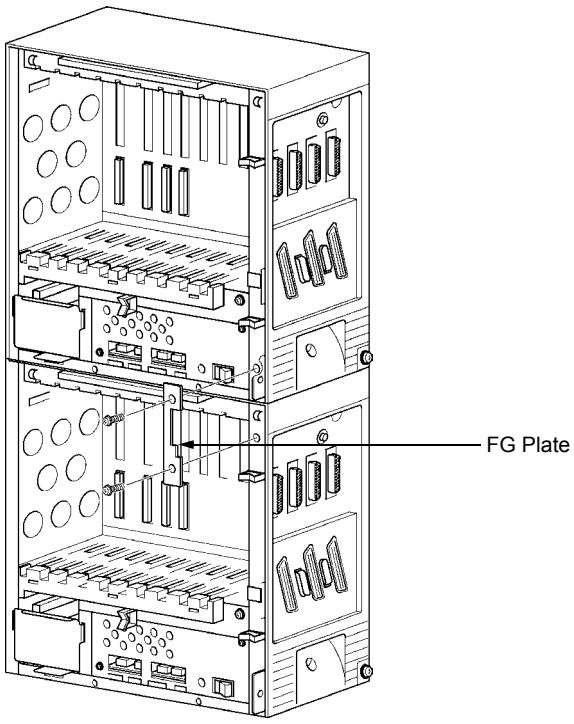


Figure 4-20 Attaching the Frame Ground Plate

3.8.2 Grounding Requirements

The KSUs must be properly grounded. B64-U13 and E64-U13 KSUs are provided with two grounding methods. The first method is via the protective earth pin of the 3-pin mains plug. In cases where 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 grounding cable (locally provided) must have an AWG greater than #16.*

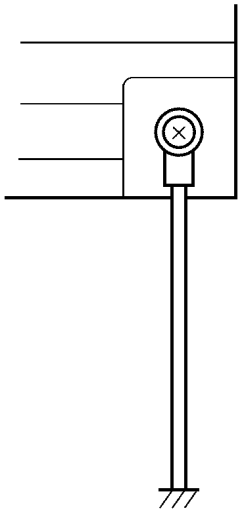


Figure 4-21 KSU Grounding

2. Provide a suitable ground inside of the building in accordance with local telephone company procedures.
3. If no suitable ground is available, a ground rod should be installed in accordance with the operating procedures of the local telephone company.

The Protective Earth and Telecommunications Reference Conductor (TRC) is permanently linked within the KSU, therefore, the Xen Master does not require the connection of an external TRC.

A6-324000-642-01 – Release 6.0
April 2003

3.9 Replacing the Power Supply Unit in the KSU

The Xen system is supplied with a P64-U13 PSU. The Power Supply Unit has a battery backup interface and accepts 240 Vac - 50Hz and outputs +5V and –24V to the system.

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

3.9.1 Installing the P64-U13 PSU

1. Locate the PSU in the space provided and connect the 8-wire cable from the PSU to the connector on the backboard of the KSU. Refer to *Figure 4-22 Connecting Wires to the PSU*.

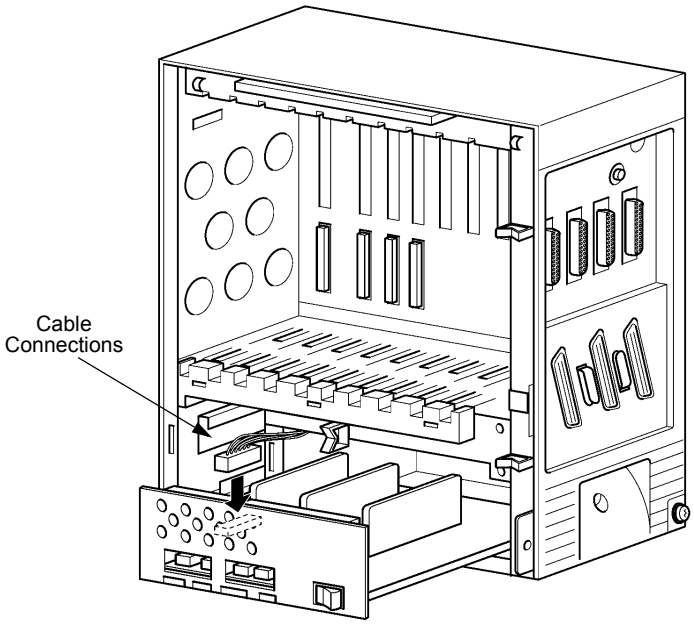


Figure 4-22 Connecting Wires to the PSU

2. Install the P64-U13 PSU into the bottom space of the KSU and attach to the KSU using the two provided screws. Refer to *Figure 4-23 Mounting the PSU onto the KSU*.

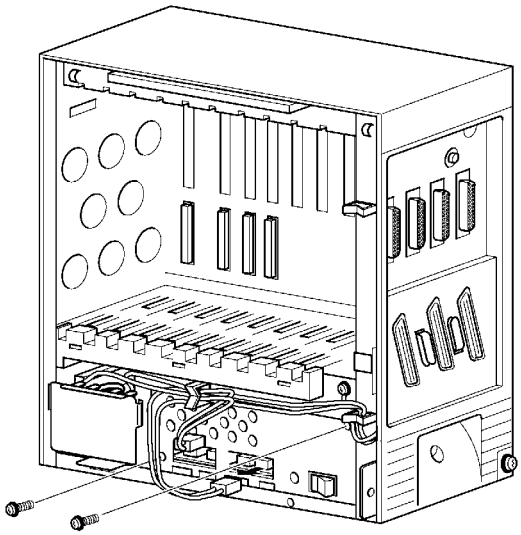


Figure 4-23 Mounting the PSU onto the KSU

3. Lead the KSU power cable through the clamp and connect the PSU as shown in *Figure 4-24 Connecting the PSU Power Cable to the Basic KSU*.

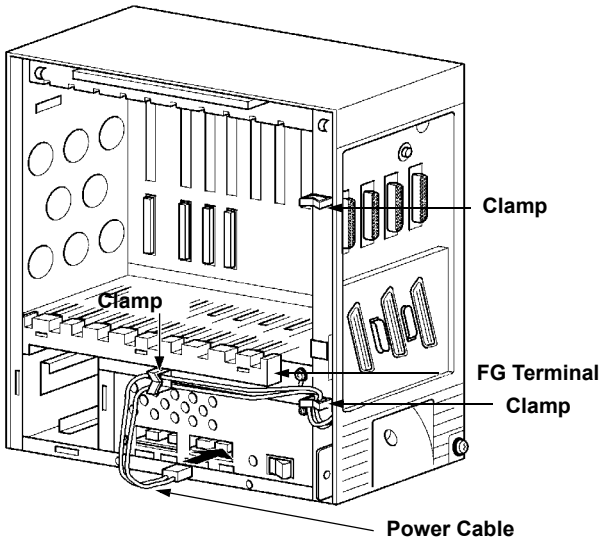


Figure 4-24 Connecting the PSU Power Cable to the Basic KSU

A6-324000-642-01 – Release 6.0
April 2003

3.9.2 Connecting Battery Expansion Cables to the Expansion KSU:

1. Using the Battery Expansion Cables (included in the Expansion KSU) lead the expansion cables through the clamps and tie them to the KSU with a tie wrap on the expansion KSU.

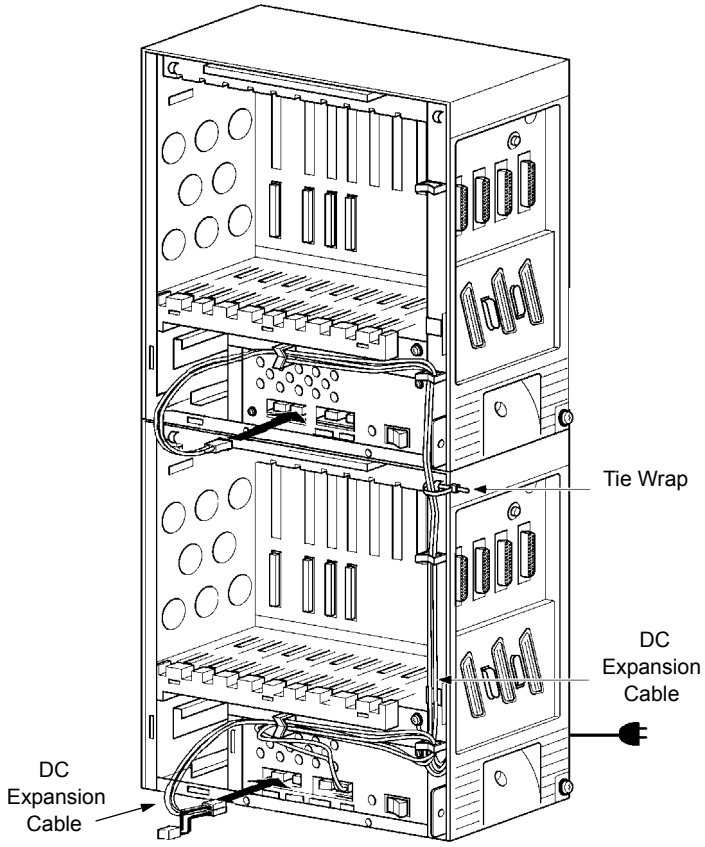


Figure 4-25 Connecting Battery Expansion Cables to the Expansion KSU

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

3.9.3 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 4-3 Removing the Front Panel of the KSU*).
2. Pull out the drawer that holds the PSU and disconnect the cable as shown in *Figure 4-26 Removing the PSU from the KSU*.

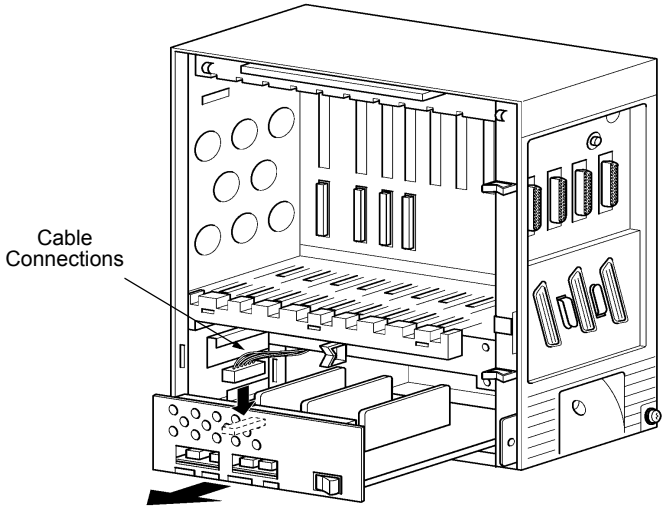


Figure 4-26 Removing the PSU from the KSU

3. Replace the fuses as necessary and return the PSU to the KSU. Fuse **F1** is a 250V, 2.5A fuse for AC input. Fuse **F101** is a 125V, 10A fuse for DC input.

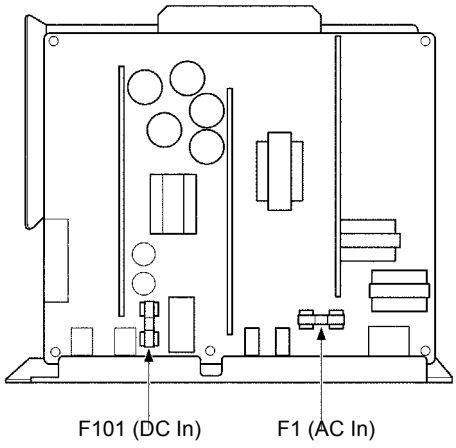


Figure 4-27 PSU Fuse Replacement

A6-324000-642-01 – Release 6.0
April 2003

3.10 Installing Built-In and External Batteries in the KSU

3.10.1 Built-In Battery Installation

1. Connect the two batteries in series as shown in *Figure 4-28 Connecting Built-In Batteries*. The red cord attaches to the **red** terminal and the black cord attaches to the **black** terminal.

Be careful not to misconnect the terminals of the batteries.

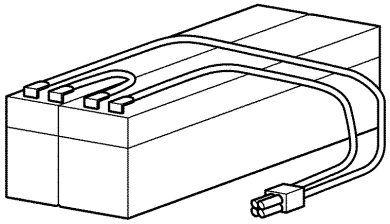


Figure 4-28 Connecting Built-In Batteries

2. Install the batteries into the bottom space at the left side the KSU. *Refer to Figure 4-29 Placing the Batteries into the KSU*.
3. Install the battery cover as illustrated in *Figure 4-29 Placing the Batteries into the KSU*.

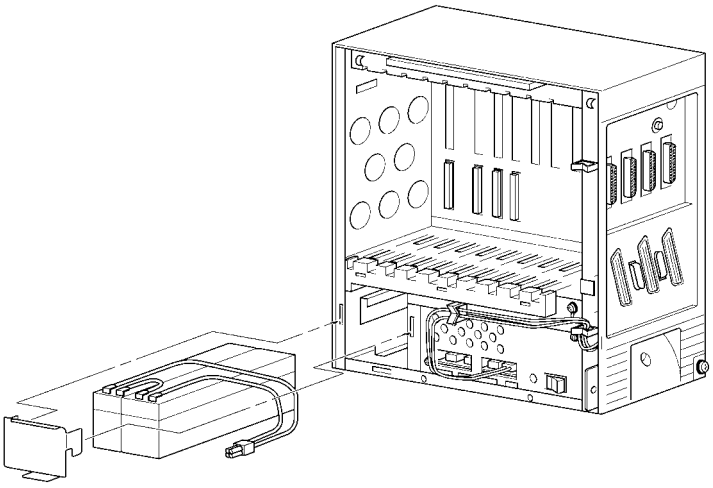


Figure 4-29 Placing the Batteries into the KSU

4. Connect the cable to the **BATTERY INT** connector of the PSU as shown in *Figure 4-30 Connecting the Batteries to the Power Supply Unit*.

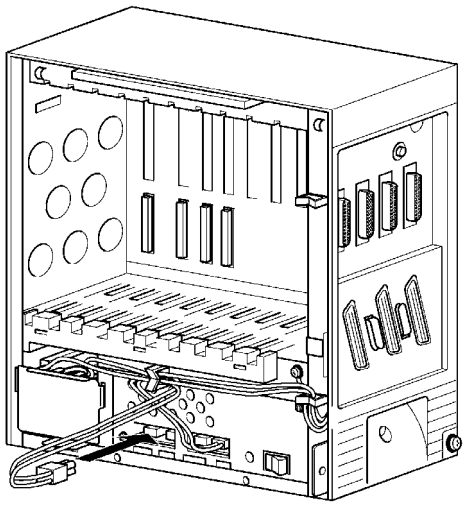


Figure 4-30 Connecting the Batteries to the Power Supply Unit

3.10.2 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. If the built-in batteries are connected with the external batteries, a large amount of charging current may flow from the external batteries to the built-in batteries. This can cause battery cable burns.

A6-324000-642-01 – Release 6.0
April 2003

1. Connect the external batteries (2 batteries = 1 unit) to the terminal board as shown.

.

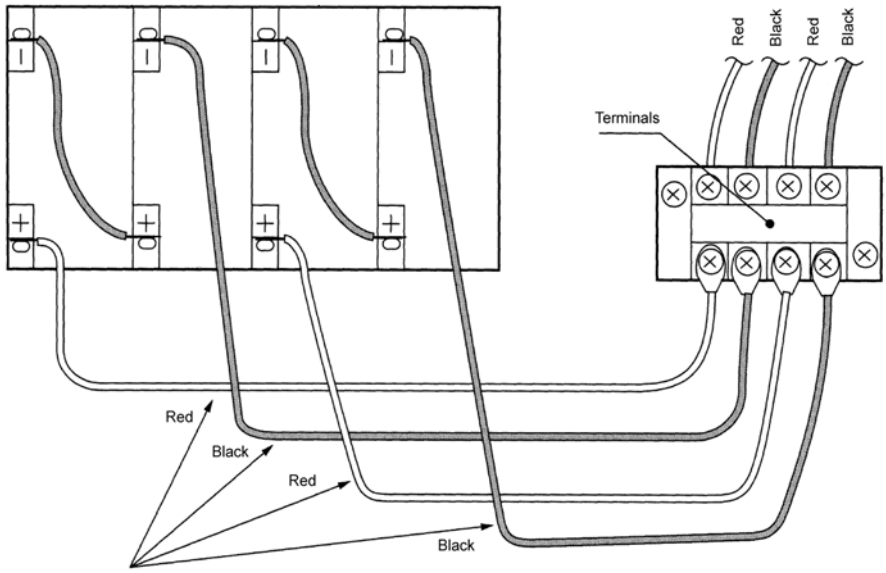


Figure 4-31 Attaching Cables to External Battery

2. Connect the battery relay cable to the BATTERY EXT socket of the power unit of the basic unit.

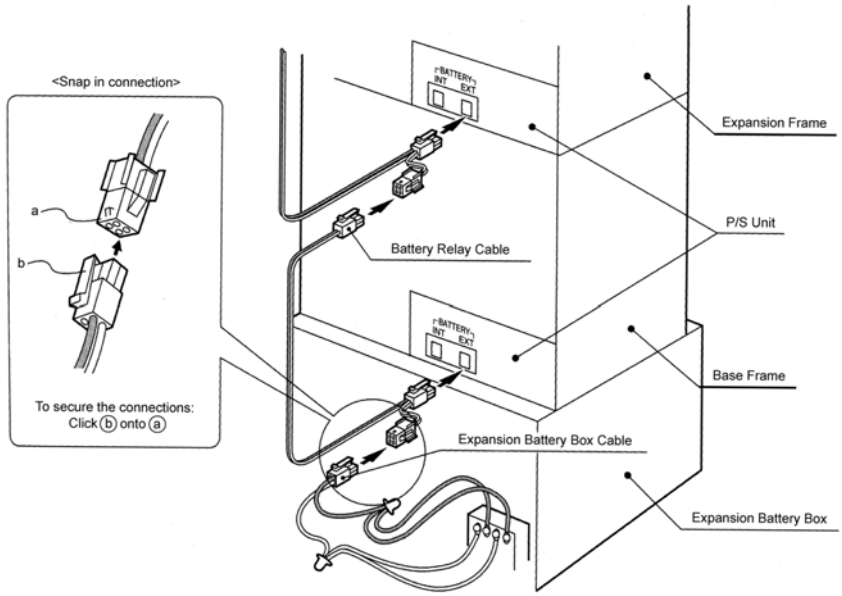


Figure 4-32 Connecting the Cable

3. Use the cable clamps at the circled locations in the diagram to clamp the battery relay cable.

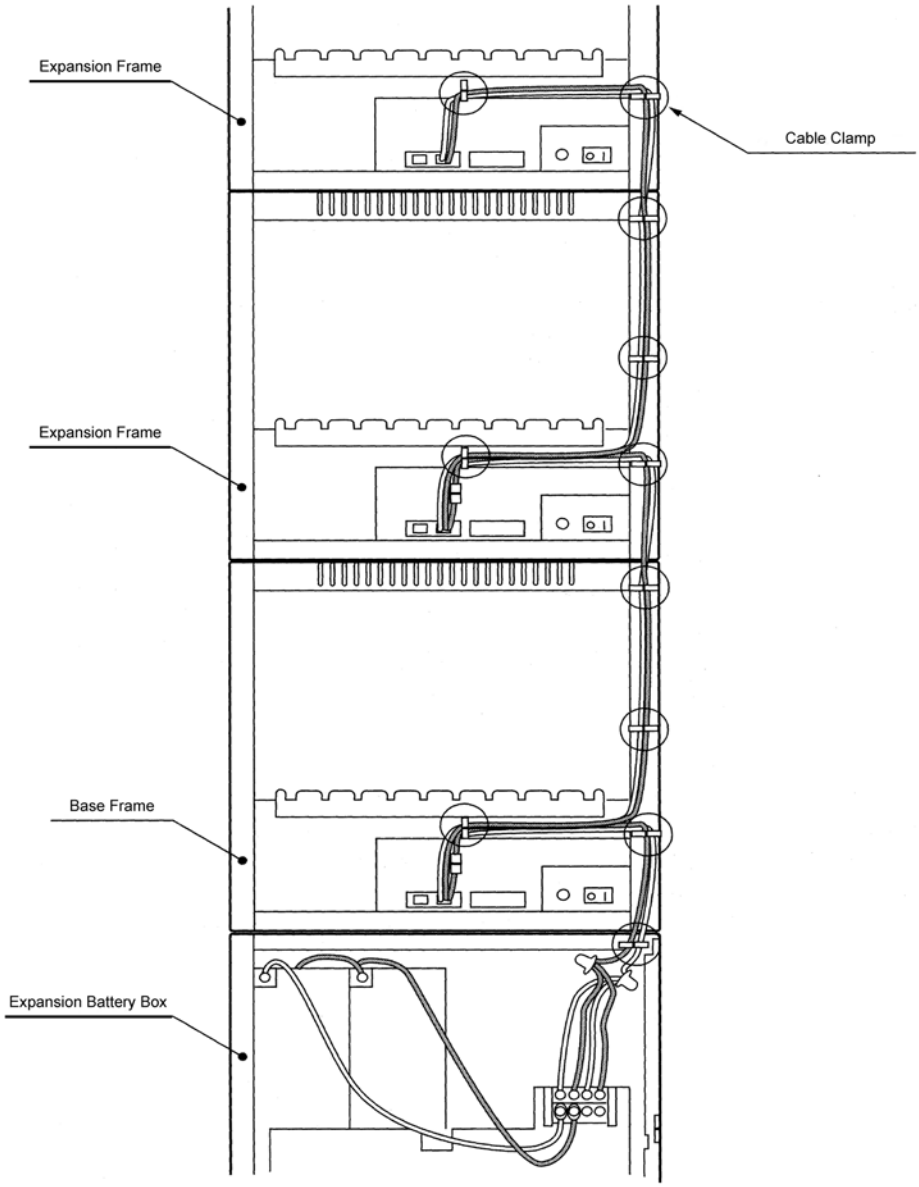


Figure 4-33 Clamping the Cables

SECTION 4 INSTALLING THE XEN AXIS KSU

The compact design of the Xen Axis KSU provides easy installation. The KSU can only be wall mounted.

Before beginning installation, be sure that the Power Supply Unit (PSU) is OFF and the power cord is disconnected from the AC outlet.

Do not touch the soldered surfaces of the ETUs with your hands.

4.1 General Information

4.1.1 KSU

The B48-U13 KSU provides service for outside lines, Attendant Consoles and interconnection to the station terminals. The B48-U13 KSU provides 48 ports and has two fixed and five flexible slots. Fixed slot S1 is reserved for the first 8 ESI ports that are mounted on the MBD-U13 Unit. Fixed slot S2 is for the MIFM-U13 ETU. A Power Supply Unit (P64-U13 PSU) and backup batteries are provided with the KSU.

4.2 Removing the KSU Cover

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

1. Loosen the screws near the bottom of the KSU. Do not remove screws from the unit.
2. Pull the front cover off toward you.

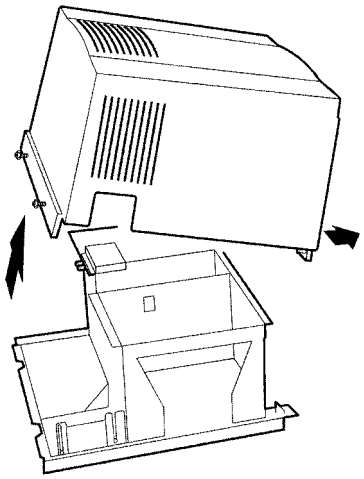


Figure 4-34 Removing the KSU Cover

A6-324000-642-01 – Release 6.0
April 2003

3. Securing Cables using the Velcro Strap

When attaching the amphenol cables to the side of the KSU, they can be secured using the provided velcro strap. This should be done prior to attaching the KSU to the wall mount bracket.

a. Thread the velcro strap through the hook on the back side of the KSU.

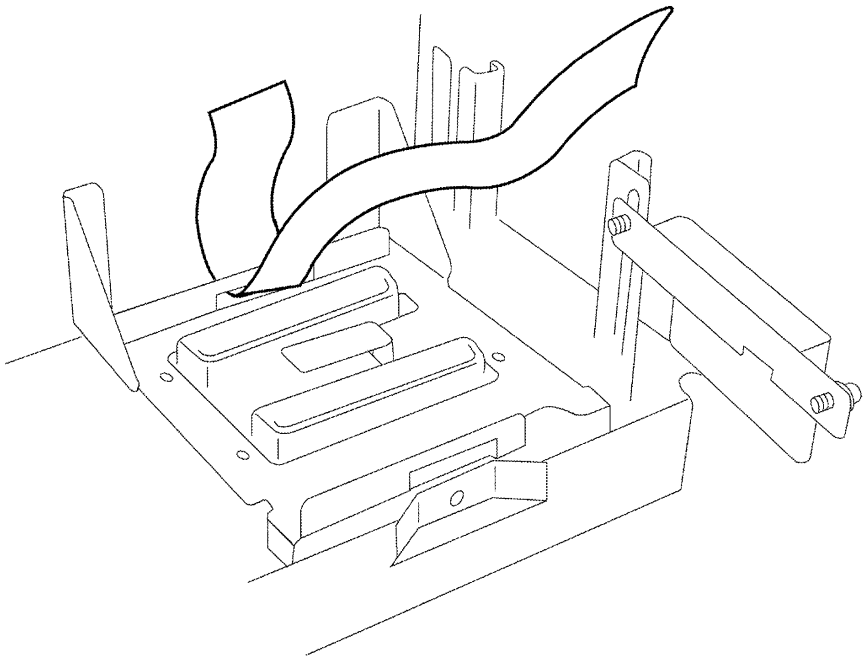


Figure 4-35 Threading the Velcro Strap Through the Hook on the KSU

4.3 Wall Mounting the KSU

1. Using the template and two of the four (locally provided) screws, attach screws to the wall as shown in *Figure 4-36 Using the Template*. Do not thread in the last 3mm of the screws.

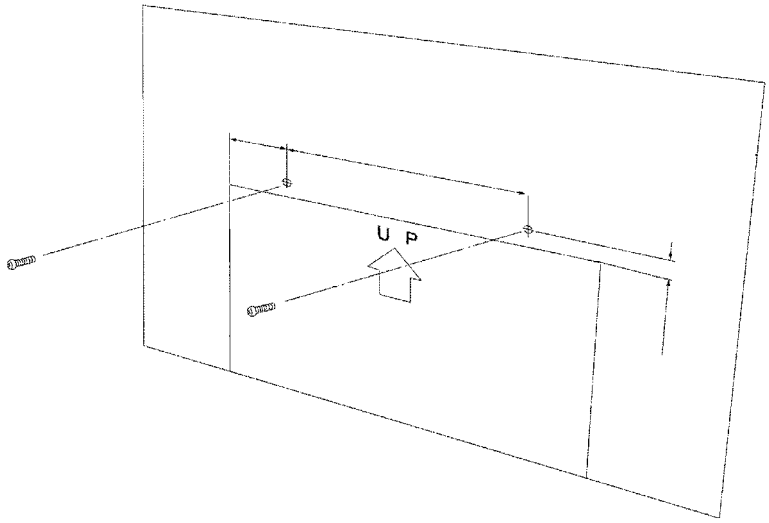


Figure 4-36 Using the Template

2. Hang the KSU as shown in *Figure 4-37 Hanging the KSU*.

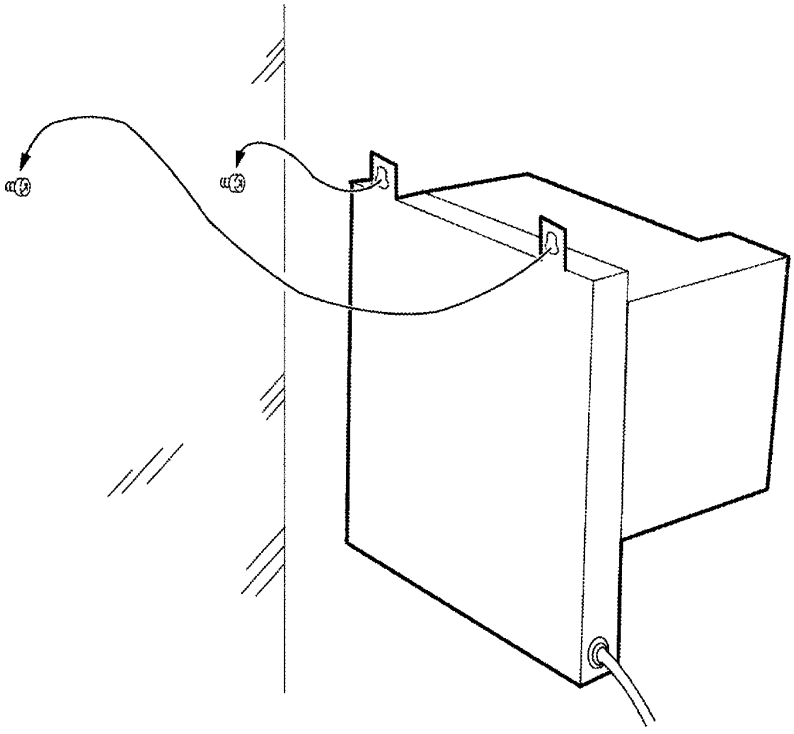


Figure 4-37 Hanging the KSU

3. Install screws in bottom of KSU and tighten screws at top.

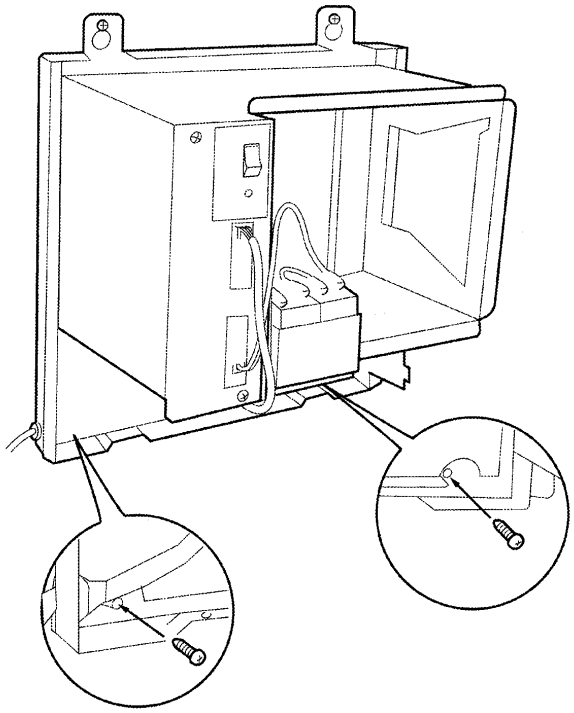


Figure 4-38 Installing Screws

4.3.1 Grounding Requirements

The KSU must be properly grounded. The Xen Axis KSU is provided with two grounding methods. The first method is the typical ac third-wire ground. In cases where this ground is questionable, an alternative ground must be provided.

1. Connect the ground cable (green wire) to the ground terminal on the right side of the KSU. *The grounding cable (locally provided) must have an AWG greater than #16.*
2. Provide a suitable ground inside of a building in accordance with local telephone company procedures.

A6-324000-642-01 – Release 6.0
April 2003

3. If not suitable ground is available, a ground rod should be installed in accordance with the operating procedures of the local telephone company.

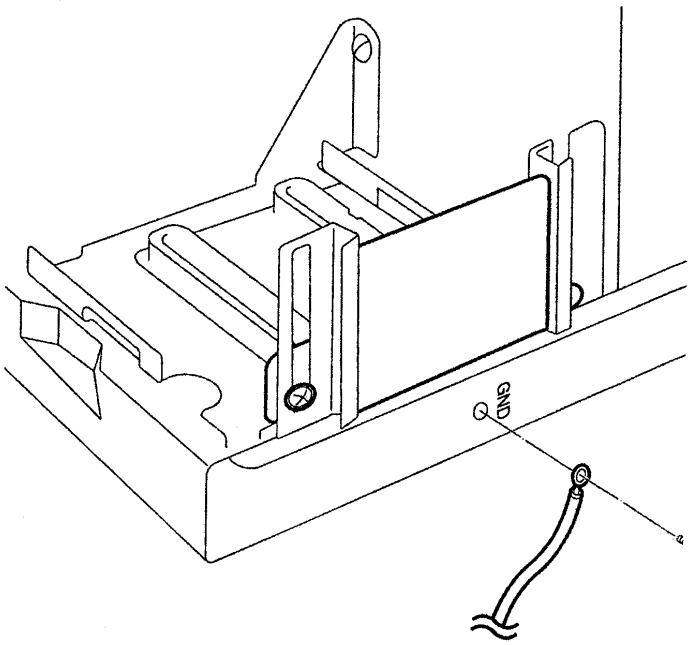


Figure 4-39 KSU Grounding

4.4 Replacing the Power Supply Unit in the KSU

The Xen system is supplied with P64-U13 PSU. The Power Supply Unit has a battery backup interface and accepts 240 Vac and outputs +5V and -24V to the system.

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

1. Disconnect power cord from P64-U13 PSU AC IN Connector.
2. Remove two screws from front of PSU.

3. Pull out the power supply being removed, and disconnect the white cable attached to the MBD-U13 unit from the PSU. Refer to *Figure 4-40 Disconnecting Cable from the PSU*.

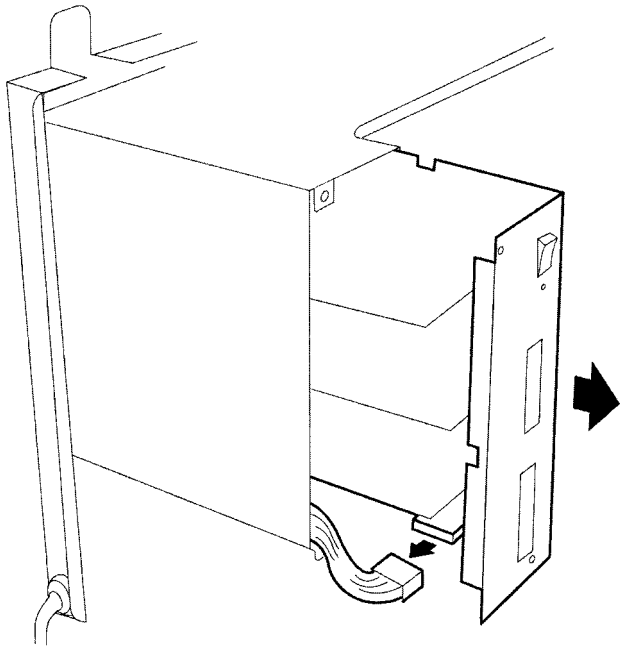


Figure 4-40 Disconnecting Cable from the PSU

4. Refer to *Figure 4-41 Installing the KSU in the PSU*. Install the P64-U13 PSU into the left space of the KSU, connect white cable attached to MBD-U13 Unit, and attach PSU to the KSU using the two screws removed in Step 1.

5. Connect the power cord to AC IN connector as per *Figure 4-41 Installing the KSU in the PSU*.

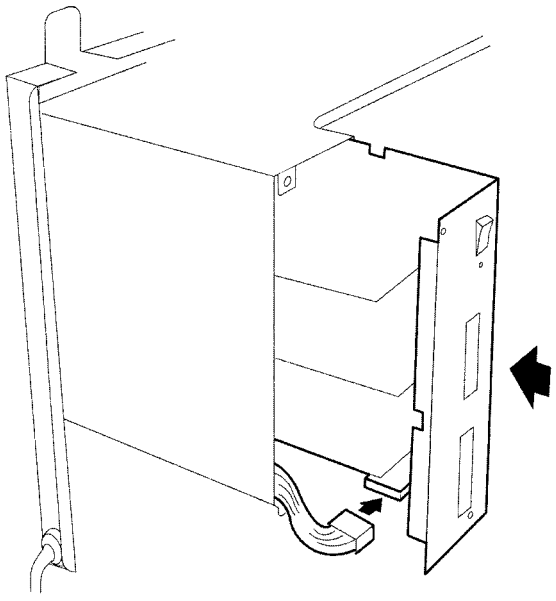


Figure 4-41 Installing the KSU in the PSU

A6-324000-642-01 – Release 6.0
April 2003

4.5 Fuse Replacement

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

1. Disconnect AC power and remove the front cover on the KSU. (Refer to *Figure 4-3 Removing the Front Panel of the KSU*).
2. Loosen two screws on the removable access plate to the left of the PSU then remove the plate.
3. Replace the fuses as necessary. Refer to *Figure 4-42 PSU Fuse Replacement*. F1 is a 250V, 2.5A fuse for AC input. Fuse F101 is a 125V, 10A fuse for DC input.

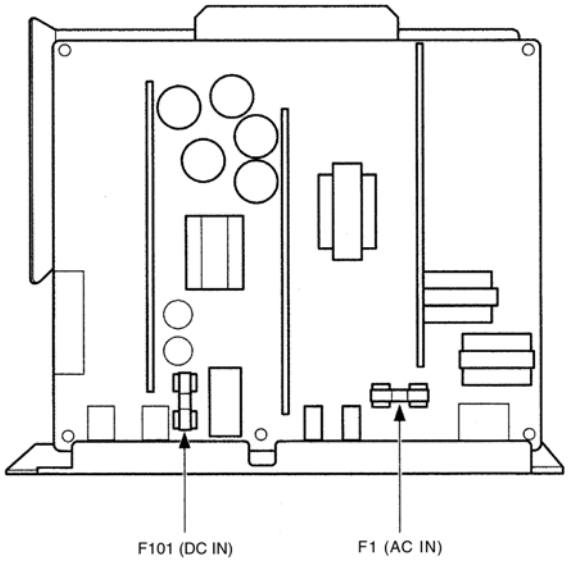


Figure 4-42 PSU Fuse Replacement

4. Install the access plate and tighten the screws.

4.6 Installing Built-in and External Batteries in the KSU

4.6.1 Built in Battery Installation

1. Connect the two batteries in series as shown in *Figure 4-43 Connecting Built-in Batteries*. The red cord attaches to the red terminal and the black cord attaches to the black terminal.

Be careful to ensure the cords are connected to the correct the battery terminals.

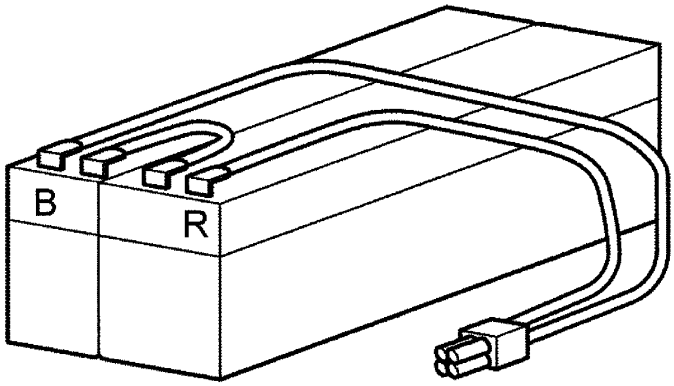


Figure 4-43 Connecting Built-in Batteries

2. Slide the batteries into the bottom space at the left side of the KSU, and install the battery cover as illustrated in *Figure 4-44 Installing the Batteries in the KSU*.

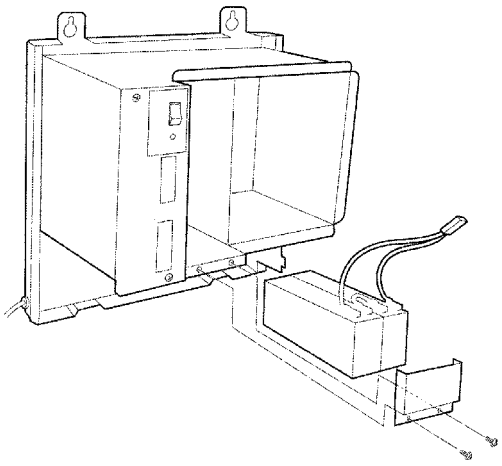


Figure 4-44 Installing the Batteries in the KSU

A6-324000-642-01 – Release 6.0
April 2003

3. Connect the cable to the BATTERY INT connector of the PSU as shown in *Figure 4-46 Connecting Cables for External Batteries*.

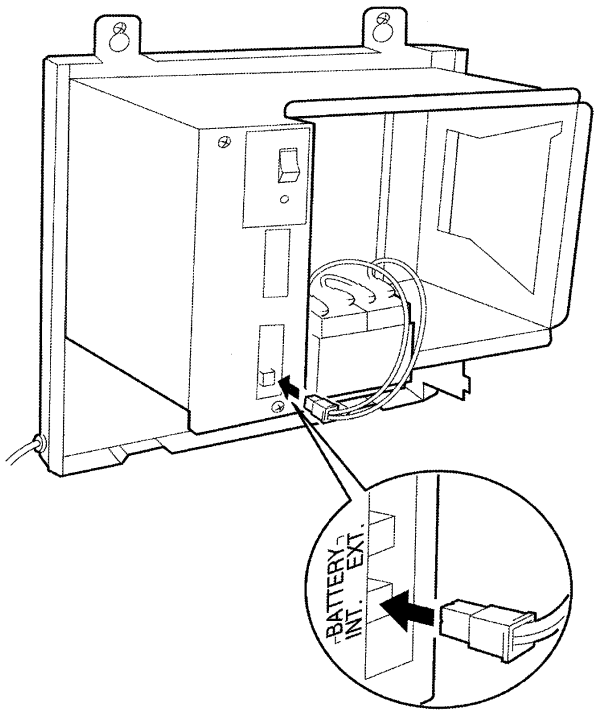


Figure 4-45 Connecting the Batteries to the Power Supply Unit

4.6.2 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 the KSU. If the built-in batteries are connected with the external batteries, a large amount of charging current may flow from the external batteries to the built-in batteries. This can cause battery cable burns.

1. Connect cabling to the external batteries as shown in *Figure 4-46 Connecting Cables for External Batteries*.

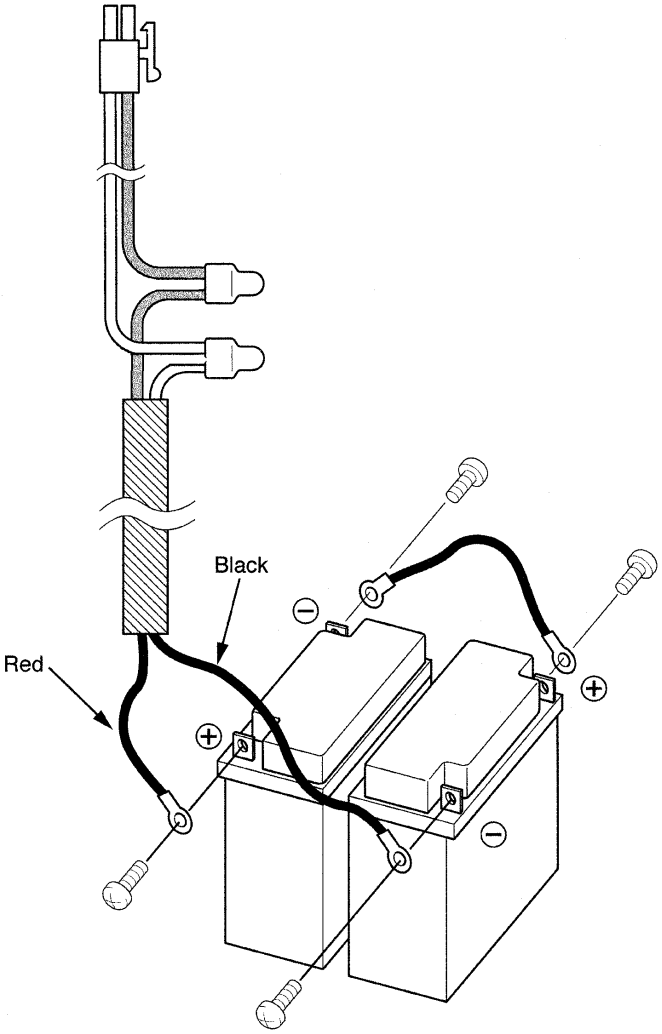


Figure 4-46 Connecting Cables for External Batteries

2. Route the cables through the clamps on the bottom right-hand side of the KSU.

A6-324000-642-01 – Release 6.0
April 2003

3. Connect the external batteries to the KSU in the location shown in Figure4-16 Connecting the External Power Cables to the PSU. Connect the external battery cable to the **BATTERY EXT** connector on the PSU of the KSU. Bundle any extra cabling together.

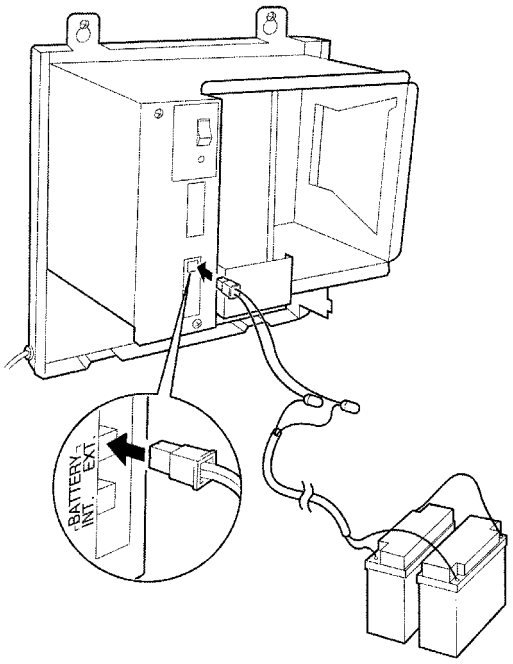


Figure 4-47 Connecting the External Power Cables to the PSU

4. Reinstall the KSU cover. Refer to *Figure 4-48 Reinstalling the KSU Cover*.

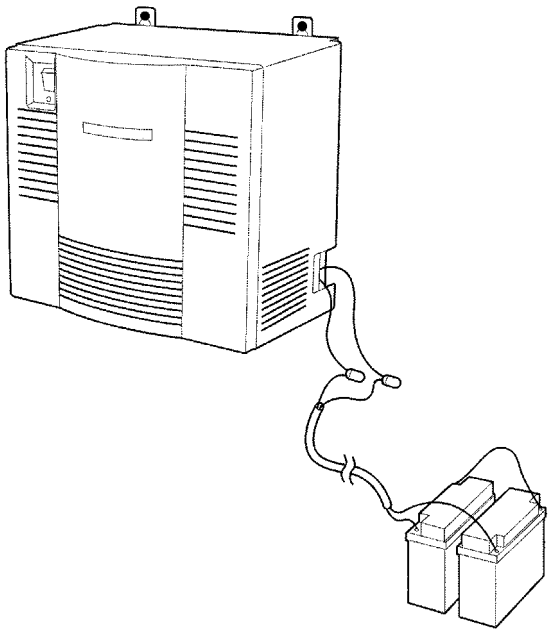


Figure 4-48 Reinstalling the KSU Cover

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Installing Electronic Telephone Units

CHAPTER 5

SECTION 1 GENERAL INFORMATION

Each Electronic Telephone Unit (ETU) is installed in a slot of the Basic or Expansion KSU. This chapter describes each ETU and the installation procedures.

Xen Master

The B64-U13 KSU has 10 slots that are divided into three categories.

CPU/EXP Slot

This is the first slot located on the left side of the KSU. A CPUB( )-U13 ETU must be installed in this slot in the Basic KSU and an EXP-U13 ETU must be installed in this slot in the Expansion KSU.

If the CPUB( )-U13 ETU is installed in slots S1~S8, it will be damaged!

ISA Slot

The ISA slot, the second slot in the Basic KSU, is reserved for the MIFA-U13 or MIFM-U13 ETU. The ISA slot is not available in the Expansion KSU.

Interface Slots (1~8)

Interface slots are physically located in slots 3~10 but are labelled S1~S8 on the KSU. All other interface ETUs can be installed in any of these slots.

The first and second slots (S1 and S2) of the B64-U13 KSU are universal slots that support the MIFA-U13 ETU or MIFM-U13 ETU

Xen Axis

The B48-U13 KSU has seven slots:

Fixed ESI Slot

Slot S1 of the B48-U13 KSU is a fixed ESI slot that is mounted on the MBD-U13 Unit.

ISA Slot

Slot S2 is the ISA slot and is reserved for the MIFA-U13 or MIFM-U13 ETU.

Interface Slots

Slots S3~S7 are the B48-U13 KSU interface slots with Amphenol Connectors.

A6-324000-642-01 – Release 6.0
April 2003

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.

- The ETUs used in this system make extensive use of CMOS technology that is very susceptible to static; therefore, extreme care must be taken to **avoid static discharge** when handling ETUs.
- Make all switch setting changes on the ETU before inserting it into 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 5-1 Inserting the ETU into the KSU*.

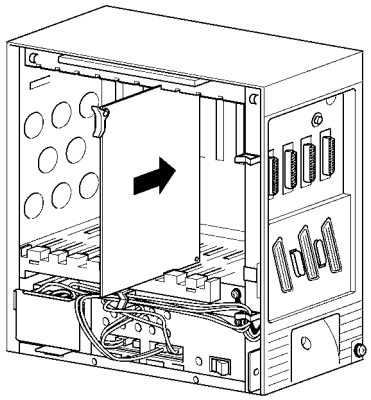


Figure 5-1 Inserting the ETU into the KSU

- When carrying an ETU be sure to keep it in a conductive polyethylene bag to prevent damage due to static electricity.
- When handling an ETU the installer must wear a grounded wrist strap to protect the ETU from static electricity.

A6-324000-642-01 – Release 6.0
April 2003

✆ When inserting or removing an ETU, be sure the wrist strap is connected to the Frame Ground Terminal on the KSU.

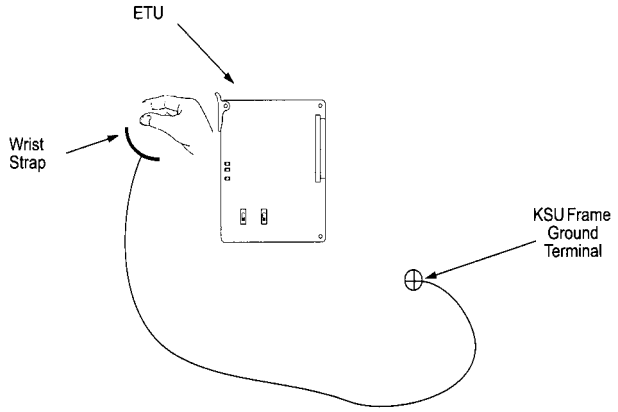


Figure 5-2 Wrist Strap Grounding

✆ When holding an ETU be sure you do not touch the components or the soldered surfaces with your 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).

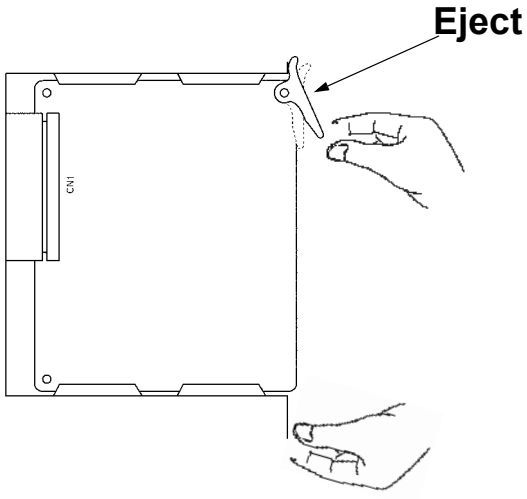


Figure 5-3 Handling an ETU

✆ When setting switches on the ETU, wear a wrist strap and stand on a grounded conductive work surface to avoid static electricity.

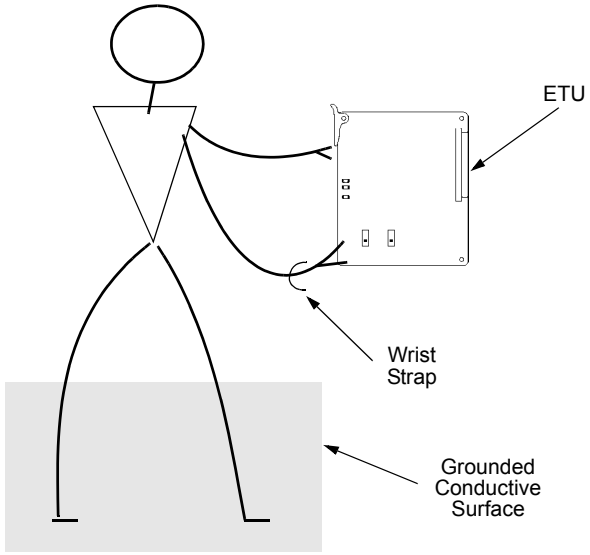


Figure 5-4 Safety Precautions when Setting Switches on an ETU

✆ Remember not to touch the surface of the ETU. A small screw driver can be used to change the switch settings if the installer follows the recommended safety precautions.

2.2 Inserting an ETU into the KSU Slots

1. To unlock the ETUs slots, push the slide bar to the left (B64/E64-U13 KSU only).
2. Slide the ETU into the proper slot in the KSU and push all the way to the back of the KSU.
3. Lock the ETU by pushing the slide bar to the right to secure the ETU (B64/E64-U13 KSU only).

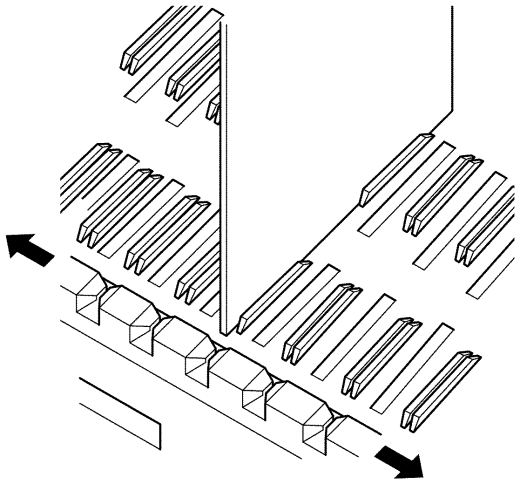


Figure 5-5 Sliding the ETU into the KSU Slot

A6-324000-642-01 – Release 6.0
April 2003

2.3 Removing an ETU from the KSU

1. To unlock the ETUs, push the slide bar to the left. (B64-U13 KSU and E64-U13 KSU only).
2. Lift the ejector tab on the ETU and pull the ETU out of the slot.

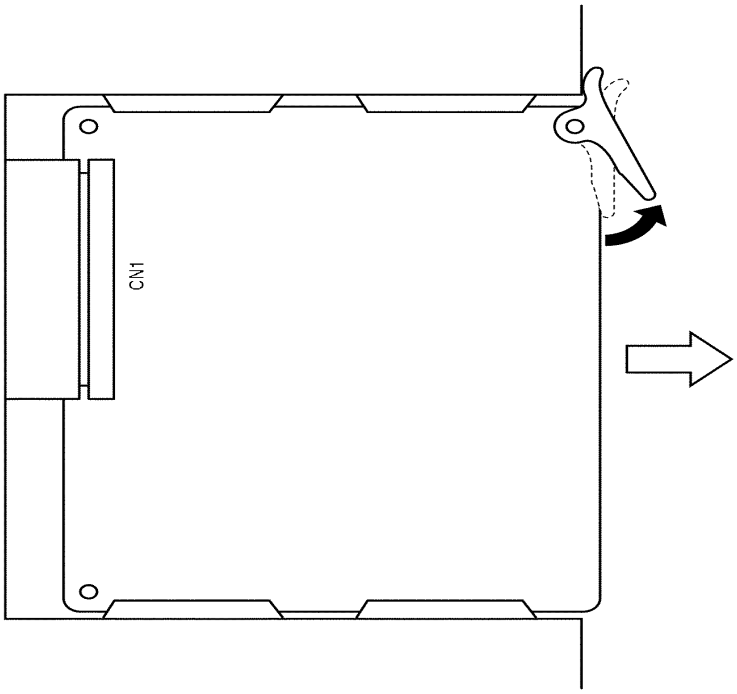


Figure 5-6 Lifting the Ejector Tabs on the ETU

3. To lock the ETU into place, push the slide bar to the right. (B64-U13 KSU and E64-U13 KSU only).

SECTION 3 COMMON CONTROL ETUS

The Electronic Telephone units described in this section control the common functions of the KSU. The information applies to both the Xen Master and Xen Axis systems unless stated otherwise.

3.1 CPUB( )-U13 ETU (Xen Master Only)

3.1.1 Description

The CPUB-U13 ETU is the Central Processing Unit for the Xen Master system. This ETU has a Central Processing Unit and a Microprocessing Unit and supports a maximum of 192 ports.

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 includes the following items:

- Time Division Switch (TDSW)
- Static Random Access Memory (SRAM)
- 32-bit Processor
- 4-channel DTMF Receiver (PBR)
- Sixteen 4-party Conference Circuits
- Internal (digital music) Music-on-Hold source
- External Music-on-Hold input (also used for station background music)
- Flash ROM
- Call Progress and DTMF Tone Generator
- Memory Backup Battery (Retains memory for approximately 21 days)

3.1.2 Installation

Install this ETU in the CPU slot (first slot) of the B64-U13 KSU. One CPUB( )-U13 ETU is installed with each system. Refer to *Figure 5-7 CPUB( )-U13 ETU*.

If the CPUB( )-U13 ETU is installed in slots S1~S8, it will be damaged!

A6-324000-642-01 – Release 6.0
April 2003

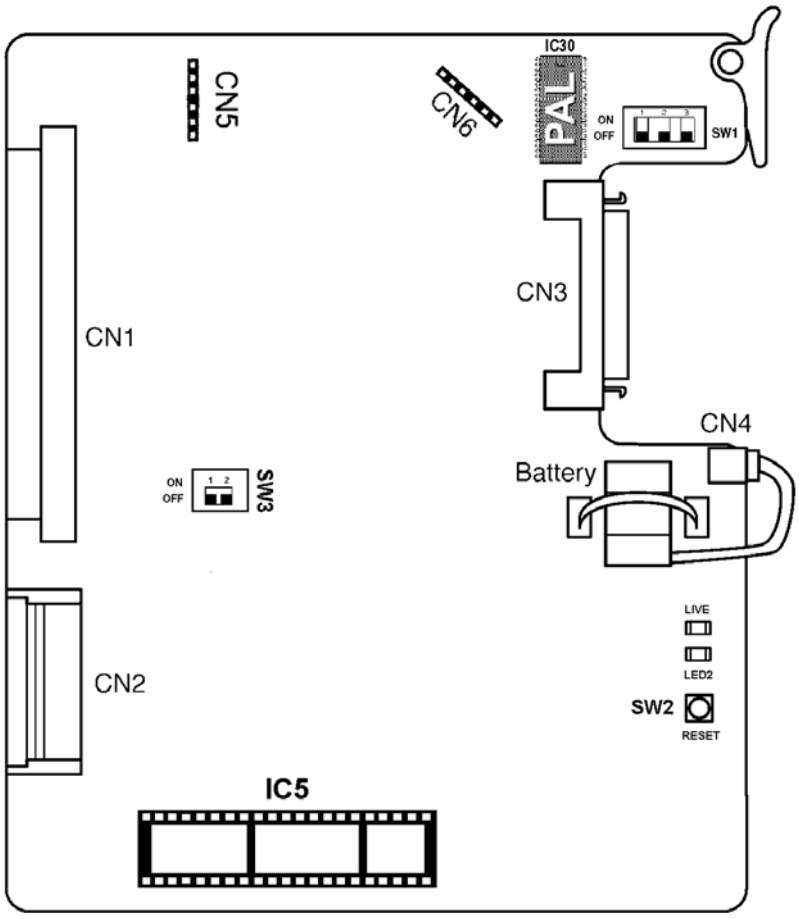


Figure 5-7 CPUB( )-U13 ETU

3.1.3 Switch Settings

The following *Table 5-1 CPUB( )-U13 ETU Default Switch Settings* indicates the default switch settings.

Table 5-1 CPUB( )-U13 ETU Default Switch Settings

SW1-1	SW1-2	Description
Off	Off	Normal Operation
On	Off	Flash ROM load from COM1 port
Off	On	Factory Test
On	On	Flash ROM load from EPROM

SW1-3	Description
Off	Not Used

SW2	Description
Momentary Switch	System Reset

SW3-1	Description
On	System boot by EPROM
Off	System boot by Flash ROM

SW3-2	Description
Off	Not Used

Pressing SW2 interrupts all service and causes a second initialization. This switch should not be used in an operating system unless absolutely necessary.

3.1.4 Connectors

Before programming System Data, the battery must be connected to **CN4** to allow memory retention if a power failure or brownout occurs. If a brownout or power failure does occur, and the battery backup circuit is not activated, System Data resets to the default values, all stations in the system reset to the default values, and any data programmed on individual stations is cleared.

When a CPUB( )-U13 ETU is installed in the system, the clock/calendar must be set. This also applies when battery backup fails for any reason.

If the CPUB( )-U13 ETU is removed for long term storage, disconnect the battery from **CN4**. This prevents the battery from discharging completely. The fully charged battery retains memory for approximately 21 days.

The following connectors are located on the CPUB( )-U13 ETU.

- CN1 — Connects to the backboard
- CN2 — Connects to the ISA-bus.
- CN3 — Connects to CN2 on the EXP-U13 ETU via the expansion cable
- CN4 — Connects to the memory backup battery via the battery cable (factory installed)
- CN5 — Connects to CN1 of the CLKG-U13 Unit
- CN6 — Connects to CN2 of the CLKG-U13 Unit

3.1.5 **LED** Indications

LED1 indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED2 indications are listed below.

- Steady Red — System Power On
- Off — No Power

A6-324000-642-01 – Release 6.0
April 2003

3.1.6 Replacing Memory Backup

The CPUB( )-U13 ETU provides memory backup for approximately 21 days. The Ni-Cad battery should be replaced about every two years.

1. Remove the battery cable from CN4 on the CPUB( )-U13 ETU. (Refer to *Figure 5-7 CPUB( )-U13 ETU*.)
2. Connect the cable from the new battery to CN4 on the CPUB( )-U13 ETU.
3. Turn off the KSU power.
4. Remove the CPUB( )-U13 ETU from the slot in the KSU.
5. Using nippers or other similar cutting tool, cut the tie wrap that fastens the old battery and remove the old the battery.
6. Fasten the new battery with a tie wrap.
7. Install the CPUB( )-U13 ETU again.
8. Turn on the KSU power.

3.1.7 Main Software Upgrade for CPUB( )-U13

The Xen system uses Flash ROM to store system main software. This allows convenient upgrade of its ability in terms of features. The following instructions are for main software upgrade for CPUB( )-U13.

1. Down load and store the current data base using current MAT.
2. Ensure the memory backup battery is connected to the CPUB( )-U13 ETU (CN4 connector).
3. Power off system.
4. Remove the CPUB( )-U13 ETU from the KTS.
5. Move SW3-1 to the 'ON (EPROM)' position.
6. Move SW 1-1&2 to the 'ON(UP)' position ("3" is not used)
7. Install Eprom into Socket IC5 (Refer Fig 5-7)
8. Remove old PAL, Socket IC 30, and install new main software compatible PAL. (Refer supplier for compatibility information)
9. Re-Install the CPUB( )-U13 ETU.
10. Power On system
11. LED's 1 & 2 will flash (approximately 2 minutes) while Eprom is writing to the Flash Roms
12. LED's 1 & 2 go solid when upload is complete.

A6-324000-642-01 – Release 6.0
April 2003

13. Power off system when upload is completed.
14. Remove the CPUB( )-U13 card.
15. Return SW1 and SW3 to their normal position.
16. Remove EPROM
17. Install the CPUB( )-U13 ETU again.
18. Power on system and operate as normal.
19. Save data base with a compatible MAT (refer supplier for relevant information)

3.2 EXP-U13 ETU (Xen Master Only)

3.2.1 Description

The EXP-U13 ETU is the Expansion KSU Controller for the Xen Master system. This ETU controls data transmission between the CPUB( )-U13 ETU and the other ETUs installed in the expansion KSU if it is installed. *Refer to Figure 5-8 EXP-U13 ETU*.

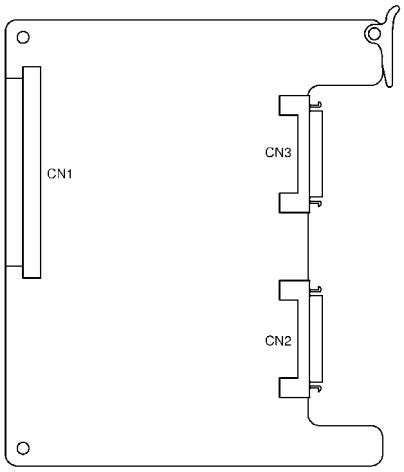


Figure 5-8 EXP-U13 ETU

3.2.2 Installation

Turn system power off, and install the EXP-U13 in the expansion ETU.

Use the Expansion Cable (included with the EXP-U13 ETU) to connect the CPUB( )-U13 ETU to the Expansion ETU. Fix the Expansion Cable to the KSU Frame using tie wraps.

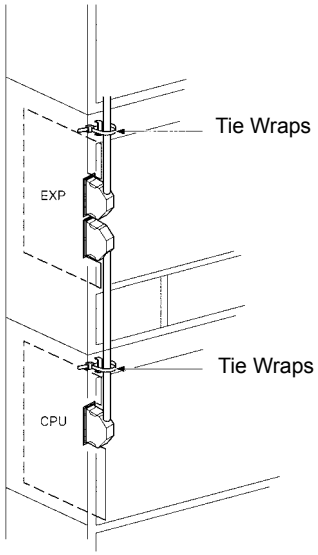


Figure 5-9 Connecting the Expansion Cable

3.2.3 The following connectors are located on the EXP-U13 ETU.

- CN1 — Connects to the backboard.
- CN2 — Connects to CN3 on the CPUB( )-U13 ETU or CN3 on EXP-U13 ETU (installed in the first expansion cabinet) using an expansion cable.
- CN3 — Connects to the CN2 on the EXP-U13 ETU installed in the third expansion cabinet using the expansion cable. This connector is not used if the EXP-U13 ETU is installed in the last expansion KSU or if a third KSU is not installed.

A6-324000-642-01 – Release 6.0
April 2003

3.3 MBD-U13 Unit for B48-U13 KSU (Xen Axis Only)

3.3.1 Description

The MBD-U13 Unit (installed on the B48-U13 KSU) is the Central Processing Unit for the Xen Axis system. This ETU has a Central Processing Unit and a Microprocessing Unit and supports a maximum of 48 ports. Refer to *Figure 5-10 KSU MBD-U13 Unit*.

A 32-bit microprocessor executes the programs stored on the Flash ROM ICs of the MBD-U13 Unit. This controls the entire system when data is transferred to and from other ETUs.

This ETU includes the following items:

- Time Division Switch (TDSW)
- Static Random Access Memory (SRAM)
- 32-bit Processor
- 4-channel DTMF Receiver (PBR)
- Sixteen 4-party Conference Circuits
- Internal (digital music) Music-on-Hold source
- External Music-on-Hold input (also used for station background music)
- Flash ROM
- Call Progress and DTMF Tone Generator
- Memory backup Battery (Retains memory for approximately 21 days)
- 8 Electronic Station Interface (ESI) ports
- 6 Flexible Card Slots

A6-324000-642-01 – Release 6.0
April 2003

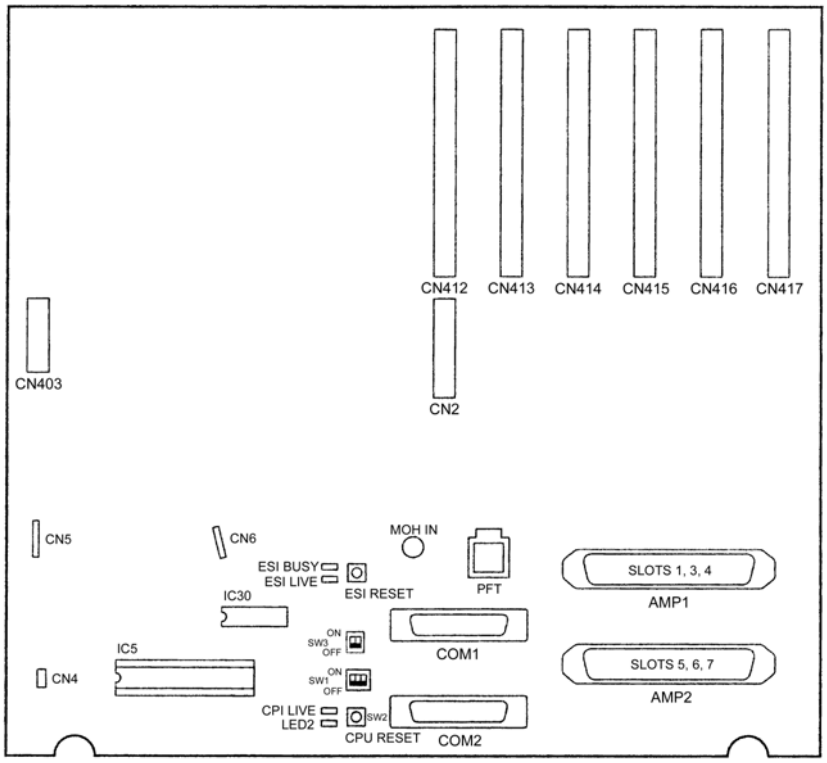


Figure 5-10 KSU MBD-U13 Unit

3.3.2 Switch Settings

The following *Table 5-2 MIFM-U13 Switch Settings* indicates the default switch settings.

SW1-1	SW1-2	Description
Off	Off	Normal Operation
On	Off	Flash ROM load from COM1 port
Off	On	Factory Test
On	On	Flash ROM load from EPROM

SW1-3	Description
Off	Not Used

SW2	Description
Momentary Switch	System Reset

A6-324000-642-01 – Release 6.0
April 2003

SW3-1	Description
On	System boot by EPROM
Off	System boot by Flash ROM

SW3-2	Description
Off	Not Used

Pressing SW2 interrupts all service and causes a second initialization. This switch should not be used in an operating system unless absolutely necessary.

3.3.3 Connectors

Before programming System Data, the battery must be connected to **CN4** to allow memory retention if a power failure or brownout occurs. If a brownout or power failure does occur, and the battery backup circuit is not activated, System Data resets to the default values, all stations in the system reset to the default values, and any data programmed on individual stations is cleared.

The following connectors are located on the MBD-U13 ETU.

- MOH IN — For Music on Hold input
- PFT — For Power Failure Transfer
- COM1 — For LCR/PC programming
- COM2 — For SMDR
- CN4 — For backup battery
- CN5 — Connects to CN1 of the CLKG-U13 Unit
- CN6 — Connects to CN2 of the CLKG-U13 Unit
- AMP1 — MDF cabling connection for slots 1, 3, 4
- AMP2 — MDF cabling connection for slots 5, 6, 7
- CN403 — Power Supply connection

A6-324000-642-01 – Release 6.0
April 2003

3.3.4 LED Indications

CPU LIVE indications are listed below**.**

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED2 indications are listed below.

- Steady Red — System Power On
- Off — No Power

ESI LIVE

- Steady Red — ESI On
- Off — ESI Off

ESI Busy

- Steady Red — ESI Busy
- Off — ESI available

3.3.5 Replacing Memory Backup

The MBD( )-U13 ETU provides memory backup for approximately 21 days. The Ni-Cad battery should be replaced about every two years.

Refer to *Figure 5-11 KSU Backup Battery Replacement*.

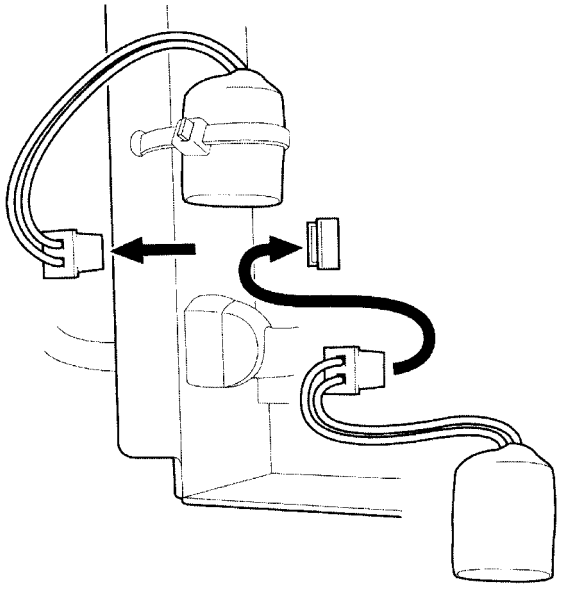


Figure 5-11 KSU Backup Battery Replacement

A6-324000-642-01 – Release 6.0
April 2003

1. Remove the battery cable from CN4 on the MBD( )-U13 ETU.
2. Connect the cable from the new battery to CN4 on the MBD( )-U13 ETU.
3. Turn off the KSU power.
4. Using nippers or other similar cutting tool, cut the tie wrap that fastens the old battery and remove the old battery.
5. Fasten the new battery with a tie wrap.
6. Turn on the KSU power.

3.3.6 Main Software Upgrade for KSU MBD-U13 Unit

The Xen system uses Flash ROM to store system main software. This allows convenient upgrade of its ability in terms of features. The following instructions are for main software upgrade for KSU MBD-U13 Unit.

1. Down load and store the current data base using current MAT.
2. Ensure the memory backup battery is connected to the KSU MBD-U13 Unit (CN4 connector).
3. Power off system.
4. Move SW3-1 to the 'ON (EPROM)' position.
5. Move SW 1-1&2 to the 'ON(UP)' position ("3" is not used)
6. Install Eprom into Socket IC5 (Refer Fig 5-10)
7. Remove old PAL, Socket IC 30, and install new main software compatible PAL. (Refer supplier for compatibility information)
8. Power On system
9. LED's 1 & 2 will flash (approximately 2 minutes) while Eprom is writing to the Flash Roms
10. LED's 1 & 2 go solid when upload is complete.
11. Power off system when upload is completed.
12. Return SW1 and SW3 to their normal position.
13. Remove EPROM
14. Power on system and operate as normal.
15. Save data base with a compatible MAT (refer supplier for relevant information).

3.4 CLKG-U13 Unit

3.4.1 Description

The CLKG-U13 Unit provides clock synchronisation for ISDN-BRI and ISDN-PRI lines that are connected to the system, as well as for the PHS facility. *Refer to Figure 5-12 CLKG-U13 Unit*.

This unit works in conjunction with the BRT(4)-U13, PRT(1)-U13 ETU, BSC-U13 ETU or BSU(2)-U13 ETU, and is plugged onto the CPUB( )-U13 ETU or MBD-U13 Unit.

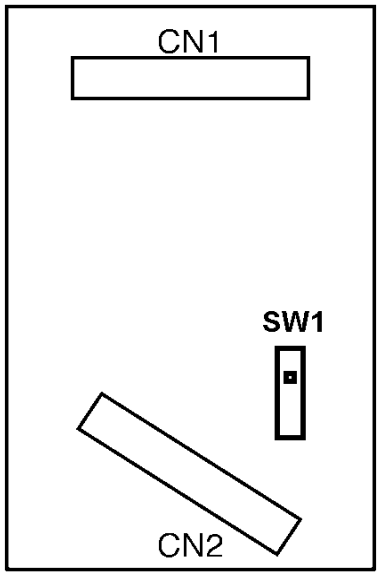


Figure 5-12 CLKG-U13 Unit

3.4.2 Installation

Only one CLKG-U13 Unit can be installed in a Xen system.

3.4.3 Connectors

The following connectors are located on the CLKG-U13 ETU.

- CN1 Connects to CN5 on the CPUB( )-U13 ETU or MBD-U13 Unit.
- CN2 Connects to CN6 on the CPUB( )-U13 ETU or MBD-U13 Unit.

A6-324000-642-01 – Release 6.0
April 2003

3.4.4 Switch Settings

Set SW1 according to the equipment installed, as follows:

ISDN.PHS — When a BRT(4)-U13 ETU or PRI(1)-13 ETU are installed, with or without a BSC-U13 ETU or BSU(2)-U13 ETU (Default).

PHS — When a BSC-U13 ETU or BSU(2)-U13 ETU is installed, but both the BRT(4)-13 ETU and PRI(1)-U13 ETU are not.

3.5 MIFM-U13 ETU

3.5.1 Description

The MIFM-U13 ETU provides additional memory and processing power for PC Programming, SMDR, LCR, and Caller ID. PC Programming and SMDR are standard with this ETU. LCR and Caller ID require the KML(XXX)UA Unit or the KMM(XXX)UA Unit to be mounted on the MIFM U13 ETU.

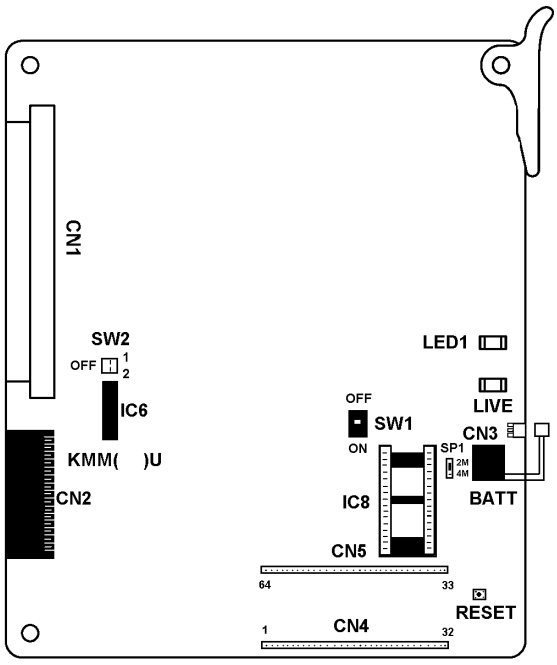


Figure 5-13 MIFM-U13 ETU

3.5.2 Installation

A maximum of one MIFM-U13 ETU can be installed in the Xen system.

When the MIFM-U13 ETU is installed in an IF slot (as opposed to the ISA slot) the MIF-Modem (MDM-U13 Unit) can be mounted on the MIFM-U13 ETU. This method is desirable because the MIF-Modem Unit does not require any external cabling to analogue ports.

In the Xen Master, the MIFM-U13 can be installed in the ISA slot or the first or second Interface Slot (S1, S2) in the basic KSU. Note however that if the MIF-Modem is required, the MIFM-U13 ETU must be installed in slot S1 or S2, NOT the ISA slot. The MIFM-U13 ETU cannot be installed in an expansion KSU.

In the Xen Axis, the MIFM-U13 ETU must be installed in the ISA Slot S2.

3.5.3 Switch Settings

Refer to *Table 5-2 MIFM-U13 Switch Settings* for MIFM-U13 ETU default switch settings.

Table 5-2 MIFM-U13 Switch Settings

SW2-1	SW2-2	Description
Off	Off	Normal Operation
On	Off	Factory Test
Off	On	Not Used
On	On	Flash ROM load from EPROM

SW1	Description
On	System boot by Flash ROM
Off	System boot by EPROM

3.5.4 LED Indications

LIVE LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No power

LED1 indications are listed below.

- Steady Red — Problem while loading FROM EEPROM (when using this mode)
- Steady Red — PC Programming or LCR Programming is connected
- Flashing Red — Loading FROM from EEPROM

A6-324000-642-01 – Release 6.0
April 2003

3.5.5 Connectors

The following connectors are located on the MIFM-U13 ETU.

- CN1 — Connects to the Backboard
- CN2 — Connects to the Backboard
- CN3 — Connects the ETU backup battery. It connects the battery during installation, and disconnects the battery when storing the ETU.
- CN4, CN5 — Connectors for the optional MIF-Modem (MDM-U13 Unit).
- IC6 — Socket for the optional KMM(XXX)UA or KML(XXX)UA Units.

SMDR and PC Programming connections are made via the COM ports on the KSU.

- COM1 — PC/LCR Programming
- COM2 — SMDR

Both COM ports are standard female RS-232C DCE ports. A straight cable is required.

When an external modem is used, connect the modem to COM1 port via the modem cable adapter. A straight RS-232C cable is required.

A6-324000-642-01 – Release 6.0
April 2003

3.6 MIFA-U13 ETU

3.6.1 Description

The MIFA-U13 ETU provides additional memory and processing power to support UCD.

In the Xen Master, the MIFA-U13 ETU can also support the ACD/MIS facility by installing the KMA(XXX)UA Unit onto this ETU.

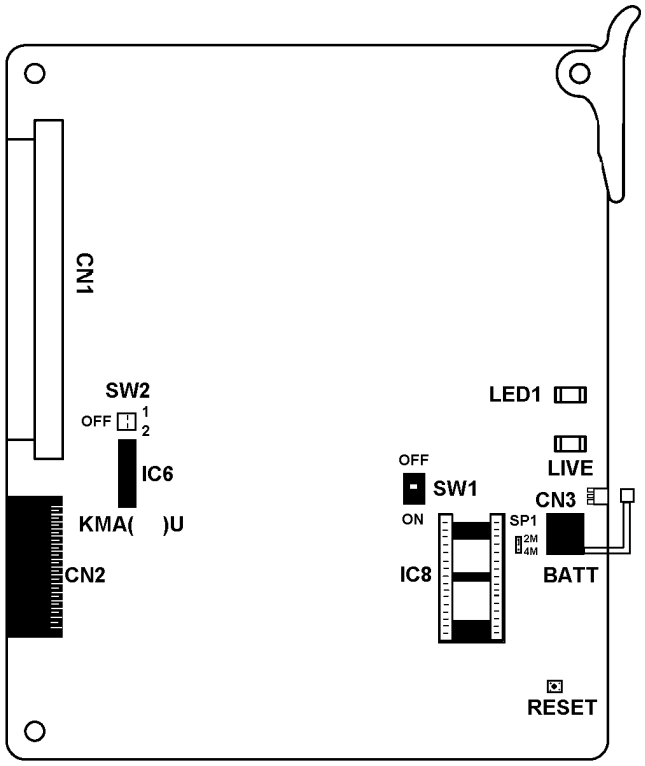


Figure 5-14 MIFA-U13 ETU

3.6.2 Installation

One MIFA-U13 ETU can be installed in the Xen system.

In the Xen Master, the MIFA-U13 ETU can be installed in the ISA slot, first Interface slot (S1), or second Interface slot (S2) of the basic KSU. Note however that the MIFA-U13 ETU must be installed in the ISA slot if the MIS terminal is to be connected to COM4. The MIFA-U13 ETU cannot be installed in an Expansion KSU.

In the Xen Axis, the MIFA-U13 ETU must be installed in the ISA slot S2.

A6-324000-642-01 – Release 6.0
April 2003

3.6.3 Switch Settings

Refer to *Table 5-3 MIFA-U13 ETU Switch Settings* for MIFA-U13 ETU default switch settings.

Table 5-3 MIFA-U13 ETU Switch Settings

SW2-1	SW2-2	Description
Off	Off	Normal Operation
On	Off	Factory Test
Off	On	Not Used
On	On	Flash ROM load from EPROM

SW1	Description
On	System boot by Flash ROM
Off	System boot by EPROM

3.6.4 LED Indications

LIVE LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED1 indications are listed below

- Steady Red — Problem while loading FROM from EEPROM (when using this mode)
- Steady Red — PC Programming or LCR Programming is connected
- Flashing Red — Loading FROM from EEPROM

3.6.5 Connectors

The following connectors are located on the MIFA-U13 ETU.

- CN1 — Connects to the Backboard
- CN2 — Connects to the Backboard
- CN3 — Connects the ETU backup battery. It connects the battery during installation, and disconnects the battery when storing the ETU.
- IC6 — Socket for the optional KMA (XXX)UA Unit (applicable to Xen Master Only)

On the Xen Master, the ACD MIS cable connects to COM4 on the KSU. It is a standard female RS-232C DCE port. A straight RS-232C cable is required.

A6-324000-642-01 – Release 6.0
April 2003

3.7 KMM(XXX)UA Unit

3.7.1 Description

The KMM(XXX)UA Unit is a feature module that mounts on the MIFM-U13 ETU. This unit is required when LCR or Caller ID scrolling and dialling features are used.

3.7.2 Installation

Like all ICs, this unit has a notch on one side. Find the notch on the IC6 silkscreen, and before mounting align the KMM(XXX)UA unit so that the notches are on the same side.

3.8 KML(XXX)UA Unit

3.8.1 Description

The KML(XXX)UA Unit is a feature module that mounts on the MIFM-U13 ETU. It is required when LCR is to be used.

3.8.2 Installation

Like all ICs, this unit has a notch on one side. Find the notch on the IC6 silkscreen, and before mounting align the KML(XXX)UA unit so the notches are on the same side.

3.9 KMA(XXX)UA Unit (Xen Master Only)

3.9.1 Description

The KMA(XXX)UA Unit is a feature module that mounts on the MIFA-U13 ETU. It is required when ACD with MIS is a required feature.

3.9.2 Installation

Like all ICs, this unit has a notch on one side. Find the notch on the IC6 silkscreen, and before mounting align the KMA(XXX)UA Unit so the notches are on the same side.

A6-324000-642-01 – Release 6.0
April 2003

SECTION 4
INTERFACE ETUS

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

4.1 BRT(4)-U13 ETU

4.1.1 Description

The Basic Rate Trunk Interface (BRT) ETU terminates ISDN Basic Rate Trunk lines complying to the ETSI standard. This unit supports four ISDN-BRI trunks, and each trunk supports two channels. These eight channels can be used for CO trunks with DTMF signalling.

The BRT(4)-U13 ETU uses an S/T-type interface and connects to the Network Termination unit (NT1) provided by the Telco.

Each BRI interface must be of point-to-multipoint type.

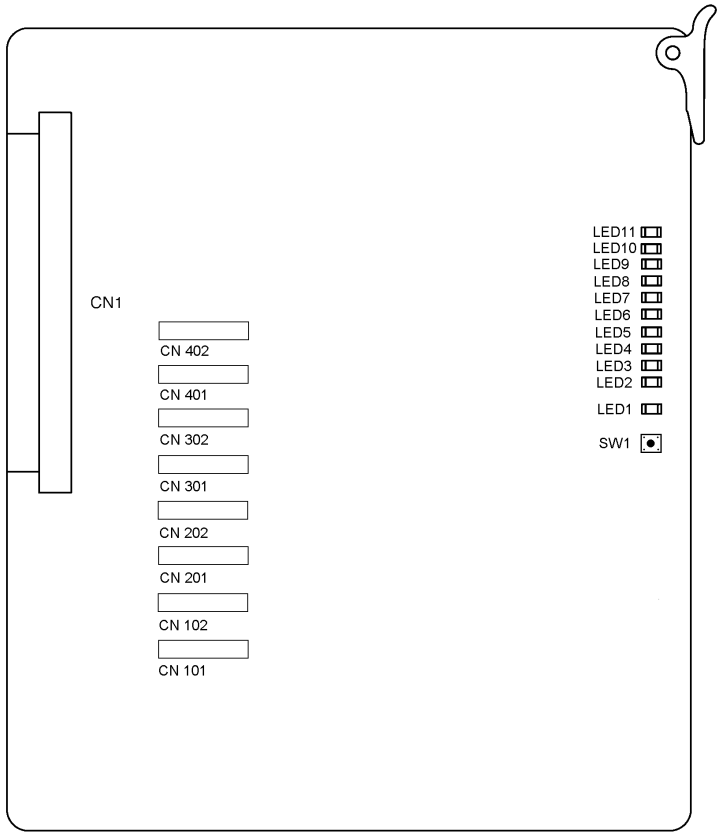


Figure 5-15 BRT(4)-U13 ETU

4.1.2 Installation

A maximum of 8 BRT(4)-U13 ETUs can be installed in the Xen Master system, in slots S1~S4 in the first or second KSU.

A maximum of 2 BRT(4)-U13 ETUs can be installed in the Xen Axis system, in slots S3 and S4.

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 Interface 1. CN101 and CN102 shorted together from the factory turns on the 100Ω terminal.

CN201 and CN202

- Set the 100Ω termination to On or Off for Interface 2. CN201 and CN202 shorted together from the factory turns on the 100Ω terminal.

CN301 and CN302

- Set the 100Ω termination to On or Off for Interface 3. CN301 and CN302 shorted together from the factory turns on the 100Ω terminal.

CN401 and CN402

- Set the 100Ω termination to On or Off for Interface 4. CN401 and CN402 shorted together from the factory turns on the 100Ω terminal.

4.1.5 LED Indications

LED1 indications are listed below.

✆	Blinking Red	Normal Operation
✆	Steady Red	Operation Stopped (power still on)
✆	Off	No Power

LED2 L1 Status for BRI Interface 1

- Steady Red when Layer 1 is working

LED3 L1 Status for BRI Interface 2

- Steady Red when Layer 1 is working

LED4 L1 Status for BRI Interface 3

- Steady Red when Layer 1 is working

LED5 L1 Status for BRI Interface 4

- Steady Red when Layer 1 is working

LED6

- Steady Red when B1 or B2 are busy in Interface 1.

LED7

- Steady Red when B1 or B2 are busy in Interface 2.

A6-324000-642-01 – Release 6.0
April 2003

LED8

✆ Steady Red when B1 or B2 are busy in Interface 3.

LED9

✆ Steady Red when B1 or B2 are busy in Interface 4.

LED10

✆ Steady Red when a communication error occurs, or during self-diagnostics. This LED is normally off.

LED11 System Communication Indication

✆ Steady Red when a communication error occurs, or during self-diagnostics. This LED is normally off.

4.1.6 Connectors

The following connector is located on the BRT ETU.

✆ CN1 Connects to the backboard

4.2 PRT(1)-U13 ETU

4.2.1 Description

The Primary Rate Trunk (PRT) Interface ETU terminates one Primary Rate ISDN line complying to the ETSI standard now operating in the Australian network. This PRI line provides up to 30 voice channels which can be used as CO trunks with DTMF signalling. Refer to *Figure 5-16 PRT(1)-U13 ETU*.

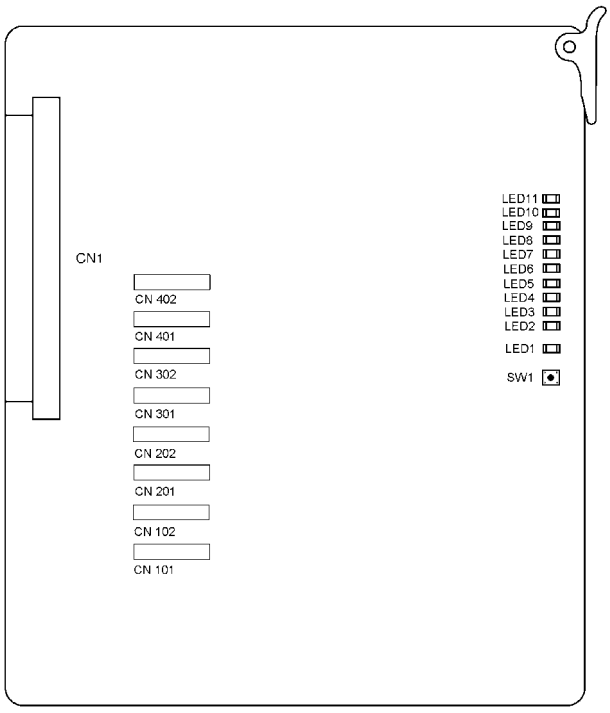


Figure 5-16 PRT(1)-U13 ETU

4.2.2 Installation

A maximum of 2 PRT(1)-13 ETUs can be installed in the Xen Master system (maximum of 60 trunks), in slot S4 of the first KSU and slot S1 of the second KSU.

A maximum of 1 PRT(1)-U13 ETUs can be installed in the Xen Axis system (maximum of 10 trunks) in slot S4 only.

4.2.3 Switch Settings

Switch SW2 resets the ETU. Switch SW1 settings are:

Table 5-4 PRT(1)-U13 ETU Switch Settings

SW1 Bits	Usage	Setting	Function (PRT Firmware V1.00)	Function (PRT Firmware V1.01 or later)
1-3	Country Selection	000	ETSI PRI (Australia)	INS Net 1500 (Japan
		001	INS Net 1500 (Japan)	ETSI PRI (Australia)
		010	NI-2 (USA)	Not Used
		011	5ESS (USA)	Not Used
		100	DMS100 (USA)	5ESS (USA)
		101	4ESS (USA)	DMS100 (USA)
		110	Not Used	4ESS (USA)
		111	Not Used	NI-2 (USA)
4-8	Not Used	00000		

Table 5-5 For PRT Firmware 2.13 or Later

DIP 1	DIP 2	DIP 3	DIP 4	DIP 5 to 8	Protocol	Country
OFF	OFF	OFF	OFF	Not Used	INS1500	Japan
ON	**OFF**	**OFF**	**OFF**	**Not Used**	**NET5**	**Aus**
OFF	ON	OFF	OFF	Not Used	INS1500	HK
ON	ON	OFF	OFF	Not Used	DMS-PRI-A233	US
OFF	OFF	ON	OFF	Not Used	5ESS	US
ON	OFF	ON	OFF	Not Used	DMS-PRI-A233	US
OFF	ON	ON	OFF	Not Used	4ESS	US
ON	ON	ON	OFF	Not Used	US-N12-PRI	US
OFF	OFF	OFF	ON	Not Used	Unused	Unused
ON	OFF	OFF	ON	Not Used	NET5	Singapore

4.2.4 LED Indications

Table 5-6 LED Indications

LED No.	Colour	PCB Marking	Description
LED1	Green	Live	Indicates communication between ETU and CPU
LED2	Red	Call	Indicates Call in progress on any channel OR channel busy
LED 3	Red	L1 Active	Indicates Physical Link up condition for ISDN interface
LED 4	Red	SLIP	Indicates SLIP has occurred
LED 5	Red	RAI	Remote Alarm Indication (RAI) from network OR channel busy
LED 6	Red	LOF	Loss of Frame (LOF) alarm OR channel busy
LED 7	Red	AIS	Alarm Indication Signal (AIS) from network OR channel busy
LED 8	Red	CRC	Cyclic Redundant Check (CRC) error in frame from network OR channel busy
LED 9	Red	Ch 0	Channel 0 busy indication
LED 10	Red	Ch 1	Channel 1 busy indication
LED 11	Red	Ch 0	Channel 2 busy indication

4.2.5 Connectors

CN1 Connects to backboard

CN2 Debug Port

CN3 Log Port

CN4 Expansion Header

CN5 Expansion Header

4.3 COI(8)-U( ) ETU

4.3.1 Description

The COI(8)-U13 (U19 for New Zealand) ETU provides an interface with the Central Office. The COI ETU contains circuitry for outside ring detection, holding, dialling and control functions.

It also incorporates line reversal detection and busy tone detection circuitry.

The COI(8)-U( ) ETU provides identical circuits to serve up to eight CO trunks that can be any combination of DTMF and Decadic signalling. Refer to *Figure 5-17 COI(8)-U( ) ETU*.

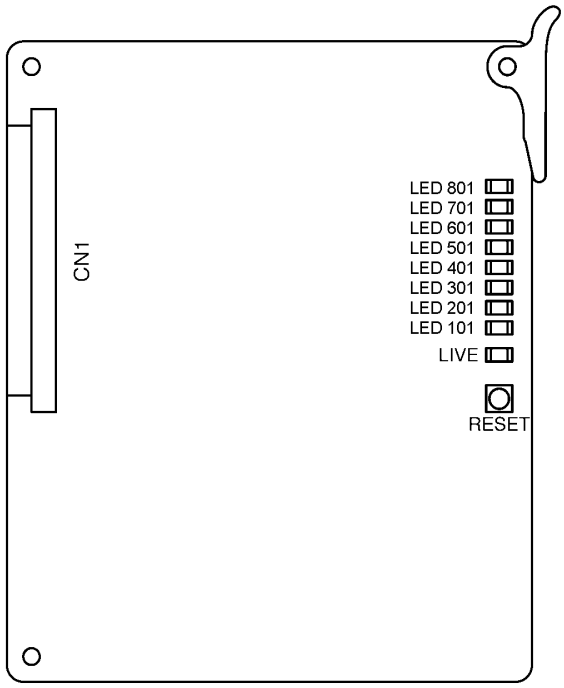


Figure 5-17 COI(8)-U( ) ETU

4.3.2 Installation

A maximum of 8 COI(8)-U( ) ETUs can be installed in the Xen Master system (maximum of 64 trunks) in slots S1~S8 in the first, second or third KSU.

A maximum of 2 COI(8)-U( ) ETUs can be installed in the Xen Axis system (maximum of 16 trunks) in slots S3 ~ S7.

4.3.3 Switch Settings

The Reset Switch resets the Unit.

4.3.4 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power still on)
- Off No Power

16 **LEDs 101~801** indications are listed below.

- Steady Red Lines 1~8 busy
- Off Lines 1~8 idle

4.3.5 Connectors

The following connector is located on the COI(8)-U( ) ETU.

- CN1 Connects to the backboard

A6-324000-642-01 – Release 6.0
April 2003

4.4 COI(4)-U( ) ETU

4.4.1 Description

The COI(4)-U13 (U19 for New Zealand) ETU provides an interface with the Central Office. The COI ETU contains circuitry for outside ring detection, holding, dialling and control functions.

It also incorporates line reversal detection and busy tone detection circuitry.

The COI(4)-U( ) ETU provides identical circuits to serve up to four CO trunks that can be any combination of DTMF and Decadic signalling. Refer to *Figure 5-18 COI(4)-U( ) ETU*.

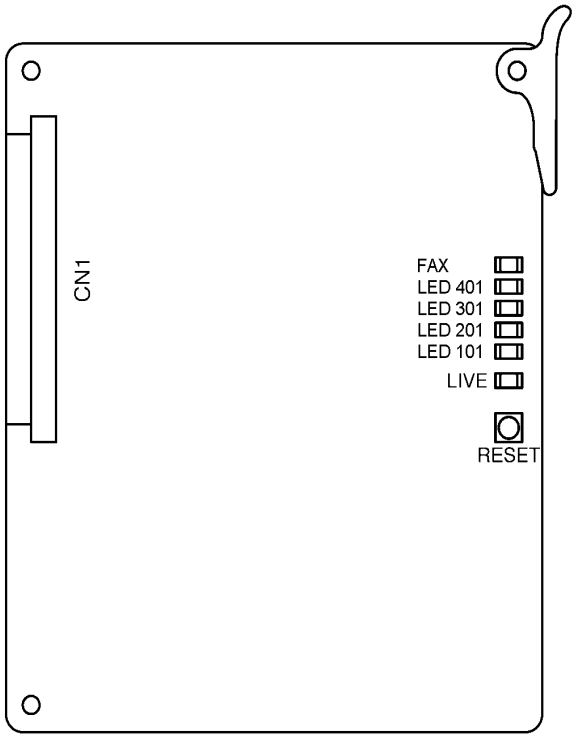


Figure 5-18 COI(4)-U( ) ETU

4.4.2 Installation

A maximum of 16 COI(4)-U( ) ETUs can be installed in the Xen Master system (maximum of 64 trunks) in slots S1~S8 in the first, second or third KSU.

A maximum of 2 COI(4)-U( ) ETUs can be installed in the Xen Axis system (maximum of 8 trunks) in slots S3 ~ S7.

4.4.3 Switch Settings

The Reset Switch resets the Unit.

4.4.4 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power still on)
- Off No Power

LEDs 101~401 indications are listed below.

- Steady Red Lines 1~4 busy
- Off Lines 1~4 idle

FAX LEDs indications are listed below.

- Steady Red Fax port is in use (device off-hook)
- Off Fax port is idle (device on-hook)

4.4.5 Connectors

The following connector is located on the COI(4)-U( ) ETU.

- CN1 Connects to the backboard

4.5 COID(8)-U( ) ETU

4.5.1 Description

The COID(8)-U13 (U19 New Zealand) ETU provides an interface with the Central Office for Caller ID Detection. This ETU provides circuitry for outside ring detection, hold, dialling, Caller ID detection, and control functions.

It also incorporates line reversal detection and busy tone detection circuitry.

A6-324000-642-01 – Release 6.0
April 2003

The COID(8)-U( ) ETU provides eight trunks that can be any combination of DTMF or Decadic signalling. Refer to *Figure 5-19 COID(8)-U( ) ETU*.

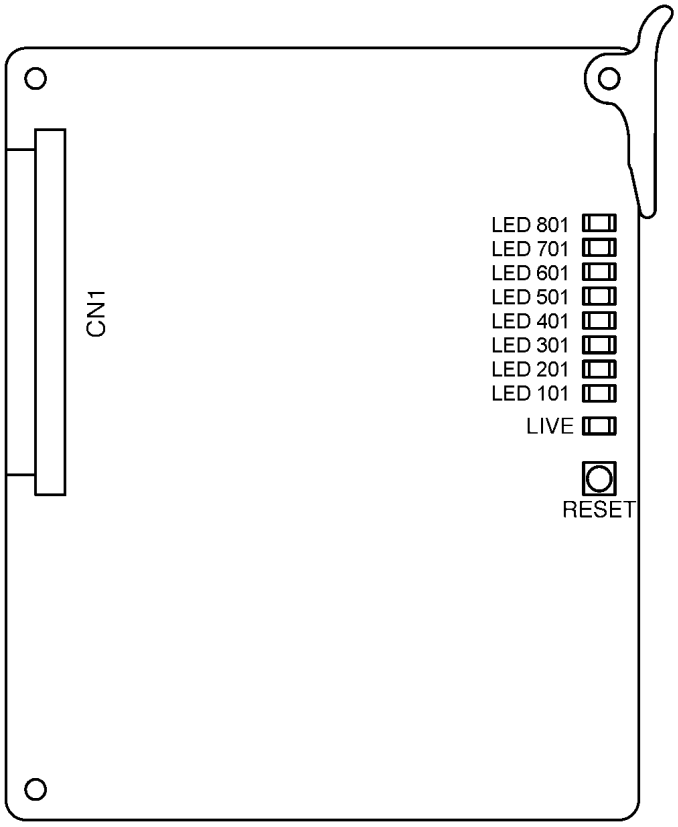


Figure 5-19 COID(8)-U( ) ETU

4.5.2 Installation

A maximum of 8 COID(8)-U( ) ETUs can be installed in the Xen Master system (maximum of 64 trunks) in slots S1~S4 in the first, second KSU.

A maximum of 2 COID(8)-U( ) ETUs can be installed in the Xen Axis system (maximum of 16 trunks) in slots S3 and S4.

4.5.3 Switch Settings

The **RESET** switch resets the unit.

4.5.4 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power still on)
- Off No Power

LED 101~801 indications are listed below.

- Steady Red Lines 1~8 busy
- Off Lines 1~8 idle

4.5.5 Connectors

The following connector is located on the COID(8)-U( ).

- CN1 Connects to the backboard

4.6 COID(4)-U( ) ETU

4.6.1 Description

The COID(4)-U13 (U19 New Zealand) ETU provides an interface with the Central Office for Caller ID Detection. This ETU provides circuitry for outside ring detection, hold, dialling, Caller ID detection, and control functions.

It also incorporates line reversal detection and busy tone detection circuitry.

A6-324000-642-01 – Release 6.0
April 2003

The COID(4)-U( ) ETU provides four trunks which can be any combination of DTMF or Decadic signalling. Refer to *Figure 5-20 COID(4)-U( ) ETU*.

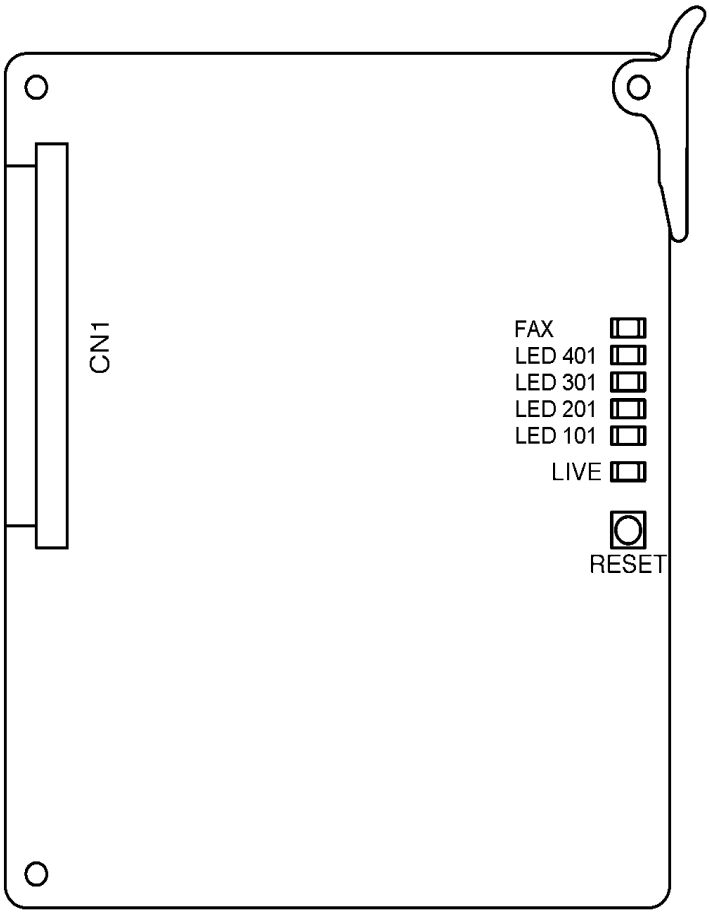


Figure 5-20 COID(4)-U( ) ETU

4.6.2 Installation

A maximum of 8 COID(4)-U( ) ETUs can be installed in the Xen Master system (maximum of 32 trunks) in slots S1~S4 in the first, second KSU.

A maximum of 2 COID(4)-U( ) ETUs can be installed in the Xen Axis system (maximum of 8 trunks) in slots S3 and S4.

4.6.3 Switch Settings

The **RESET** switch resets the unit.

A6-324000-642-01 – Release 6.0
April 2003

4.6.4 LED Indications

Live LED indications are listed below.

- ✆ Blinking Red Normal Operation
- ✆ Steady Red Operation Stopped (power still on)
- ✆ Off No Power

LED 101~401 indications are listed below.

- ✆ Steady Red Lines 1~4 busy
- ✆ Off Lines 1~4 idle

FAX LED indications are listed below.

- ✆ Steady Red Fax port is in use (device off-hook)
- ✆ Off Fax port is idle (device on-hook)

4.6.5 Connectors

The following connector is located on the COID(4)-U( ) ETU.

- ✆ CN1 Connects to the backboard

4.7 DID(4)-U13 ETU

4.7.1 Description

The DID(4)-U13 ETU provides interface for Direct Inward Termination (or DID) lines. This ETU provides for a maximum of four DID lines. Wink start, delay start, immediate start, and second Dial Tone are accommodated with this ETU. Dial Pulse and DTMF are also supported. There are four built-in DTMF signal detectors. Refer to *Figure 5-21 DID(4)-U13 ETU*.

A6-324000-642-01 – Release 6.0
April 2003

The DID ETU is not available in New Zealand.

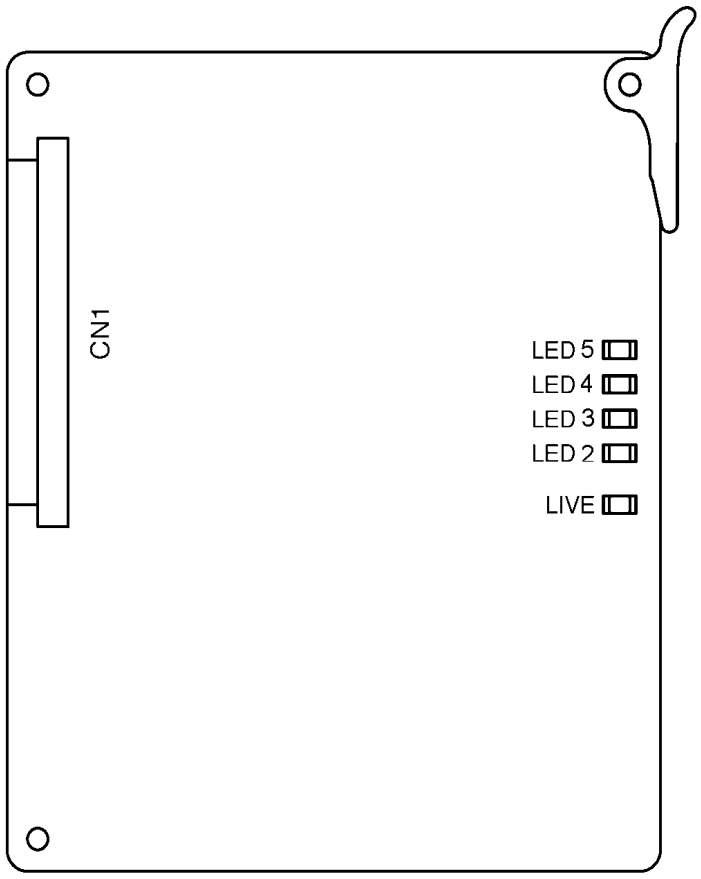


Figure 5-21 DID(4)-U13 ETU

4.7.2 Installation

1 A maximum of 16 DID(4)-U13 ETUs can be installed in the Xen Master system (maximum of 64 trunks) in slots S1~S8 in the first, second or third KSU.

2 A maximum of 4 DID(4)-U13 ETUs can be installed in the Xen Axis system (maximum of 16 trunks) in slots S3 ~ S7.

4.7.3 LED Indications

Live LED indications are listed below.

- ✆ Blinking Red Normal Operation
- ✆ Steady Red Operation Stopped (power still on)
- ✆ Off No Power

LED 2~5 indications are listed below.

- ✆ Steady Red Lines 1~4 busy
- ✆ Off Lines 1~4 idle

4.7.4 Connectors

The following connector is located on the DID(4)-U13 ETU.

✆ CN1 Connects to the backboard

4.8 TLI(2)-U13 ETU

4.8.1 Description

The TLI(2)-U13 ETU provides for the termination and operation of a maximum of two E&M Tie lines (4-wire, Type I, or Type V, 10 pps or 20 pps, Dial Pulse, or DTMF). Immediate Start, Delay Start, Wink Start, and second Dial Tone signalling are also provided. The TLI(2)-U13 ETU has two built-in DTMF signal detectors. Refer to *Figure 5-22 TLI(2)-U13 ETU*.

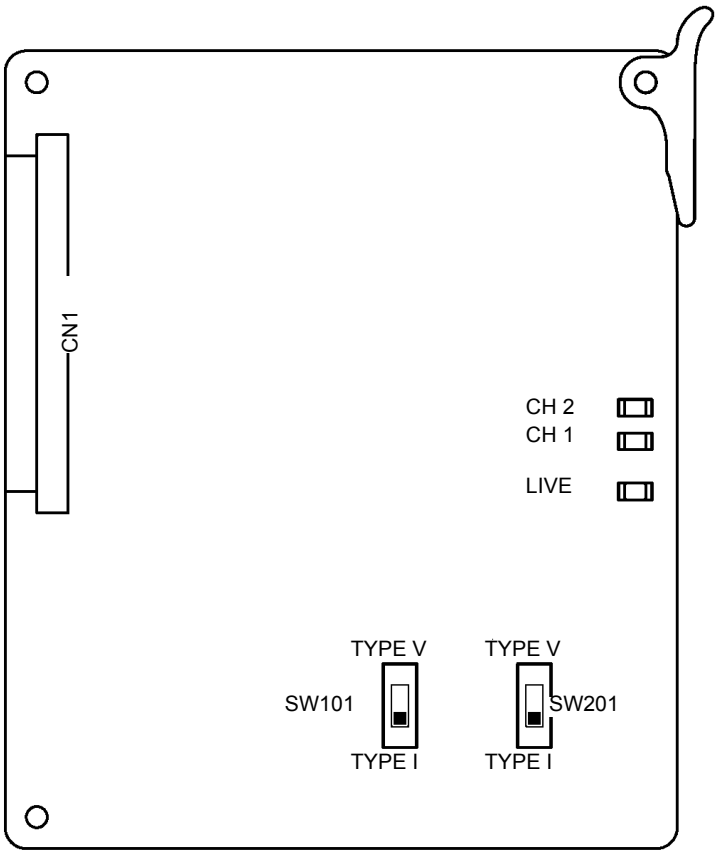


Figure 5-22 TLI(2)-U13 ETU

4.8.2 Installation

A maximum of 16 TLI(2)-U13 ETUs can be installed in the Xen Master system (maximum of 32 lines) in slots S1~S4 in the first, second or third KSU.

A maximum of 4 TLI(2)-U13 ETUs can be installed in the Xen Axis system (maximum of 8 lines) in slots S3 ~ S7.

A6-324000-642-01 – Release 6.0
April 2003

4.8.3 Switch Settings

Refer to Table 5-7 TLI(2)-U13 ETU Default Switch Settings.

Table 5-7 TLI(2)-U13 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 between 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 between Type I or Type V for Line 2

4.8.4 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power still on)
- Off No Power

CH 1 ~ CH 2 indications are listed below.

- Steady Red Lines 1~2 busy
- Off Lines 1~2 idle

4.8.5 Connectors

The following connector is located on the TLI(2)-U13 ETU.

- CN1 Connects to the backboard

4.8.6 Connections

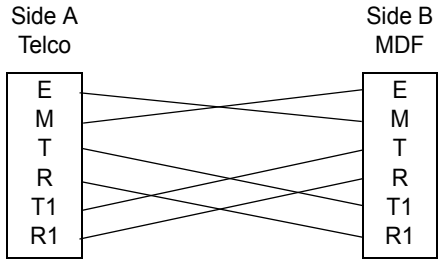


Figure 5-23 TLI(2)-U10 ETU Connections

4.9 ESI(8)-U13 ETU

4.9.1 Description

The Electronic Station Interface ETU provides an 8-port interface for Multiline Terminals, Attendant Consoles, and Single Line Telephone Adapter SLT(1)-U13 ADP. Refer to *Figure 5-24 ESI(8)-U13 ETU*.

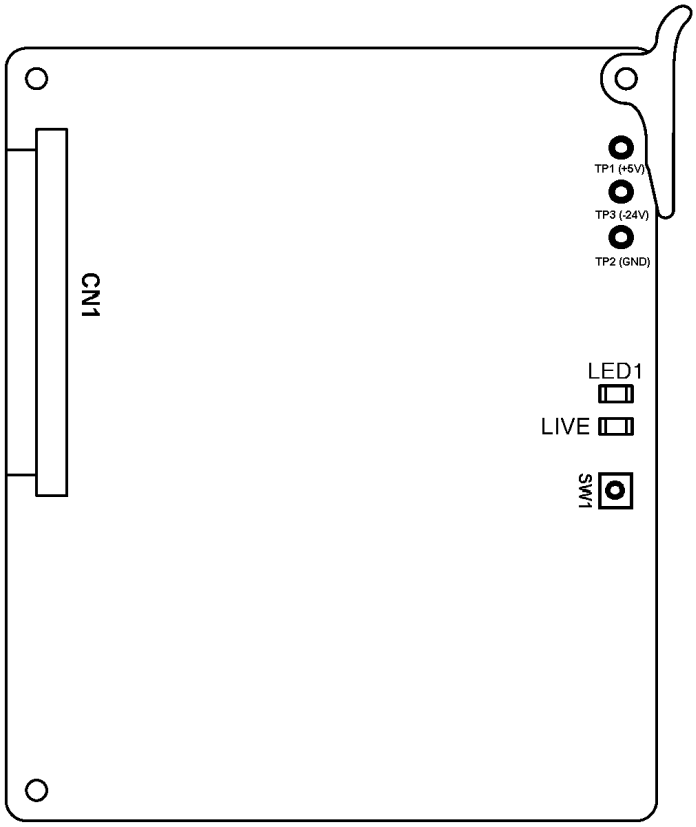


Figure 5-24 ESI(8)-U13 ETU

4.9.2 Switch Settings

SW1 resets the ETU.

4.9.3 Installation

A maximum of 15 ESI(8)-U13 ETUs can be installed in the Xen Master system (maximum of 120 ports), in slots S1~S8 in the first, second or third KSU.

A maximum of 3 ESI(8)-ETUs can be installed in the Xen Axis system in slots S3-S7, in addition to the 8 ESI ports provided on the MBD-U13 Unit (maximum of 32 ports).

A6-324000-642-01 – Release 6.0
April 2003

4.9.4 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED1 indications are listed below.

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

4.9.5 Connectors

The following connector is located on the ESI(8)-U13 ETU.

- CN1 — Connects to the backboard

A6-324000-642-01 – Release 6.0
April 2003

4.10 SLI(8)-U13 ETU

4.10.1 Description

The SLI(8)-U13 ETU provides an interface for Single Line Telephones and for analogue voice mail units. It has a built-in ringing generator (RSG) and supports a maximum of eight Single Line Telephones or analogue Voice Mail ports. Refer to *Figure 5-25 SLI(8)-U13 ETU*.

This ETU also provides circuitry for loop status detection, talk battery, sending ringing signals, message waiting, and loop disconnect for dial pulse signal detection.

Note: The PBR circuit in the CPUB( )-U13 ETU or the PBR ( )-U13 ETU is required with Voice Mail or DTMF Single Line Telephones.

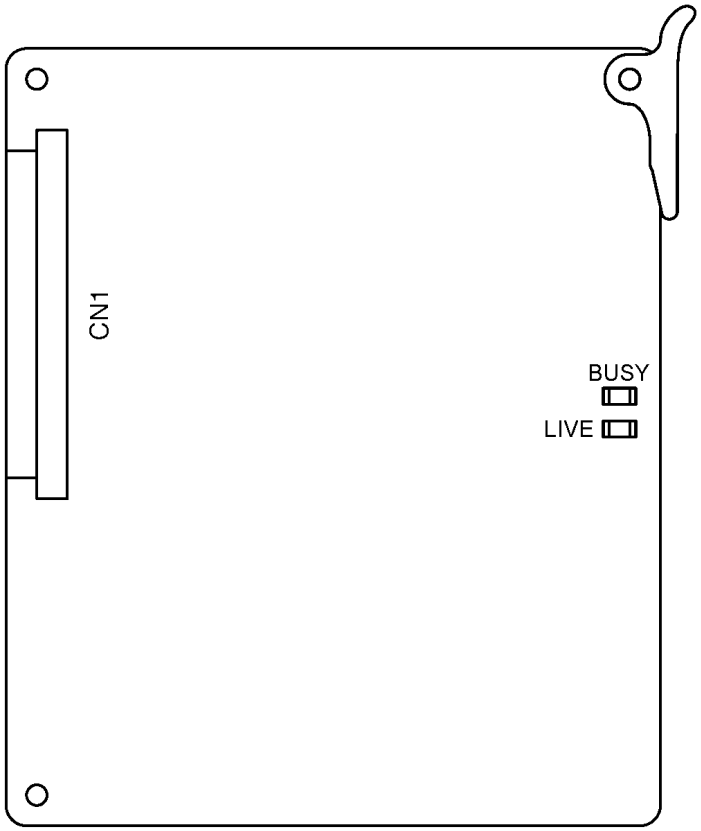


Figure 5-25 SLI(8)-U13 ETU

4.10.2 Installation

A maximum of 14 SLI(8)-U13 ETUs can be installed in the Xen Master system (maximum of 112 ports) in slots S1~S8 in the first, second or third KSU.

A maximum of 3 SLI(8)-U13 ETUs can be installed in the Xen Axis system (maximum of 24 ports) in slots S3~S7.

A6-324000-642-01 – Release 6.0
April 2003

4.10.3 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

BUSY indications are listed below.

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

4.10.4 Connectors

The following connector is located on the SLI(8)-U13 ETU.

- CN1 — Connects to the backboard

4.11 SLI(4)-U13 ETU

4.11.1 Description

The SLI(4)-U13 ETU provides an interface for Single Line Telephones and for analogue voice mail units. It has a built-in ringing generator (RSG) and supports a maximum of four Single Line Telephones or analogue Voice Mail ports. Refer to *Figure 5-26 SLI(4)-U13 ETU*.

This ETU also provides circuitry for loop status detection, talk battery, sending ringing signals, message waiting, and loop disconnect for dial pulse signal detection.

Note: The PBR circuit in the CPUB( )-U13 ETU or the PBR ( )-U13 ETU is required with Voice Mail or DTMF Single Line Telephones.

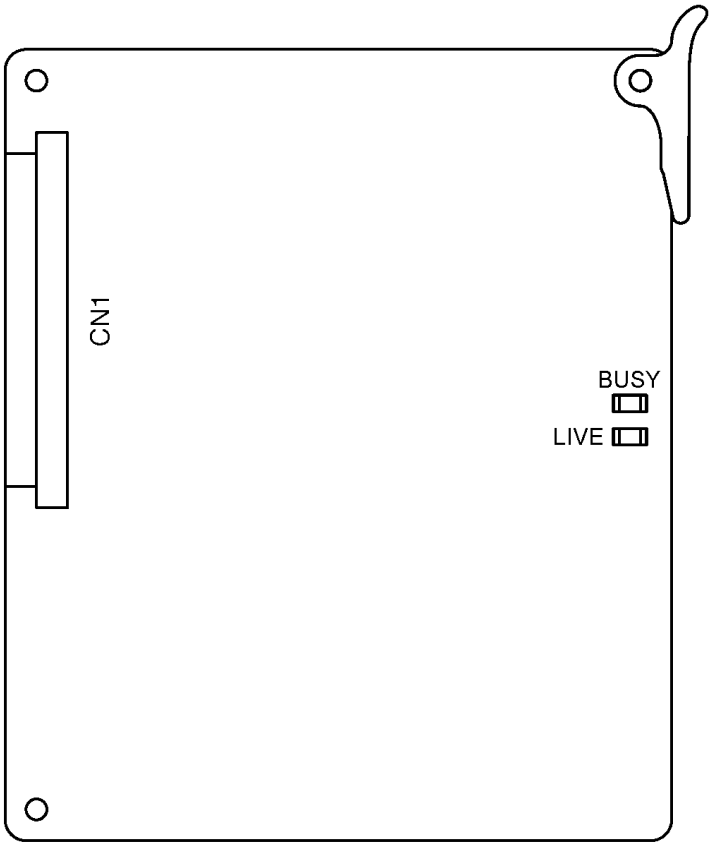


Figure 5-26 SLI(4)-U13 ETU

4.11.2 Installation

A maximum of 23 SLI(4)-U13 ETUs can be installed in the Xen Master system (maximum of 92 ports) in slots S1~S8 in the first, second or third KSU.

A maximum of 5 SLI(4)-U13 ETUs can be installed in the Xen Axis system (maximum of 10 ports) in slots S3~S7.

A6-324000-642-01 – Release 6.0
April 2003

4.11.3 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

BUSY indications are listed below.

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

4.11.4 Connectors

The following connector is located on the SLI(4)-U13 ETU.

- CN1 — Connects to the backboard

4.12 OPX(2)-U13 ETU

4.12.1 Description

The OPX(2)-U13 ETU is the interface for two off-premise extensions. This ETU has a built-in ringing generator (RSG). A maximum of 1800Ω of loop resistance (including about 200Ω for the Single Line Telephone) is acceptable between the OPX(2)-U13 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 a dial pulse detection.

Note: The PBR circuit in the CPUB( )-U13 ETU or the PBR ( )-U13 ETU is required with Single Line Telephone Connection.

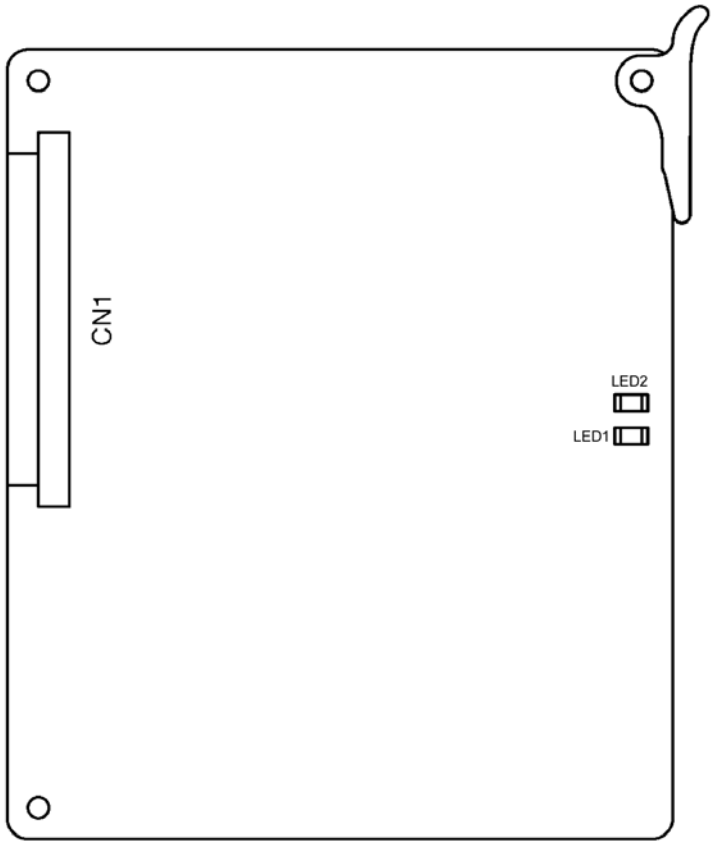


Figure 5-27 OPX(2)-U13 ETU

A6-324000-642-01 – Release 6.0
April 2003

4.12.2 Installation

A maximum of 23 OPX(2)-U13 ETUs can be installed in the Xen Master system (maximum of 46 ports) in slots S1~S8 in the first, second or third KSU.

A maximum of 5 OPX(2)-U13 ETUs can be installed in the Xen Axis system (maximum of 10 ports) in slots S3~S7.

The analogue extension can be located up to 6 kms away using 24AWG single-pair wiring (maximum 1800Ω loop resistance, including the internal resistance of the analogue device).

4.12.3 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED1 indications are listed below.

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

4.12.4 Connectors

The OPX(2)-U13 ETU has one connector.

- CN1 — Connects to the backboard

A6-324000-642-01 – Release 6.0
April 2003

4.13 IPT(4)/(8)-U13 ETU

4.13.1 Description

The IP Gateway IPT(4)/(8)-U13 ETU is an optional interface for the Xen KSU that can combine various trunk and Tie line calls into Gateway trunks. This ETU can be assigned as a two-port TLI(2)-U13, four port DID(4)-U13/ COI(4)-U13/COID(4)-U13 ETU, or eight-port COI(8)/ COID(8)-U13 ETU

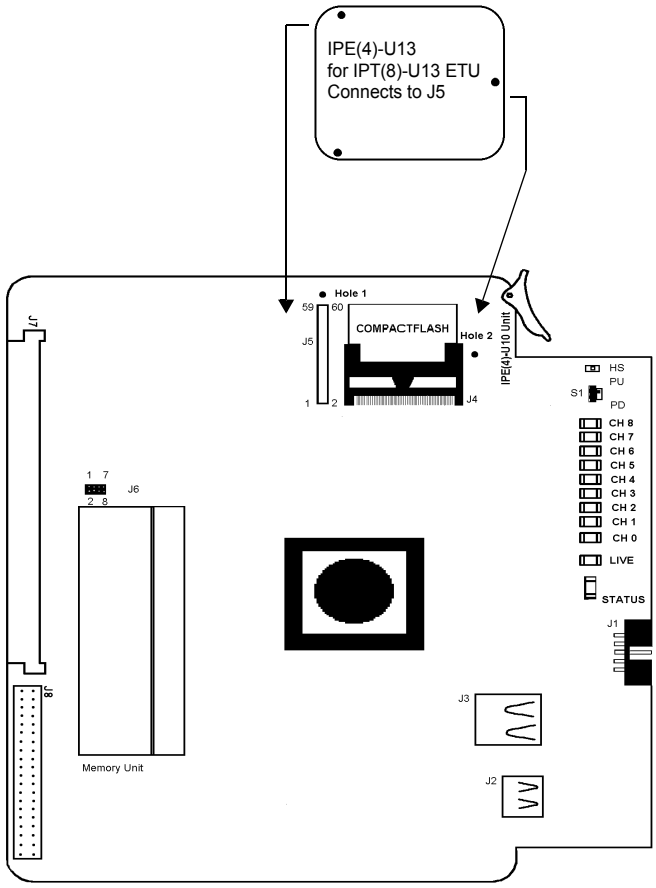


Figure 5-1 IPT(8)-U13 ETU

The IP Gateway trunk board has the following options:

Table 5-8 IP Gateway Options

#	Configuration	Number of Ports IPT(4)	Number of Ports IPT(8)	Installation Slot Elite 48	Installation Slot Elite 192
1	COI	4	8	S3~S7	S1~S8
2	COID	4	8	S3 or S4	S1~S4
3	DID	4	4	S3~S7	S1~S8
4	TLI	2	2	S3~S7	S1~S8

4.13.2 Installation

The Gateway ETU can be installed in KSU slots that support the applicable ETU simulated.

The IPT(4)-U13 ETU is converted to IPT(8)-U13 by installing daughter board IPE(4)-U13 Unit.

Refer to Elite IP Gateway Installation Manual 750367.

4.13.3 LED Indications:

✆ HS

When Switch S1 is placed to PD, this LED lights red. The IPT ETU starts shutdown. When shut down is complete, this LED goes off along with all others to indicate that the ETU can be removed from the KSU.

✆ CH8~1

Indicates the status of associated channel or trunk as in COID/DID as follows:

Trunk Status	COID LED	DID LED
Not Installed or Idle	Off	Off
Incoming	Off	On
Busy	On	On

✆ Live

Flashes red when ETU is receiving power from the KSU.

✆ Ethernet Status

Two built-in LEDs (one green and one yellow) on the RJ-45 indicate Ethernet connection status. The yellow LED is On when the Ethernet link is up. The green LED flashes to indicate activity.

✆ Status

This bi-color (red and green) LED shows status of all Gateway trunks. When an error is detected, the location is indicated by the following table.

Trunk Status	LED Condition	Error Location
Power On	Off	BIOS, Hardware
Start DSP download	Red	DSP Driver
DSP download OK	Red and Green	DSP Download
Successful Application Start	Green	Application Load

4.13.4 IPT(4)-U13 to IPT(8)-U13 ETU Conversion

The IPE(4)-U13 Unit is attached to the IPT(4)-U13 ETU to convert it to the IPT(8)-U13 ETU. This unit comes with two attached standoffs with an extra screw in the bottom.

1. Remove the screw from the bottom of each standoff.
2. Line up the IPE(4)-U13 Unit standoffs with Holes 1 and 2 and connector J1 with IPT(4)-U13 ETU connector J5, and press down until the IPE(4)-U13 Unit is firmly attached to the IPT(4)-U13 ETU.
3. Install the two previously removed screws through holes 1 and 2 to Connect the standoffs to the IPT(4)-U10 ETU.

4.13.5 Connectors

The IPT(4)/(8)-U13 ETU has two connectors

✆ CN1 Connects to the backboard

✆ RJ-45 Connects to the Ethernet

4.13.6 Switch S1

Switch S1 must be in power down (PD) for ETU installation, and placed in PU to activate the ETU. After the ETU is activated, S1 is placed in PD to power down the ETU for removal.

4.13.7 Connections

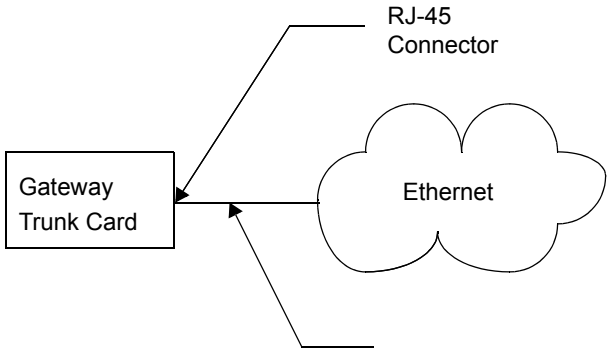


Figure 5-2 IPT(4)/(8)-U10 ETU Connections

A6-324000-642-01 – Release 6.0
April 2003

SECTION 5
OPTIONAL ETUS

This section describes optional Electronic Telephone Units that provide additional functions for a Xen system.

5.1 ACD(8)-U10 ETU

5.1.1 Description

The ACD(8)-U10 ETU interfaces the Elite ACD Plus Server to the Electra Elite KSU. Elite ACD Plus provides Windows-based software programs to enhance the ACD features of the Electra Elite Key Telephone System.

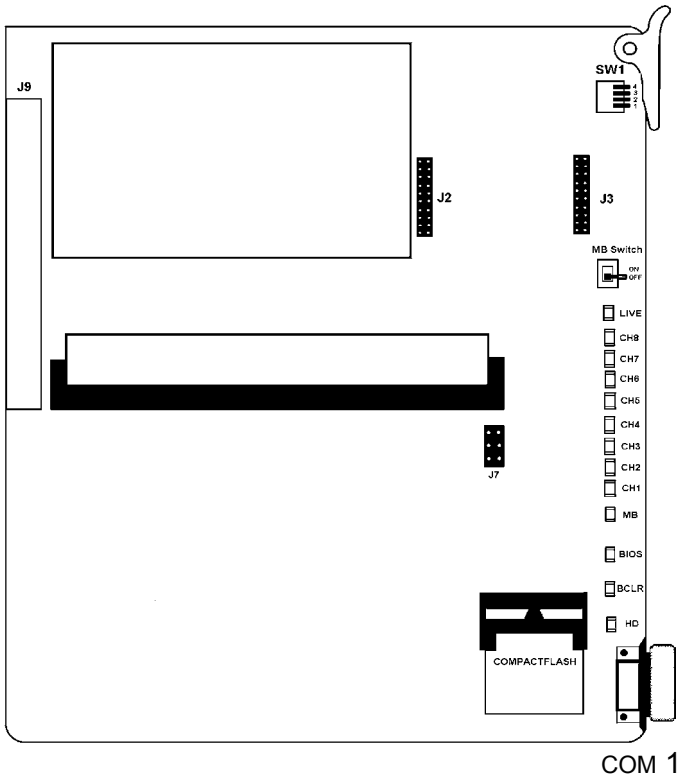


Figure 5-3 ACD(8)-U10 ETU

5.1.2 Installation

Only one ACD(8) can be installed in each system in slot S1~S8 in any Electra Elite 192 system KSU.

5.1.3 LED Indications

The front edge of the ETU has 13 LEDs. (Refer to *Figure 5-3 ACD(8)-U10 ETU*.) LEDs CH1~CH8 indicate the port status as follows:

- On Port Busy
- Off Port idle or not used

1 The Live LED is red if ETU is receiving power.

1 The MB LED indicates the status of the MB switch.

1 The DOS (BIOS) LED is red if a BIOS error has occurred.

1 The Bicolor (BCLR) LED indicates application status as follows:

- Red DOS started (ACD application not ready)
- Green ACD application is running
- The hard disk drive (HD) LED flashes red when HDD is active.

Note: Do not reset the ETU while the HD LED is flashing.

5.1.4 Connectors

The ACD(8)-U10 ETU has the following connectors:

- J9 Connects to the backboard
- 9-pin RS-232(COM1)

  Local Serial connector on main ETU for direct connection.

5.1.5 Installation Precautions

The ETUs used in this system make extensive use of CMOS technology that is very susceptible to static electricity. **Static discharge must be avoided** when handling ETUs. Always use the following precautions:

- Wear a grounding strap anytime you handle the ETU.
- Make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that Make Busy switch is off.
- Carry ETU in a conductive polyethylene bag to prevent static electricity damage.PBR( )-U13 ETU

A6-324000-642-01 – Release 6.0
April 2003

5.2 PBR( )-U13 ETU

5.2.1 Description

The Push Button Receiver (PBR) ETU detects and translates DTMF tones generated by Single Line Telephones, modems, or facsimile machines, etc. This ETU is required if the four built-in PBR channels are not enough to support all the PBR requirements of the system, or the CPUB( )-U13 PBRs are dedicated to the VRS(4)-U13 ETU. Refer to *Figure 5-28 PBR( )-U13 ETU*.

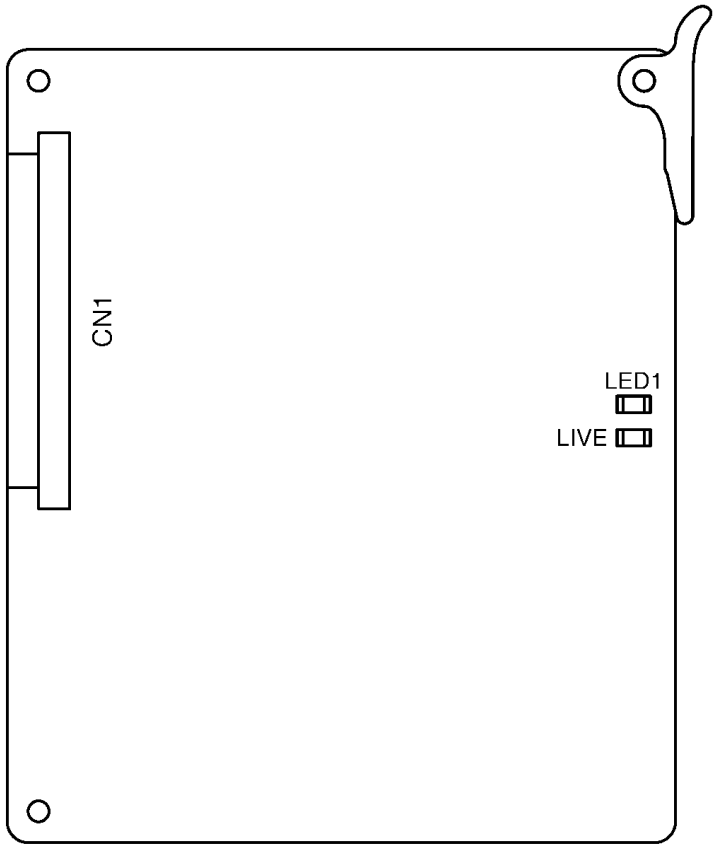


Figure 5-28 PBR( )-U13 ETU

5.2.2 Installation

A maximum of one PBR( )-U13 ETU can be installed in the Xen Master (slots S1~S8) or Xen Axis (slots S2~S7) systems to provide a total of eight PBR circuits.

5.2.3 LED Indications

Live LED indications are listed below.

- Blinking Red Normal Operation
- Steady Red Operation Stopped (power still on)
- Off No Power

LED 1 indications are listed below.

- On Some circuit(s) are receiving DTMF signalling
- Off All PBR(s) are idle

5.2.4 Connectors

The following connector is located on the PBR( )-U13 ETU.

- CN1 Connects to the backboard

5.3 VDH2(8)-U13 ETU

5.3.1 Description

The VDH2(8)-U13 ETU integrates both LAN and station cabling. This is a standard ESI ETU with additional circuitry for the LAN integration function.

Key Telephones and Attendant Consoles can be connected to the VDH2(8)-U13 ETU via a VDD-UA Unit., CTU(C)-UA Unit or PCT(C)-U13 Unit.

Each VDH2(8)-U13 ETU has a built-in HUB facility that has eight ports (IEEE 802.3 10Base-2).

A6-324000-642-01 – Release 6.0
April 2003

5.3.2 Specifications

Refer to *Table 5-9 VDH2(8)-U13 ETU Specifications*.

Table 5-9 VDH2(8)-U13 ETU Specifications

Description	Specifications
General Specifications	
Access Method	CSMA/CD Method (IEEE 802.3)
Transmission Speed	10 Mbps
Transmission Interface	10Base-2:1 port 10Base-2 + *D*^{term} Interface:8 ports
Transmission Interface Connectors	
10Base-2	BNC (coaxial cable)
10Base-2 + Dterm Interface	RJ45 (modular for 10Base-2)
Transmission Cable Type and Maximum Cable Length	
10Base-2	Coaxial Cable – 185 metres
10Base-2 + *D*^{term} Interface	Twisted Pair Cable (LAN Category 3 or higher) – 100 metres for 10Base-2 technology.

5.3.3 Cabling

The information listed below applies when connecting the VDH2(8)-U13 unit.

- Normally the 10Base-2 cables connected to the VDH2(8)-U13 units cannot be directly connected to another HUB or to a LAN terminal. A set of jumpers is provided on the VDH2(8)-U13 to turn off the station abilities for ports 1~7. In this case LAN terminals can be connected directly to the VDH2(8)-U13 ETU. Refer to *Figure 5-30 VDH2(8)-U13 ETU Connections* for the layout of jumpers on the KTU.

- Port 8 is unique in that the station abilities cannot be separated by changing a jumper setting like ports 1~7. Port 8 is to be used for cascading HUBs. Connect Port 8 either to another VDH2(8)-U13 (Port 1~7) or an external HUB. In this case be sure to set SW2 on the VDH2(8)-U13 to '='. If SW2 is set to 'X', then Port 8 is used as a regular Telamux connection. See *Figure 5-29 VDH2(8)-U13 ETU*.

- The VDH2(8)-U13 ETU can be used with 10Base-2 and 10Base-2 cables. VDH2(8)-U13 ETU HUBs can be cascaded using 10Base-2 cables. The 10Base-2 connector can also be used to connect the VDH2(8)-U13 ETU to a LAN backbone. (Refer to *Figure 5-30 VDH2(8)-U13 ETU Connections*.)
- In these cases the port 8 is still used for core line. The 10Base-2 cable interconnecting VDH2(8)-U13 ETUs must be greater than 0.5 meters. Care should be taken so the 10Base-2 cables are neatly coiled. When the 10Base-2 cables are connected to the VDH2(8)-U13 BNC connector, a terminating plug must be used if this is the last device on the cable. Refer to *Figure 5-29 VDH2(8)-U13 ETU*.
- Using the 10Base-2 cables is the preferred method of cascading VDH2(8)-U13 ETU hubs since it does not reduce the quantity of station ports that the ETU can provide.

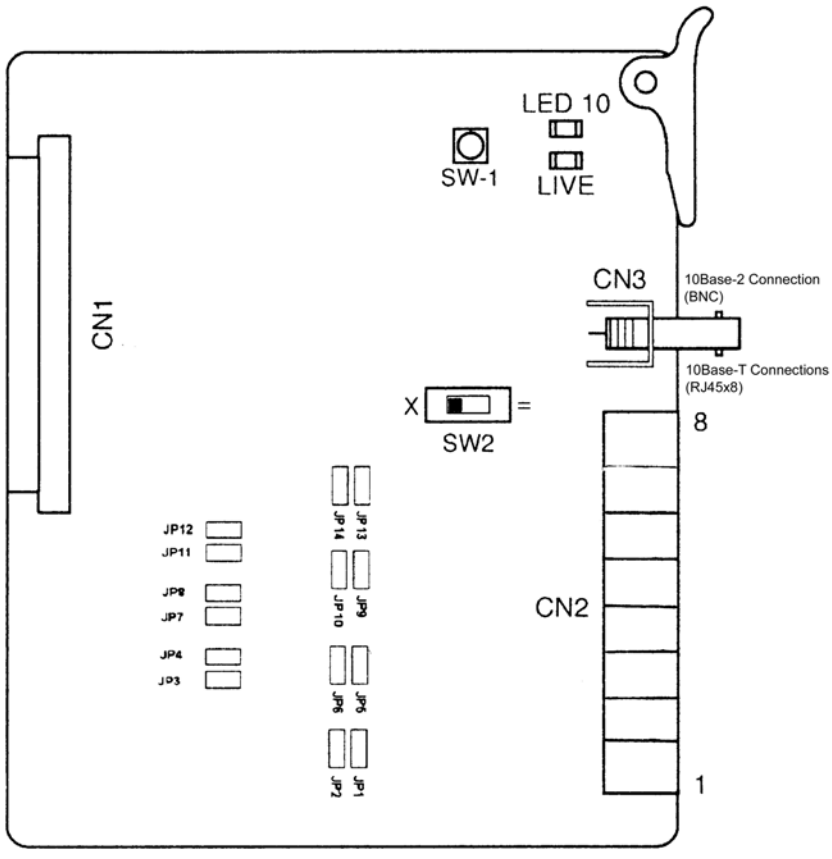


Figure 5-29 VDH2(8)-U13 ETU

A6-324000-642-01 – Release 6.0
April 2003

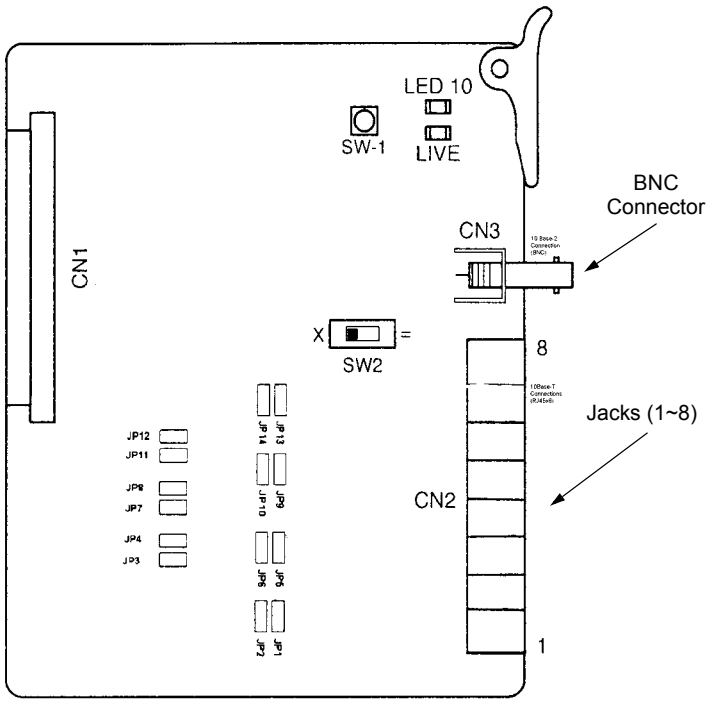


Figure 5-30 VDH2(8)-U13 ETU Connections

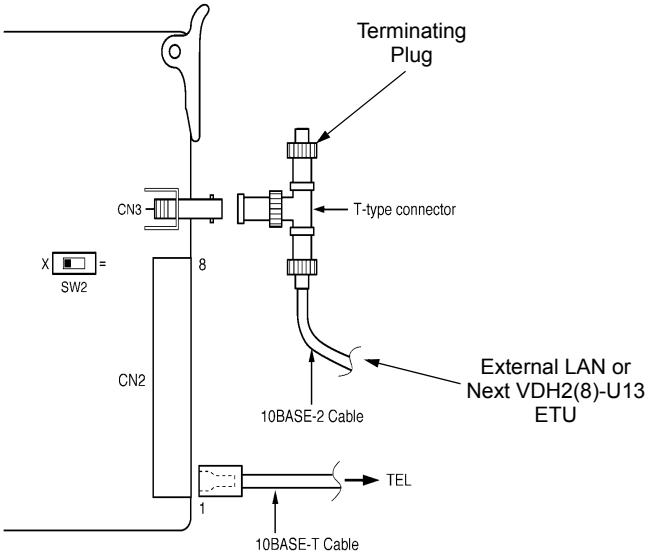


Figure 5-31 10 Base 2 Cable Connections

5.3.4 Installing the VDH2(8)-U13

- A maximum of 9 VDH2(8)-U13 ETUs can be installed in the Xen Master system (maximum of 72 ports), 3 per KSU in slots S1~S8.
- A maximum of 3 VDH2(8)-U13 ETUs can be installed in the Xen Axis system (maximum of 24 trunks), in slots S2~S7.
- The 10Base-2 ports on the VDH2(8)-U13 ETU use 4-wire polar cables.
- When connecting a VDH2(8)-U13 ETU to a multiline terminal, avoid using under-carpet cables because the device becomes susceptible to outside noises. It is better to use EIA/TIA round cables instead of flat cables. If under-carpet cables are used, you must follow the installation instructions provided by the cable manufacturer. Also consider these precautions:
  - Limit the under-carpet cable length to 20 metres.
  - When using multiple pair cabling to connect the VDH2(8)-U13 units to the multiline terminal, do not include analogue lines in the same cable.
- When connecting a VDH2(8)-U13 ETU, use the FCE-U13 Unit for proper wiring. Lead the cable connected to the ETUs out through the clamp on the KSU as shown in *Figure 5-32 Front Cover Extender for VDH2(8)-U13 ETUs*. Refer to Installing a Front Cover Extender (FCE-U13 Unit) in Chapter 4.

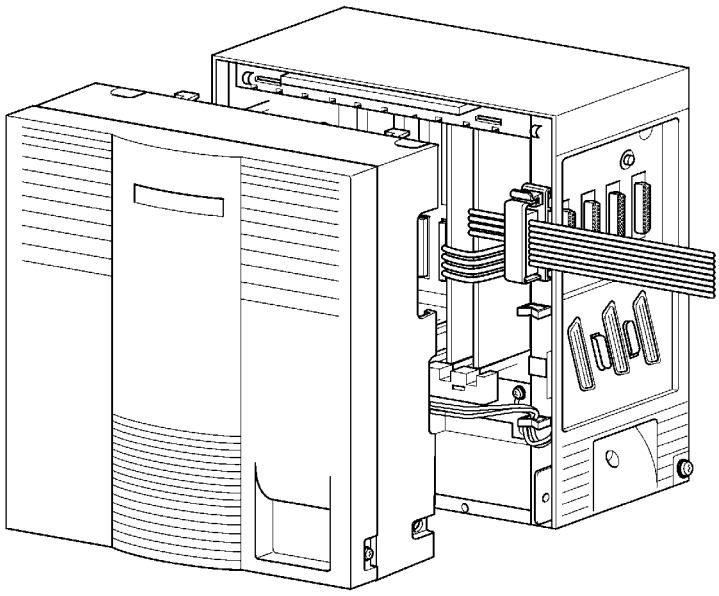


Figure 5-32 Front Cover Extender for VDH2(8)-U13 ETUs

A6-324000-642-01 – Release 6.0
April 2003

Figure 5-29 VDH2(8)-U13 ETU shows cable connections to the LAN using 10Base-2 cabling. Use an EIA/TIA category 3 (or higher) unshielded twisted pair cable. ***Do not use 10Base-2 cable for overhead wiring or for outdoor wiring.***

5.3.5 Switch Settings and Jumpers

Table 5-10 VDH2(8)-U13 ETU Default Switch Settings indicates the default switch settings for the VDH2(8)-U13 ETU and jumpers settings are given in *Table 5-11 Jumper Settings*.

Table 5-10 VDH2(8)-U13 ETU Default Switch Settings

Switch	Setting	Description
SW1	N/A	Reset Switch
SW2	**X**Port 8 Normal Use Mode (LAN Cable Integration) **=**Port 8 10Base-2 cascades to another VDH2(8)-U13 ETU or HUB	Defines Port 8 communication mode.

Table 5-11 Jumper Settings

Port	Jumper	Setting
1	JP1 JP2	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
2	JP3 JP4	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
3	JP5 JP6	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
4	JP7 JP8	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
5	JP9 JP10	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
6	JP11 JP12	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)
7	JP13 JP14	Both 1 and 2 LAN connection only Both 2 and 3 LAN station integration (default)

A6-324000-642-01 – Release 6.0
April 2003

5.3.6 LED Indications

LED indications are located on both sides of the ETU as indicated in *Figure 5-33 VDH2(8)-U13 LED Indications*.

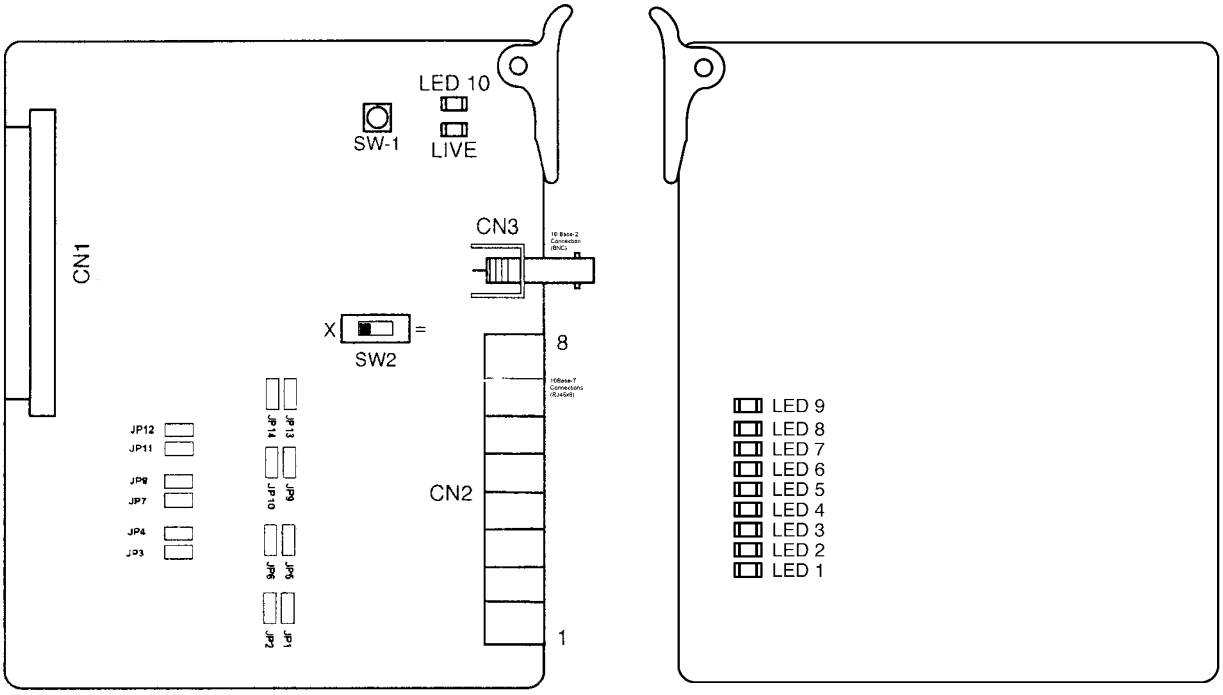


Figure 5-33 VDH2(8)-U13 LED Indications

Live LED indications are listed below.

✆	Blinking Red	Normal Operation
✆	Steady Red	Operation Stopped (power still on)
✆	Off	No Power

LEDs 1~8 indication are listed below.

✆	Steady Green	LAN connections on channels 1~8 are established
✆	Steady Orange	LAN terminals 1~8 transmitting data
✆	Off	LAN terminals 1~8 not active

LED 9 indications are listed below.

✆	Steady Red	10Base-2 sending data
✆	Off	10Base-2 not active

LED 10 indications are listed below.

✆	Steady Red	Intercom terminal on some channel in use
✆	Off	No intercom terminals in use

A6-324000-642-01 – Release 6.0
April 2003

5.3.7 Connectors

The following connectors are located on the VDH2(8)-U13 ETU.

- CN1 Connects to the backboard.
- CN2 – CH1~7 Connects to Multiline Terminals.
- CN2 – CH8 Connects to Multiline Terminal or cascade connection to another HUB.
- CN3 Connects 10Base-2 cascade cables from another HUB or mainframe LAN.

When SW2 is set to **X**, the following table indicates the pin assignments for the RJ-45 pins for CN2 – CH8.

In the tables below, TD indicates Transmit Data and RD indicates Receive Data.

Table 5-12 Normal

Pin	Signalling
6	TD-
3	TD+
2	RD-
1	RD+

When SW2 is set to **=**, the following table indicates the pin assignments for the RJ-45 pins for CN2-CH8.

Table 5-13 Cascade

Pin	Signalling
6	RD-
3	RD+
2	TD-
1	TD+

Note: Cables that connect a terminal to a HUB are straight, and cables that connect HUB-to-HUB are crossed. Core line uses straight cables only.

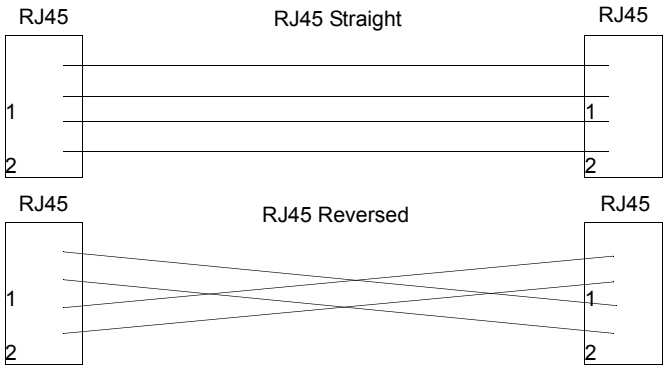


Figure 5-34 Cable Connection Comparison

5.4 VRS(4)-U13 ETU

5.4.1 Description

The Voice Recording Service ETU provides record/playback of voice messages for the Automated Attendant, Voice Prompt, and Delay Announcement features. The VRS(4)-U13 ETU must use the built-in PBR circuits on the CPUB( )-U13 ETU for Automated Attendant or DISA.

Each VRS(4)-U13 ETU has four record/playback channels. The maximum voice recording ability for each channel is 240 seconds. The technician can select one of four message lengths. The available message lengths and the maximum number of messages that can be recorded are listed in the following table.

Table 5-14 Message Length

Message Length	Maximum Number of Recorded Messages
15 seconds	16
30 seconds	8
60 seconds	4
120 seconds	2

A6-324000-642-01 – Release 6.0
April 2003

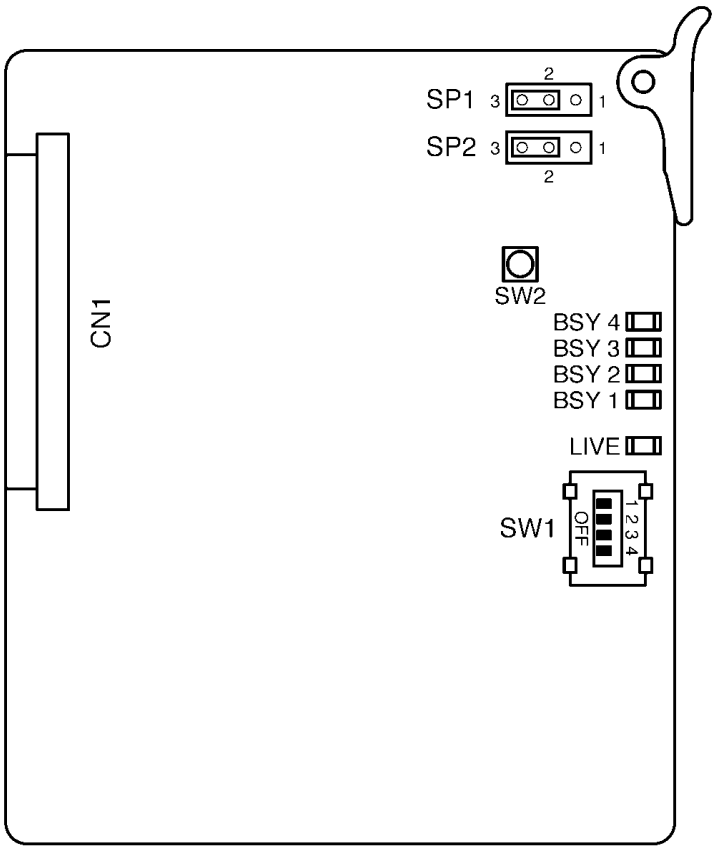


Figure 5-35 VRS(4)-U13 ETU

5.4.2 Installation

- A maximum of 2 VRS(4)-U13 ETUs can be installed in the Xen Master system, 3 per KSU in slots S1~S8 of the first, second or third KSU.
- A maximum of 2 VRS(4)-U13 ETUs can be installed in the Xen Axis system, in slots S2~S7.

5.4.3 Switch Settings

The following table indicates the default switch settings for the VRS(4)-U13 ETU.

Table 5-15 VRS(4)-U13 ETU Default Switch Settings

Switch	Setting			Description
SW1–1	**SW1–1**	**SW1–2**	**SW1–3**	Record decibel adjustment
SW1–2	Off	Off	Off	0 decibels (default)
SW1–3	On	Off	Off	1 decibel
	Off	On	Off	2 decibels
	On	On	Off	3 decibels
	Off	Off	On	4 decibels
	On	Off	On	5 decibels
	Off	On	On	6 decibels
	On	On	On	7 decibels
SW1–4	On			Record Gain
	Off			Record Pad (default)
SW2	N/A			Test Switch and Reset Switch

5.4.4 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

BSY 1~4 indications are listed below.

- Steady Red — Channels 1~4 are busy with replay/ record or detecting DTMF signals
- Off — Channels 1~4 are idle

5.4.5 Connectors

The following connector is located on the VRS(4)-U13 ETU.

- CN1 — Connects to the backboard

5.4.6 Pins

There are two jumpers labelled **SP1** and **SP2** located on the top right of the VRS ETU. These are for maintenance purposes. ***Do not*** change the factory default settings on these pins. Pins 2 and 3 are to remain short-circuited.

A6-324000-642-01 – Release 6.0
April 2003

5.5 VMS(2/4/8)-U13 ETU

5.5.1 Description

The VMS(2/4/8)-U13 ETU is a 2-, 4- or 8-port Digital Voice Mail system.

This ETU is a PC platform installed in the Xen system 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 capable of direct connect speeds up to 19.2 Kbps or for connecting external modem.

A6-324000-642-01 – Release 6.0
April 2003

This ETU provides two, four or eight digital voice mail ports. 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 5-16 Configuration Support Table*.

Table 5-16 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)
Message Notification	Through message waiting lamps
Call Forwarding	Supported
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)
Message Notification	Through message waiting lamps
Call Forwarding	Supported
Operator Console	100 (default) Positive disconnect: Digital Signal
Hardware	One VMS(2/4/8)-U13 ETU
Connections	Connects to backplane connector of the KSU
Telephone	One of the following telephones is required to program Xen system data: DTU-8D-1A(WH) TEL DTU-16D-1A(WH) TEL DTU-32D-1A(WH) TEL ETW-16C-1A(SW) TEL (Not available in NZ) ETW-16D-1A(SW) TEL (Not available in NZ) ETW-24S-1A(SW) TEL (Not available in NZ)
DSP-F-21 Unit	Adds four additional voice mail ports Required by VMS(8)-U13 ETU

A6-324000-642-01 – Release 6.0
April 2003

5.5.2 Installation

- A maximum of 4 VMS( )-U13 ETUs can be installed in the Xen Master system, 3 per KSU in slots S1~S8 of the first, second or third KSU, up to a maximum of 16 Voice Mail ports.
- A maximum of 4 VMS( )-U13 ETUs can be installed in the Xen Axis system, in slots S2~S7, up to a maximum of 16 Voice Mail ports.

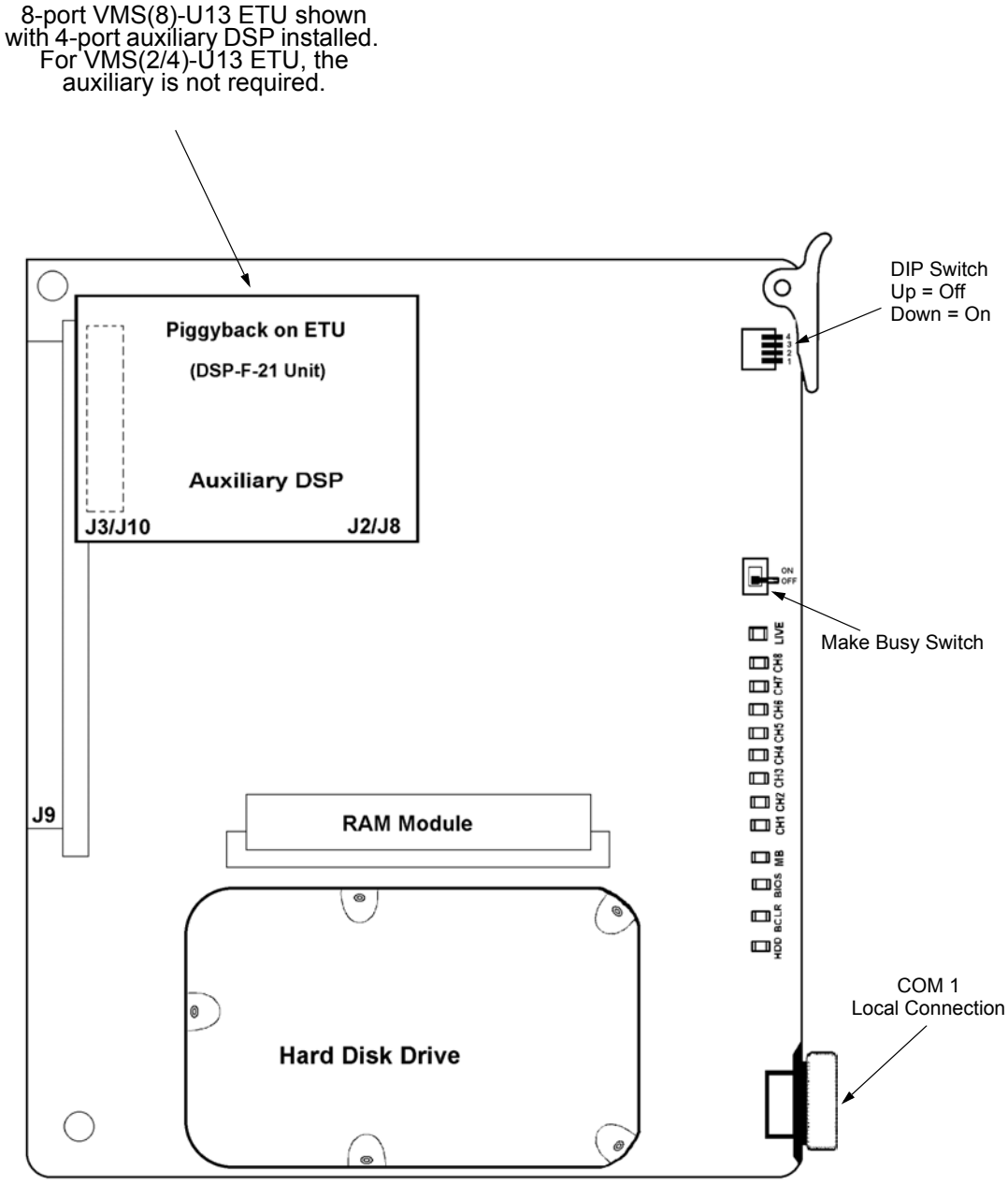


Figure 5-36 VMS( )-U13 ETU

5.5.3 Switch Settings

The following table indicates the switch settings for the VMS(2/4/8)-U13 ETU.

Table 5-17 VMS(2/4/8)-U13 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	Normally Off COM1 local connection.
4	Not Used

5.5.4 LED Indications

The front edge of the ETU has 13 LEDs. (Refer to Figure 5-31 VMS( )-U13 ETU.)

LEDs CH1~CH8 indicate port status as follows:

- On — Port Busy
- Off — Port idle or not used

The **LIVE LED** is red if ETU is receiving power.

The **MB LED** indicates the status of the MB switch.

The **BIOS LED** is red if a BIOS error has occurred.

The **BCLR LED** (Bi-colour) indicates application status as follows:

- Red — DOS started (VM application not ready)
- Green — VM application is running
- Orange — Error

Note: 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.

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

Note: Do not reset the ETU while the HD LED is flashing.

A6-324000-642-01 – Release 6.0
April 2003

5.5.5 Connectors

The VMS(2/4/8)-U13 ETU has the following connectors:

- J9 connects to the backboard
- J1 (9-pin RS-232) is COM1 and is used for PC Programming of the VMS(2/4/8)-U13 ETU. The PC can be connected directly or via an external modem.
- J8 and J10 accommodation the DSP-F-21 Unit.
- J2 and J3 are not used.

5.5.6 Installation Precautions

The ETUs used in this system make extensive use of CMOS technology that is very susceptible to static electricity. **Static discharge must be avoided** when handling ETUs. Always use the following precautions:

- Wear a grounding strap anytime you handle the ETU.
- Make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that Make Busy switch is off.
- Carry ETU in a conductive polyethylene bag to prevent static electricity damage.

5.6 FMS(2/4)-U13 ETU

5.6.1 Description

The FMS(2/4)-U13 ETU is a 2 or 4 port Digital Voice Mail system.

This ETU is a PC platform installed in the Xen system and contains Flash ROM 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 capable of direct connect speeds up to 19.2 Kbps or for connecting external modem.

A6-324000-642-01 – Release 6.0
April 2003

This ETU provides two or four digital voice mail ports. Refer to *Table 5-18 Configuration Support Table*.

Table 5-18 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)
Message Notification	Through message waiting lamps
Call Forwarding	Supported
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)
Message Notification	Through message waiting lamps
Call Forwarding	Supported
Operator Console	100 (default) Positive disconnect: Digital Signal
Hardware	One FMS(2/4)-U13 ETU
Connections	Connects to backplane connector of the KSU
Telephone	One of the following telephones is required to program Xen system data: DTU-8D-1A(WH) TEL DTU-16D-1A(WH) TEL DTU-32D-1A(WH) TEL ETW-16C-1A(SW) TEL (Not available in NZ) ETW-16D-1A(SW) TEL (Not available in NZ) ETW-24S-1A(SW) TEL (Not available in NZ)

A6-324000-642-01 – Release 6.0
April 2003

5.6.2 Installation

- A maximum of 4 FMS( )-U13 ETUs can be installed in the Xen Master system, 3 per KSU in slots S1~S8 of the first, second or third KSU, up to a maximum of 16 Voice Mail ports.
- A maximum of 4 FMS( )-U13 ETUs can be installed in the Xen Axis system, in slots S2~S7, up to a maximum of 16 Voice Mail ports.

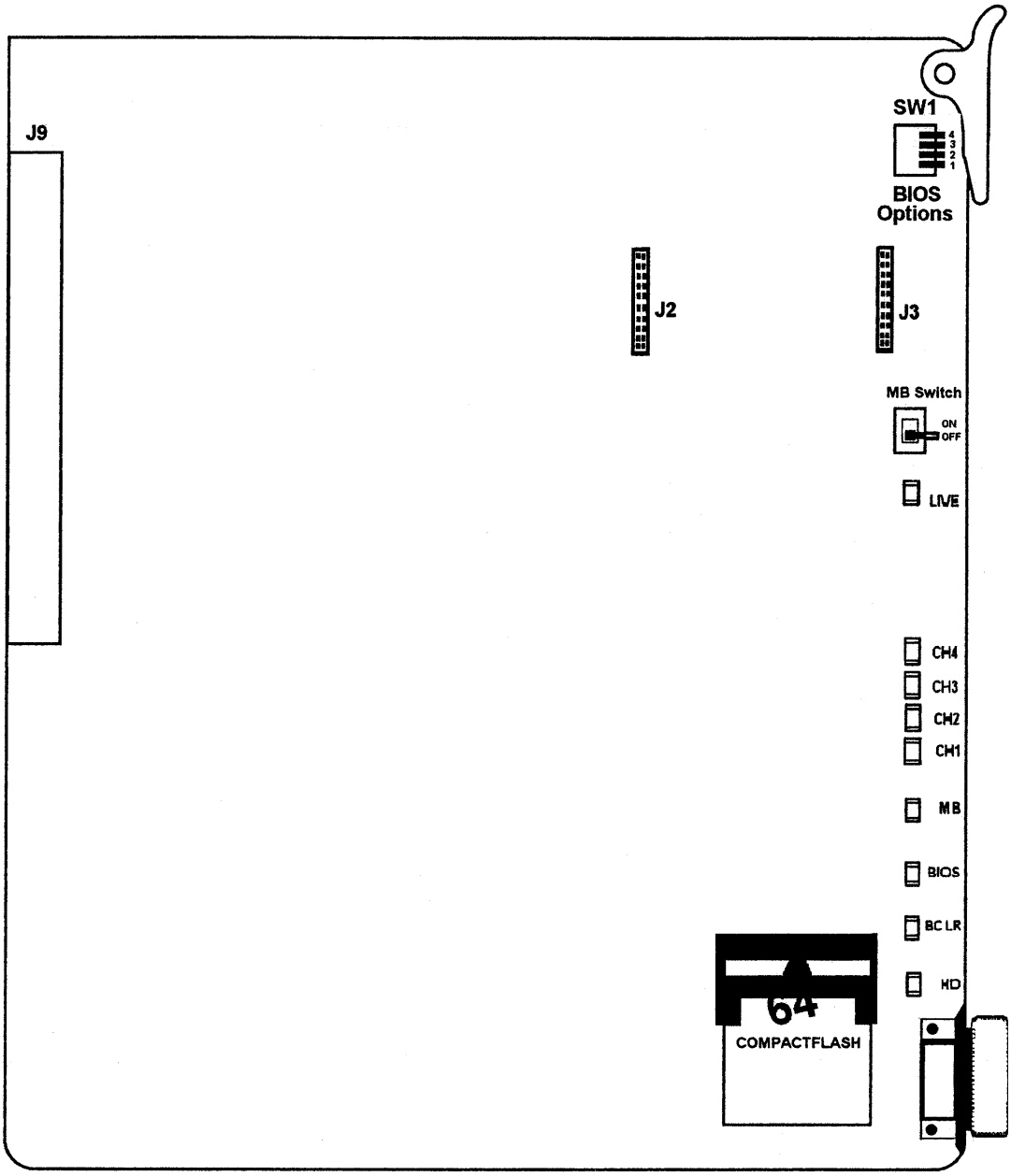


Figure 5-37 FMS( )-U13 ETU

5.6.3 Switch Settings

The following table indicates the switch settings for the FMS(2/4)-U13 ETU.

Table 5-19 FMS(2/4)-U13 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	Normally Off COM1 local connection.
4	Not Used

5.6.4 LED Indications

The front edge of the ETU has 9 LEDs. (Refer to Figure 5-31 FMS( )-U13 ETU.)

LEDs CH1~CH4 indicate port status as follows:

- On Port Busy
- Off Port idle or not used

The **LIVE LED** is red if ETU is receiving power.

The **MB LED** indicates the status of the MB switch.

The **BIOS LED** is red if a BIOS error has occurred.

The **BCLR LED** (Bi-colour) indicates application status as follows:

- Red DOS started (VM application not ready)
- Green VM application is running
- Orange Error

Note: 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.

The **HD LED** flashes red when the Flash ROM is being accessed.

Note: Do not reset the ETU while the HD LED is flashing.

A6-324000-642-01 – Release 6.0
April 2003

5.6.5 Connectors

The FMS(2/4)-U13 ETU has the following connectors:

- J9 connects to the backboard
- J1 (9-pin RS-232) is COM1 and is used for PC Programming of the FMS(2/4)-U13 ETU. The PC can be connected directly or via an external modem.
- J2 and J3 are not used.

5.6.6 Installation Precautions

The ETUs used in this system make extensive use of CMOS technology that is very susceptible to static electricity. **Static discharge must be avoided** when handling ETUs. Always use the following precautions:

- Wear a grounding strap anytime you handle the ETU.
- Make all ETU DIP switch setting changes before inserting it in the KSU. Ensure that Make Busy switch is off.
- Carry ETU in a conductive polyethylene bag to prevent static electricity damage.

A6-324000-642-01 – Release 6.0
April 2003

5.7 ECR-U13 ETU

5.7.1 Description

The ECR-U13 ETU provides external relay control for Zone Paging systems (3 relays), External Ringing control relays (4 relays), Night Chime ringing control (1 relay), and two general purpose relays.

There are two RCA audio jacks. One provides the both-way audio-for-paging system (CN3). The other provides a tone output for External Tone Ringing and Night Chime (CN4).

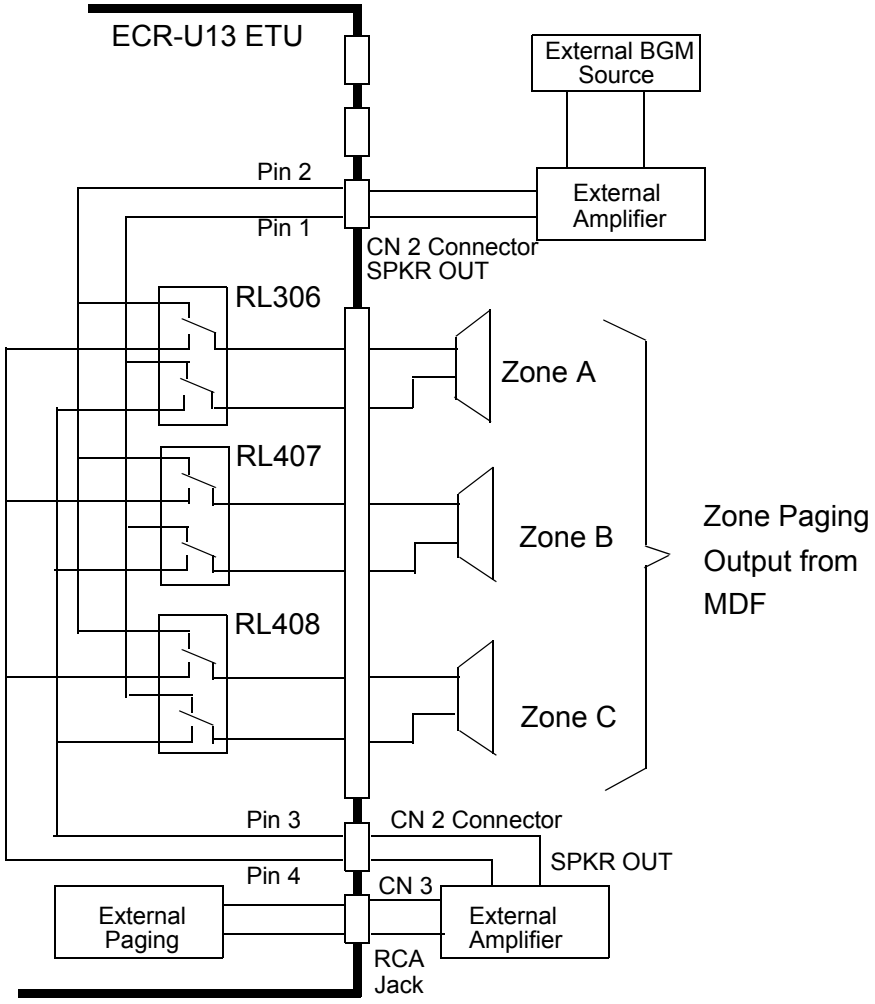


Figure 5-38 ECR-U13 Block Diagram - External Paging

A6-324000-642-01 – Release 6.0
April 2003

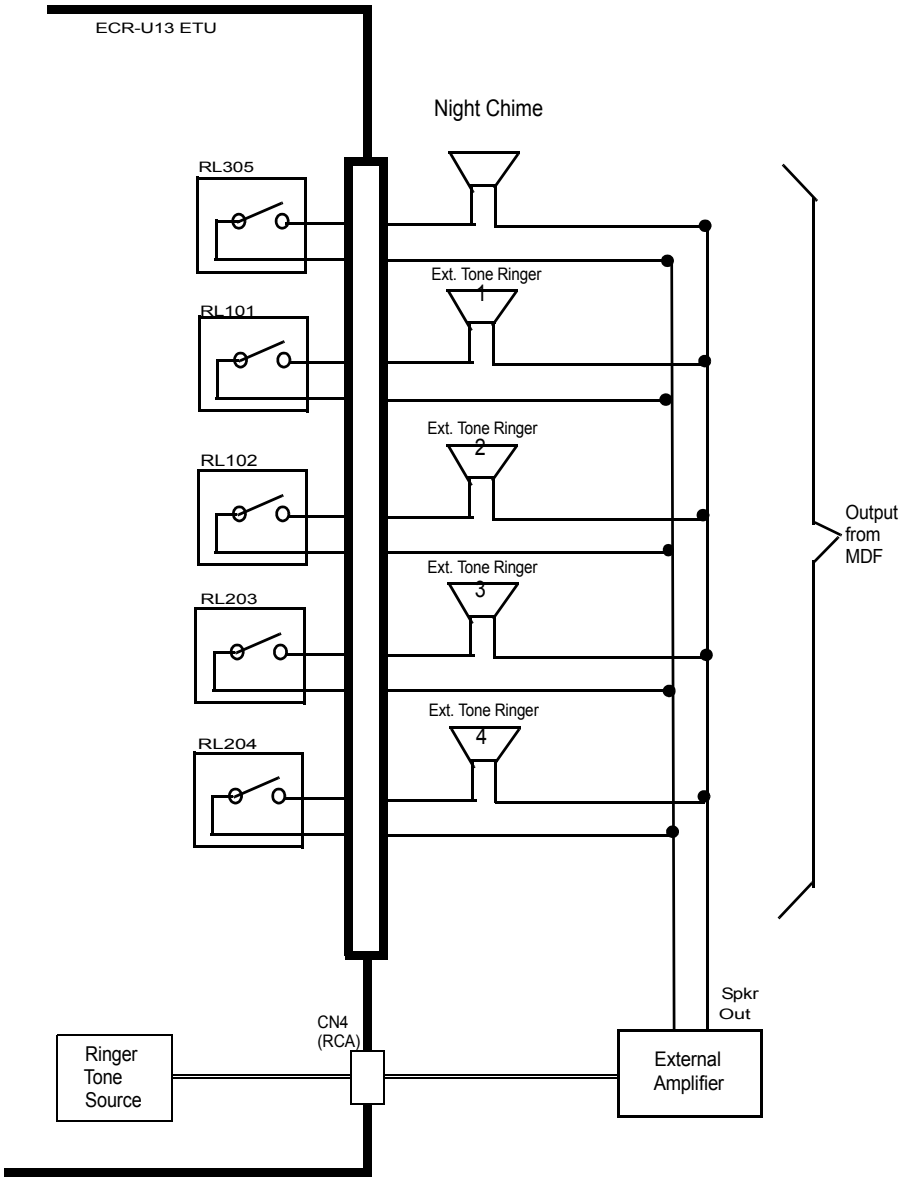


Figure 5-39 ECR-U13 Block Diagram - External Ringing

5.7.2 Installation

A maximum of one ECR-U13 ETU can be installed in both the Xen Master (slots S1-S8) and the Xen Axis (slots S3 S7).

5.7.3 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

Busy LED indications are listed below.

- Steady Red — Some Relays Are Busy
- Off — All Relays Are Idle

5.7.4 Connectors

The following connectors are located on the ECR-U13 ETU. Refer to *Table 5-20 Connector Descriptions (CN2)* and *Figure 5-40 ECR-U13 ETU*.

- CN1 — Connects to the Backboard
- CN2 — Relay Contacts for Relays 11 and 12
- CN3 — Both-way Audio Connection for External Paging
- CN4 — Audio output for Tone Ringer and Night Chime

Table 5-20 Connector Descriptions (CN2)

Pin Number	Description
13~16	Not Used
12	Relay #2 General Purpose
11	
10	Relay #1 General Purpose
9	
5~8	Not Used
4	Zone Paging Audio Input
3	
2	External Paging BGM input
1	

A6-324000-642-01 – Release 6.0
April 2003

Refer to *Table 4-1 MDF Cable Connections - Xen Master* and *Table 4-2 Power Fail Transfer Connections - Xen Master* for all other ECR-U13 ETU cable connections.

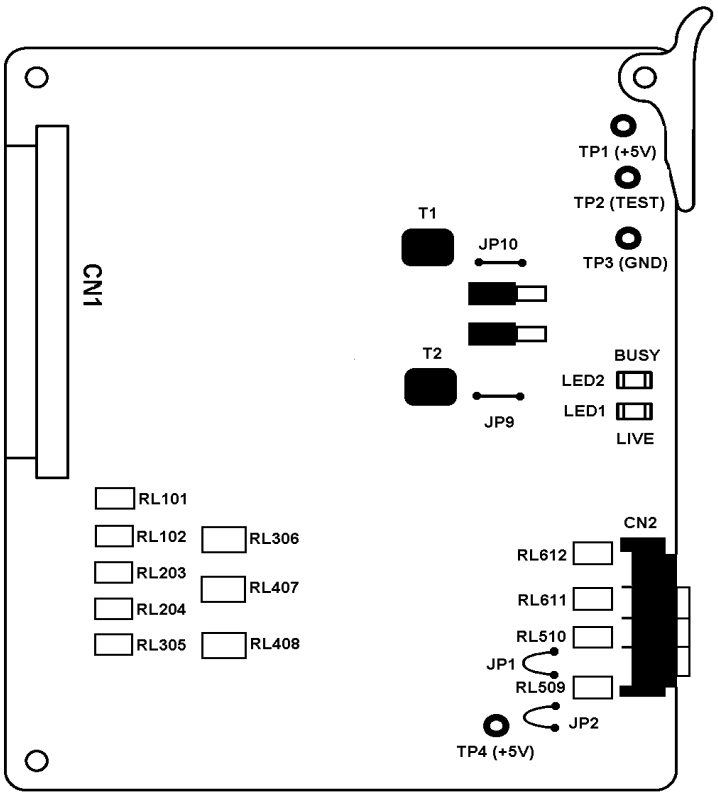


Figure 5-40 ECR-U13 ETU

5.7.5 Specifications

✆	Relays	All relays are rated 24 Vdc at 500 mA
✆	External Tone	Output Power -10 dBm
✆	Ringer/Night Chime	Output Impedance 600Ω
✆	External Paging	Output power -10 dBm
✆	Output Impedance	600Ω

5.8 DPH(4)-U13 ETU

5.8.1 Description

The DPH(4)-U13 ETU provides connection for four Doorphones (DP-D-1D), and also provides the associated four Door Lock Release relays.

Doorphones and relays are paired together so that a station user talking into a doorphone, controls only that Door Lock Release relay when the feature code is dialled.

The DPH(4)-U13 has two audio paths to be shared by four doorphones. Two simultaneous doorphone calls are allowed. Doorphones 1/3 and 2/4 are paired together.

5.8.2 Installation

A maximum of one DPH(4)-U13 ETU can be installed in both the Xen Master (slots S1~S8) and Xen Axis (slots S3~S7).

5.8.3 Switch Settings

Refer to *Figure 5-41 DPH(4)-U13 ETU* and *Table 5-21 DPH(4)-U13 Jumper Settings* for DPH(4)-U13 ETU default jumper settings and jumper locations.

Table 5-21 DPH(4)-U13 Jumper Settings

Jumper	Setting	Description
S101	Shorted	DP1 and DP3 removed short bar to increase DP volume by 6 dB.
S201	Shorted	DP2 and DP4 removed short bar to increase DP volume by 6 dB.
S102	Shorted	DP1 and DP3 remove shorting bar to increase DP transmit volume by 6 dB.
S202	Shorted	DP2 and DP4 remove shorting bar to increase DP transmit volume by 6 dB.

5.8.4 LED Indications

Live LED indications are listed below.

- Blinking Red — Normal Operation
- Steady Red — Operation Stopped (power still on)
- Off — No Power

LED 1 indication are listed below.

- Steady Red — A Circuit Is Busy
- Off — All Circuits Are Idle

A6-324000-642-01 – Release 6.0
April 2003

5.8.5 Connectors

The following connectors are located on the DPH(4)-U13 ETU. Refer to *Figure 5-41 DPH(4)-U13 ETU*.

- CN1 Connects to the Backboard
- Relay Connections Provided at the MDF
- Doorphone Connections Provided at the MDF

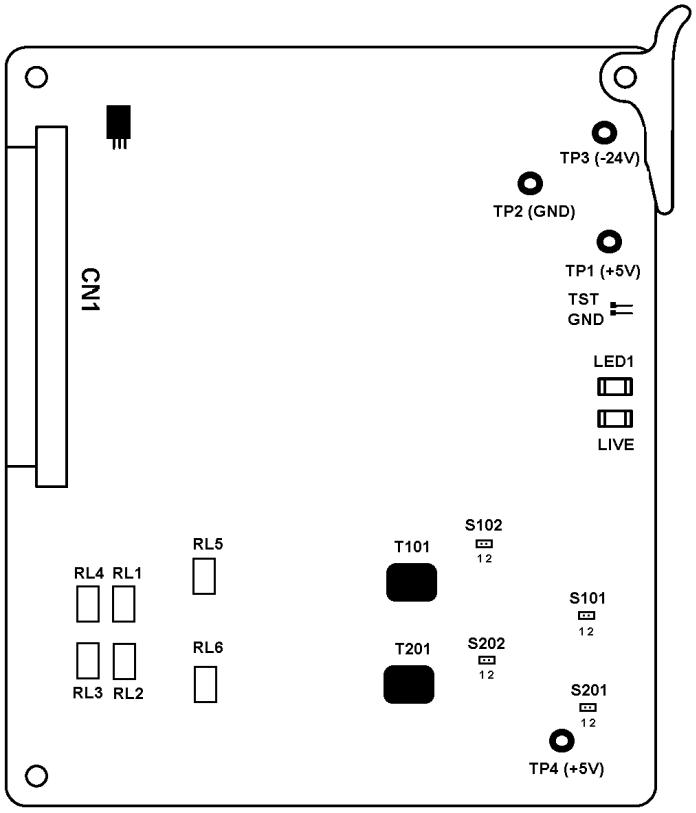


Figure 5-41 DPH(4)-U13 ETU

5.8.6 Specifications

- Relay contacts are 24 Vdc at 500 mA

5.9 CNF(8)-U13 ETU

5.9.1 Description

The Multiline Conference Bridge allows any intercom user and any outside party calling to a port of the CNF(8)-U13 ETU to make a multiparty conference call. One 8-party conference or two 4-party conferences are supported and regulated by a switch setting. System Software release 2 or higher is required.

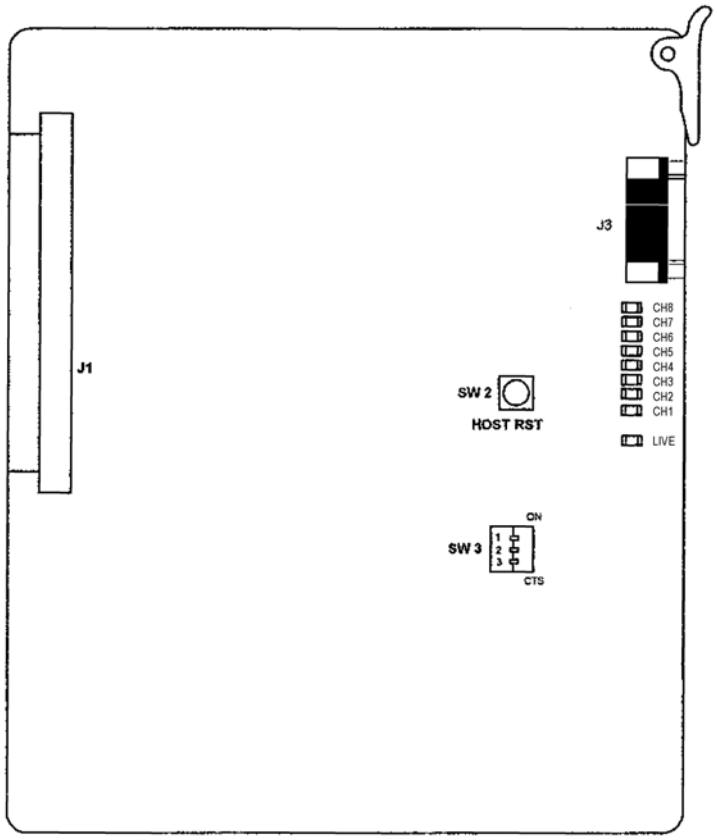


Figure 5-42 CNF(8)-U13 ETU

5.9.2 Installation

A maximum of 2 CNF(8)-U13 ETUs can be installed in the Xen Master system in slots S1~S8 of the first, second or third KSU.

A maximum of 2 CNF(8)-U13 ETUs can be installed in the Xen Axis system, in slots S2~S7.

A6-324000-642-01 – Release 6.0
April 2003

5.9.3 Switch Settings

Table 5-22 CNF(8)-U13 ETU Reset Settings

Switch	Setting	Description
SW2	Press to Reset	Host Reset Switch

Table 5-23 CNF(8)-U13 ETU Maximum Conference Time Switch

Switch	Setting		Max Conference Time
SW3	SW3-2	SW3-3	
	ON	ON	1 Hour
	ON	OFF	2 Hour
	OFF	ON	3 Hour
	OFF	OFF	No Limit

Table 5-24 CNF(8)-U13 ETU Party Size Switch

Switch	Setting	Description
SW3-1	ON	1 Eight-Channel Conference
SW3-1	OFF	2 Four Channel Conferences

5.9.4 LED Indications

Status Flashing when active

Channel 0-7 Channel Busy Status

5.9.5 Connectors

This ETU has three connectors:

- J1 Connects to the backboard
- J2 Not currently used
- J3 Nine-pin RS-232C connector for maintenance

It is the characteristic of the network that audio losses of up to 6dB may be experienced over analogue PSTN services, depending on the length of the line back to the local exchange. When analogue lines are incorporated into a conference, the end to end loss can therefore add up to 12dB. This loss is significant and may not be able to be compensated for by the Automatic Gain Control (AGC) facility of the Xen conference card, resulting in some conversations being low in volume. Such losses should not be experienced when using ISDN lines. Therefore, in order to ensure audio leves are maintained at acceptable levels, NEC recommend to use ISDN lines where possible, for all conference parties.

5.10 BSU(2)-U13 ETU

5.10.1 Description

The BSU(2)-U13 ETU provides the connection for Base Stations associated with the Multizone Cordless Telphone (PHS) facility of the Xen System.

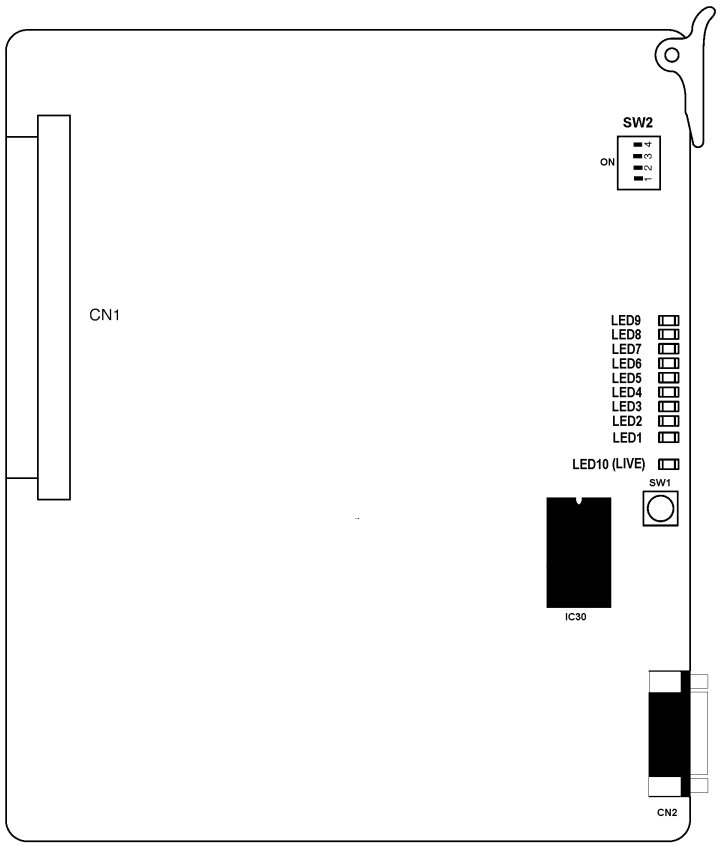


Figure 5-43 BSU(2)-U13 ETU

A6-324000-642-01 – Release 6.0
April 2003

5.10.2 Installation

Up to eight ETUs can be installed in slots S1~S8 in any Xen Master KSU.

Up to three ETUs can be installed in slots S3~S7 in the Xen Axis KSU.

5.10.3 Switch Settings

The switch settings are shown in *Table 5-25 BSU(2)-U13 ETU Switch Settings on page -171*.

Table 5-25 BSU(2)-U13 ETU Switch Settings

SW1	Description
Momentary Switch	BSU ETU Reset

SW2-1	Description
Off	Reports BSU ID to Main Software (Default)
On	Does not report BSU ID to Main Software

SW2-2	Description
Off	Boot by Flash memory (Default)
On	Boot from EPROM (IC30)

SW2-3	Description
Off	Normal Operation (Default)
On	Test Mode

SW2-4	Description
Off	Watch Dog Timer On (Default)
On	Watch Dog Timer Off

Pressing SW1 interrupts all Wireless users connected to the BSU(2)-U13 ETU. Use *this switch only as a last resort.*

Recommended switch settings when setting up multiple BSU cards.

Table 5-26 Switch Settings

Switch Type	Switch Number	Status
Master	SW2-1	Off
	SW2-2	Off
	SW2-3	Off
	SW2-4	Off
Slave	SW2-1	On
	SW2-2	Off
	SW2-3	Off
	SW2-4	Off

5.10.4 LED Indications

Table 5-27 LED Indications

LED	Description	On	Flashing	Off
1	Link Status for BS1	Layer 1: Up Layer 2: Up	Layer 1: Up Layer 2: Down	Layer 1: Down Layer 2: Down
2	Link Status for BS2	Layer 1: Up Layer 2: Up	Layer 1: Up Layer 2: Down	Layer 1: Down Layer 2: Down
3	Not used	Always Off		
4				
5	Status for BS1	Refer to *Table 5-28 BS Status Table for LEDs 5 and 6*		
6	Status for BS2			
7	Not used	Always Off		
8				
9	BSU Status	Alarm	Normal Operation	Not Operating
10	LIVE	Operation stopped (Power still on)	Normal Operation	No Power

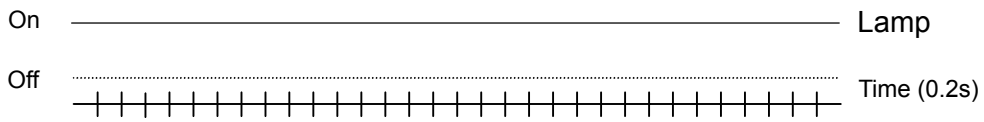
A6-324000-642-01 – Release 6.0
April 2003

Table 5-28 BS Status Table for LEDs 5 and 6

Lamp Off Line is not Connected

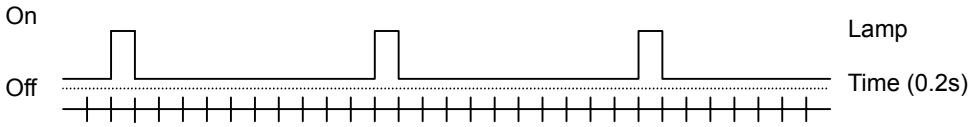
Lamp On indications are shown below.

No Flicker (BS is in standby)

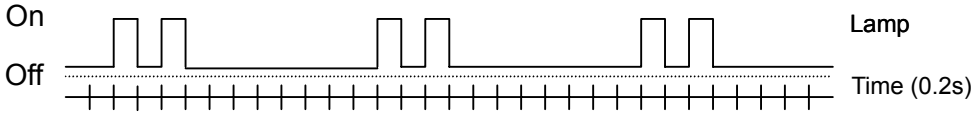


Flash cycle is 0.2 seconds. Remaining indications depend on the number of PS connections.

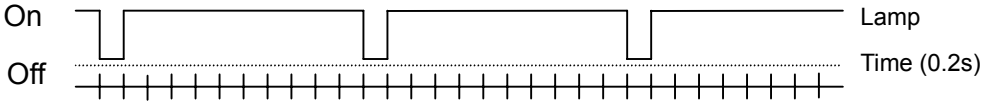
1 PS connection



2 PS connections



3 PS Connections (BS is busy)



5.10.5 Connectors

The following connectors are located on the BSU(2)-U13 ETU:

- CN1 Connects to the backboard
- CN2 For future use

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Installing DTU-Type Multiline Terminals

CHAPTER 6

SECTION 1 GENERAL INFORMATION

The Xen system provides six different Multiline Terminals, an Attendant Console and several adaptors that allow peripheral equipment to be attached to the Multiline Terminals. With the exception of the VDD-UA Unit, the adaptors can also be used with DTU-type Multiline Terminals. This chapter describes each terminal, console, and adaptor and provides applicable installation instructions.

SECTION 2 MULTILINE TERMINALS

2.1 DTU-8-1A (WH) TEL

This digital non-display Multiline Terminal is equipped with eight programmable line keys (each with a two-colour LED), a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units.

A maximum of 119 DTU-8-1 (WH) TELs can be installed in the Xen Master system and a maximum of 31 in the Xen Axis system.

Figure 6-1 DTU-8-1A (WH) TEL Multiline Terminal

A6-324000-642-01 – Release 6.0
April 2003

2.2 DTU-8D-1A (WH) TEL

This digital Multiline Terminal has eight programmable line keys (each with the two-colour LED), four softkeys, a built-in speakerphone, headset jack, a Large LED to indicate incoming calls and messages, and compatibility with ADA-UA, APR-UA, CTU( )-UA, CTA-UA, HFU-UA AND VDD-UA Units.

This terminal is also equipped with a 3-line, 24-character, adjustable Liquid Crystal Display (LCD).

A maximum of 120 DTU-8D-1A (WH) TELs can be installed in the Xen Master system and a maximum of 32 in the Xen Axis system.

Figure 6-2 DTU-8D-1A (WH) TEL Multiline Terminal

2.3 DTU-16D-1A (WH) TEL

This digital Multiline Terminal has 16 programmable line keys (each with a two-colour LED), four softkeys, a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-UA, APR-UA, CTU( )-UA, CTA-UA, HFU-UA, and VDD-UA Units.

This terminal is also equipped with a 3-line, 24-character, adjustable Liquid Crystal Display (LCD).

A6-324000-642-01 – Release 6.0
April 2003

A maximum of 120 DTU-16D-1A (WH) TELs can be installed in an Xen Master system and a maximum of 32 in the Xen Axis system.

Figure 6-3 DTU-16D-1A (WH) TEL Multiline Terminal

2.4 DTU-32D-1A (WH) TEL

This digital Multiline Terminal has 16 programmable line keys (each with a two-colour LED), 16 one-touch keys, four softkeys, a built-in speakerphone, headset jack, a large LED to indicate incoming calls and messages, and compatibility with ADA-UA, APR-UA, CTA-UA, CTU( )-UA, HFU-UA, and VDD-UA Units.

This terminal is also equipped with a 3-line, 24-character, adjustable Liquid Crystal Display (LCD).

System software can be changed so this Multiline Terminal can have 24 programmable line keys and 8 one-touch keys.

A6-324000-642-01 – Release 6.0
April 2003

A maximum of 120 DTU-32D-1A (WH) TELs can be installed in an Xen Master system and a maximum of 32 in the Xen Axis system.

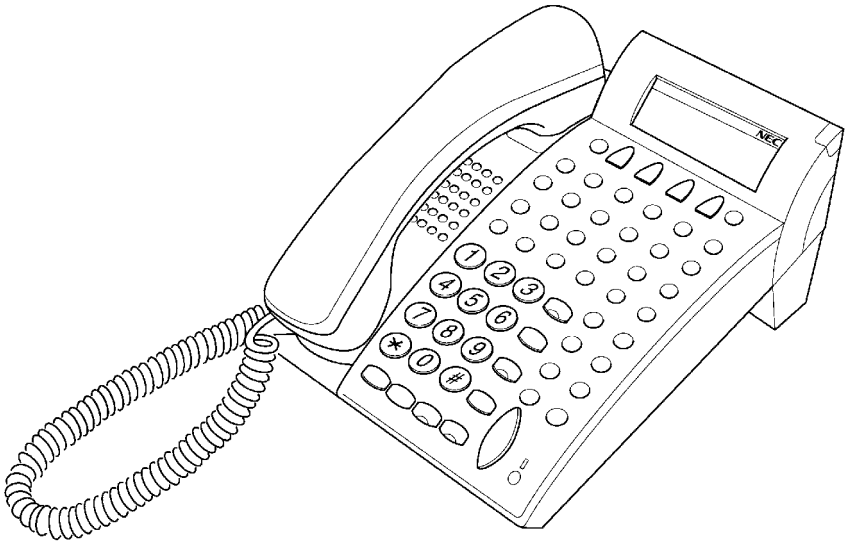


Figure 6-4 DTU-32D-1A (WH) TEL Multiline Terminal

2.5 DCU-60-1A (WH) CONSOLE

The Attendant Console has 60 programmable line keys (each with a two-colour 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 adaptor) is provided with the Attendant Console.

A maximum of four DCU-60-1A (WH) CONSOLES can be installed in both the Xen Master and Xen Axis systems. An Attendant Position can have two DCU-60-1A (WH) CONSOLEs attached to it.

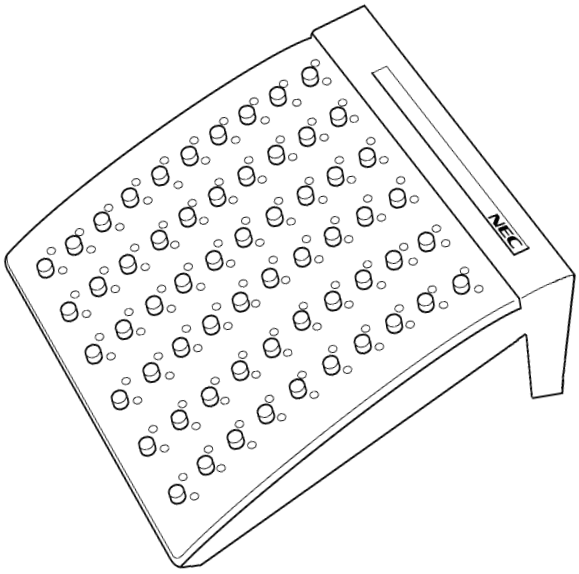


Figure 6-5 DCU-60-1A (WH) Console

A6-324000-642-01 – Release 6.0
April 2003

SECTION 3 CONNECTING A MULTILINE TERMINAL TO THE SYSTEM

These instructions for connecting a Multiline Terminal to the system applies to all of the DTU-type 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.

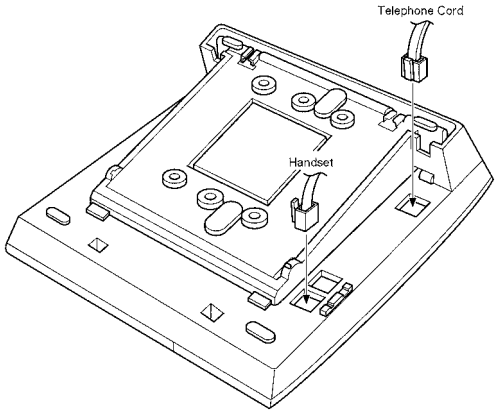


Figure 6-6 Connecting a Multiline Terminal to the System

2. Lead the telephone and handset cords through the appropriate grooves.

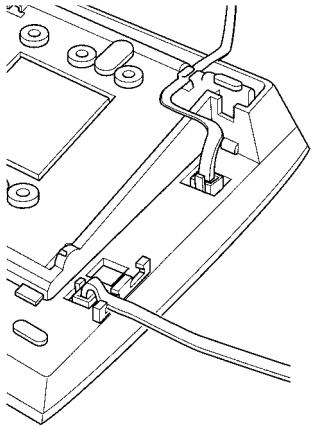


Figure 6-7 Leading Line Cords on a Multiline Terminal

A6-324000-642-01 – Release 6.0
April 2003

SECTION 4 CONNECTING AN 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.

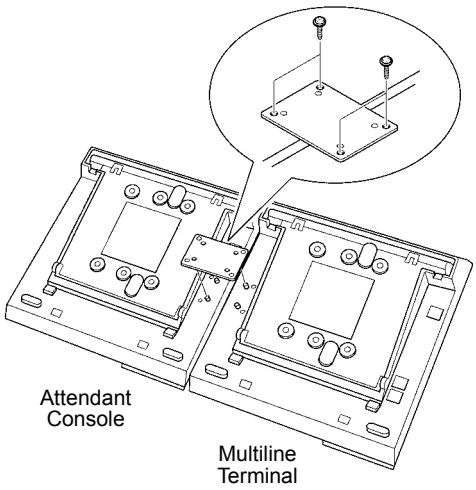


Figure 6-8 Connecting an Attendant Console to a Multiline Terminal

3. Connect the line cord and the AC adaptor to the indicated locations on the bottom of the Attendant Console.

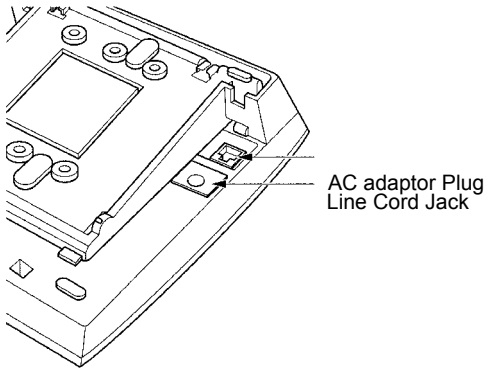


Figure 6-9 Connecting the Line Cord and AC adaptor when Installing an Attendant Console

A6-324000-642-01 – Release 6.0
April 2003

4. When the Attendant Console and the Multiline Terminal are properly connected, they sit side-by-side as shown in *Figure 6-10 Attendant Console and Multiline Terminal*.

   Make sure that the AC adaptor, supplied with the Attendant Console, is used. Using a different AC adaptor may cause problems. Check that the voltage of the electricity matches that specified for the adaptor supplied, before plugging it into an outlet.

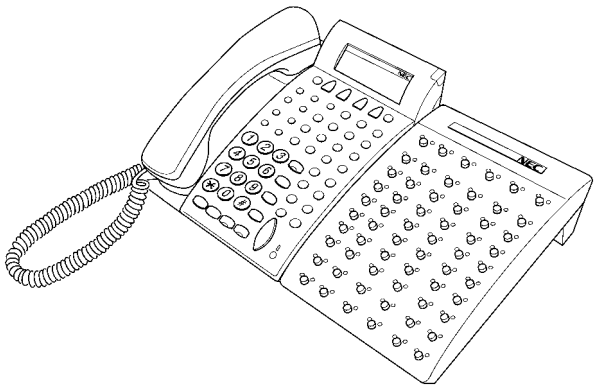


Figure 6-10 Attendant Console and Multiline Terminal

SECTION 5 ADJUSTING THE LCD

The adjustable Liquid Crystal Display (LCD) comes equipped on the display DTU-type Multiline Terminals. The LCD can be adjusted by pushing downward and upward as desired.

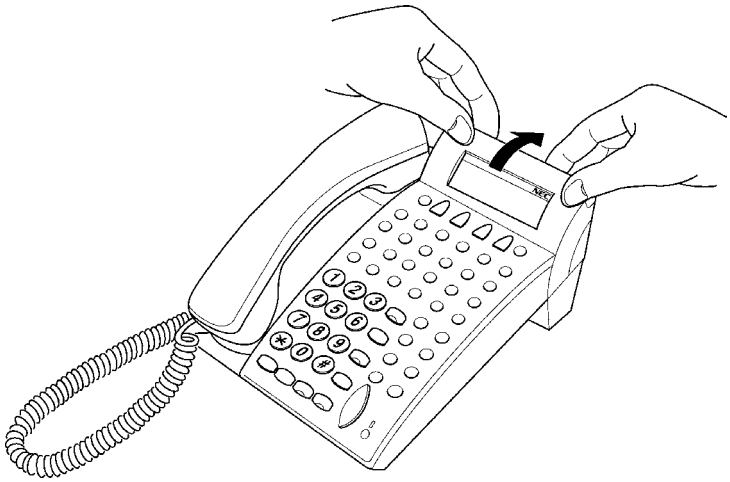


Figure 6-11 Adjusting the LCD

SECTION 6 INSTALLING LINE CARDS AND PLASTIC PANELS

6.1 Line Card and Plastic Panel Installation

Line Cards can be used to print the line key designations. These are then placed on the Multiline Terminal providing a quick reference of key designations to the Multiline Terminal users. 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 into the grooves at the terminal bottom, and press top right and left ends to secure plastic panel to the Multiline Terminal. Refer to *Figure 6-12 Installing Line Card and Plastic Panel on a Multiline Terminal* and *Figure 6-13 Installing Plastic Panel*.

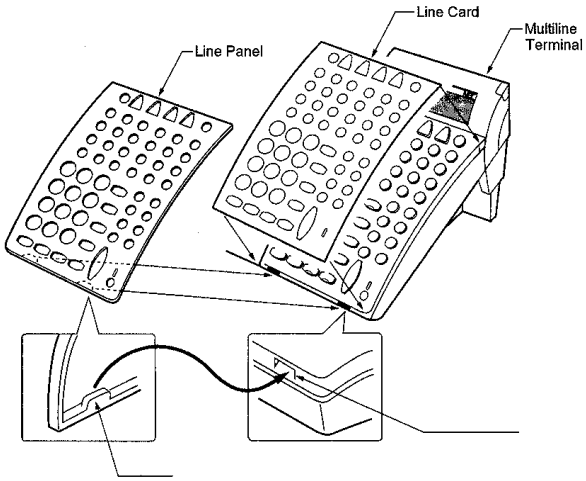


Figure 6-12 Installing Line Card and Plastic Panel on a Multiline Terminal

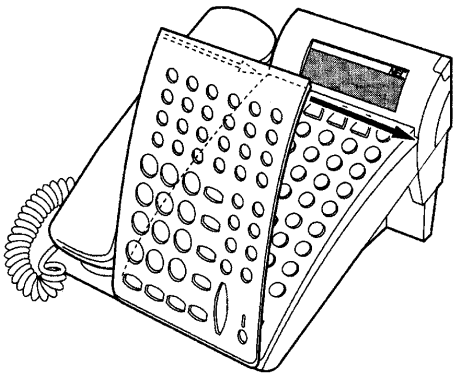


Figure 6-13 Installing Plastic Panel

A6-324000-642-01 – Release 6.0
April 2003

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; damage to the plastic panel could result.

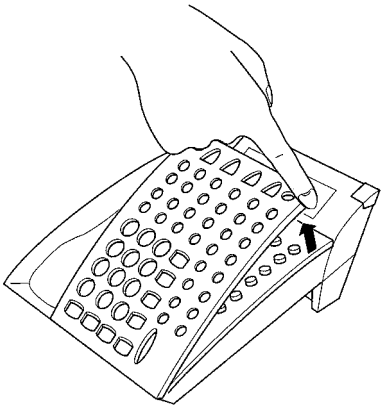


Figure 6-14 Removing the Plastic Panel from the Multiline Terminal

SECTION 7 REMOVING SOFTKEYS

If softkeys are not going to be used on the Multiline Terminal they can be removed. This section describes the process for removing the keys.

1. Remove the softkeys by pulling the softkey plate upward as shown in *Figure 6-15 Removing Softkeys*.

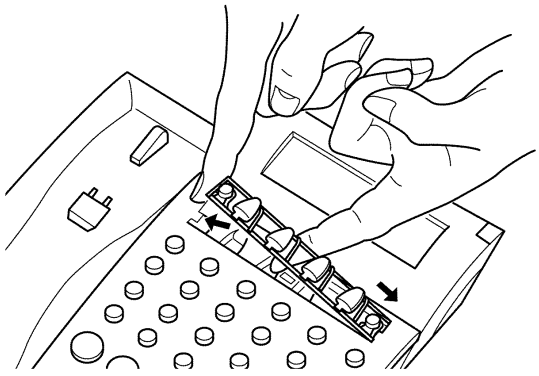


Figure 6-15 Removing Softkeys

2. Install the plastic panel again.

A6-324000-642-01 – Release 6.0
April 2003

SECTION 8 ADJUSTING THE HEIGHT OF THE MULTILINE TERMINAL

The base plate on DTU-type Multiline Terminals are hinged. The bottom portion can be adjusted up or down to raise or lower the height of the terminal.

1. Turn the Multiline Terminal upside down and locate the tabs as shown in *Figure 6-16 Locating the Adjustment Tabs on the Multiline Terminal*.

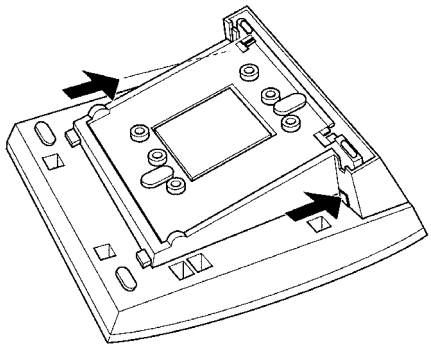


Figure 6-16 Locating the Adjustment Tabs on the Multiline Terminal

2. Push the adjustment tabs and raise the base plate until it locks.

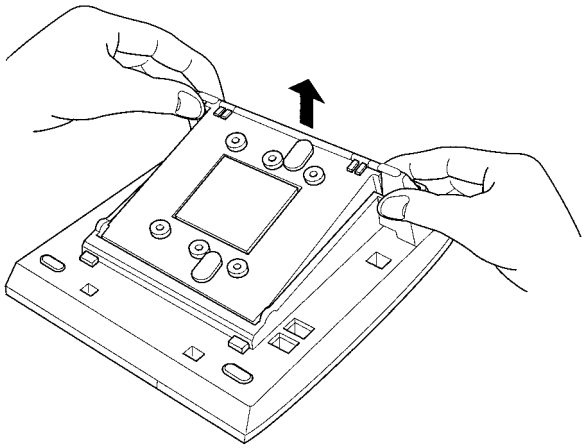


Figure 6-17 Raising the Base Plate on the Multiline Terminal

A6-324000-642-01 – Release 6.0
April 2003

3. The length of the cord can be adjusted by pulling the line cord though the groove in the bottom of the Multiline Terminal.

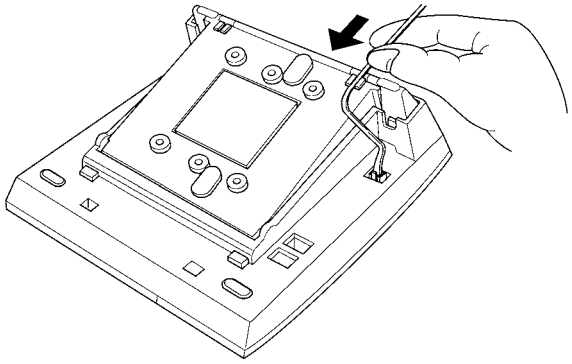


Figure 6-18 Adjusting the Line Cord Length

4. To lower the base plate on the Multiline Terminal, push on the adjustment tabs and push the base plate downward.

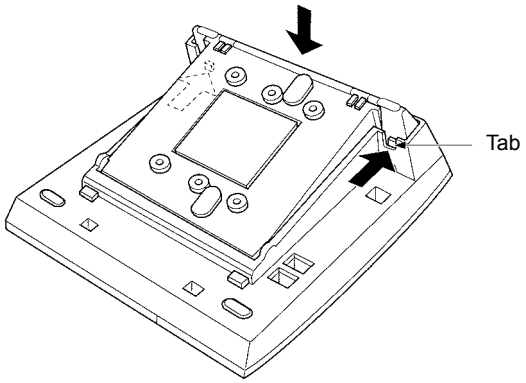


Figure 6-19 Lowering the Base Plate on the Multiline Terminal

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Installing Optional Equipment

CHAPTER 7

SECTION 1 GENERAL INFORMATION

Optional equipment is available to enhance the Xen system. This equipment can be purchased separately from the system and added as the customer business needs grow. All these adaptors can be installed on the DTU-Type Xen Multiline Terminals.

A Multiline Terminal can have up to three adaptors installed at the same time. If attaching an APR-UA Unit, a CTA-UA Unit, a CTU( )-UA Unit, VDD-UA Unit or an HFU-UA Unit, an external power supply is required. Only **one** power supply is needed even if more than one adaptor is installed.

When an adaptor is installed for the first time into a telephone, 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 adaptors 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 7-1 Raising the Base Plate*, and raise the inner area of the base plate.

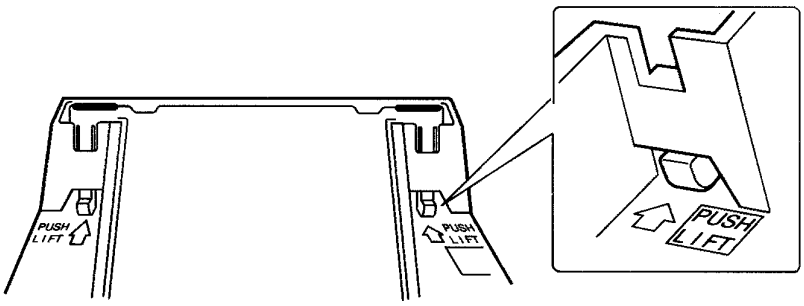


Figure 7-1 Raising the Base Plate

A6-324000-642-01 – Release 6.0
April 2003

3. Insert flat head screwdriver into A in *Figure 7-2 Unlocking Tab* and press straight down until tab unlocks.

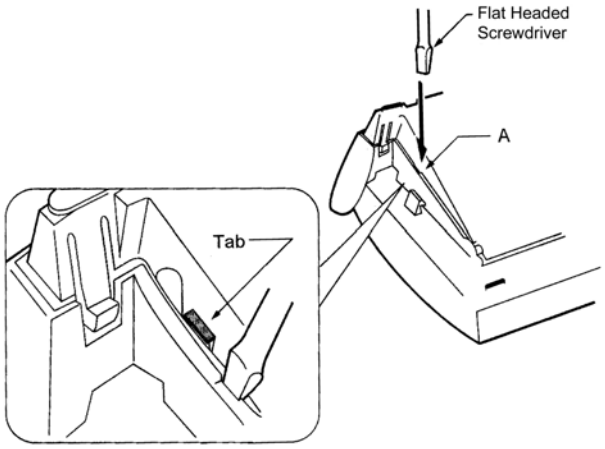


Figure 7-2 Unlocking Tab

4. Lightly press right side of leg shown as B in *Figure 7-3 Releasing Right Tab*, insert flat head screwdriver at C and Press straight down until other tab unlocks.

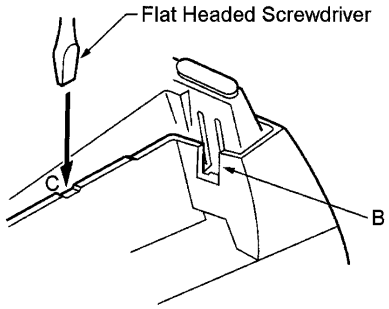


Figure 7-3 Releasing Right Tab

5. Open and remove Bottom Cover by rotating counterclockwise as shown in *Figure 7-4 Removing Bottom Cover*.

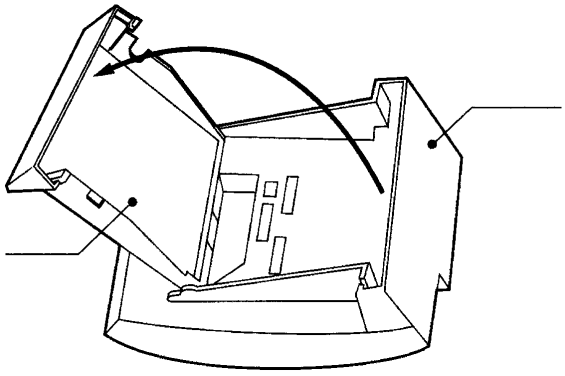


Figure 7-4 Removing Bottom Cover

6. If an adapter is being installed, press tabs A and B to remove the dummy end from the base plate as shown in *Figure 7-5 Removing Base Plate Dummy End*.

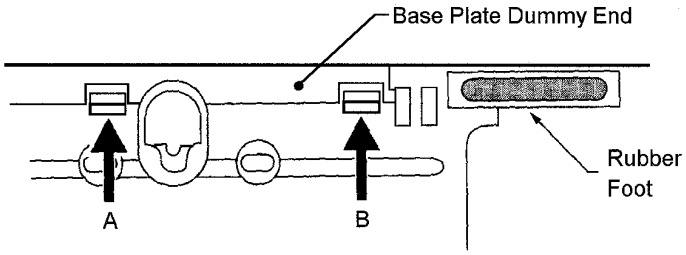


Figure 7-5 Removing Base Plate Dummy End

7. Cut the dummy end in half as shown in *Figure 7-6 Cutting Dummy End in Half*.

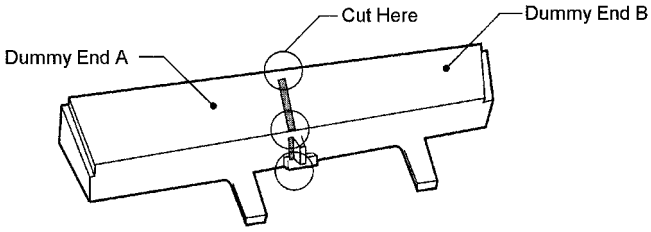


Figure 7-6 Cutting Dummy End in Half

8. If Adapter is installed in Connector 1 as show in *Figure 7-7 Installing Adapter in Connector 1*, Install Dummy end B as shown in *Figure 7-8 Installing Dummy End B*.

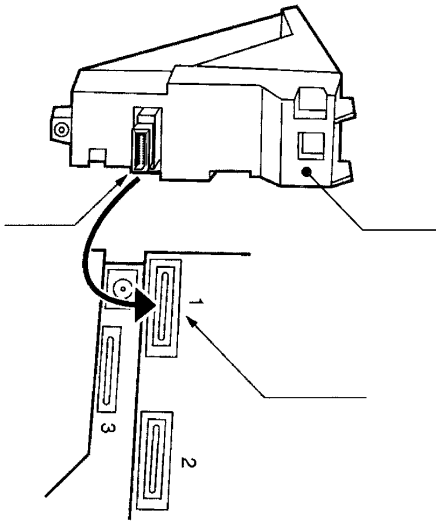


Figure 7-7 Installing Adapter in Connector 1

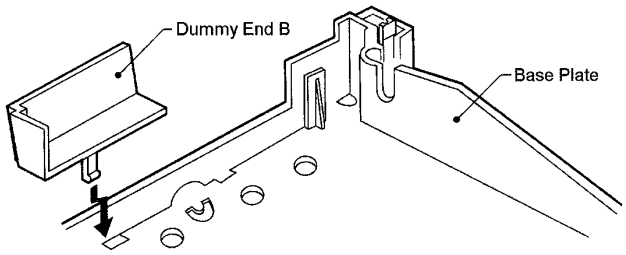


Figure 7-8 Installing Dummy End B

SECTION 3
INSTALLATION
PROCEDURES

3.1 ACA-UA Unit (AC adaptor)

This unit provides power to ancillary devices or Attendant Consoles. The ACA-UA Unit must be connected to an adaptor that is installed on a Multiline Terminal. If more than one adaptor is installed on a Multiline Terminal, only one ACA-UA Unit is necessary.

The power requirements for the ACA-UA Unit are:

- Input: 240 Vac, 50 Hz
- Output: 24V DC, 400 mA
- Polarity: ⊖——•——⊕

3.1.1 Connecting the ACA-UA Unit

1. Unplug the line cord from the Multiline Terminal and unplug the ACA-UA Unit from the AC outlet. (Failing to do this can damage the unit and/or the Multiline Terminal).
2. Turn the Multiline Terminal upside down and open the base plate.

A6-324000-642-01 – Release 6.0
April 2003

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.

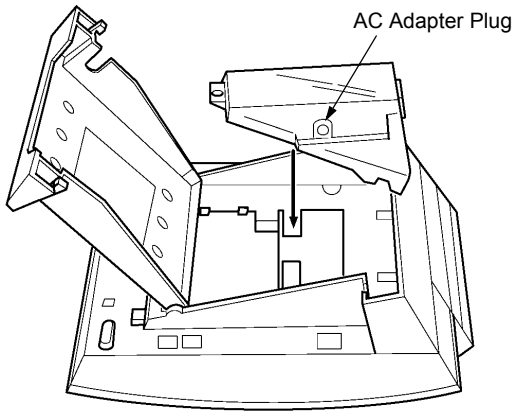


Figure 7-9 ACA-UA Unit Connection

3.2 ADA-UA Unit (Ancillary Device Adapter)

Ancillary Device Adapters allow connection of a recording device to DTU-type Multiline Terminals.

When installing an ADA-UA Unit, first connect the cables to the ADA-UA Unit, set the dip switches, and then install the ADA-UA Unit on the Multiline Terminal.

3.2.1 Installing an ADA-UA 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-UA Unit connector into the receptacle connector on the back of the Multiline Terminal. Snap the ADA-UA Unit into the hooks on the Multiline Terminal to secure it.

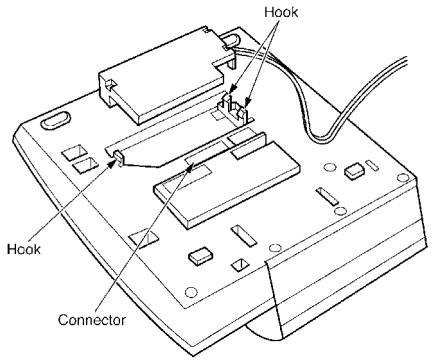


Figure 7-10 Attaching the ADA-UA Unit to the Multiline Terminal

4. Replace base plate.
5. Lead the audio cable out through the groove on the base cover. Plug in the telephone cord.

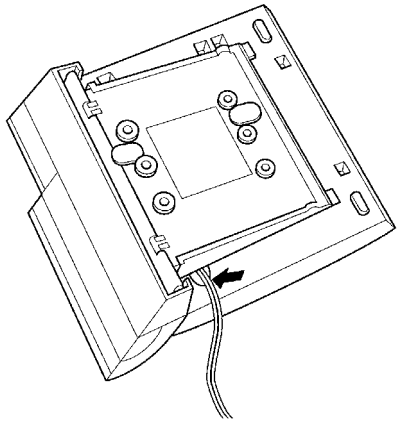


Figure 7-11 Leading the Audio Cable out from the ADA-UA Unit

3.2.2 Connecting Cables to the ADA-UA Unit

Cable terminal connectors are located on the right side of the ADA-UA Unit. Cables should be connected on this unit before installing the unit on the Multiline Terminal.

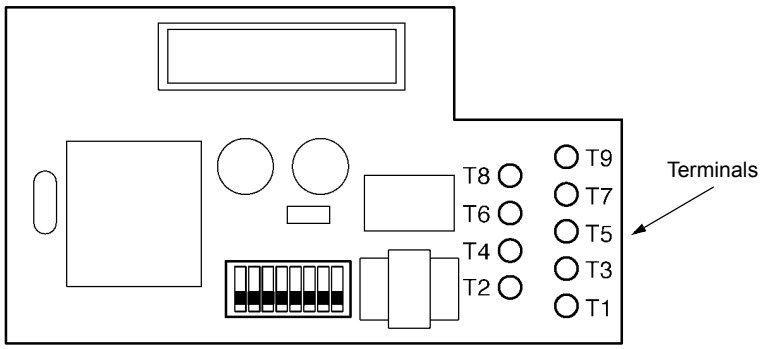


Figure 7-12 ADA-UA Unit

1. Cut off the plug on one end of the cable.
2. Locate the adaptor terminals on the right side of the unit as illustrated in *Figure 7-12 ADA-UA Unit*.

3. Remove the cap on the adaptor 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 7-13 Attaching Cables to the ADA-UA Unit*.

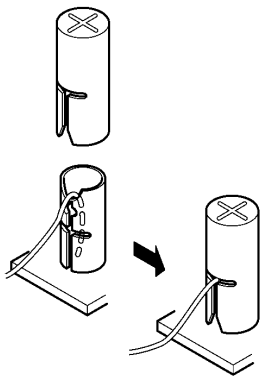


Figure 7-13 Attaching Cables to the ADA-UA Unit

4. Insulate the end of the cable that needs to be shielded with insulating tape. *Table 7-1 ADA-UA Cable Connections* provides a list of cable connections to ADA-UA ADP terminals and describes the specifications for the terminals.

Table 7-1 ADA-UA 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-UA on T3:T4 over a separate wire pair to the recorder.	Input Terminal:T1 and T2 are enabled for tone generating device when DIP switches 3 and 4 are OFF. (If switches 3 and 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	Connect recorder device wire pair speech input to T3:T4. If 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 7-2 ADA-UA Unit Switch Settings*.
T4		
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. If 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. If recorder owner manual specifies start on closed circuit, connect T6 and T7.
T8	Unused	
T9	Unused	

A6-324000-642-01 – Release 6.0
April 2003

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-UA Unit. (T3 and T4 are used as the Analogue recorder input.)
- If 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-UA Unit. (Connecting to T5 or T7 is determined by the specifications of the recorder.)
- If a warning Tone is provided from the recording equipment, it should be input via T3 and T4 on ADA-UA Unit. (Do not use T1 and T2 to input Beep Tone.)
- Conversations cannot be recorded from terminals connected to an APR-UA Unit. Speakerphone calls through the HFU-UA Unit cannot be recorded.

3.2.3 Switch Settings

The DIP Switch is located at the bottom center of the ADA-UA Unit. The DIP Switch allows a technician to configure the board to specific settings. *Figure 7-14 ADA-UA Unit Switch Settings* shows the default settings.

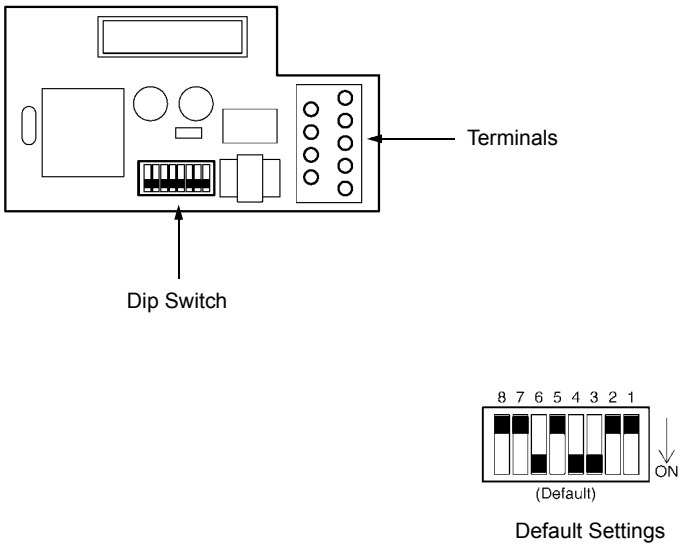


Figure 7-14 ADA-UA Unit Switch Settings

The following switch settings should be made on the ADA-UA Unit to enable or disable the record start warning tone. Switch settings should be made before installing the ADA-UA Unit in the Multiline Terminal. (Refer to *Table 7-2 ADA-UA Unit Switch Settings*).

Table 7-2 ADA-UA Unit Switch Settings

Switch	Setting		Description
SW1–1	On		If the ADA-UA 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 600Ω
SW1–7	ON		If warning tone from any device is sent to telephone
SW1–8	Off		Leave Off

* Do not connect T1 and T2 when switches 3 and 4 are ON.

A6-324000-642-01 – Release 6.0
April 2003

3.3 APR-UA Unit (Analogue Port Ringer)

The Analogue Port adaptor with Ringing provides an interface for installing Single Line Telephones, modems, NEC VoicePoint Conferencing unit, and other compatible analogue devices. The APR-UA 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 adaptor; one allows for 600Ω or a complex impedance interface to devices such as a modem or Single Line Telephone, the second switch (SW1) is permanently set to position 2. The APR-UA Unit ***requires*** an AC adaptor (ACA-UA Unit). If a CTA-UA Unit, the CTU( )-UA Unit, or the HFU-UA Unit and an APR-UA Unit are both installed, only one AC adaptor is required.

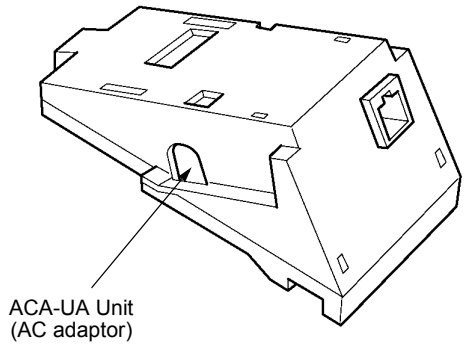


Figure 7-15 APR-UA Unit

3.3.1 Installing an APR-UA 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 unit into the receptacle connector inside the base plate. Refer to *Figure 7-10 Attaching the ADA-UA Unit to the Multiline Terminal*.

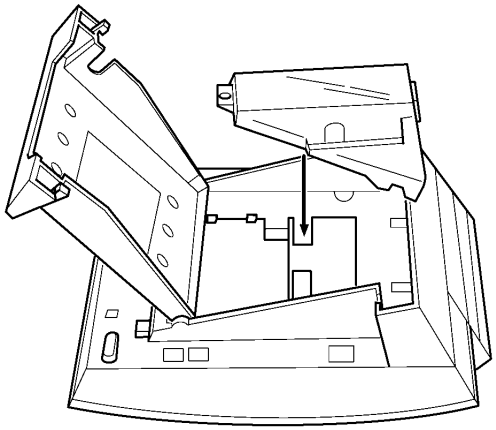


Figure 7-16 Attaching the Unit to the Multiline Terminal

4. Plug the cord of the ACA-UA Unit (AC adaptor) into the jack on the APR-UA Unit. Lead the telephone cord out through the groove in the base as shown in *Figure 7-17 Leading the Telephone Cord out from the Unit*.

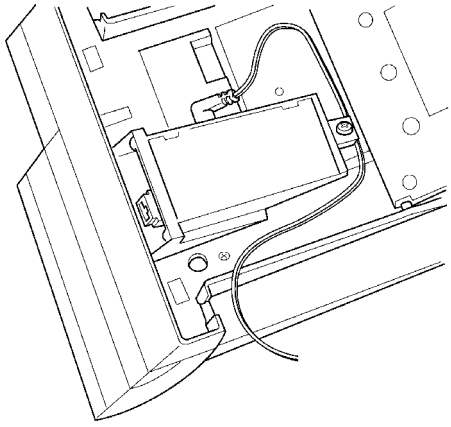


Figure 7-17 Leading the Telephone Cord out from the Unit

A6-324000-642-01 – Release 6.0
April 2003

5. Close the base plate, lead the AC adaptor cord out through the hole, and snap the cover in place.

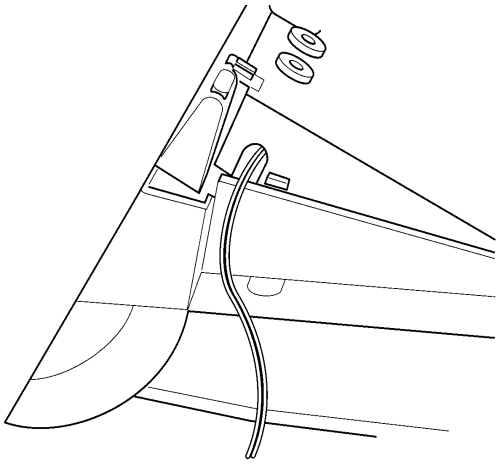


Figure 7-18 Closing the Base Plate Cover

6. Plug in the power cord on the AC adaptor and the telephone cord in the jack.

3.3.2 Switch Settings

There are two switch settings on the APR-UA Unit.

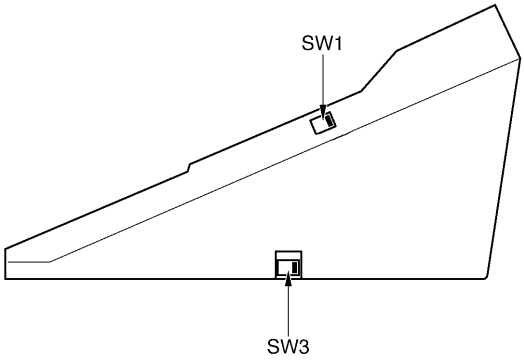


Figure 7-19 APR-UA Unit Switches

The following table lists the switch settings for SW1 and SW3.

Table 7-3 APR-UA 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-UA 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.

3.3.3 Connecting Cables on the APR-UA Unit

Plug the telephone cord from the Single Line Telephone into the modular jack on the APR-UA Unit.

Limit the cable length from the APR-UA Unit to the Single Line Telephone to a maximum of 15 metres.

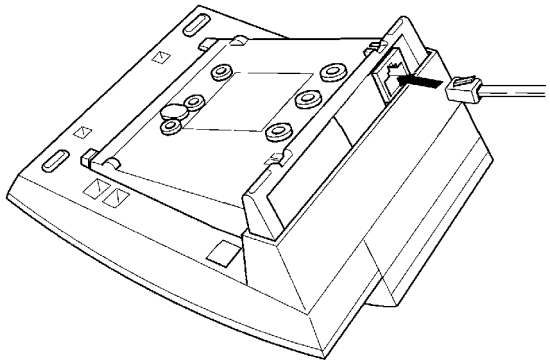


Figure 7-20 Connecting Cables on the APR-UA Unit

A6-324000-642-01 – Release 6.0
April 2003

3.4 CTA-UA Unit (Computer Telephony Application)

Computer Telephony Application allows a DTU-type Multiline Terminal to be connected to a PC. The PC can then be used to perform all of the functions of the Multiline Terminal by using a TAPI-compatible application software.

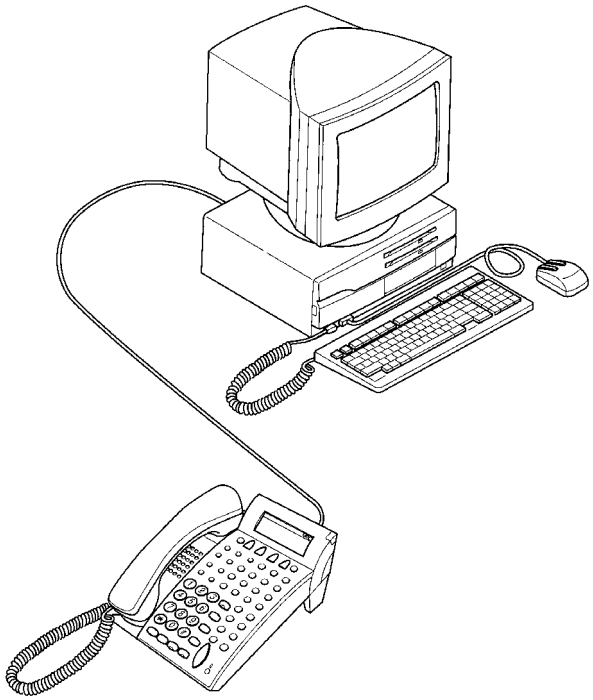


Figure 7-21 Attaching an Xen Multiline Terminal to a PC

The CTA-UA Unit is attached to the bottom of a DTU-type Multiline Terminal.

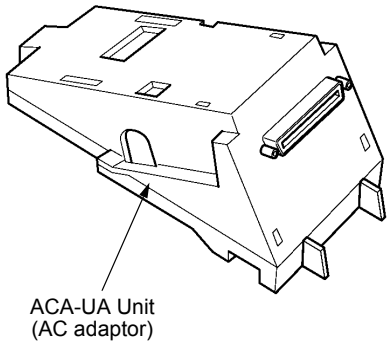


Figure 7-22 CTA-UA Unit

A6-324000-642-01 – Release 6.0
April 2003

3.4.1 Installing the CTA-UA Unit

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 unit into the receptacle connector inside the base plate on the Multiline Terminal. Refer to *Figure 7-16 Attaching the Unit to the Multiline Terminal*.

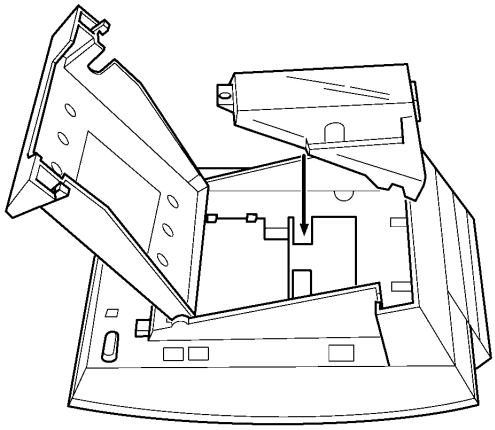


Figure 7-23 Attaching the Unit to the Multiline Terminal

4. Close the base plate.

3.4.2 Connecting the Cables on the CTA-UA Unit

Connect the RS-232C cable from the computer to the connector on the CTA-UA Unit as shown in *Figure 7-24 Connecting the RS-232C Cable to the CTA-UA Unit on the Multiline Terminal*.

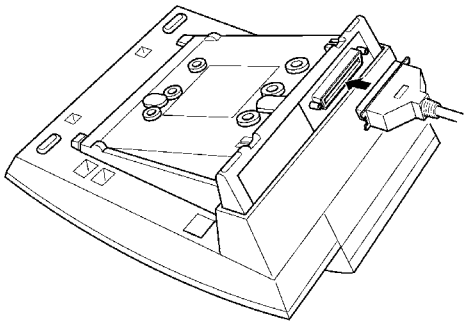


Figure 7-24 Connecting the RS-232C Cable to the CTA-UA Unit on the Multiline Terminal

A6-324000-642-01 – Release 6.0
April 2003

3.4.3 Installing the Driver on the PC

Using the setup disk provided with the CTA-UA Unit install the driver onto your PC. Refer to the *CTA installation Guide* for instructions on installing CTA setup disks.

3.5 Computer Telephony Adapter 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 MLT Emulation

  This function provides the functions of MLT such as normal telephone indications, LCD, Line Keys or Hook Switch.

- Sound Support

  Allows playing and recording sound on an audio device assigned to the PC. Voice Mail and Live Record are supported on the PC.

- Supports Plug and Play

3.5.1 CTU(S)-UA Unit

3.5.1.1 CTU(S)-UA Unit Connections

This unit is a Computer Telephony Application adapter to connect your PC's Universal Serial Bus to an ESI(8)-U13 ETU. It can be connected only to a DTU-type Multiline Terminal.

An ACA-U13 Unit (AC Adapter) is required with this unit.

The following connections are required:

- AC Adapter (not provided)
- Multiline Terminal
- PC USB port (USB cable not provided)

A6-324000-642-01 – Release 6.0
April 2003

✆ Line Cable to ESI(8)-U13 ETU

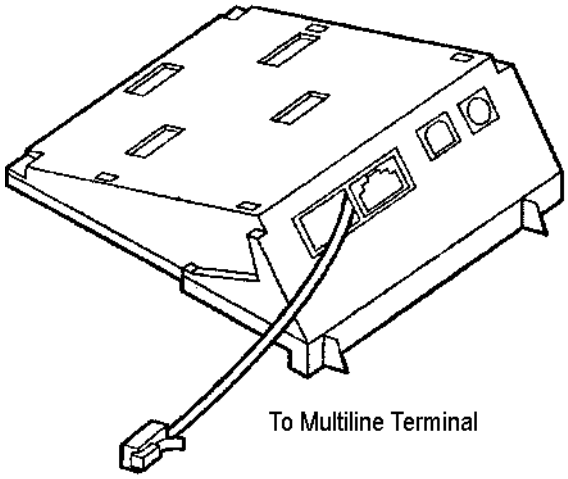


Figure 7-25 CTU(S)-UA Unit

3.5.1.2 Outline

1. Telephone Stations that support CTU(S)-UA
   - DTU-8-1A ( ) TEL
   - DTU-8D-1A ( ) TEL
   - DTU-16D-1A ( ) TEL
   - DTU-32D-1A ( ) TEL
2. Optional hardware to use with Telephone at same time is restricted to ADA-UA Unit.

- The CTU Unit requires an AC adapter (ACA-UA Unit).
- WMU-UA Unit is required to wall mount the telephone fitted with a CTU Unit.
- Do not modify CTU's display switch.

A6-324000-642-01 – Release 6.0
April 2003

3.5.1.3 Connection

A CTU(S)-UA Unit can support an ESI(8)-U13 ETU connection only.

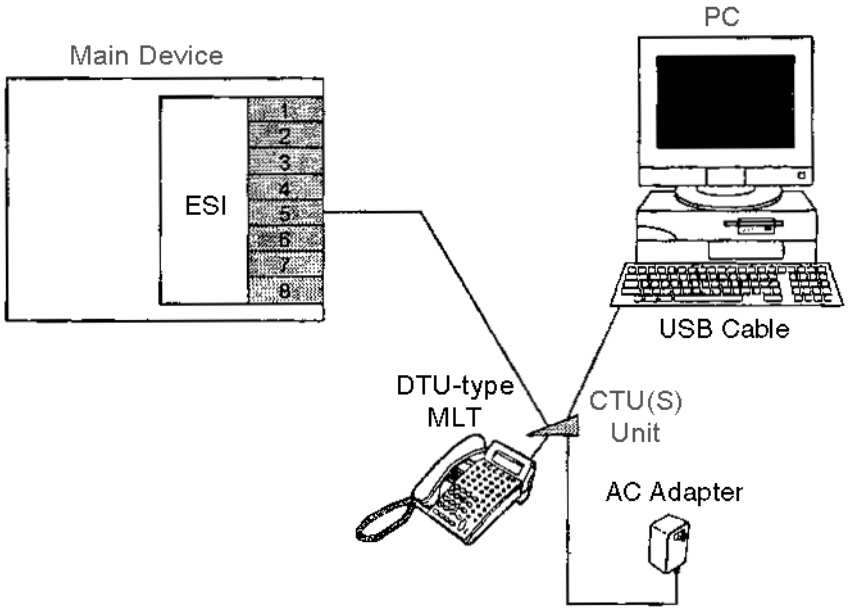


Figure 7-26 CTU(S) Connection

Required Equipment:

- ESI(8)-U13 ETU
- DTU-type MLT
- CTU(S)-UA Unit
- ACA-U13 Unit (AC Adapter) (not provided)
- USB cable (A to B type) (not provided)

3.5.1.4 Set-up Sequence

Configure the CTU(S) with the DTU-type MLT as follows.

1. Flip phone upside down.

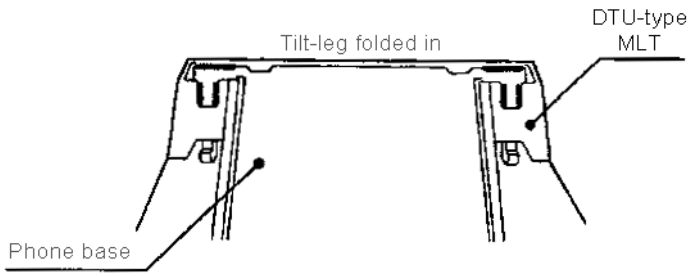


Figure 7-27 Base of DTU-type MLT

2. Open DTU-type MLT's tilt-leg.
   Pull out Line Cord's modular plug from Phone's modular jack.

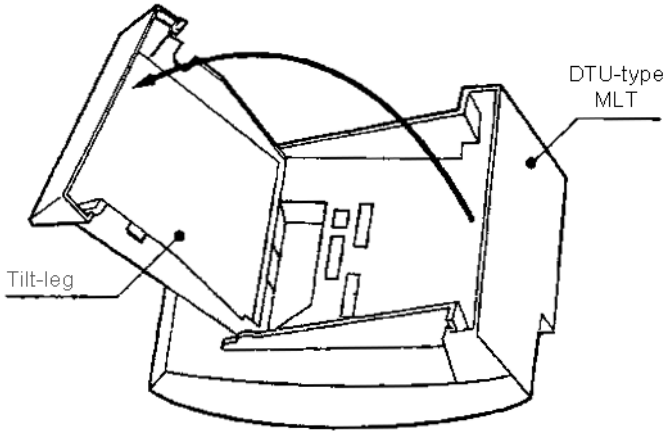


Figure 7-28 Opening the Base of the DTU-type MLT

3. PLug the CTU(S) Unit's connector into DTU-Type MLT's Connector #1.

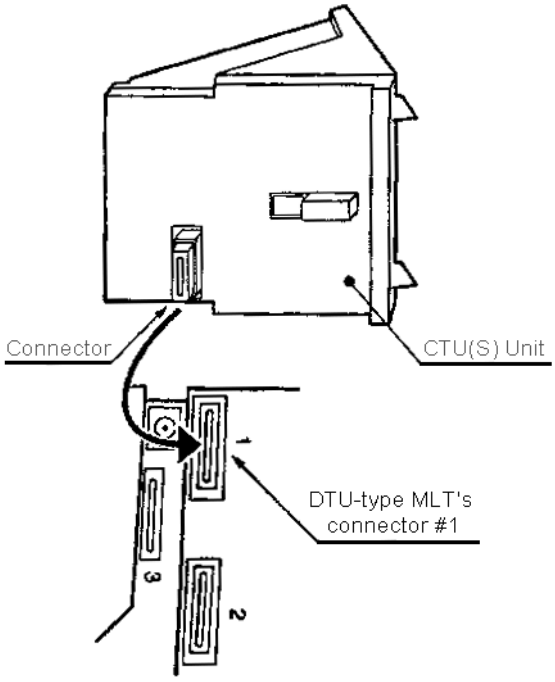


Figure 7-29 Installing the CTU(S)-UA Unit

4. With both thumbs, press in a & b to remove the end cover.

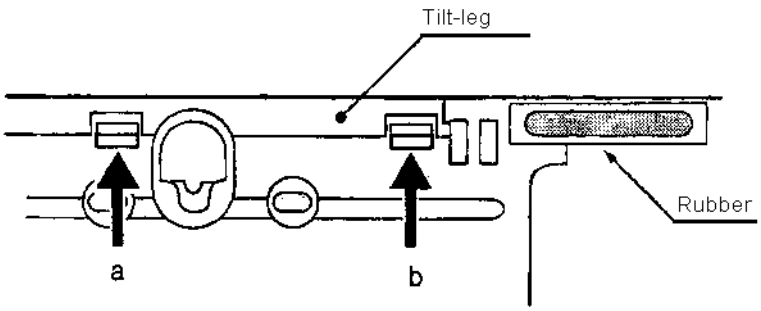


Figure 7-30 Removing the End Cover

5. Replace tilt-leg in original position.

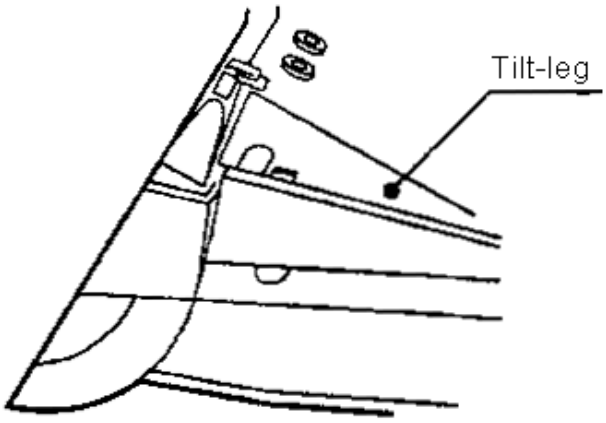


Figure 7-31 Closing the Base

6. Plug AC Adapter into CTU(S)'s AC Adapter.

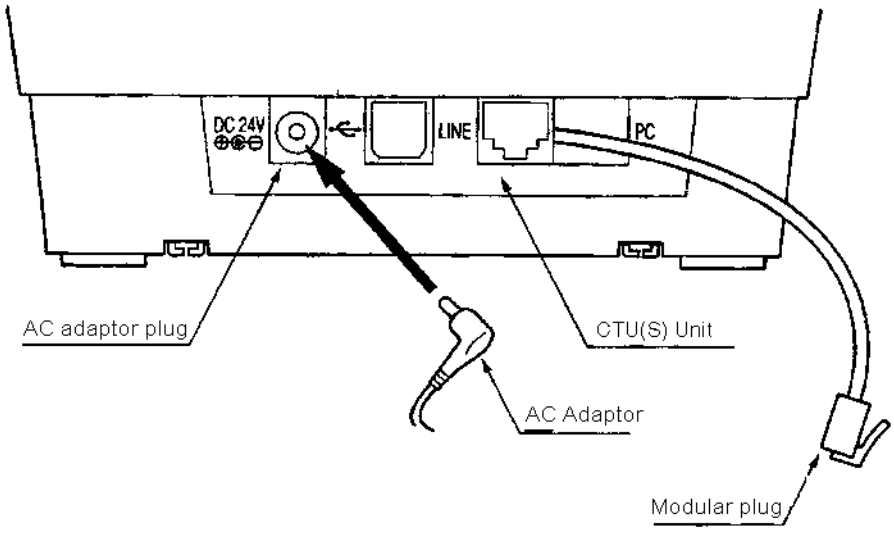


Figure 7-32 Connecting AC Adaptor to CTU(S)

7. Insert CTU(S)'s line cord modular jack into DTU-Type MLT's modular jack marked "LINE" until you hear a click.

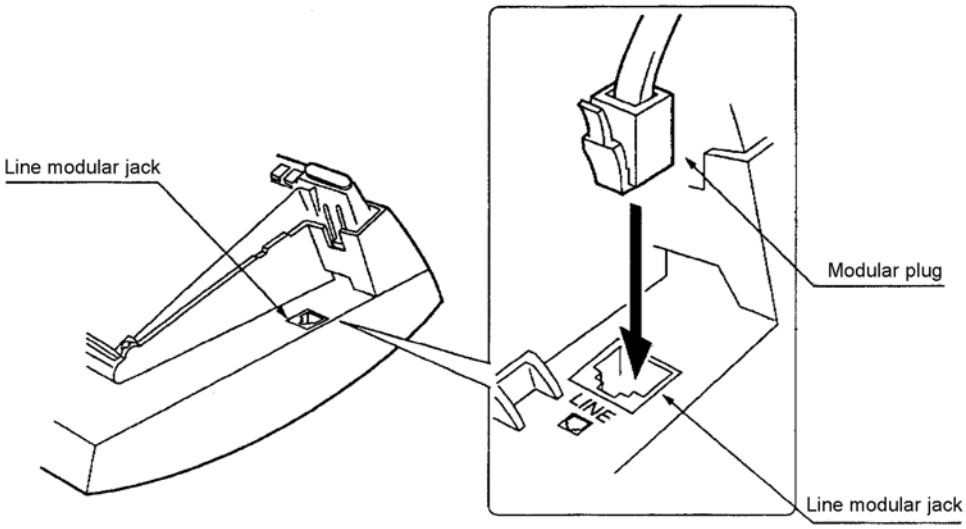


Figure 7-33 Connecting the CTU(S) Line Cord

8. Secure the line cord by slotting it in the tilt-leg's clasp.

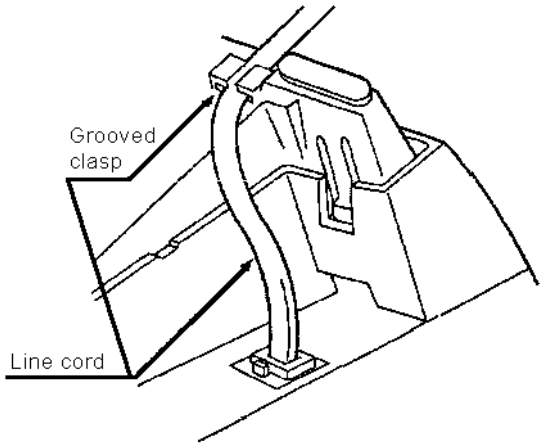


Figure 7-34 Securing the Line Cord

9. Insert the ESI port line cords modular plug into CTU(S) modular jack marked "LINE" until it clicks.

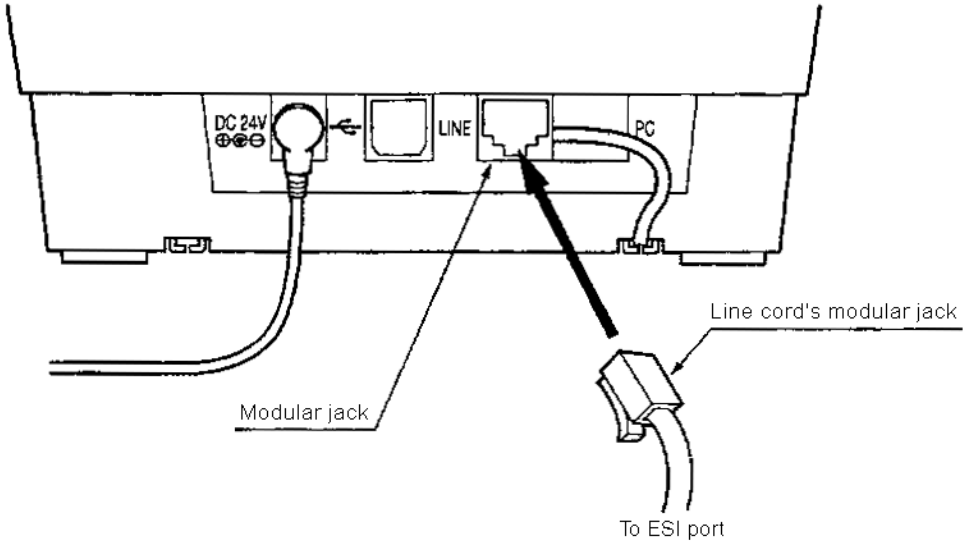


Figure 7-35 Connecting the Line to the CTU(S)

10. Insert the USB Cable's Series B square connector into the USB port.

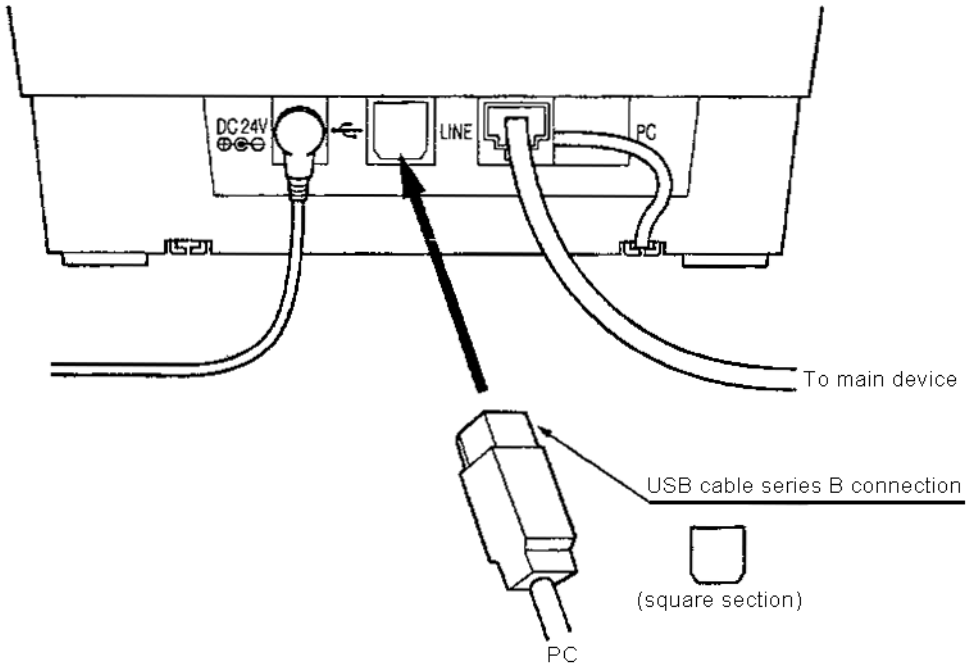


Figure 7-36 Connecting the USB to the CTU(S)

11. Once you have inserted the USB Cable's Series A connector (rectangular) into the PC's USB port, the CTU(S) connection is completed.

3.5.2 CTU(C) Unit

3.5.2.1 CTU(C) Unit Connections

This unit is a Computer Telephony Application adapter to connect a Universal Serial Bus to a VDH2(8)-U13 ETU. It can be connected only to a DTU-type Multiline Terminal.

An ACA-UA Unit (AC Adapter) is required with this unit.

The following connections are required:

- AC Adapter (not provided)
- Multiline Terminal
- PC USB port (USB cable not provided)
- Line Cable to VDH2(8)-U13 ETU

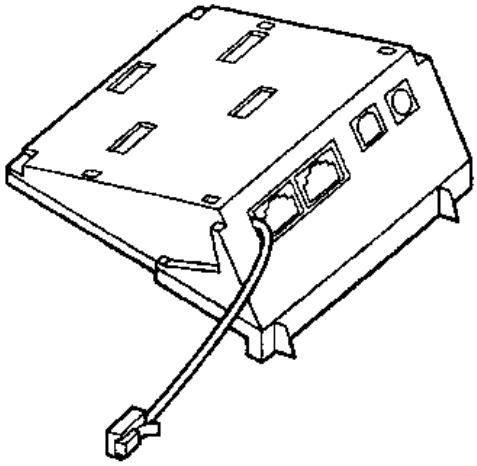


Figure 7-37 CTU(C) Unit

3.5.2.2 Outline

1. Telephone Stations that support CTU(C)
   - DTU-8-1A ( ) TEL
   - DTU-8D-1A ( ) TEL
   - DTU-16D-1A ( ) TEL
   - DTU-32D-1A ( ) TEL
2. Optional hardware to use with Telephone at same time is restricted to ADA-UA Unit.

- The CTU Unit requires an AC adapter (ACA-UA Unit).
- WMU-UA Unit is required to wall mount the telephone fitted with a CTU Unit.
- Do not modify CTU's display switch.

A6-324000-642-01 – Release 6.0
April 2003

3.5.2.3 Connections

The CTU(C) Unit can support connections from the VDH2(8)-U13 ETU.

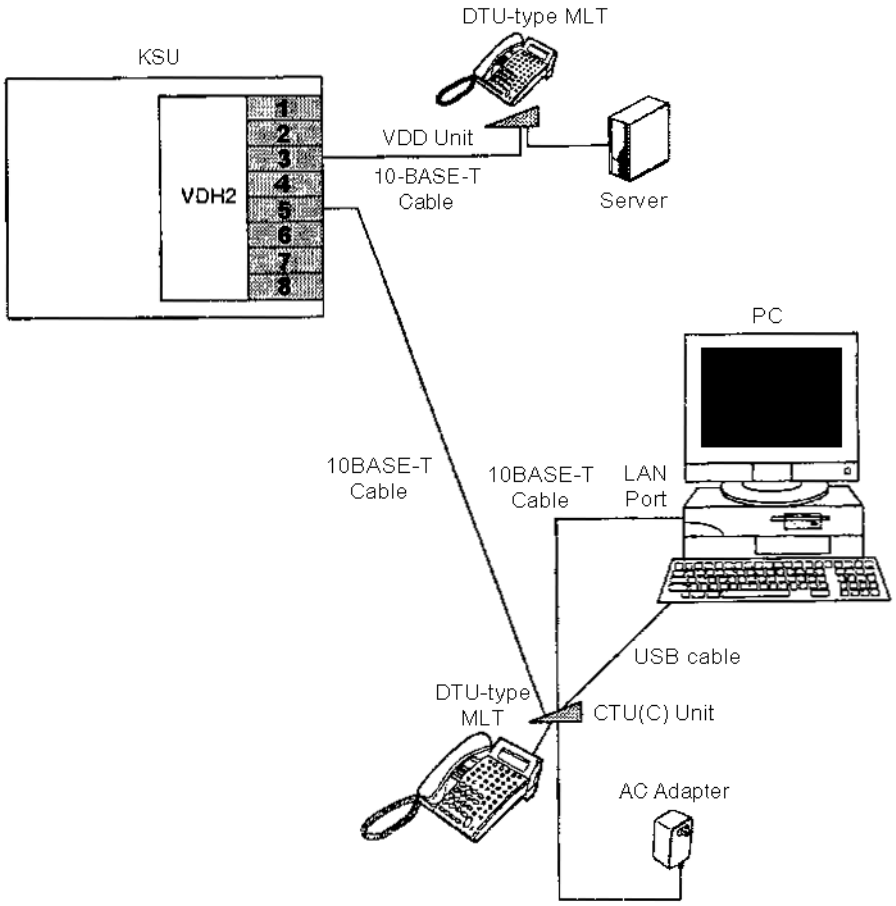


Figure 7-38 CTU(C) Connection

Required Equipment:

- VDH(8)-U13 ETU
- DTU-type MLT
- CTU(S)-UA Unit
- ACA-U13 Unit (AC Adapter) (not provided)
- USB cable (A to B type) (not provided)
- 10-BASE-T cable (not provided)

3.5.2.4 Set-up Sequence

Configure the CTU(C) with the DTU-type MLT as follows.

1. Flip phone upside down.

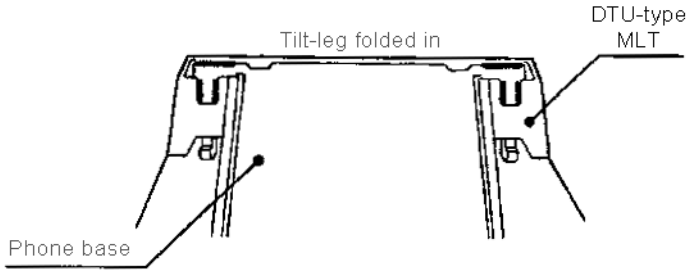


Figure 7-39 Base of DTU-type MLT

2. Open DTU-type MLT's tilt-leg.

   Pull out Line Cord's modular plug from Phone's modular jack.

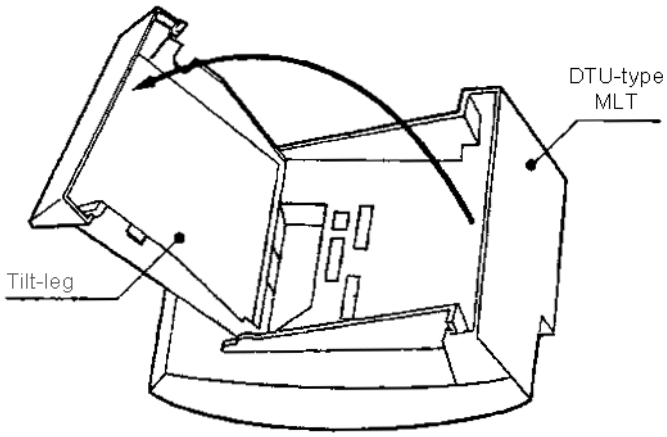


Figure 7-40 Opening the Base of the DTU-type MLT

3. PLug the CTU(C) Unit's connector into DTU-Type MLT's Connector #1.

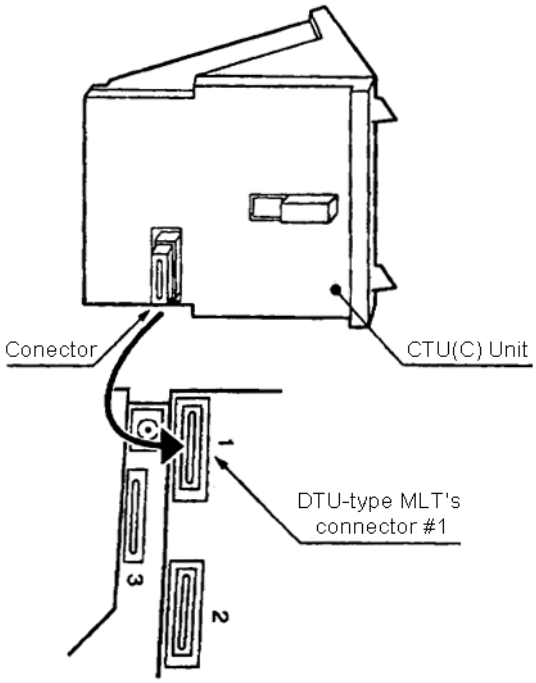


Figure 7-41 Installing the CTU(C)-UA Unit

4. With both thumbs, press in a & b to remove the end cover.

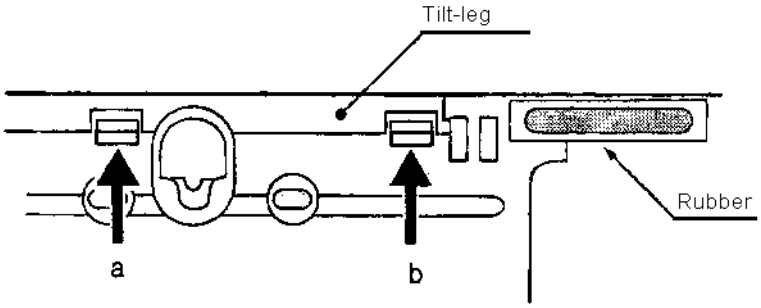


Figure 7-42 Removing the End Cover

5. Replace tilt-leg in original position.

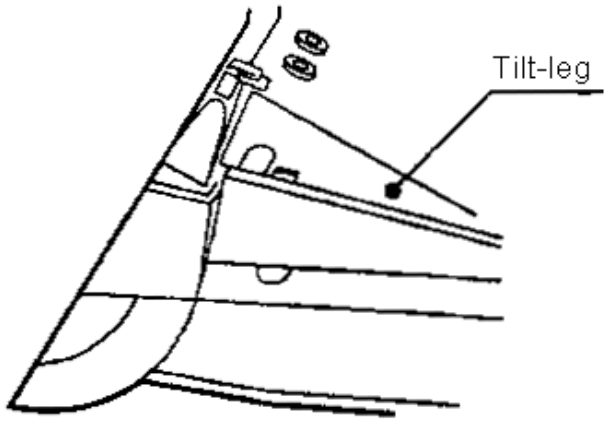


Figure 7-43 Closing the Base

6. Plug AC Adapter into CTU(C)'s AC Adapter.

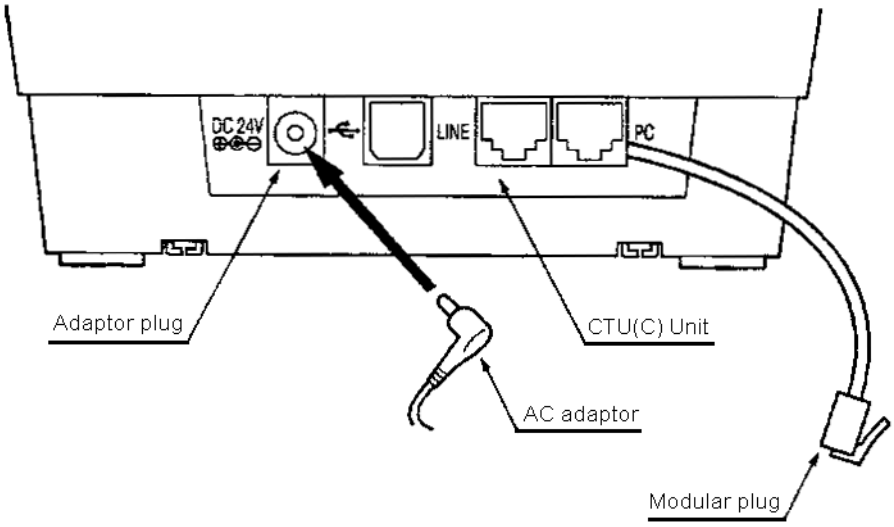


Figure 7-44 Connecting AC Adapter to CTU(C)

7. Insert CTU(C)'s line cord modular jack into DTU-Type MLT's modular jack marked "LINE" until you hear a click.

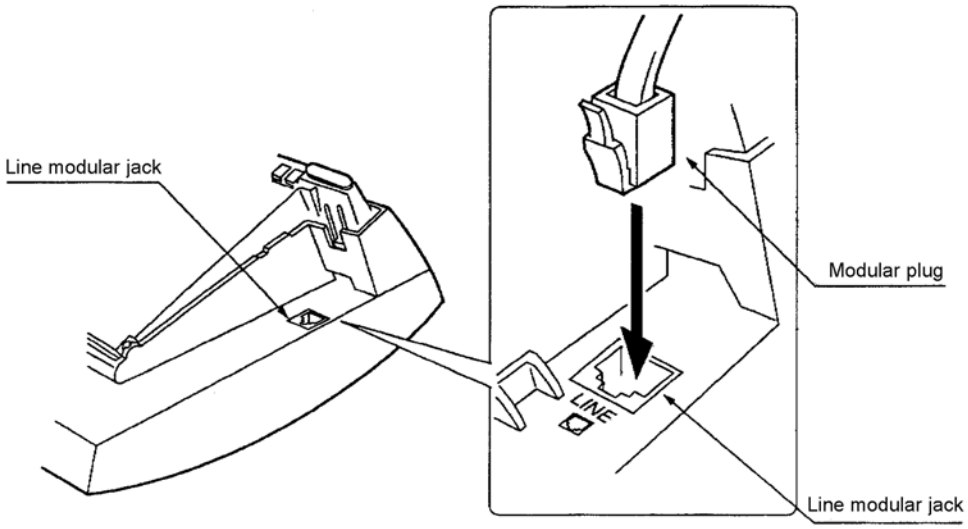


Figure 7-45 Connecting the CTU(C) Line Cord

8. Secure the CTU(C) line cord by slotting it in the tilt-leg's clasp.

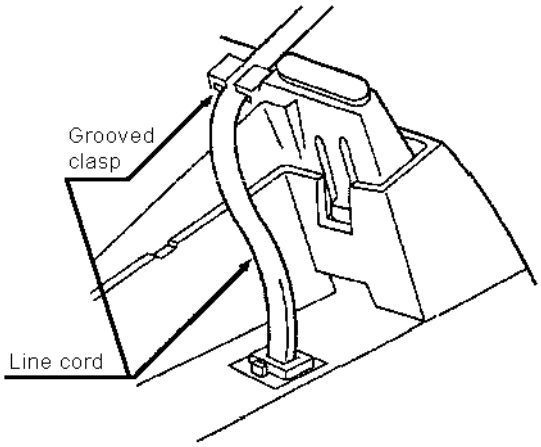


Figure 7-46 Securing the Line Cord

9. Insert the VDH2(8)-U13 ETU line cord's modular plug into CTU(C) modular jack marked "LINE" until it clicks.

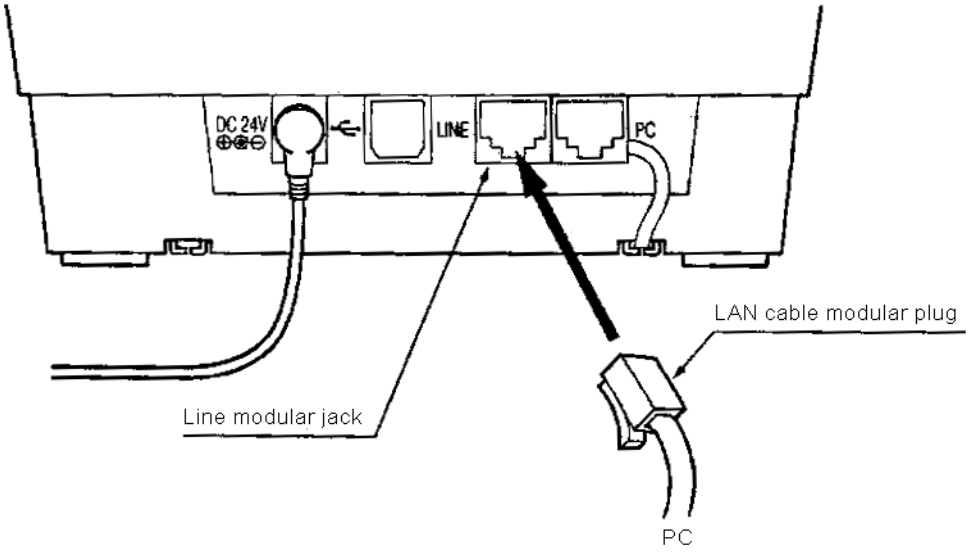


Figure 7-47 Connecting the Line to the CTU(C)

10. Insert the LAN cable module plug into CTU(C)'s modular jack marked "PC".

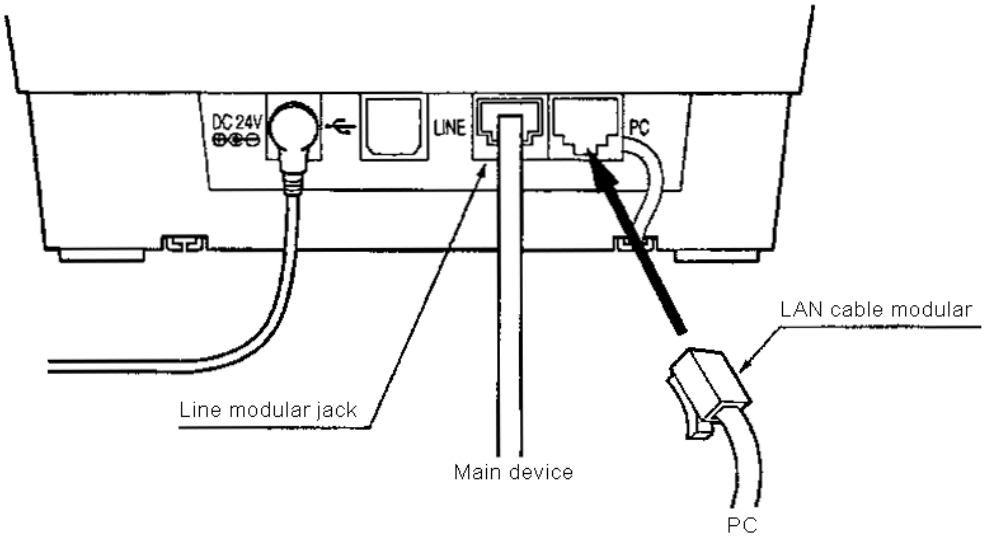


Figure 7-48 Connecting the LAN (PC) to the CTU(C)

A6-324000-642-01 – Release 6.0
April 2003

11. Insert the USB Cable's Series B square connector into the USB connector.

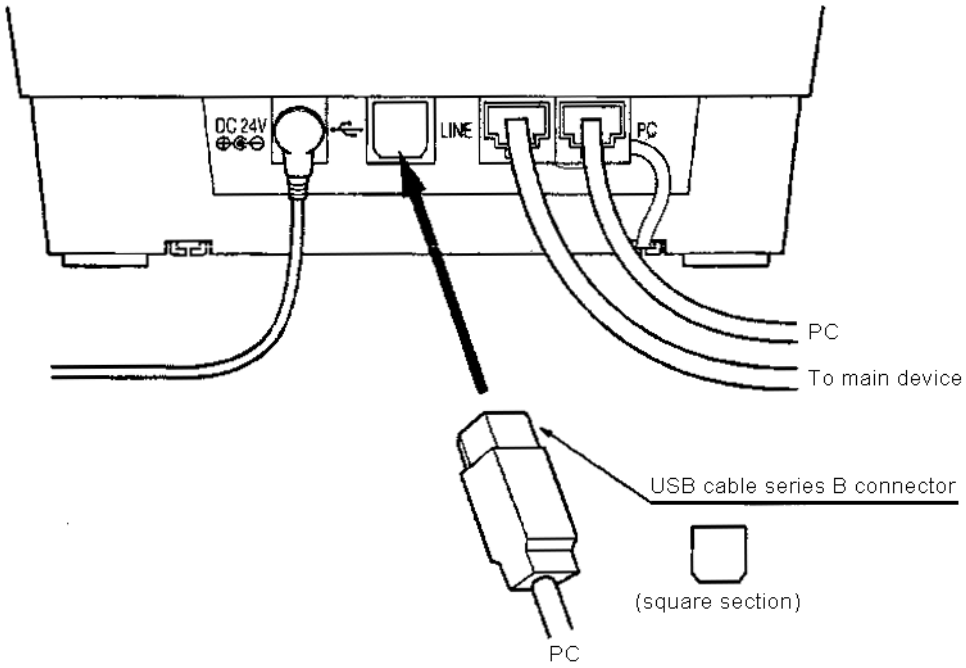


Figure 7-49 Connecting the USB to the CTU(C)

12. Once you have inserted the USB Cable's Series A connector (rectangular) into the PC's USB connector, the CTU(C) connection is completed.

3.6 HFU-UA (WH) 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 adaptor and an external microphone. With terminal upside down, facing from the bottom of the open cover, install this unit on the left side.

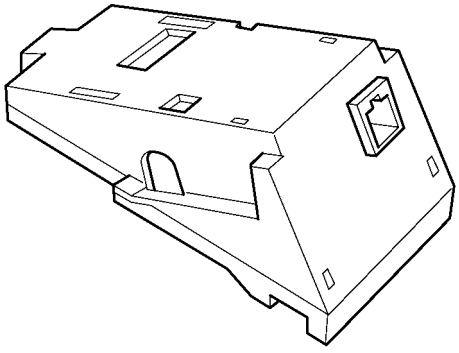


Figure 7-50 HFU-UA (WH) Unit

3.6.1 Installing an HFU-UA (WH) Unit on a Multiline Terminal

Refer to *3.3.1 Installing an APR-UA Unit on a Multiline Terminal on page 7-197*. The instructions for installing these units are the same.

3.6.2 Installing the External Microphone

An external microphone can be installed on the HFU-UA (WH) Unit. These instructions apply to the external microphone supplied with the HFU-UA (WH) Unit. This microphone is equipped with a mute button.

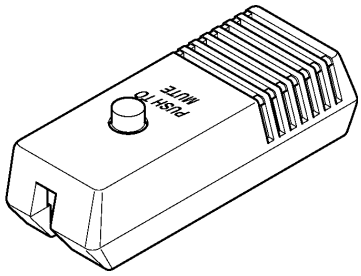


Figure 7-51 Microphone with Mute

1. Plug the microphone cord into the jack on the HFU-UA (WH) Unit as shown in *Figure 7-52 Attaching a Microphone to a Multiline Terminal*.

   ☞ The microphone should be at least 30 cm away from the Multiline Terminal, but not more than 1 metre.

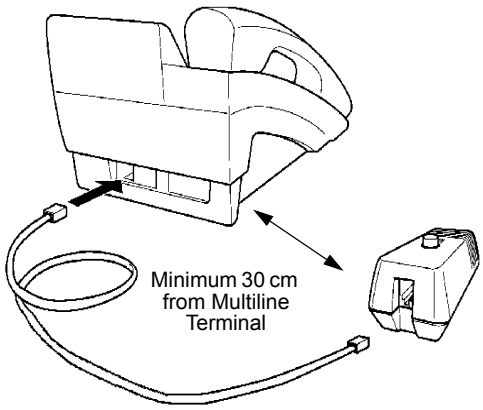


Figure 7-52 Attaching a Microphone to a Multiline Terminal

A6-324000-642-01 – Release 6.0
April 2003

3.6.3 Switch Settings

The HFU-UA (WH) Unit uses two-position switches SW1 and SW2.

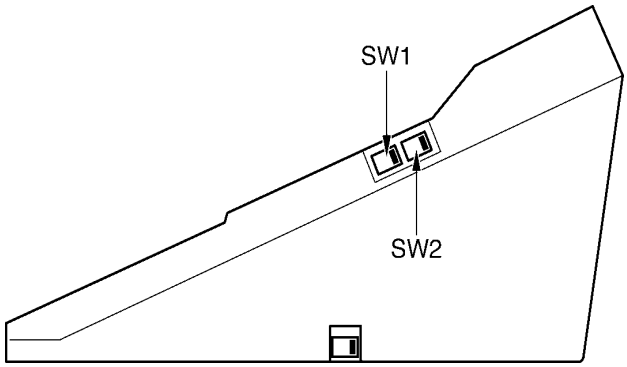


Figure 7-53 HFU-UA (WH) Unit Switches

The following table lists the SW1 and SW2 switch settings.

Table 7-4 HFU-UA (WH) Unit Switch Settings

SW1		SW2		
Position 1	Position 2	Position 1	Position 2	Description
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)

Notes:

Full Duplex: In some large areas or noisy locations half duplex should be used. There are limits to the echo cancelling ability of the HFU-UA.

Half Duplex: If voice clipping occurs, use a lower decibel setting.

3.7 PCT( )-U13 Unit (PC Telephony Board)

The NEC PC Board is a multifunction PC-AT add-in card with telephone, sound system, fax, and modem abilities and combines multimedia audio, Telephone Application Programming Interface (TAPI), and a 33.6K fax/data modem. The board is available with/ without the built-in modem.

The PC Board replaces an NEC desk set as the primary telephone device; the telephone line from the wall now plugs directly into the PC board instead of the desk set. The desk set can be connected to the PC board and used as an adjunct or auxiliary telephone. An external microphone and external speakers can also be connected to the PC Board

The PC Board allows telephone operations with a headset or microphone and has the following audio abilities:

- Records audio from the calling or called party of a telephone conversation
- Records audio from both parties of a telephone conversation
- Records audio (or music) from a microphone, line-level device, or CD player
- Plays live or recorded audio (or music) through an adjunct telephone, handset or stereo speakers

The PC Board uses Computer Telephony Integration (CTI) technology through Microsoft Windows 95 or higher to support speech and data transmission, allow a variety of attachment devices, and support complex calling features such as conference calls, call waiting, and voice mail.

The PC Board supports the following terminals:

✆ DTU-type Multiline Terminals.

✆ ETW-type Multiline Terminals

The NEC PC Telephony board can be installed on the ISA bus on any IBM-compatible PC.

Refer to the PCT Installation Guide provided with the PCT-UA for installation instructions.

3.7.1 Connecting a MIC/Line-In

✆ If using the microphone input (MIC), connect an electric condenser microphone. Phantom power (-2.2 Vdc) is supplied.

✆ If using the line-level input (Line-In), connect to a line-level device such as a CD or cassette player.

A6-324000-642-01 – Release 6.0
April 2003

3.8 SLT(1)-U13 ADP (Single Line Telephone)

The Single Line Telephone adaptor provides an interface for Single Line Telephones and other similar devices from an ESI ETU channel. This adaptor can be connected to any ESI port.

3.8.1 Connecting the SLT(1)-U13 ADP to the System

1. Connect one end of the RJ-11 to the ESI port on the KSU and one end to the jack on the SLT adaptor marked **ESI**.
2. Connect one end of a second RJ-11 to the jack marked **TEL** on the SLT adaptor and the other end to the Single Line Telephone.

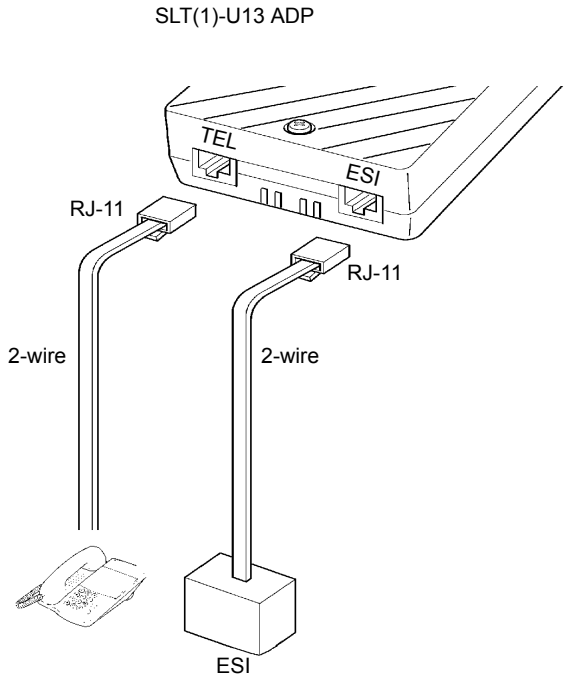
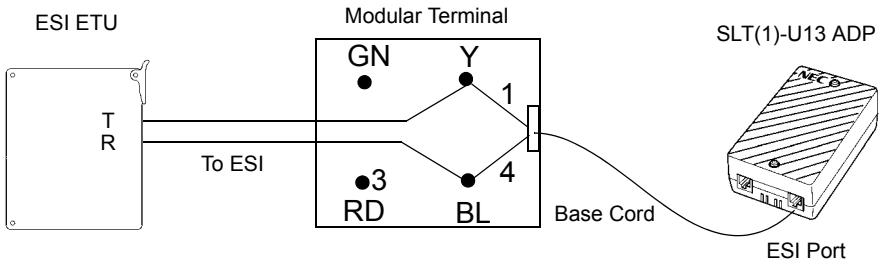
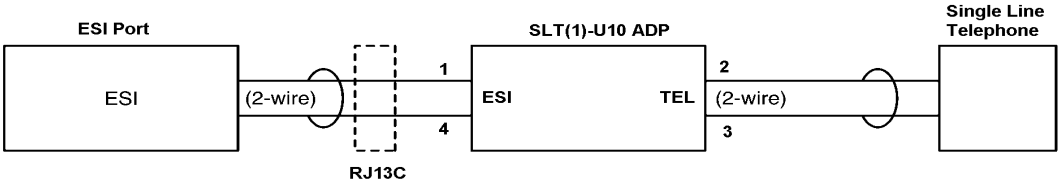


Figure 7-54 Connecting a Single Line Telephone to the System using an SLT(1) U13 ADP

A6-324000-642-01 – Release 6.0
April 2003



Modular Terminal Connections



Single Line Telephone Connections

Figure 7-55 Connecting the SLT(1)-U13 ADP

3.8.2 Wall Mounting the SLT(1)-U13 ADP

1. Remove the two screws from the top to open the SLT adaptor as shown in *Figure 7-56 Removing the Screws from the SLT(1)-U13 ADP*.

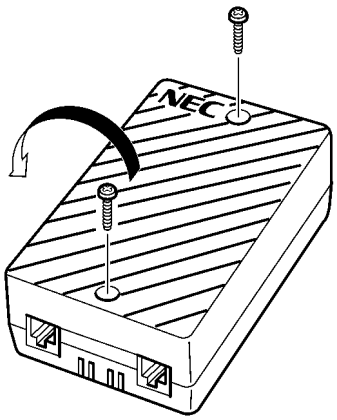


Figure 7-56 Removing the Screws from the SLT(1)-U13 ADP

A6-324000-642-01 – Release 6.0
April 2003

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.

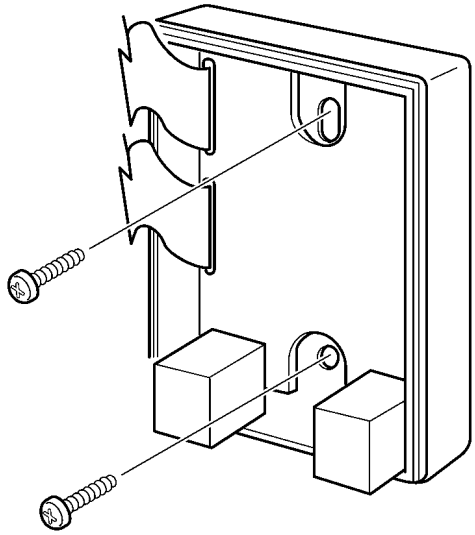


Figure 7-57 Attaching the SLT(1)-U13 ADP to the Wall

3.9 VDD-UA Unit (Voice/Data Unit for Digital Terminals)

This unit provides the station and LAN split for digital terminals. This adaptor can be installed on any DTU-type Multiline Terminal. It is used when LAN and telephone lines are incorporated into one cable.

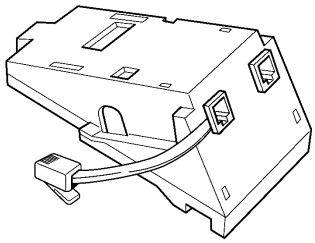


Figure 7-58 VDD-UA Unit

3.9.1 Installing a VDD-UA Unit on a Multiline Terminal

Refer to *3.4 CTA-UA Unit (Computer Telephony Application) on page 7-201*. The instructions for installing these units are the same.

A6-324000-642-01 – Release 6.0
April 2003

3.9.2 Connecting Cables to the VDD-UA Unit

1. If the Multiline Terminal is already connected to the ESI(8)-U13 ETU, unplug the telephone cord.
2. Plug the cable from the VDH2(8)-U13 ETU and from the PC LAN board into the modular jacks on the VDD-UA Unit. The jacks are labelled. Plug the cable from the VDD-UA Unit into the modular jack on the Multiline Terminal.

   Limit the cable length from the VDH to the PC via the VDD to a maximum of 100 meters.

   ☞ If 10Base-2 cables are reversed on the VDD-UA Unit, the unit will not be damaged, but the Multiline Terminal will not operate.

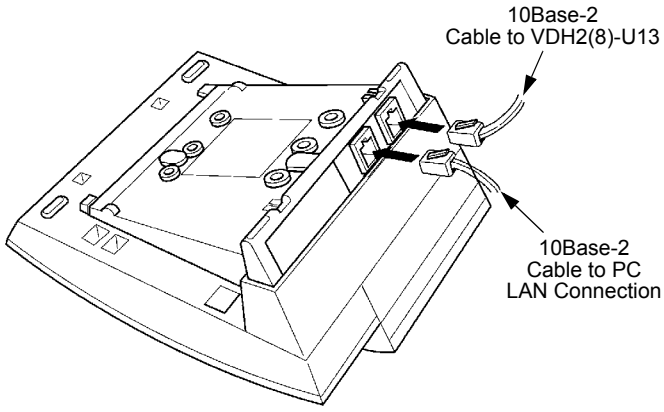


Figure 7-59 Connecting the Cables on the VDD-UA Unit

3.10 Wall Mounting

Any DTU-type 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-UA Unit to accommodate adaptors that are installed on the Multiline Terminal.

3.10.1 Removing and Remounting the Handset Hanger

1. Remove the hanger by sliding it out of the slot.
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-UA Unit.) Refer to *Figure 7-60 Positioning the Handset Hanger* for the steps for removing and remounting the handset hanger.

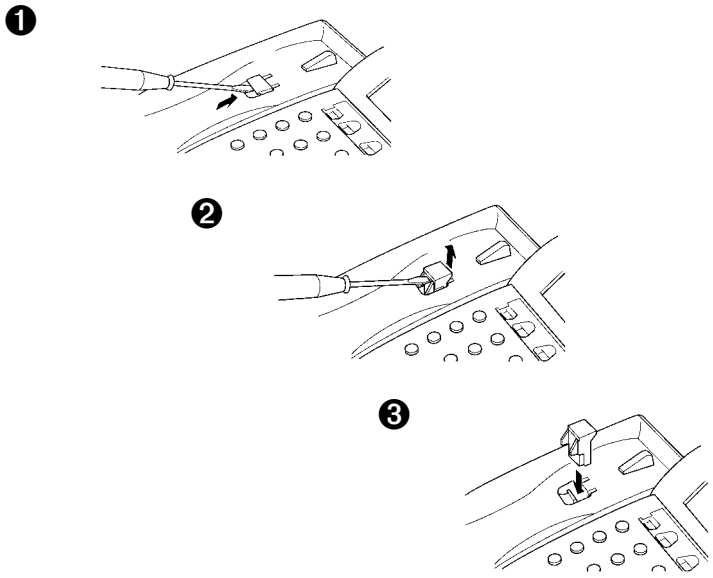


Figure 7-60 Positioning the Handset Hanger

3.10.2 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 7-61 Removing the Knockout* with nippers.

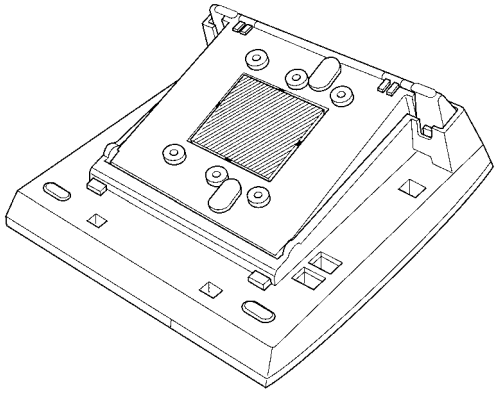


Figure 7-61 Removing the Knockout

5. Assemble the base plate and base cover.
6. As illustrated in *Figure 7-62 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.

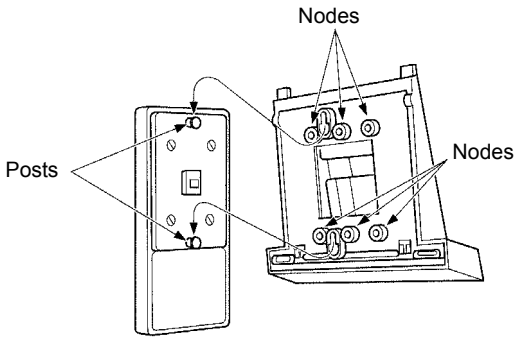


Figure 7-62 Attaching the Base Plate to the Wall

If using a modular jack instead of a wall plate, put the modular jack inside the base unit as shown in *Figure 7-63 Wall Mounting using a Modular Jack*. Use the locally provided screws to attach the base unit directly to the wall.

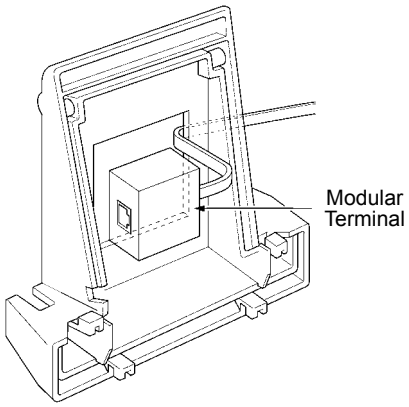


Figure 7-63 Wall Mounting using a Modular Jack

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.

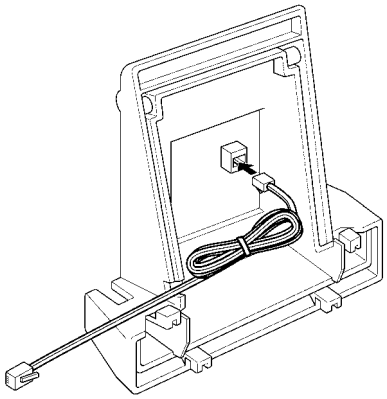


Figure 7-64 Plugging in the Line Cord using a Wall Jack

If 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.

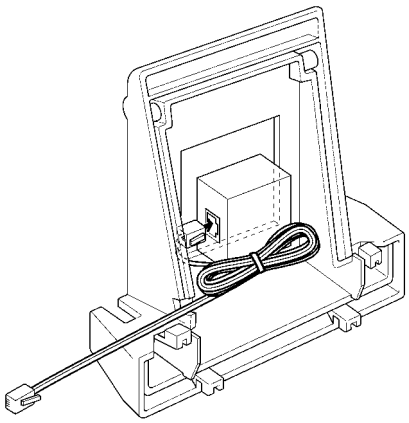


Figure 7-65 Plugging in the Line Cord Using a Modular Jack

8. With the base plate and base cover assembly attached to the wall, hook the two bottom tabs on the base cover into the tab slots on the base of the Multiline Terminal.

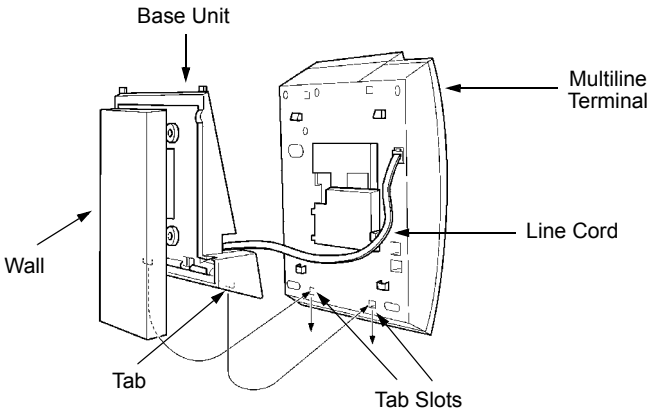


Figure 7-66 Attaching the Bottom Tabs of the Multiline Terminal to the Base Cover

A6-324000-642-01 – Release 6.0
April 2003

9. Push up on the Multiline Terminal and lock the top tabs on the base cover into the tab slots on the base of the Multiline Terminal. Turn terminal slightly clockwise to interface with base cover. *Figure 7-67 Attaching the Top Tabs of the Multiline Terminal to the Base Plate* shows how the Multiline Terminal is attached.

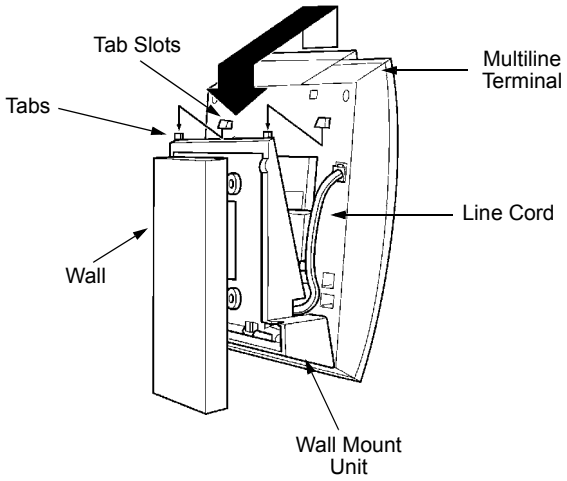


Figure 7-67 Attaching the Top Tabs of the Multiline Terminal to the Base Plate

10. When properly installed, the wall-mounted Multiline Terminal looks similar to the one shown in *Figure 7-68 Installed Wall Mount Unit*.

    ☞ Do not adjust the tilt panel LCD after the Multiline Terminal is mounted on the wall.

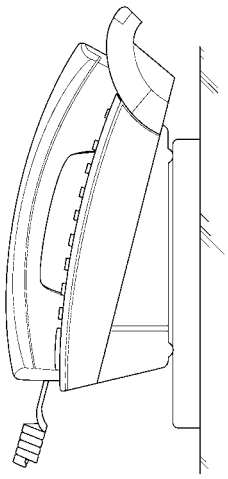


Figure 7-68 Installed Wall Mount Unit

3.10.3 Installing the Wall Mount Unit and Mounting the Multiline Terminal using the WMU-UA Unit

If installing an HFU-UA Unit, CTA-UA Unit, CTU( )-UA Unit, VDD-UA Unit or APR-UA Unit, a separate WMU-UA Unit must be purchased to accommodate these units.

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 adaptor as shown in *Figure 7-69 Removing the Tabs from the adaptor*.

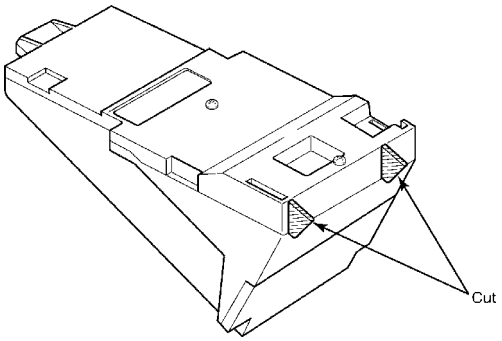
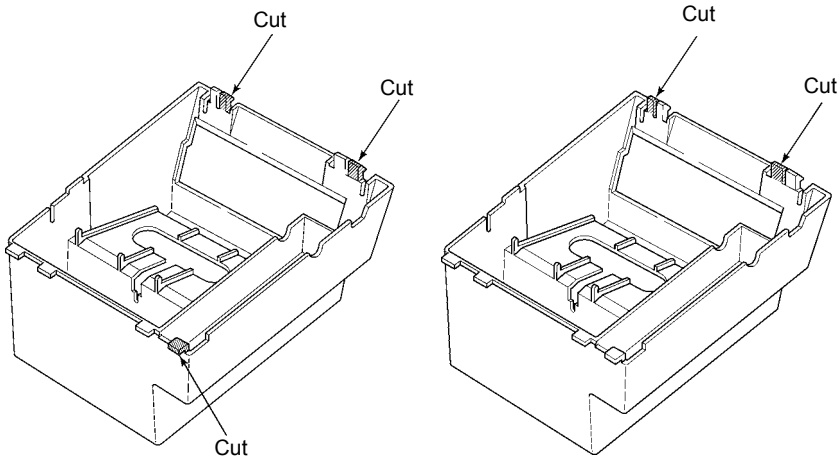


Figure 7-69 Removing the Tabs from the adaptor

3. Remove the tabs from the WMU-UA Unit as shown in *Figure 7-70 Removing the Tabs from the WMU-UA Unit*. (Tabs removed depends on the Multiline Terminal type.)



DTU-8-1A (WH) TEL
DTU-8D-1A (WH) TEL
DTU-16D-1A (WH) TEL
DCU-60-1A (WH) CONSOLE

DTU-32D-1A (WH) TEL

Figure 7-70 Removing the Tabs from the WMU-UA Unit

A6-324000-642-01 – Release 6.0
April 2003

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 in the space between the WMU-UA Unit and the wall. Lead the line cord out through the slits as shown in *Figure 7-71 Leading the Line Cord out of the WMU-UA Unit*.

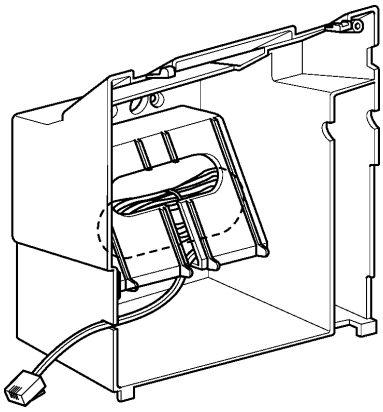


Figure 7-71 Leading the Line Cord out of the WMU-UA Unit

6. Attach the WMU-UA Unit to the posts on the wall plate (locally provided). Place locally provided screws in the nodes on the WMU-UA Unit and secure the WMU-UA Unit to the wall.

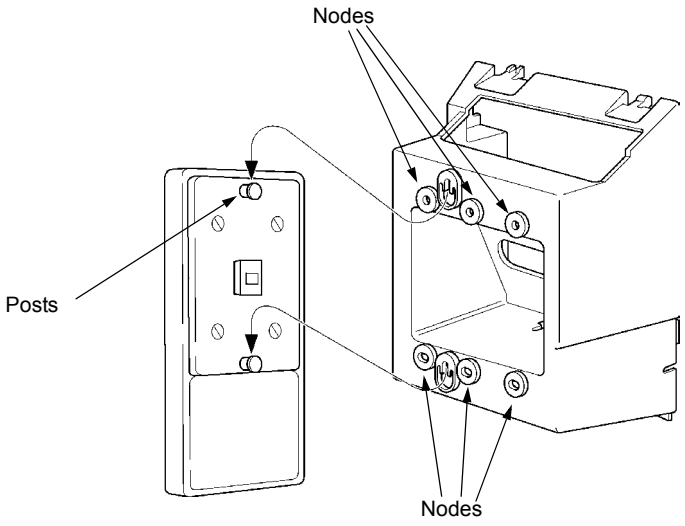


Figure 7-72 Attaching the Wall Mount Unit to the Wall

7. Connect the line cord to the Multiline Terminal.

8. With the WMU-UA Unit attached to the wall, hook the two bottom tabs on the WMU-UA Mount Unit into the tab slots on the Multiline Terminal. Then push the two top tabs on the WMU-UA Unit into the tab slots on the Multiline Terminal. If the adaptor has a power supply, lead the AC adaptor cord out through the opening at the bottom of the Multiline Terminal. Refer to *Figure 7-73 Attaching the Multiline Terminal to the WMU-UA Unit*.

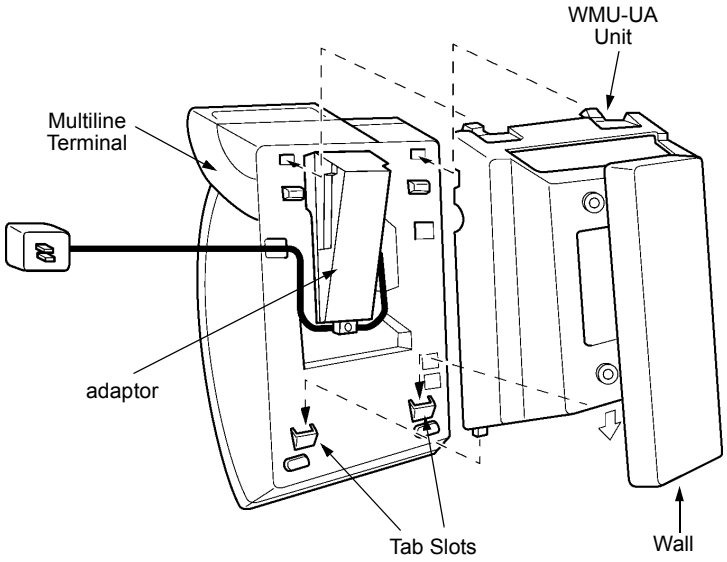


Figure 7-73 Attaching the Multiline Terminal to the WMU-UA Unit

3.10.4 Removing the Multiline Terminal from the Base Cover

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.

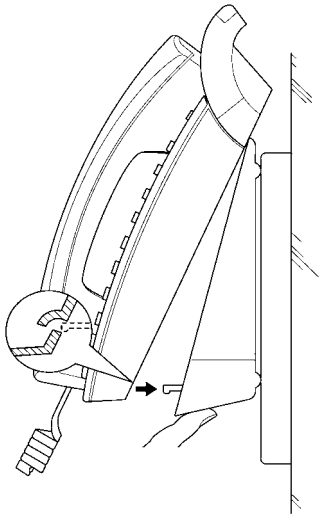


Figure 7-74 Removing the Multiline Terminal from the Base Cover

A6-324000-642-01 – Release 6.0
April 2003

3.10.5 Removing the Multiline Terminal from the WMU-UA Unit

To remove the Multiline Terminal from the WMU-UA Unit, lift the Multiline Terminal to disengage top tabs and lower the terminal from the WMU-UA Unit.

3.11 Music on Hold

The Xen Master and Xen Axis KSUs allow a Music on Hold source to be connected to the system. Both Internal and External music sources can be used. External Music on hold is unavailable if an Internal Music source is used (digital music).

3.11.1 Connecting Audio Sources to the KSU

Connect the plug end into the AUDIO IN 1 jack on the side of the Xen Master Basic KSU or into the MOH IN jack inside the Xen Axis KSU. Refer to *Figure 7-75 Music Source Connections*.

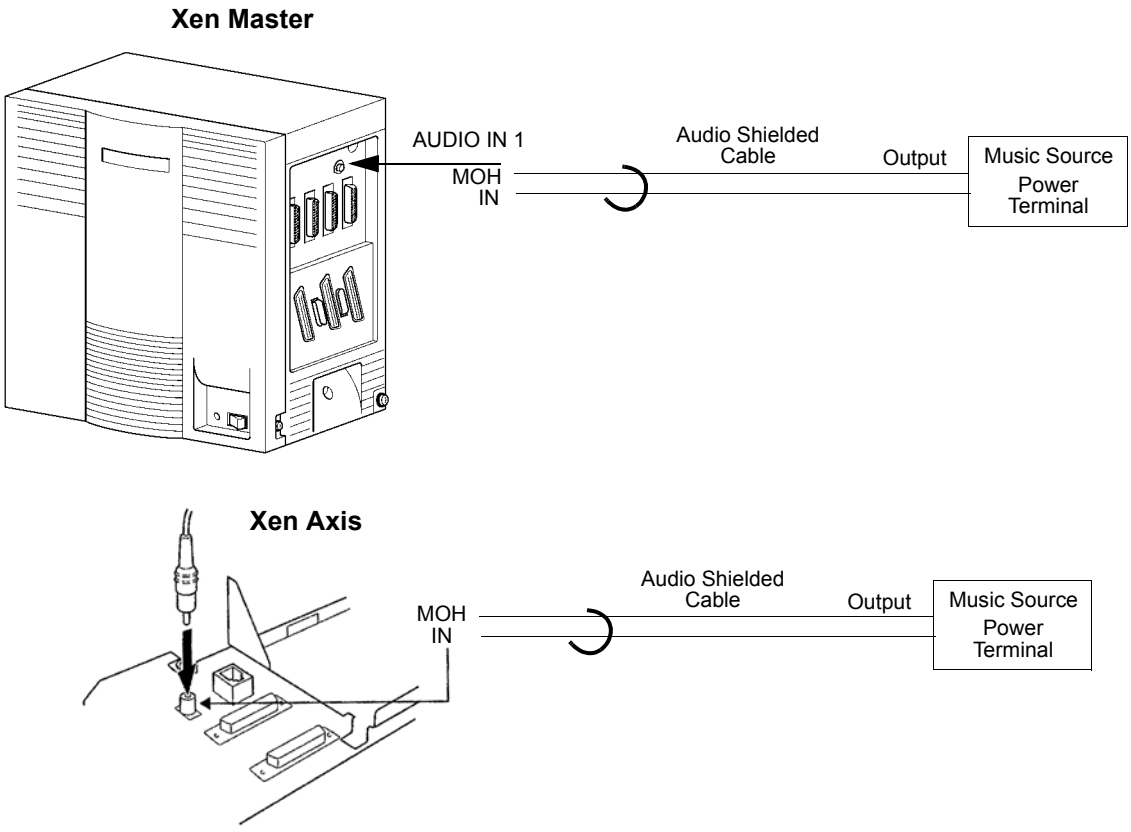


Figure 7-75 Music Source Connections

Alternatively, multiple Music On Hold sources can be connected via a free COI port and an approved Line Isolation Unit (LIU). Any number of MOH sources can be connected in this way, limited only by the number of COI ports available in the system.

The LIU must provide 48Vdc to the COI port. One suitable LIU is the Batesford Electronics Model No. TIC2F2. This will require connection to a 240Vac mains power outlet.

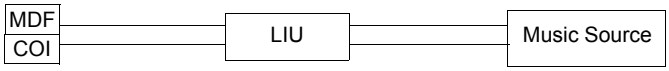


Figure 7-76 Connecting a Music Source via a COI Port

3.12 Station Background Music

Station Background Music can be provided using an internal or an external source. The same connection used for Music on Hold can be used for Station Background Music. (Refer to Section *3.11 Music on Hold*).

Alternatively, one Station background Music source can be connected via a free COI port and an approved Line Isolation Unit (LIU). Refer to *Section 3.11 Music on Hold*, *Figure 7-76 Connecting a Music Source via a COI Port*.

3.13 Paging Connections

When connecting background music, the ECR-U13 ETU is used for the interface with Paging In/Out, Background Music (External Speaker) Out and/or External Tone Ringer/Night Chime Out.

3.14 Connecting a KSU to a Personal Computer

To use the Automatic Call Distribution (ACD) (Xen Master Only), Least Cost Routing (LCR), and PC Programming, specialized software must installed in the user PC and the PC must be connected via a serial port to the KSU.

A6-324000-642-01 – Release 6.0
April 2003

3.14.1 Connecting the PC to the KSU

Using an RS232C straight cable, connect the PC to one of the COM ports on the KSU. Refer to *Figure 7-77 Connecting a PC to the KSU*.

The functions and the communication port connections are:

Table 7-5 Functions and Communication Port Connections

Function	Port
PC Programming	COM 1
Least Cost Routing (LCR)	COM 1
Station Message Detail Recording (SMDR)	COM 2
Automatic Call Distribution (ACD)	COM 4 (Xen Master only)

Serial-port characteristics include:

Table 7-6 Serial Port Characteristics

Characteristic	Value
Baud Rate	19.2 K (maximum)
Parity	None
Stop Bit	1 stop bit
Data Bit	8 bits
Port Type	DCE

A6-324000-642-01 – Release 6.0
April 2003

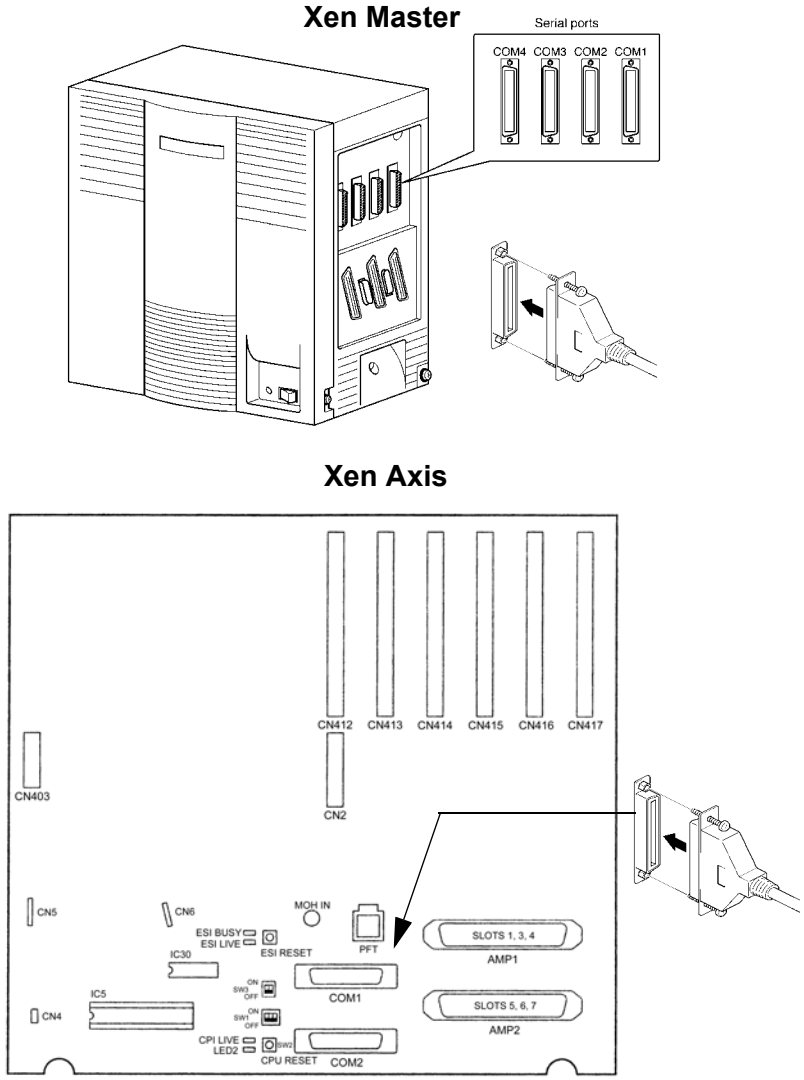


Figure 7-77 Connecting a PC to the KSU

3.14.2 Connecting the Printer to the KSU

When using the SMDR 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 KSU with an RS 232C straight cable. Use the COM 2 port to connect the printer.

A6-324000-642-01 – Release 6.0
April 2003

3.14.3 Remote Programming using the Built-in MIF-Modem (MDM-U13 Unit)

The following characteristics apply to the built-in modem.

Table 7-7 Modem Specifications

Characteristic	Value
Baud Rate	28.8 Kbps
Parity	None
Stop Bit	1
Data Bit	8

A feature of the PC Programming software is to allow Remote Programming via a Modem.

The modem could be a locally provided external unit connected to COM 1 via an SLI port or an SLT Adapter, or it could be the MDM-U13 Unit installed onto the MIFM U13 ETU.

By calling in to the modem station number (a phantom number in the case of the MIF-Modem port) a remotely located modem can establish communications with the system for the purpose of transferring system or LCR data

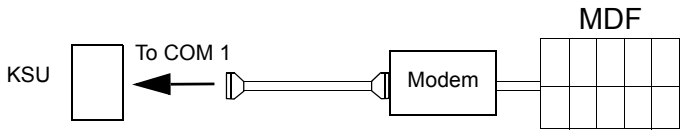


Figure 7-78 Connecting an External Modem

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

Installing ETW-Type Multiline Telephones

CHAPTER 8

SECTION 1 GENERAL INFORMATION

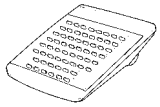
ETW-type Multiline Terminals can be installed on a Xen system providing inexpensive migration to the Xen system. This chapter provides instructions for connecting these terminals to the Xen system.

☞ ETW-type Multiline Terminals are not available in New Zealand.

SECTION 2 ETW-TYPE MULTILINE TERMINALS

The following ETW-type Multiline Terminals can be connected to the Xen system.

Table 8-1

	ETW-8E-1A (SW) TEL
	ETW-16C-1A (SW) TEL
	ETW-16D-1A (SW) TEL
	ETW-24S-1A (SW) TEL
	EDW-48-2A (SW) DSS/BLF Console

A6-324000-642-01 – Release 6.0
April 2003

SECTION 3 CONNECTING AN ETW-TYPE MULTILINE TERMINAL TO THE XEN SYSTEM

3.1 Terminal Update

Before ETW-type Multiline Terminals can be operated on a Xen system, the keypad must be changed. Replacement keypads and installation instructions are available for purchase from the NEC PPG Service Department.

3.2 Modular Terminal Connections

3.2.1 Connecting Multiline Terminals, Attendant Add-On Consoles, and SLT Adapters

When connecting ETW-type Multiline Terminals or Attendant Add-On Consoles, or SLT Adapters to the MDF or IDF, individually twisted 1-pair cabling must be used. Refer to *Figure 8-1 Modular Terminal Connections for Multiline Terminals & Attendant Add-On Consoles* for an illustration of connections.

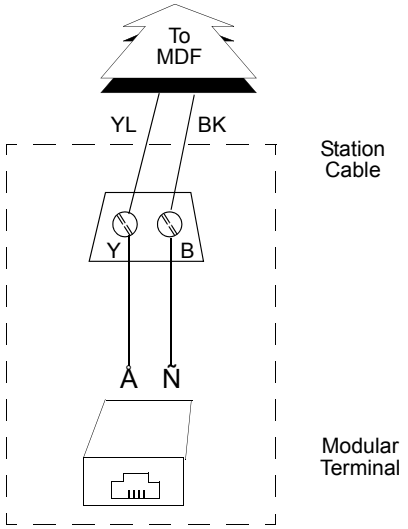


Figure 8-1 Modular Terminal Connections for Multiline Terminals & Attendant Add-On Consoles

A6-324000-642-01 – Release 6.0
April 2003

3.3 Attach a Multiline Terminal to the System

1. Plug a telephone cord into the modular jack on the bottom side of the Multiline Terminal.
2. Lead the cord out through the cord groove as shown in *Figure 8-2 Connect an ETW-type Multiline Terminal to the Xen system*.

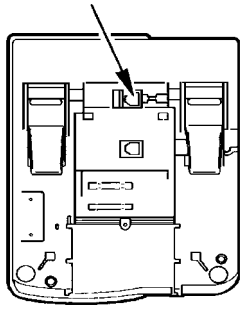


Figure 8-2 Connect an ETW-type Multiline Terminal to the Xen system

A6-324000-642-01 – Release 6.0
April 2003

THIS PAGE INTENTIONALLY LEFT BLANK

A6-324000-642-01 – Release 6.0
April 2003

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.
ACR	**Automatic Carrier Routing** Chooses the preferred trunk for an outgoing call based on the external telephone number dialled.
BNC	**Bayonet-Neill-Concelman** Connector for slim coaxial cables. This is similar to ones used with Ethernet.
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 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. There are two BRI standards:U Interface – 2-wire T Interface – 4-wire
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 block of data. 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 (phone number) assigned to each telephone or data terminal.
DNIS	**Dialled Number Identification Service** Allows the display of a name, extension number and caller ID for incoming DID calls on subscribed ISDN lines.
ISDN	**Integrated Services Digital Network** An international plan to migrate the public switched network to the universal implementation of standard digital technology.
LCR	**Least Cost Routing** A feature that automatically chooses the lowest cost phone line to the destination.

Abbreviations	Definition
OPX	**Off-Premise Extension** A telephone that is located in a different office or building from the mail phone system. The OPX is connected by a dedicated telephone line. This extension has all abilities of the mail phone system.
PRI	**Primary Rate Interface** ISDN subscriber interface. PRI has 30 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. There are two PRI standards: U Interface – 2 wire S/T Interface – 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 Internet Protocol; 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** IDSN service is ordered with certain parameters. The SPID is an eight to 12 digit number that uniquely identifies the service ordered. The phone company assigns an SPID for every phone number. Each ISDN BRI line usually has two phone 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 phone, 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 and voice quality. The Public Switched Telephone Network (PSTN) connects to the LAN IP network through a VoIP gateway. Digitised 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 phone-to-phone, computer-to-phone or computer-to-computer.

A6-324000-642-01 – Release 6.0
April 2003