



**AT&T**

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Issue 2  
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**DEFINITY<sup>®</sup>** Communications  
System Generic 2  
**and System 85**  
Upgrades

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The ordering number for this document is 555-104-111. To order this document, call the AT&T Customer Information Center at 1-800-432-6600 (in Canada, 1-800-255-1242). For more information about AT&T documents, refer to the *Business Communications Systems Publications Catalog* (555-000-010).

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**DEFINITY® Communications System Generic 2 and System 85 Upgrades  
555-104-111, Issue 2**

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# CONTENTS

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<b>ABOUT THIS DOCUMENT</b>	<b>xi</b>
PURPOSE	xi
INTENDED AUDIENCES	xi
REASON FOR REISSUE	xi
PREREQUISITE SKILLS AND KNOWLEDGE	xii
HOW THIS DOCUMENT IS ORGANIZED	xii
HOW TO USE THIS DOCUMENT	xii
RELATED RESOURCES	xii
HOW TO MAKE COMMENTS ABOUT THIS DOCUMENT	xvi
<b>1. OVERVIEW OF DEFINITY™ GENERIC 2 AND SYSTEM 85 UPGRADES</b>	<b>1-1</b>
HARDWARE AND SOFTWARE FEATURES	1-1
QUALITY PROTECTION PLAN CHANGE NOTICES	1-4
PRICE ELEMENT CODES	1-4
SUPPORT ORGANIZATIONS	1-4
EQUIPMENT REMOVAL	1-5
<b>2. TRANSLATION RECOVERY PROCEDURES</b>	<b>2-1</b>
THE TRT	2-1
THE CUSTOMER UPGRADE TAPE	2-1
BUILDING THE TRT	2-2
PRODUCING THE CUSTOMER UPGRADE TAPE	2-3
<b>3. DEFINITY GENERIC 2 AND SYSTEM 85 HARDWARE UPGRADES</b>	<b>3-1</b>
UPGRADING TO SYSTEM 85 R2V3	3-2
UPGRADING TO SYSTEM 85 R2V4	3-5
UPGRADING TO DEFINITY COMMUNICATIONS SYSTEM GENERIC 2	3-10
	iii

---

CONFIGURING RMATS AND PPG PORTS FOR SYSTEM MANAGEMENT	3-23
RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access	3-24
RMATS 1: Switched Analog Dial Access	3-26
PPG 0: Switched Analog Dial Access	3-28
PPG 1: Non-Switched Direct Access	3-30
<b>4. DEFINITY GENERIC 2 AND SYSTEM 85 SOFTWARE UPGRADES</b>	<b>4-1</b>
CHECKING FOR SOFTWARE FIELD UPDATES	4-1
SWITCH/212 DATA SET CONSIDERATIONS	4-2
SWITCH SUPPORT BASE INSTALLATION	4-2
MANAGER II	4-3
UPGRADE PROCEDURE FOR SINGLE CC SYSTEMS	4-3
UPGRADE PROCEDURE FOR DUPLICATE CC SYSTEMS	4-4
<b>5. SYSTEM 75/GENERIC 1 H/W UPGRADES TO DEFINITY GENERIC 2</b>	<b>5-1</b>
THE UPGRADE PROCESS: AN OVERVIEW	5-1
SYSTEM 75 R1V1,V2,V3 HARDWARE UPGRADES TO DEFINITY Generic 2	5-3
DUPLICATED TO DUPLICATED	5-17
DEFINITY G1 TO DEFINITY G2 HARDWARE UPGRADE PROCEDURE	5-17
UNDUPLICATED TO UNDUPLICATED	5-17
UNDUPLICATED TO DUPLICATED	5-22
DUPLICATED TO DUPLICATED	5-26
SYSTEM 75 TO DEFINITY COMMUNICATIONS SYSTEM REMOTE MODULES	5-30
GENERIC 1 SINGLE CARRIER CABINET H/W UPGRADES TO GENERIC 2	5-30
<b>6. SYSTEM 85 UPGRADES FROM R1 TO R2</b>	<b>6-1</b>
OVERVIEW	6-1
GETTING STARTED	6-1
UPGRADE UNDUPLICATED 301CC TO 501CC	6-3
PUT SYSTEM IN SERVICE	6-27
UPGRADE DUPLICATED 301CC TO 501CC	6-27

---

UPGRADE DUPLICATED 301CC TO 501CC	6-28
REMOVE DOCUMENT FILE ASSEMBLY (IF MOUNTED ON CC CABINET)	6-37
UPGRADE UNDUPLICATED 301CC TO DUPLICATED 501CC	6-52
UNPACKING AND INSTALLING CABINET	6-86
INITIAL SYSTEM TEST	6-91
A. SYSTEM CONFIGURATION LIMITS BY VERSION	A-1
B. FEATURE AVAILABILITY	B-1
C. RELATED FORMS AND FLOWCHARTS	C-1
SYSTEM 85 R2 UPGRADE OVERVIEW FLOWCHART	C-2
SYSTEM 85 R2 HARDWARE UPGRADE PROCEDURE FLOWCHART	C-3
SYSTEM 85 R2 SOFTWARE UPGRADE PROCEDURE FLOWCHART	C-4
TRANSLATION RECOVERY PROCESS FLOWCHART	C-5
SYSTEM 85 R2 HARDWARE UPGRADE PEC WORKSHEET	C-7
REQUEST FOR SYSTEM 85 TAPE RETRIEVAL FORM	C-9
GLOSSARY	GL-1
INDEX	IN-1



## LIST OF FIGURES

Figure 3-1. Disk Tape System Cabinet Mounting	3-16
Figure 3-2. CC Backplane Connections for DTS Installation	3-17
Figure 3-3. CC/ADU Connector Locations	3-18
Figure 3-4. RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access	3-25
Figure 3-5. RMATS 1: Switched Analog Dial Access	3-27
Figure 3-6. PPG 0: Switched Analog Dial Access	3-29
Figure 3-7. PPG 1: Non-Switched Direct Access	3-31
Figure 3-8. ADU Rear Connector and 103 Connections at Cross Connect Field: Duplicated System	3-32
Figure 5-1. Universal Module Cabinet Configuration	5-4
Figure 5-2. Power Distribution Unit (Cover Removed) - With RMSS	5-6
Figure 5-3. Power Distribution Unit (Cover Removed) - With HCMR	5-6
Figure 5-4. TDM/LAN Buss Terminators and Current Limiter Placement	5-9
Figure 5-5. Power Distribution Unit (Cover Removed) - With RMSS	5-11
Figure 5-6. Power Distribution Unit (Cover Removed) - With HCMR	5-12
Figure 5-7. TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations	5-15
Figure 5-8. Universal Module Cabinet Configuration	5-18
Figure 5-9. TDM/LAN Buss Terminators and Current Limiter Placement	5-21
Figure 5-10. TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations	5-24
Figure 5-11. TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations	5-28
Figure 5-12. AC Power Scheme	5-32
Figure 5-13. System 75 XE Four-Cabinet System (Rear View)	5-34
Figure 5-14. Single Carrier Cabinet Stack (Rear View)	5-35
Figure 5-15. Port Address Shorting Strap Connections	5-36
Figure 6-1. Module Control Cabinet	6-4
Figure 6-2. Rear View of Typical Cabinet	6-5
Figure 6-3. Rear View of Cabinet Showing Digital Ground (GRDD) Straps	6-6
Figure 6-4. Top/Bottom View of Carrier Showing Application of Tape	6-7
Figure 6-5. J58888M Module Control Carrier	6-8
Figure 6-6. Rear view of Module Control Carrier	6-8
Figure 6-7. Attachment/Removal of Wire Cover Plate	6-10

---

Figure 6-8. Bonding Strap Location	6-11
Figure 6-9. Earthquake Mounting	6-12
Figure 6-10. Location of Wheel Locking Bolts	6-12
Figure 6-11. Document File Assembly	6-13
Figure 6-12. Circuit Ground Connections	6-14
Figure 6-13. Lightning Ground Connections for Single Common Control	6-15
Figure 6-14. ED-1E479 Connector Panel Adapter	6-16
Figure 6-15. Rear View of Common Control Carrier	6-18
Figure 6-16. Rear View of Port Carrier	6-20
Figure 6-17. Connections for Alarm Distribution Units	6-22
Figure 6-18. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet	6-23
Figure 6-19. External Alarm Connections	6-24
Figure 6-20. Duplicated Module Control Cabinet	6-29
Figure 6-21. Rear View of Typical Cabinet	6-30
Figure 6-22. Rear View of Cabinet Showing Digital Ground (GRDD) Straps	6-31
Figure 6-23. Top/Bottom View of Carrier Showing Application of Tape	6-32
Figure 6-24. J58888M Module Control Carrier	6-33
Figure 6-25. Rear View of Module Control Carrier	6-34
Figure 6-26. Duplicated Common Control Cabinet	6-35
Figure 6-27. Bonding Strap Location	6-36
Figure 6-28. Earthquake Mounting	6-37
Figure 6-29. Location of Wheel Locking Bolts	6-37
Figure 6-30. Document File Assembly	6-38
Figure 6-31. Cable Wireway Located Behind Common Control Cabinet	6-39
Figure 6-32. Bottom view of ED-1E465-70, G15 Wireway	6-40
Figure 6-33. AC Connections for Duplicated Common Control	6-41
Figure 6-34. Circuit Ground Connections	6-42
Figure 6-35. Ground Connections for Duplicated Common Control	6-43
Figure 6-36. Rear View of Common Control Carrier	6-44
Figure 6-37. Connections for Alarm Distribution Units	6-47
Figure 6-38. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet	6-48
Figure 6-39. External Alarm Connections	6-49
Figure 6-40. Module Control Cabinet	6-54
Figure 6-41. Rear View of Typical Cabinet	6-55

---

Figure 6-42. Rear View of Cabinet Showing Digital Ground (GRDD) Straps	6-56
Figure 6-43. Top/Bottom View of Carrier Showing Application of Tape	6-57
Figure 6-44. J58888M Module Control Carrier	6-58
Figure 6-45. Rear view of Module Control Carrier	6-59
Figure 6-46. Unduplicated Common Control Cabinet	6-61
Figure 6-47. Document File Assembly	6-63
Figure 6-48. Duplicated Common Control Cabinet	6-64
Figure 6-49. I/O Trough Installation	6-65
Figure 6-50. Installation of Shielded Intercabinet Ductwork	6-66
Figure 6-51. Installation of AC Power Ductwork and AC Receptacle	6-67
Figure 6-52. Installation of AC Power Ductwork and AC Receptacle (Contd)	6-68
Figure 6-53. AC Connections for Added Cabinet	6-69
Figure 6-54. Bonding Strap Location	6-70
Figure 6-55. Ground Connections for Duplicated Common Control Cabinet	6-71
Figure 6-56. Ground Connection for Extended Battery Reserve	6-72
Figure 6-57. Battery Plant Connections to Common Control Cabinet	6-72
Figure 6-58. Alarm Connections Between Battery Plant and Cabinet	6-73
Figure 6-59. Rear View of Common Control Carrier	6-74
Figure 6-60. SMDR Connections for Duplicated Common Control	6-75
Figure 6-61. RMATS Connections for Duplicated Common Control	6-76
Figure 6-62. DCIU Connections for Duplicated Common Control	6-77
Figure 6-63. Connectors, Slots, and Cables for TN403 and TN492 Circuit Packs used with Duplicated Common Control	6-78
Figure 6-64. Connections for Alarm Distribution Units	6-80
Figure 6-65. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet	6-81
Figure 6-66. External Alarm Connections	6-82
Figure 6-67. Rear View of Typical Cabinet	6-87
Figure 6-68. Location of Cabinet Mounting Feet	6-88
Figure 6-69. Location of Wheel Locking Bolts	6-88
Figure 6-70. Mounting Bolt Tightening Sequence	6-89
Figure 6-71. Earthquake Mounting	6-90



## LIST OF TABLES

TABLE 4-1. 212 AR Data Set Switch Settings	4-2
TABLE 5-1. P/O Backplane Universal Module Control 0,1 (Rear View)	5-16
TABLE 5-2. P/O Backplane Universal Module Control 0,1 (Rear View)	5-25
TABLE 5-3. P/O Backplane Universal Module Control 0,1 (Rear View)	5-29
TABLE 5-4. Single Carrier Module Control Circuit Pack Placement	5-37
TABLE 6-1. Tool and Test Equipment Inventory	6-2
TABLE 6-2. Alarm Cable Connections for Single Common Control	6-15
TABLE 6-3. Port Carrier Connections	6-17
TABLE 6-4. Emergency Transfer -48V & GRD Wiring	6-19
TABLE 6-5. Sense Lead Connections	6-19
TABLE 6-6. Connections for Auxiliary Cabinet Slot 40A	6-24
TABLE 6-7. Unit Lead Connections	6-25
TABLE 6-8. Rectifier and Converter Voltage Limits	6-27
TABLE 6-9. Emergency Transfer -48V & GRD Wiring	6-44
TABLE 6-10. Sense Lead Connections	6-45
TABLE 6-11. Connections for Auxiliary Cabinet Slot 40A	6-49
TABLE 6-12. Unit Lead Connections	6-50
TABLE 6-13. Rectifier and Converter Voltage Limits	6-52
TABLE 6-14. Sense Lead Connections	6-75
TABLE 6-15. Emergency Transfer -48V & GRD Wiring	6-77
TABLE 6-16. Connections for Auxiliary Cabinet Slot 40A	6-82
TABLE 6-17. Unit Lead Connections	6-83
TABLE 6-18. Rectifier and Converter Voltage Limits	6-86
TABLE 6-19. Microdiagnostic Test Procedures	6-92
TABLE B-1. System 85 Feature Availability	B-2



## ABOUT THIS DOCUMENT

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### PURPOSE

This document describes hardware and software upgrades to AT&T System 85 and DEFINITY™ Communications System Generic 2. Sequentially ordered steps provide the details necessary to implement System 85 version upgrades and to perform upgrades to DEFINITY™ Generic 2 from either AT&T System 85 or AT&T System 75. Finally, *DEFINITY™ Communications System Generic 2 and System 85 Upgrades* includes the System 85 R1 to R2 upgrade procedures previously provided in a separate document, *System 85 In-Service Upgrades from R1 (301CC) to R2 (501CC) (555-101-111)*.

*DEFINITY™ Communications System Generic 2 and System 85 Upgrades* is a revision of the *AT&T System 85 Release 2 Upgrades Guide (555-104-111)* which contained only version upgrade information for AT&T System 85 versions R2V1 through R2V4.

As detailed version and system-specific upgrade information becomes available, it will be incorporated into future editions of this document.

DEFINITY™ is a trademark of AT&T. In this document DEFINITY™ Communications System Generic 2 is often abbreviated to DEFINITY Generic 2 or Generic 2.

### INTENDED AUDIENCES

This document is intended for use by tier I and tier II craftspeople tasked with configuring and implementing hardware and software upgrades, switch installation, and system testing for AT&T System 85 and DEFINITY™ Communications System Generic 2.

### REASON FOR REISSUE

This document has been reissued to incorporate addenda 1 and 2 into Issue 2. The addenda pages that have been incorporated into this issue contain new information or information that has changed from Issue 1. These changes include new information about adjunct power and terminal loop lengths, protection devices, synchronization clock, single carrier cabinet module, TN754B and TN746B to port pack listings, floor templates, Disk/Tape Subsystem (DTS) installation, and software upgrade procedures.



## PREREQUISITE SKILLS AND KNOWLEDGE

To use this document, the reader should have a working knowledge of System 85 and should have completed the AT&T System 85 installation course. Depending on the upgrade, AT&T System 75 and DEFINITY Communications System Generic 2 knowledge may be required.

## HOW THIS DOCUMENT IS ORGANIZED

This document is organized into six chapters and three appendixes. They are described below.

- Chapter 1 provides an overview of the upgrade procedures.
- Chapter 2 describes translation recovery procedures for AT&T System 85.
- Chapter 3 describes hardware upgrade procedures for AT&T System 85.
- Chapter 4 describes software upgrade procedures for AT&T System 85.
- Chapter 5 describes AT&T System 75 upgrades to the DEFINITY Communications System Generic 2.
- Chapter 6 describes AT&T System 85 R1 to R2 upgrade procedures. Currently, this chapter contains a direct copy of the document, *AT&T System 85 In-Service System Upgrades from R1 (301cc) to R2 (501cc) (555-101-111)*.
- Appendix A describes system configuration limits for R2V1 through V4 and for DEFINITY Communications System Generic 2.
- Appendix B describes available System 85 and DEFINITY Generic 2 features.
- Appendix C provides forms and flowcharts referenced in this document.

## HOW TO USE THIS DOCUMENT

Because *AT&T Upgrades* contains specific procedures for completing various version and system upgrades, follow the instructions in the document carefully and sequentially. If you are an experienced installer and have performed System 85 upgrades in the past, you may want to quickly review the overview in chapter 1 before beginning. If you have not performed System 85 upgrades, read chapter 1 carefully before you begin.

## RELATED RESOURCES

The manual assumes you have the *required* Customer System Document (CSD) and are familiar with its contents. The CSD identifies the specific equipment and cabling installed as part of your upgrade.

Except for MAAP and System Management Terminal (SMT) flipcharts (Electronic Flip Charts (EFCs) for DEFINITY Communications System Generic 2), supporting documentation for System 85 version upgrades and DEFINITY Communications System Generic 2 upgrades is *not* provided with the upgrade

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PECs. Order support documentation separately. Order early enough to ensure receipt of documentation before beginning the hardware upgrade procedures. Refer to *Reference Documents* below for a general listing of helpful documents and to the *Required Documentation and Equipment* sections of chapters 3 and 5 for upgrade-specific documentation requirements.

## Reference Documents

The following is a list of reference documents used in *AT&T Upgrades*. Documents are listed according to upgrade target. If, for example, you are upgrading your System 85 to version 4 from any preceding R2 version, simply look at the documents listed under *AT&T System 85 R2V4* below. For convenience, document titles are repeated when they apply to more than one version or system.

Documents *required* for the specific version and system upgrades addressed in this document are listed in each of the *Required Documentation and Equipment* sections of chapters 3 and 5. Although every effort has been made to ensure the information presented in these sections meets the requirements for version and system upgrades, each upgrade and each specific system is unique. Keep this in mind when ordering support documentation.

For a complete listing of AT&T documents and for document ordering information, refer to *AT&T Business Communications Systems Publications Catalog* (555-000-010).

### *AT&T System 85 R1*

- *AT&T System 85 In-Service System Upgrades from R1 (301CC) to R2 (501CC)* (555-101-111)

### *AT&T System 85 R2V1*

- *AT&T Remote Module and Remote Group Interface Installation and Test* (555-103-112, Issue 1)
- *AT&T System 85 Equipment Room Floor Plans and Specifications Planning Manual* (555-102-603, Issue 1)
- *AT&T System 85 Features Reference Manual* (555-103-301, Issue 1)
- *AT&T System 85 Feature Translations Service Manual (R2V1 and R2V2)* (555-101-107, Issue 3)
- *AT&T System 85 Installation Service Manual* (555-103-104, Issue 1)
- *AT&T System 85 Maintenance Service Manual (R2V1 and R2V2)* (555-101-108, Issue 2)
- *AT&T System 85 System Description* (555-103-201, Issue 1)
- *AT&T System 85 System Tests* (555-103-109, Issue 1)

### *AT&T System 85 R2V2*

- *AT&T Remote Module and Remote Group Interface Installation and Test* (555-103-112, Issue 1)
- *AT&T System 85 Equipment Room Floor Plans and Specifications Planning Manual* (555-102-603, Issue 1)
- *AT&T System 85 Features Reference Manual* (555-103-301, Issue 1)

- *AT&T System 85 Feature Translations Service Manual (R2V1 and R2V2) (555-101-107, Issue 3)*
- *AT&T System 85 Installation Service Manual (555-103-104, Issue 1)*
- *AT&T System 85 Maintenance Service Manual (R2V1 and R2V2) (555-101-108, Issue 2)*
- *AT&T System 85 System Description (555-103-201, Issue 1)*
- *AT&T System 85 System Tests (555-103-109, Issue 1)*
- *AT&T System 85 X-Ray Tests Service Manual (R2V2) (555-101-114, Issue 2) AT&T System 85 X-Ray Tape R2V2 (J58889TS-1, L1 ) Optional*

#### ***AT&T System 85 R2V3***

- *AT&T Remote Module and Remote Group Interface Installation and Test (555-103-112, Issue 1)*
- *AT&T System 85 Equipment Room Floor Plans and Specifications Planning Manual (555-102-603, Issue 1)*
- *AT&T System 85 Features Reference Manual (555-103-301, Issue 1)*
- *AT&T System 85 Feature Translations Service Manual (R2V3) (555-102-107, Issue 1)*
- *AT&T System 85 Installation Service Manual (555-103-104, Issue 1)*
- *AT&T System 85 R2V3 Maintenance (555-102-108, Issue 2)*
- *AT&T System 85 System Description (555-103-201, Issue 1)*
- *AT&T System 85 System Tests (555-103-109, Issue 1)*
- *AT&T System 85 X-Ray Tests Service Manual (R2V3) (555-102-105, Issue 1)*

#### ***AT&T System 85 R2V4***

- *AT&T Remote Module and Remote Group Interface Installation and Test (555-103-112, Issue 1)*
- *AT&T System 85 Equipment Room Floor Plans and Specifications Planning Manual (555-102-603, Issue 1)*
- *AT&T System 85 Features Reference Manual (555-103-301, Issue 1)*
- *AT&T System 85 Feature Translations (R2V4) (555-103-107, Issue 1)*
- *AT&T System 85 Installation Service Manual (555-103-104, Issue 1)*
- *AT&T System 85 Advanced Networking Switch (R2V4) Maintenance (555-103-108, Issue 1)*
- *AT&T System 85 System Description (555-103-201, Issue 1)*
- *AT&T System 85 System Tests (555-103-109, Issue 1)*
- *AT&T System 85 X-Ray Tests (R2V4) (555-103-105, Issue 1)*

#### ***DEFINITY™ Communications System Generic 2***

- *DEFINITY™ Communications System Generic 2 and System 85 Provisioning Process (555-104-610 Issue 1)*

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- *DEFINITY™ Communications System Generic 2 and System 85 System Description* (555-104-201 Issue 1)
  - *DEFINITY™ Communications System Generic 2 Maintenance Procedures* (555-104-117 Issue 1)
  - *DEFINITY™ Communications System Generic 2 and System 85 Feature Description* (555-104-301 Issue 1)
  - *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118 Issue 1)
  - *DEFINITY™ Communications System Generic 2 ISDN-BRI Reference* (555-025-102 Issue 1)
  - *DEFINITY™ Communications System and System 75 and System 85 DS1/DMII/ISDN PRI Reference* (555-025-101 Issue 1)
  - *DEFINITY™ Communications System Generic 2 and System 85 X-Ray and System Tests* (555-104-109 Issue 1)
  - *DEFINITY™ Communications System Generic 2 and System 85 Electrical Protection, Grounding, and Exposure Checklist* (555-104-120 Issue 1)
  - *DEFINITY™ Manager™ II Operation* (555-104-505 Issue 1)

#### *AT&T System 75 (RIV1 - RIV3) and System 75 XE*

- *AT&T System 75 Installation and Test* (555-200-104)
- *AT&T System 75 XE Installation and Test* (555-201-104)
- *AT&T System 75 Wiring Guide* (555-200-111)
- *AT&T System 75 Upgrades and Additions* (555-200-106)
- *AT&T System 75 XE Upgrades and Additions* (555-201-106)

### **Schematic Drawings**

More detailed connectivity information can be found in the following schematic drawings (SDs).

- SD-1E558-01, *CS500 Time Multiplexed Switch Circuit*
- SD-1E565-01, *CS500 501 Common Control Circuit*
- SD-1E580-01, *CS500 System Interconnection and Information Circuit For Use With Single and Multimodule Circuits* (traditional module)
- SD-1E626-01, *System Interconnection and Information Circuit For Use With Single and MultiModule Circuits* (universal module)
- SD-1E627-01, *Universal Module Cabinet Schematic*
- SD-1E620-01, *Module Control Circuit* (to be issued)

- SD-1E621-01, *DEFINITY™ Communications System Port Circuit* (to be issued)
- SD-1E622-01, *Disk/Tape System Circuit*
- SD-66969-01, *System 75 Circuit*

Refer to *DEFINITY™ Communications System Generic 2 and System 85 Installation* (555-104-104, Issue 1) for more information on the cabinet and hardware component installation.

## Flipcharts

The following is a list of flipcharts used for administration of R2V2, R2V3, and R2V4 systems. For the DEFINITY Communications System, electronic flip charts (EFCs) provide on-line administration information.

- MAAP Flipcharts:
  - R2V2 Comcode 844176776
  - R2V3 Comcode 845303114
  - R2V4 Comcode 845552223
- SMT Flipcharts:
  - R2V2 Comcode 844176784
  - R2V3 Comcode 845305424
  - R2V4 Comcode 845552231
- Binder Retainer for MAAP flipcharts:
  - Comcode 843160300 (Order as a non-stock item.)

## HOW TO MAKE COMMENTS ABOUT THIS DOCUMENT

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## 1. OVERVIEW OF DEFINITY™ GENERIC 2 AND SYSTEM 85 UPGRADES

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The upgrade procedures described in this document provide the system technician with sufficient information to complete the upgrade process without on-site support from higher-tiered personnel. Upgrade procedures are addressed according to *target* version or system with instructions given sequentially for each specific upgrade scenario.

The AT&T *System 85 R2 Upgrade Overview Flowchart* in appendix C shows the upgrade process. These procedures do not apply to systems with special development software.

Upgrades to various AT&T System 85 versions and to the DEFINITY Communications System bring the system *directly* to the targeted version or system. For example, you may upgrade from any preceding version of AT&T System 85 directly to R2V4 or from any preceding version of AT&T System 85 or System 75 directly to the DEFINITY Communications System. However, all upgrades must be planned and implemented carefully. National Engineering Center/Regional Engineering Center (NEC/REC) support is not normally required for AT&T System 85 R2 version-to-version upgrades, but for certain upgrades such as those requiring an additional cabinet (eg. AT&T System 75 to DEFINITY Communications System Generic 2 or AT&T System 85 R1 to R2), the marketing organization should request NEC/REC support via form 1154.

The current interval for AT&T System 85 R2 upgrades is six weeks. However, the upgrade process can be completed in about four weeks if the hardware and software are upgraded concurrently. This interval is subject to change; National Product Scheduling (NPS) should be consulted for the most current information.

Software intervals include two weeks for Software Technical Support (STS) procedures and one week for factory procedures plus transportation time. Large system upgrades may require more time.

Although the hardware and software can be upgraded concurrently, the hardware must perform alarm free before installing the target-version software.

Finally, if a customer requires an interval shorter than four weeks, that interval must be negotiated with NPS, Field Service Operations (FSO), and Software Technical Support (STS) organizations and may result in additional charges to the customer.

### HARDWARE AND SOFTWARE FEATURES

The hardware and software features for each AT&T System 85 version generally build on the preceding version. For example, Uniform Call Distribution (UCD) in V1 became Enhanced Uniform Call Distribution (EUCD) in V2. EUCD in V2 became Automatic Call Distribution (ACD) in V3, then became ACD with vectoring in V4.

The following is a summary of the new hardware and software features provided in each AT&T System 85 R2 version. For additional information on each AT&T System 85 R2 version and DEFINITY



Communications System Generic 2, refer to *DEFINITY™ Communications System Generic 2 and System 85 System Description* (555-104-201). Refer also to *DEFINITY™ Communications System Generic 2 and System 85 Feature Description* (555-104-301 Issue 1)

#### **R2V1 —**

The hardware and software changes between R1 and R2V1 include the following:

- The 501 Common Control (CC) processor replaced the 301CC processor.
- The Time-Multiplexed Switch (TMS), which allows multimodule configurations of AT&T System 85, was introduced.
- Circuitry was added to support up to nine remote modules.
- Support was added for Distributed Communications Service (DCS)

#### **R2V2 —**

The hardware and software changes between R2V1 and R2V2 include:

- Support was added for the Audio Information Exchange (AUDIX) adjunct.
- An interface to the Information Systems Network (ISN) was included.
- Capacity was increased for up to 31 total modules, 30 of which can be remote.
- Automatic Trunk Measurement System (ATMS) was added to improve customer testing capabilities.
- Digital Service 1 (DS-1) digital trunking capabilities were improved for digital central office (CO) and tie trunk touch-tone signal only.

#### **R2V3 —**

The hardware and software changes between R2V2 and R2V3 include:

- Support for remote groups was added.
- Call distribution features were consolidated and enhanced to provide the ACD feature.
- Support was added for the 3B5 Applications Processor (AP), which further provided:
  - Call Management System (CMS) for managing ACD groups
  - Centralized System Management (CSM) for system administration.
- Digital Multiplexed Interface (DMI) with bit-oriented signaling was added.
- 5-Digit Dialing for Unrestricted, and Hotline service was included.

#### **R2SE —**

R2SE is described follows:

- It is a single-module system with duplicate common control.
- AT&T System 85 R2V3 hardware and software is used.
- Electronic tandem networking (ETN) and Distributed Communications Systems (DCS) software were eliminated from the main software program to reduce cost.

The upgrade procedures for R2SE to R2V3 do not require hardware changes; therefore, follow the software upgrade procedures described in chapter 4 and skip the hardware procedures described in chapter 3. Contact your Field Services Organization (FSO) representative for details on field upgrades of R2SE.

#### R2V4 —

The hardware and software changes between R2V3 and R2V4 include the following:

- Support was added for Integrated Service Digital Network—Primary Rate Interface (ISDN—PRI) introducing the concept of bearer capability to the AT&T System 85.
- 501CC processor performance was improved.
- A 4-megaword memory circuit pack (TN394) was added, increasing memory to 12 megawords.
- A 2-port processor communications circuit (TN474B) was added.
- Firmware changes to several AT&T System 85 circuit packs were required to support ISDN.
- Call Vectoring, Malicious Call Trace, Tenant Services, and Variable Format Call Detail Recording (CDR) were added.

#### DEFINITY Communications System Generic 2 —

The hardware and software changes introduced with the DEFINITY™ Communications System Generic 2 include the following:

- Each DEFINITY Communications System Generic 2 uses four TN394 circuit packs increasing memory to 16 megawords.
- The Disk/Tape Subsystem (DTS) functionally replaces the High-Capacity Mini-Recorder (HCMR). Improvements introduced with DTS include decreased data retrieval times, and increased mass storage capabilities. With a 140 Mbyte disk drive and a 125 Mbyte streaming tape drive the DTS offers substantial performance enhancements.
- An associated Small Computer System Interface (SCSI) circuit pack (TN563) replaces the TN430 circuit pack in the CC carrier and provides an ANSI-based bus specification for the DTS connection.
- A new sequencer circuit pack, TN370C, replaced the "B" version in use for R2V4.
- TN379 Cache Memory circuit pack option may be selected instead of the TN369 circuit pack in use prior to the DEFINITY™ Communications System. The TN379 increases processor occupancy load handling capabilities. The TN369 remains upward compatible with DEFINITY™ Generic 2 systems.
- DEFINITY Manager II replaces the Maintenance and Administration Panel (MAAP) for switch administration and maintenance. DEFINITY Manager II is a PC-based administration and maintenance tool offering version-independent MAAP panel emulation, version-dependent Electronic Flip Charts (EFCs), system information data base access, and screen-driven system administration.
- A dual serial interface, the Programmable Processor Gateway (PPG) provides connectivity options for the DEFINITY™ Manager II system administration tool.

- DEFINITY Communications System fully supports ISDN-BRI (Basic Rate Interface). With the Basic Rate Interface enhancement to ISDN, two 64Kbps bearer channels and one 16Kbps data channel support two independent communication channels and one control/signaling channel respectively. This arrangement allows simultaneous voice and data terminal communication from a combined voice/data station or from a single voice/single data station.
- Although actually a part of the *installation* process, it should be noted that DEFINITY™ Communications System Generic 2 supports the use of the Universal Module Cabinet (UMC) as well as the traditional cabinet which is commonly used for field retrofit of System 85.
- DEFINITY Communications System Generic 2 supports much of the existing common port hardware for upgrades from AT&T System 75.

Refer to appendix B for more information on features supported by each version.

### QUALITY PROTECTION PLAN CHANGE NOTICES

Complete all CNs relating to the target version of your AT&T System 85 or DEFINITY™ Communications System before performing the actual upgrade. CNs are summarized and described in the "Reference Guide for Change Notices and Circuit Pack Vintages, which is issued no less than twice yearly as part of the *Technical Monthly*. Contact your CSSO change notice coordinator for information regarding CNs. The CSSO coordinator for your region is listed in each issue of the "Technical Monthly".

### PRICE ELEMENT CODES

The hardware and software required to upgrade an AT&T System 85 R2 switch from one version to a succeeding version are assigned specific PECs. By specifying the PECs for a particular upgrade through the delivery operating support system (DOSS), all components (except those specified in hardware ISCNs) required to complete that upgrade will be provided.

Refer to the *Related Resources* section of *About This Document* for a general listing of helpful documents and to the *Required Documentation and Equipment* sections of chapters 3 and 5 for upgrade-specific documentation requirements.

### SUPPORT ORGANIZATIONS

*National Engineering Center/National Engineering Center-East* — Equipment installation support for more complicated upgrades (such as between releases or cabinet additions) is provided by the NEC via the installation-specification, floor plan, and configuration documents.

*Technical Assistance Center (TAC)* — Technical and procedural support for R2 version-to-version upgrades is provided by the governing regional TAC.

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## EQUIPMENT REMOVAL

All equipment that is replaced in a system upgrade is considered "traded-in" and is the property of AT&T. This equipment includes memory circuit packs, CC circuit packs, and R1 cabinets and carriers. The cost of the upgrade assumes the return of the replaced equipment.

The replaced hardware must be returned to the Material Management Services Organization (MMS), and the replaced tape cartridges must be returned, via the least expensive method, to:

AT&T TAPE SHOP SECTION CHIEF  
Dept. 706-3  
1200 W. 120th Avenue  
Westminster, CO 80234



## 2. TRANSLATION RECOVERY PROCEDURES

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The translation recovery process consists of two basic groups of procedures; building the translation recovery tape (TRT) and producing the customer upgrade tape. This chapter addresses both groups of procedures and applies them to all Release 2 version upgrades of the AT&T System 85 and DEFINITY™ Communications System Generic 2.

Familiarize yourself with the translation recovery procedures below, then follow the step-by-step instructions for building the TRT and producing the customer tape.

### THE TRT

Before you upgrade a System 85, you must build a *translation recovery tape* (TRT). The first step in building a TRT is recording the currently installed R2 version software and customized translations by performing a RUNTAPE on a tape other than the system or backup tapes. After saving translations and generic current-version software onto the TRT, you are ready to send this tape, along with a Request For System Tape Retrieval Form, to the Software Technical Support organization (STS). The system consultant or systems implementation manager (SIM) prepares and ships the necessary TRT materials. Contact your AT&T account team representative for details. Shipping the TRT marks the beginning of the procedure for producing the customer upgrade tape. The procedure for producing the customer upgrade tape is performed away from the customer site by AT&T personnel.

### THE CUSTOMER UPGRADE TAPE

Upon receiving the TRT materials from a customer, STS physically carries the TRT materials to the Denver Works' Cartridge Tape Shop. The Tape Shop then incorporates translations from the TRT into a *source* customer upgrade tape (in DTS format) to customers upgrading to DEFINITY Communications System Generic 2. This source tape is simply a means of plugging the new hardware into the old software for testing purposes. If, for example, the new software data and the new hardware are installed *simultaneously* and an error occurs, the problem might be hardware or software originated. By isolating the hardware and software portions of an upgrade, the system can be tested and trouble spots isolated much more efficiently.

For upgrades to versions up to and including AT&T System 85 R2V4, the customer receives only the *target* customer upgrade tape from the Cartridge Tape Shop. Unlike upgrades to DEFINITY Communications System Generic 2, which involve conversion to DTS-compatible storage media, the AT&T System 85 *version* upgrade site already owns source, HCMR-formatted tapes and normally does not need to consider the DTS portion of the upgrade. Therefore, the transfer of old data from HCMR to DTS format tapes for DTS hardware burn-in and software-independent testing is not necessary.

The turnaround time for building the target customer upgrade tape is approximately three weeks from the time STS receives the TRT until the tape is returned to the customer.



The translation recovery tape is not supplied as part of the upgrade PEC. Use a blank CAPDEF tape or spare tape of the same "dot issue" as the system tape.

*Verify that the target customer upgrade tapes are on-site before beginning the software upgrade procedures.*

#### **TRT Considerations for DEFINITY Communications System Generic 2**

- If upgrading to DEFINITY Communications System Generic 2, the customer receives two DTS-compatible tapes from STS: the *source* and *target* customer upgrade tapes. The source tape is received before the target tape.
- The Cartridge Tape Shop processes and ships the source DTS-compatible customer upgrade tape in 24 hours. This permits DEFINITY Communications System hardware installation, test, and burn-in before the DEFINITY Communications System software upgrade. (Twenty-four hours is a projected turnaround time for DEFINITY™ Communications System Generic 2 and is subject to change.)
- For upgrades to DEFINITY Communications System Generic 2, the Tape Cartridge Shop retains the HCMR cartridge tape provided by STS for at least 3 months after its contents have been transferred to the DTS cartridge tape. The Tape Shop discards the tape when this retention period has expired.
- No software Customer System Document (CSD) is provided with the source DTS-compatible tape cartridge for DEFINITY™ Communications System Generic 2 customers.

#### **BUILDING THE TRT**

1. Before building the TRT, check for software patches as explained below.

##### *CHECKING FOR SOFTWARE PATCHES:*

Use PROC 490 to determine if there are 900-series patches installed on the system to be upgraded. These patches are created to correct particular software problems. They are later incorporated into subsequent software loads. If patches exist on the source tape, they must be included in the target (and current-version, for DEFINITY Communications System Generic 2) customer upgrade tape. The factory provides the most-current issue of the target tape *without software patches*. TAC must arrange to have patches reinstalled after the software upgrade is complete.

Additional system-specific information pertaining to 900 series patches is provided in the EDI and ISCN information for your upgrade. Contact your AT&T account team representative for appropriate EDI and ISCN documentation.

2. Ensure that the tape onto which the translations will be recovered (the TRT) is the same "J" number and at least the same or greater tape issue (for example, dot-issue 2) as the tapes currently used in the System 85 switch.
3. Ensure that the switch does not have any service-affecting alarms.

4. Execute a RUNTAPE on both the currently installed system tape and the backup tape before attempting to save translations on the TRT.
5. Execute a RUNTAPE on the TRT.
6. Deliver the TRT to the system consultant (SC) or systems implementation manager (SIM).

The TRT is now considered *frozen*. Any customer software translation changes that are made after this time must be documented and included in the target software after the target customer upgrade tape is installed.

## PRODUCING THE CUSTOMER UPGRADE TAPE

1. The SC or SIM must complete the Request for System 85 Tape Retrieval Form and ship the TRT, via overnight mail, to the address on the form. (See appendix C for a copy of the Request form.)

**NOTE:**

When upgrading from a system 85 R2V1 or earlier to a system equipped with 7407D terminals, also ship a list of all the 7407D terminals and their associated equipment line locations (ELLS) along with the TRT and the tape retrieval form. Special programming of the 7407D terminals is required on the target version tape for this pre-R2V2 upgrade.

2. When STS receives the TRT, they upload upgrade software and vectorize (if applicable). They then begin the upgrade audit process.
3. STS performs the upgrade audit process using the translation recovery additions and conversions system (TRACS).

The upgrade audit process includes the following:

- Running an error listing (generated from the binary source off the TRT)
  - Running an audit to check for problems such as switch rule violations, and translation inconsistencies
  - Identifying and correcting errors as required
  - Documenting and notifying the account team of any changes made to the TRT
4. For System 85 version upgrades up to and including R2V4, the Tape Shop now produces the customer's HCMR-formatted, target customer upgrade tape.
  5. For upgrades to DEFINITY Communications System Generic 2, the Tape Shop transfers the TRT's HCMR-formatted data onto a DTS-compatible tape cartridge. This DTS tape cartridge is the source customer upgrade tape. The source customer upgrade tape is shipped to the customer in advance of the DEFINITY™ Communications System Generic 2 target upgrade tape.
  6. Finally, tape shop personnel label the cartridge according to Release Management organization specifications.

7. SHOPS produces the shipping authorization paperwork needed by the Cartridge Tape Shop for delivering the source customer upgrade tape back to the customer's DEFINITY Communications System Generic 2 upgrade site.
8. After obtaining authorization paperwork for any Release 2 upgrade, the Tape Shop ships the customer upgrade tape(s) and associated customer system documents (CSDs) to the address on the delivery operating support system (DOSS) order.

The turnaround time for the target customer upgrade tape (from the time it is received by STS until it is returned to the customer) is approximately three weeks for all R2 upgrades. If an accelerated turnaround time is required by the customer, the SC or SIM must negotiate and coordinate it with STS, Field Service Operations (FSO), and the factory.

### 3. DEFINITY GENERIC 2 AND SYSTEM 85 HARDWARE UPGRADES

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The overall process for upgrading any AT&T System 85 R2 version is the same. It includes the following general steps:

1. Marketing places a Delivery Operating Support System (DOSS) order for both the hardware and software upgrade Price Element Codes (PECs).
2. Once notified of the order, services checks the "Reference Guide for Change Notices and Circuit Pack Vintages" for any outstanding Change Notices (CNs). If there are one or more unimplemented CNs, services orders the required materials and completes them.
3. Field Service Operations (FSO) receives the order, verifies that all the components defined by the upgrade PECs for both hardware and software are included in the order, and resolves any discrepancies.
4. FSO performs the version-specific hardware upgrade procedures as described in the following sections.  
  
All hardware that is replaced by upgraded hardware must be returned to the Material Management Services Organization (MMS). The cost of the upgrade assumes the return of these parts.
5. FSO performs the software upgrade procedures as described in chapter 4.

Refer to the *System 85 R2 Hardware Upgrade Procedure Flowchart* in Appendix E for a graphic representation of this procedure.

Do *not* try to shorten the process. Run all prescribed tests and microdiagnostics. Clear alarms as you go and do not hesitate to escalate problems when results are unsatisfactory.

The hardware upgrade procedures are described in detail in the following subsections. The procedures are arranged according to the target version of the upgrade, because the target version determines the hardware required.

## UPGRADING TO SYSTEM 85 R2V3

1. Ensure that all applicable change notices (CNs) listed in the "Reference Guide for Change Notices and Circuit Pack Vintages" are complete. Contact your CSSO CN coordinator with any questions about CNs before proceeding.
2. Ensure that the system is running alarm free.

Proceed with the upgrade by taking inventory of the following items:

- Required documentation and equipment
- Hardware and software PECs
- AT&T applications processor, J59222A (AP16) and centralized system management (CSM) compatibility requirements

These items, and the actual R2V3 hardware upgrade procedure, are described in the following subsections.

### Required Documentation and Equipment

The following documentation and equipment must be on site before you upgrade the System 85 hardware:

- One copy of the *AT&T System 85 Feature Translation Manual* (R2V3 555-102-107), Issue 1
- One copy of the *AT&T System 85 Maintenance Service Manual* (R2V3 555-102-108), Issue 1
- One copy of the *AT&T System 85 System Tests Service Manual* (R2V3 555-102-109), Issue 1
- One copy of *AT&T System 85 Installation* (555-103-104)
- One *MAAP J58889J-1 L2,B*
- One wrist strap

### Price Element Codes

The following PECs must have been ordered through DOSS and received on site:

#### *Hardware for R2V3*

PEC 65400A Each PEC provides one TN394 memory circuit pack. For an R2V1 to V3 upgrade, six of these PECs are required per CC. For an R2V2 to V3 upgrade, four of these PECs are required per CC.

Verify that at least two of the TN394 circuit packs are vintage 4 or later.

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### Software for R2V3

PEC 65465

Each PEC provides:

- Custom software tapes (J58889TM-1 L31, 33). Four are included for duplicate CC systems (PEC attribute DUP02), three for single CC systems (PEC attribute DUP01). DUP01 is the DOSS default if no attribute is specified. *Be sure to specify the appropriate PEC attribute for duplicated systems.* Additional tapes may be ordered and billed according to the appropriate PEC.
- Three sets of customized customer system documents (CSDs)
- One set of maintenance and administration panel (MAAP) flipcharts (845303114) issue 6 or later
- One set of system management terminal (SMT) flipcharts (845305424) issue 6 or later

### AP16 and CSM Compatibility Requirements

**NOTE:** AP-16 system management is not supported in System 85 R2V4 and DEFINITY® Generic 2 software.

If the system to be upgraded is configured with an AP16 or administered by CSM, compatibility problems may exist. For example, all AP16s served by a System 85 R2V3 must be equipped with a 160-Mbyte disk and be running 1f.4.3 software. If the AP16 needs upgrading, contact the regional AP16 coordinator to provide upgrade assistance.

If the switch to be upgraded (to R2V3) is running CSM, only Version 2 CSM is compatible and must be installed before the switch upgrade.

When you are upgrading a switch supported by CSM, you *must* reinitialize the CSM database for the target-version tape. Nonswitch data can be retrieved from the database and reentered mechanically only if the numbering plan does not change. Otherwise, you must fully reinitialize CSM, which takes one week *after* completing the switch upgrade.

**NOTE:** Because they can affect translations, SMT, MAAP, INADS, and VMAAP should not be used in conjunction with CSM for change administration. MAAP/SMT should be used only for maintenance or read-only administration in this context.

Extra disk capacity is required for 90 to 120 days during switch upgrades if the switch is running CSM with Cost Management (CM). The extra storage capacity is required for data base duplication and MDR storage for version upgrades of switches running CM. This allows for the pre-processing of MDR's after the switch upgrade. This activity must be coordinated with the NCSC. Contact your Branch Specialist or RCRC CSM specialist for more information.



## R2V3 Hardware Upgrade Procedure

Notify the customer that during the upgrade their System 85 service will be impaired. Arrange for alternate service, if requested.

The specific steps for upgrading System 85 hardware from either R2V1 or R2V2 to R2V3 follow:

1. Advise the serving CSSO of the upgrade.
2. Plug in the MAAP and save the current translations by executing a RUN TAPE on both the currently installed system tape and the backup tape.
3. If this is a duplicate CC system, turn the EMERGENCY TRANSFER switch to INHIBIT and turn the CC SELECT switch (labeled the LOCK ON-LINE switch on some panels) to the active CC. (The active CC is indicated by an LED.)
4. Halt the CC in a single CC system or the off-line CC in a duplicate CC system.

**NOTE:** Be sure to attach your wrist strap before handling the circuit packs and replace the covers on the carriers after inserting the new packs. The wrist strap *must be clamped to bare metal, not painted*, for proper grounding.

5. Install the additional TN394 memory circuit packs in the halted CC, slots 09 through 14 (if you are upgrading from R2V1) or slots 11 through 14 (if you are upgrading from R2V2).
6. Run the microdiagnostics on the halted CC. Refer to *performing CC Microdiagnostics* in this chapter or to the *AT&T System 85 Maintenance Service Manual (R2V3 555-102-108)* for this procedure.

Be sure the PASS LED stabilizes on the TN430B and the TN406 (if configured) before continuing.

7. If this is the first pass on a duplicate CC system, turn the CC SELECT switch to OFF, halt the active CC, and repeat steps 4 through 6. This forces a "hard switch" of the current off-line and on-line CCs and allows you to upgrade the second CC.
8. If this is a single CC system or the second pass on a duplicate CC system, test all the hardware (refer to the flipchart for PROC 620).
9. If this is the first pass on a duplicate CC system, turn the CC SELECT switch to the now active CC (the one you just finished upgrading).
10. Clear the alarm history (refer to the flipcharts for PROCs 600 and 612).
11. If this is a duplicate CC system, turn both the EMERGENCY TRANSFER switch and the CC SELECT switch to OFF.
12. If this is a duplicate CC system, perform a "soft switch" between the two CCs five to seven times to verify that duplication works correctly with the new hardware.
13. Perform the operational tests on equipment, including the console, switch, and critical circuits.
14. Refer to *Feature Translation Updates* in this chapter for a list of the features requiring reactivation or reprogramming after the hardware upgrade.

This completes the R2V3 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete. The next step is the software upgrade described in chapter 4. *The upgraded hardware must run alarm free before you upgrade the software.*

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**UPGRADING TO SYSTEM 85 R2V4**

1. Ensure that all applicable CNs listed in the "Reference Guide for Change Notices and Circuit Pack Vintages" are complete. Contact your CSSO CN coordinator with any questions about CNs before proceeding.
2. Ensure that the system is running alarm free.

Proceed with the upgrade by taking inventory of the following items:

- Required documentation and equipment
- Hardware and software PECs
- AT&T applications processor, J59222A (AP16) and Centralized System Management (CSM) compatibility requirements

These items, and the R2V4 hardware upgrade procedure, are described in the following sections.

**Required Documentation and Equipment**

The following documentation and equipment must be on site before you upgrade the System 85 hardware:

- One copy of the *AT&T System 85 Feature Reference Manual* (555-103-301), Issue 1
- One copy of the *AT&T System 85 Maintenance Service Manual* (555-103-108), Issue 1
- One copy of the *AT&T System 85 System Tests Service Manual* (555-103-109), Issue 1
- One copy of *AT&T System 85 Installation* (555-103-104)
- One MAAP J58889J-1, L2,B
- One wrist strap

**Price Element Codes**

The following PECs must have been ordered through DOSS and received on site:

*Required Hardware PECs for R2V4*

PEC 65400A Each PEC provides one TN394 4-Mbyte memory circuit pack. Three of these PECs are required per CC.

The 4-Mbyte TN394 fully replaces the 1-Mbyte TN392 (these circuit packs cannot run in the same system).

- PEC 65452 Each PEC provides:
- One TN370B — processor sequencer
  - One TN430B — tape interface
  - One TN491B — diagnostic processor
  - One UN152B — instruction decoder
  - One UN153B — bus interface
- One of these PECs is required per CC.
- PEC 65490 Each PEC provides one SN261C test circuit
- One of these PECs is required per system plus an additional one for each PEC 65390 (SN261B) configured in the system.

#### *Optional Hardware PECs for R2V4*

- PEC 65421 Each PEC provides one Digital Service-1 (DS-1) trunk interface upgrade (ANN11E). One of these PECs is required to upgrade an earlier version ANN11 circuit pack.
- PEC 65422A Each PEC provides one ISDN interface (ANN35)
- PEC 65401A Each PEC provides one processor communications circuit pack (TN474B)
- PEC 65402A Each PEC provides one remote module console interface (RMCI)

#### *Software PECs for R2V4*

- PEC 65466 Each PEC provides:
- Custom software tapes (J58889TM-1 L41, 43). Four are provided for duplicate CC systems (PEC attribute DUP02), three for single CC systems (PEC attribute DUP01).
  - Three customized customer system documents (CSDs)
  - One set of maintenance and administration panel (MAAP) flipcharts (845552223)
  - One set of system management terminal (SMT) flipcharts (845552231)

### **AP16 and CSM Compatibility Requirements**

**NOTE:** AP-16 system management is not supported in System 85 R2V4 and DEFINITY Generic 2 software.

If the system to be upgraded is configured with an AP16 or administered by CSM, compatibility problems may exist. For example, all AP16s served by a System 85 R2V3 must be equipped with a 160-Mbyte disk and be running 1f.4.3 software. If the AP16 needs upgrading, contact the regional

AP16 coordinator to provide upgrade assistance. Not all AP16 features are fully compatible with System 85 R2V4 software. These features are as follows:

- Facilities Management (FM), Terminal Change Management (TCM) and Call Detail Record Recording (CDRR) do not support R2V4 software.
- Call Management System (CMS) software must be Issue 2.12 or later to support R2V4.
- Message Center functions with R2V4 systems as it did on the preceding version.

For a System 85 R2V4 to fully use these features, the AP16 must be replaced by an AT&T 3B2 Computer running CSM Version 4 and AT&T 3B2 Messaging Server.

**NOTE:** Because they can affect translations, SMT, MAAP, INADS, VMAAP, and Manager II should not be used in conjunction with CSM for change administration. These tools should be used only for maintenance or read-only administration in this context.

Extra disk capacity is required for 90 to 120 days during switch upgrades if the switch is running CSM with Cost Management (CM). The extra storage capacity is required for data base duplication and MDR storage for version upgrades of switches running CM. This allows for the pre-processing of MDR's after the switch upgrade. This activity must be coordinated with the NCSC. Contact your Branch Specialist or RCRC CSM specialist for more information.

### R2V4 Hardware Upgrade Procedure

**CAUTION:** When upgrading *from* R2V2 or R2V3, the system must be running one of the following dot-issues:

R2V2 Issue 1.5 or later  
R2V3 Issue 1.3 or later

Earlier issues of R2V2 or R2V3 software will not run correctly with the 4-Mbyte (TN394) circuit packs. No dot-issue prerequisites exist for upgrades from R2V1. R2V1 hardware and software upgrade procedures differ slightly for specific steps. See step 5 under *R2V4 Hardware Upgrade Procedure* in this chapter, step 5 under Chapter 4 - *UPGRADE PROCEDURE FOR SINGLE CC SYSTEMS*, and step 7 under Chapter 4 - *UPGRADE PROCEDURE FOR DUPLICATE CC SYSTEMS* for these differences.

Notify the customer that during the upgrade their System 85 service will be impaired. Arrange for alternate service, if requested.

The specific steps for upgrading the System 85 hardware from R2V1, R2V2, R2SE or R2V3 to R2V4 follow:

1. Advise the serving CSSO of the upgrade.
2. Plug in the MAAP and save the current translations by executing a RUN TAPE on both the currently installed system tape and the backup tape.
3. If this is a duplicate CC system, turn the EMERGENCY TRANSFER switch to INHIBIT and turn the CC SELECT switch (labeled the LOCK ON-LINE switch on some panels) to the active CC. (The active CC is indicated by the CC ACTIVE LED on the alarm panel.)

4. Halt the CC in a single CC system or the off-line CC in a duplicate CC system.

NOTE: For the next three steps, be sure to attach your wrist strap before handling any circuit packs, have enough boxes available to store all the removed packs, and replace the covers on the carriers after inserting the new packs. The wrist strap *must be clamped to bare metal, not painted*, for proper grounding.

5. If this is an upgrade from R2V1, go to step 8; you will install new R2V4 circuit packs during the software upgrade procedure.
6. If this is an upgrade from version R2V2 or later, remove all TN392 circuit packs from slots 07 through 14 of halted CC.
7. If this is an upgrade from version R2V2 or later, install TN394 circuit packs in slots 07, 08, and 09 of the halted CC.
8. Replace packs in the following slots with the indicated packs:
  - Slot 00 — TN370B
  - Slot 02 — UN152B
  - Slot 03 — UN153B
  - Slot 20 — TN430B
  - Slot 31 — TN491B
9. As required by your system options, replace the circuit packs listed under *Optional Hardware PECs for R2V4* in this chapter.
10. Perform the microdiagnostics on the halted CC. Refer to *Performing CC Microdiagnostics* in this chapter or the *AT&T System 85 Maintenance Service Manual (R2V4 555-103-108)* for this procedure.

Be sure the PASS LED stabilizes on the TN430B and the TN406 (if configured) before continuing.
11. If this is the first pass on a duplicate CC system, turn the CC SELECT switch to OFF, halt the active CC and repeat steps 4 through 10. If this is a single CC system or the second pass on a duplicate CC, test all the hardware (refer to the flipchart for PROC 620). This forces a "hard switch" of the current off-line and on-line CCs and allows you to upgrade the second CC.
12. If this is a single CC system or the second pass on a duplicate CC system, test all the hardware (refer to the flipchart for PROC 620).
13. If this is the first pass on a duplicate CC system, turn the CC SELECT switch to the now active CC (the one you finished upgrading).
14. Clear the alarm history (refer to the flipcharts for PROC 600 and 612)
15. If this is a duplicate CC system, turn both the EMERGENCY TRANSFER switch and the CC SELECT switch to OFF.
16. If this is a duplicate CC system, perform a "soft switch" between the two CCs five to seven times to ensure that duplication works with the new hardware.
17. Perform the operational tests on equipment, including the console, switch, and critical circuits.
18. Refer to *Feature Translation Updates* in this chapter for a list of the features requiring reactivation or reprogramming after the hardware upgrade.

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This completes the R2V4 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete. The next step is the software upgrade described in chapter 4. *The upgraded hardware must run alarm-free before you upgrade the software.*



## **UPGRADING TO DEFINITY COMMUNICATIONS SYSTEM GENERIC 2**

Change Notices (CNs) for DEFINITY Communications System are not yet available and will be provided in a subsequent release of this document.

1. Ensure that all applicable CNs listed in the "Reference Guide for Change Notices and Circuit Pack Vintages" are complete. Contact your CSSO CN coordinator with any questions before proceeding.
2. Ensure that the system is running alarm free.

Proceed with the upgrade by taking inventory of the following items:

- Hardware and software PECs
- Required documentation and equipment
- AT&T applications processor, J59222A (AP16) and Centralized System Management (CSM) compatibility requirements

These items, and the DEFINITY Communications System hardware upgrade procedures, are described in the following sections.

### **Equipment Requirements**

#### *Required Hardware PECs for DEFINITY Communications System*

Hardware requirements are summarized by component number in the following list.

#### *DTS Upgrade Requirements for DEFINITY Communications System*

The following components are required for the DTS upgrade.

- DEFINITY Manager II assembly, J58889EA-1 List 1,3,4,5
- Upgrade hardware and cables, J58889EA-1 List 10
- Small Computer System Interface (SCSI) host adapter circuit pack, TN563
- DTS tape cartridge, J58889UC

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### *CC Upgrade Requirements for DEFINITY Communications System*

The following components are required to upgrade the R2V4 CC to DEFINITY Communications System Generic 2.

- Additional 4-megaword memory circuit pack, TN394
- Sequencer circuit pack, TN370C
- Cache memory, TN379 (optional under certain circumstances, as is the TN369, which may already be installed)

The 4-megaword TN394 fully replaces the 1-megaword TN392 circuit pack. These circuit packs are incompatible and cannot be used in the same system.

### *Optional Hardware PECs for DEFINITY Communications System*

TN379, cache memory, is optional for DEFINITY Communications System under select conditions. Confirm the need for this circuit pack before installation.

### *Software PECs for DEFINITY Communications System*

- Four custom software tapes (J58889UC-1) are provided for duplicate CC systems (PEC attribute DUP02); three are provided for single CC systems (PEC attribute DUP01).
- Three customer system documents (CSDs) (when available)

## **Required Documentation and Equipment**

The following documentation and equipment must be on-site before upgrading the System 85 hardware:

- One copy of *DEFINITY Communications System Generic 2 and System 85 Provisioning Process* (555-104-610 Issue 1)
- One copy of *DEFINITY Communications System Generic 2 and System 85 Installation* (555-104-104 Issue 1)
- One copy of *DEFINITY Communications System Generic 2 Maintenance Procedures* (555-104-117 Issue 1)
- One copy of *DEFINITY Communications System Generic 2 Maintenance and Repair Strategies* (555-104-104 Issue 1)
- One copy of *DEFINITY Communications System Generic 2 and System 85 X-Ray and System Tests* (555-104-109 issue 1)
- One copy of *DEFINITY Communications System Generic 2 and System 85 Wiring* (555-104-630)
- One copy of *DEFINITY Communications System Generic 2 Administration of Features and Hardware* (555-104-507 Issue 1)
- One copy of *DEFINITY Manager II Operation* (555-104-505 Issue 1)

- One Manager II PC
- One wrist strap
- Installation tools, to include:
  - Standard screwdriver
  - Ratchet set
  - Adjustable Wrench
  - Flashlight
  - Drill and Driver for hex washer head screw

(See "Installing The Disk/Tape System (DTS)" step 6 for details on hex washer head screw.)

### **AP16 and CSM Compatibility Requirements**

- Facilities Management (FM), Terminal Change Management (TCM) and Call Detail Record Recording (CDRR) do not support DEFINITY Communications System software.
- Call Management System (CMS) software must be Issue 2.12 or later to support DEFINITY Communications System.
- Message Center functions with DEFINITY Communications System systems as it did on the preceding version.

**NOTE:** AP-16 system management is not supported in System 85 R2V4 and DEFINITY Generic 2 software.

*For a DEFINITY Communications System switch to fully use these features, the AP16 must be replaced by a 3B2 computer running CSM Version 4 and the Messaging Server.*

When you are upgrading a switch supported by CSM, you *must* reinitialize the CSM database for the target-version tape. Nonswitch data can be retrieved from the database and reentered mechanically only if the numbering plan does not change. Otherwise, you must fully reinitialize CSM, which takes one week *after* completing the switch upgrade.

**NOTE:** Because they can affect translations, Manager II, SMT, MAAP, INADS, and VMAAP should not be used in conjunction with CSM for change administration. MAAP/SMT should be used only for maintenance or read-only administration in this context.

Extra disk capacity is required for 90 to 120 days during switch upgrades if the switch is running CSM with Cost Management (CM). The extra storage capacity is required for data base duplication and MDR storage for version upgrades of switches running CM. This allows for the pre-processing of MDR's after the switch upgrade. This activity must be coordinated with the NCSC. Contact your Branch Specialist or RCRC CSM specialist for more information.

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## DEFINITY Communications System Hardware Upgrade Procedure

**CAUTION:** When upgrading *from* R2V2 or R2V3, the system must be running one of the following dot-issues:

R2V2 Issue 1.5 or later

R2V3 Issue 1.3 or later

For upgrades from R2V1, there are no dot-issue prerequisites; however, there are slight differences in the upgrade procedures (see step 5 in single CC software upgrade procedures and step 7 in the duplicate CC software upgrade procedure).

Notify the customer that during the upgrade process their System 85 service will be impaired. Arrange for alternate service, if requested.

The specific steps for upgrading the System 85 hardware from R2V1, R2V2, R2V3, or R2V4 to DEFINITY Communications System are provided in the following sections.

### Saving Current Translations

1. Ensure that your account team has exchanged your HCMR-formatted source-version TRT with a DTS-formatted source-version customer upgrade tape. You must have this tape in hand before you begin. If you do not have a DTS-formatted tape, do not continue with these procedures.
2. Advise the serving CSSO of the upgrade.
3. Plug in the maintenance and administration panel (MAAP) and save the current translations by executing a RUNTAPE on both the currently installed system tape and the backup tape.

### Halting the Off-Line CC

**NOTE:** In a duplicated system, performing the CC1 upgrade first simplifies DTS alignment in the cabinet. This implies halting CC1 during the first pass and CC0 during the second pass for duplicated system upgrades.

1. Consult your AT&T FSO representative or AT&T account representative for down-time estimates specific to your system. Arrange for alternate service if necessary.
2. If this is a duplicate CC system, turn the EMERGENCY TRANSFER switch to INHIBIT and turn the CC SELECT switch (labeled the LOCK ON-LINE switch on some panels) to the active CC. The active CC is indicated by the CC ACTIVE LED on the alarm panel.
3. Halt the CC in a single CC system or the off-line CC in a duplicate CC system.
4. Power off the halted CC. Powering off the halted CC is a *recommended* safeguard against circuit pack damage during circuit pack installation and replacement. Power off implies subsequent reload of the switch.

## Replacing CC Circuit Packs

**NOTE:** For the next three steps, attach your wrist strap before handling any circuit packs, have enough boxes available to store all the removed packs, and replace the covers on the carriers after inserting the new circuit packs. The wrist strap *must be clamped to bare metal, not painted*, for proper grounding.

1. If this is an upgrade from R2V1, go to step 4. (The R2V4 memory circuit packs are installed during the software upgrade procedure.)
2. If this is an upgrade from R2V2 or R2V3, remove the TN392 circuit packs from slots 07 through 14 of the halted CC.
3. Ensure that the TN394 circuit packs are installed in slots 07, 08, 09, and 10 of the halted CC.
4. Replace circuit packs in the following slots with the indicated packs:
  - Slot 00 — TN370C
  - Slot 02 — UN152B
  - Slot 03 — UN153B
  - Slot 20 — TN563
  - Slot 31 — TN491B
5. Replace the circuit packs listed under *Optional Hardware PECs for DEFINITY Communications System* earlier in the chapter.

*Do not install the optional TN379 cache memory circuit pack at this time.* (The TN379 is installed after the DEFINITY Communications System software upgrade procedure in chapter 4.)

## Installing The DTS

Steps *Installing Disk/Tape System (DTS)* and steps under *Performing CC Microdiagnostics* outline the procedures for installation and test of the DTS unit and associated cabling:

- For *duplicated* systems, perform steps under *Installing Disk/Tape System (DTS)* and steps under *Performing CC Microdiagnostics* sequentially for CC1 (and associated DTS assembly), then perform the steps for both *Installing Disk/Tape System (DTS)* *Performing CC Microdiagnostics* again for CC0 (and associated DTS assembly). This "two pass" procedure ensures proper fit of the DTS units, and keeps switch operation interrupts to a minimum.

*If you are upgrading a duplicated CC system, do not attempt an upgrade of both CCs at once. Keep one CC on line while upgrading the other, halted, CC. Installing both DTS units concurrently can interrupt switch operation and create DTS alignment problems in the cabinet.*

*Perform all steps sequentially, as they are presented.*

- For *unduplicated* systems, perform all the steps only once. Again, be sure to perform the steps in the order they are presented.
1. Before you install the DTS, you must add a new stick-on label to the CC breaker panel. (The label, DTSU/HCMR, COMCODE 846194496, replaces the HCMR label on the panel.) Replace this label before continuing.

2. Turn off the white switch (breaker) on the right side of the CC breaker panel. The switch is labeled "DTSU/HCMR". (For duplicate systems, disable CC1 only, leaving CC0 on line.)
3. Disconnect red (-48V) and black (-48RET) power wires from the back of the HCMR, but leave them connected to the breakers for use with the DTS.
4. From the back of the CC carrier, completely remove the HCMR flat cables, cable number ED1E434-11, cutting cable tie-wraps as necessary.
  - If upgrading a duplicated system, remove CC1 group numbers 40 and 41 on the first pass and remove CC0 group numbers 37 and 39 on the second pass.
  - If upgrading an unduplicated system remove the group 99 and 100 HCMR flat cables.Stick-on labels denote cable group numbers for the HCMR flat cables.
5. Remove the HCMR and mounting brackets from the CC cabinet as follows:
  - If the HCMR is mounted on the floor, remove the front and rear HCMR brackets.
  - If the HCMR is mounted on a shelf, remove the front HCMR bracket.
6. Mount the DTS where the HCMR was located as follows:
  - *DTS brackets*

Ensure one front and one rear DTS bracket is included with the upgrade hardware. These brackets differ from the old HCMR brackets and may eliminate the need to drill new holes in the cabinet.
  - *mounting screws*

For both floor and shelf-mounted situations, align the DTS with holes at the rear of the cabinet first, then install the front DTS bracket. Use two screws in the front and two screws in the rear of the DTS to ensure the unit is properly anchored.
  - *duplicated system*

If the system is duplicated, mount the right-facing (from the front of the cabinet) DTS (CC1) on the first pass, then line up the second DTS (CC0) beside it on the second pass as described in the beginning of this section. Mounting the right-facing DTS first ensures that both machines will fit properly in the cabinet.
  - *floor mount*

To mount the DTS on the floor of the cabinet, you must use a different group of mounting holes provided *alongside* those for the HCMR.
  - *shelf mount*

When mounting the DTS in a shelf, alignment is usually unnecessary. Simply replace the HCMR with the DTS, using the same mounting holes.



When the DTS replaces a shelf-mounted HCMR, make sure that the DTS is engaged into the pins on the back of the shelf. If the DTS is not engaged with the pins and pushed back against the rear lip of the shelf, there may be interference between the front door and the tape.

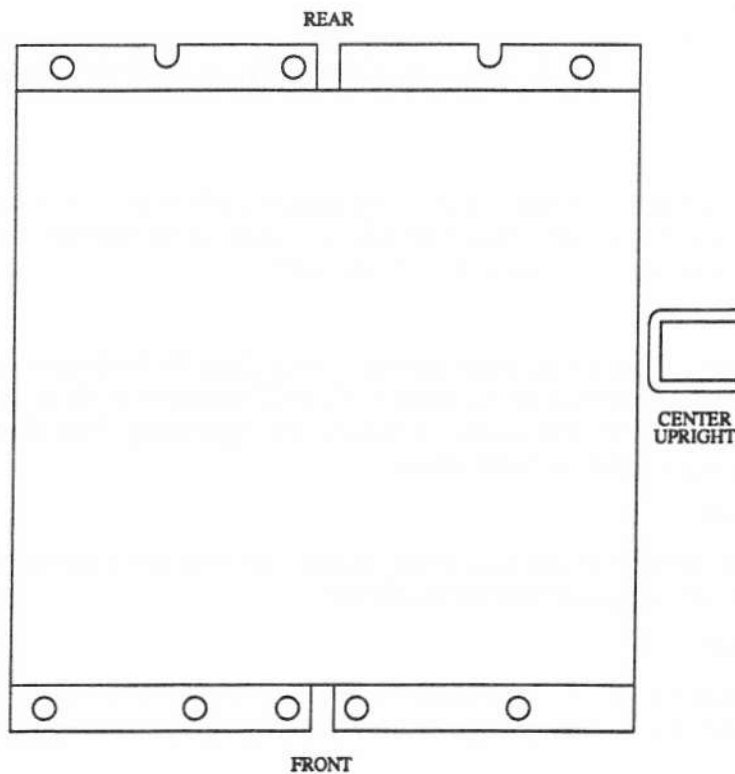
**NOTE:** If the holes do not line up properly with the DTS brackets, drill new holes for the following screw: (This screw is included with J58889EA-1 lists 10 and 11)

- Description: hex washer head (tt)
- Size: .190-32 x 3/8
- COMCODE: 840027049

In some cabinets, the cabinet casters block the mounting holes for the DTS unit. In this situation, new holes must be drilled in the cabinet. Similarly, some cabinets now designated for field retrofit were not previously drilled for the DTS brackets.

In both situations, align the DTS units in the old HCMR positions. Drill holes according to the description earlier in step 6 using the DTS brackets as templates for marking hole centers. Always use self-tapping screws when mounting the DTS.

Figure 3-1 shows factory-drilled cabinet base mounting holes.



**Figure 3-1. Disk Tape System Cabinet Mounting**

7. Once the DTS is aligned properly, tighten it down before proceeding.
8. Attach the red and black power wires from the DTSU/HCMR breaker panel to the DTS terminals labeled -48V (red) and -48RET (black).



9. Install the DTS SCSI cable, H600-253, Group 1 at the CC backplane.

(Installing the DTS SCSI cables is tight, detailed work. You will need a flashlight.)

Attach 2x12 connectors marked A6 and A7 to locations A6 and A7 on the CC backplane. If upgrading a duplicated system, make CC1 Connections on the first pass and CC0 connections on the second pass.

Always ensure that the arrows marked on the connectors are pointing up during installation.

10. Once the connectors are properly aligned on the pins, use extra pressure to firmly seat the connectors on the backplane.

Figure 3-1 shows the A6 and A7 connector positions as they appear on the Common Control backplane.

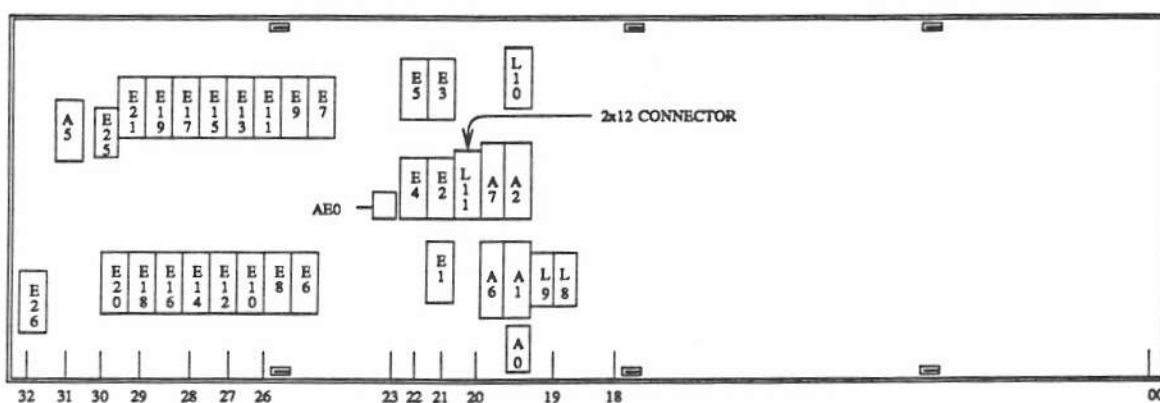


Figure 3-2. CC Backplane Connections for DTS Installation

11. If possible, dress the DTS SCSI cables down the left rear side of the CC cabinet. Otherwise, secure the cables where you can inside the cabinet.
12. Connect the DTS SCSI cable's 25-pair connector (402019269) labeled "DTS SCSI" to the DTS. This connection is made on the *back* of the DTS and is labeled "SCSI". Attach and secure the 25-pair connector with the 4B retainer provided on the DTS.
13. Connect the SCSI alarm wire, which runs with the H600-253 cable, to the pins labeled ALM on the rear of the DTS. (This is the only two-pin connector associated with the H600-253 cable. The cable's connector is labeled PTMP.)

*Installation of the H600-253 group 1, DTS SCSI cable is now complete.*

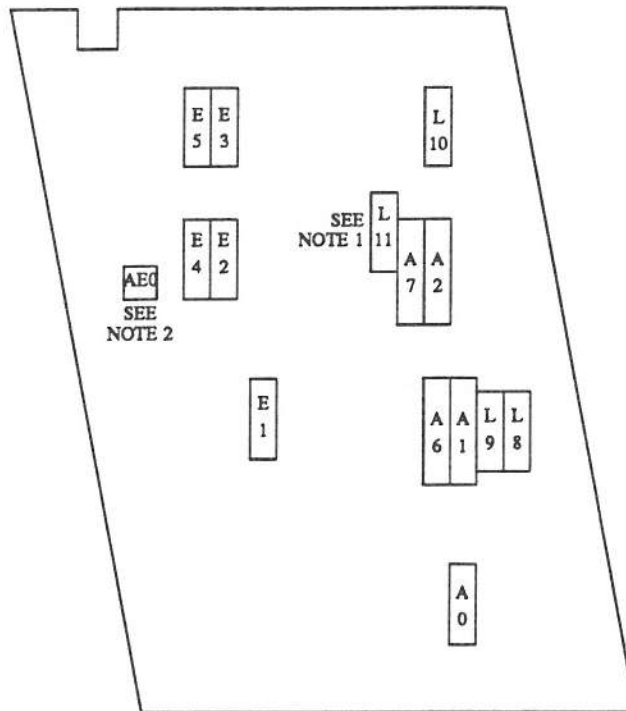
14. Install the H600-174 group 1, CC/ADU cable at the CC backplane as follows:

(Installing the CC/ADU cables is tight, detailed work. You will need a flashlight.)

Using the CC/ADU cable's paddleboard-type connector, connect the CC/ADU cable to position 20 on the CC backplane. Ensure that the arrow is pointing up. (The CC/ADU cable's connector is a 2x12 paddleboard.)

The 2x12 paddleboard occupies pins 035 through 046, and 135 through 146 of slot 20.

The following figure shows the specific location for the CC/ADU connector at the CC backplane.



NOTE 1: Common Control Carrier Backplane position for connector L11 is slot 20 pins 039 to 046 and 139 to 146. This is a 2x12 paddleboard connector.

NOTE 2: Common Control Carrier Backplane position for connector AEG is slot 23 pin 332.

Figure 3-3. CC/ADU Connector Locations

NOTE: The A7 carrier label can obscure a side row of pins required for the 2x12 connector. Ensure that these pins are visible and available to the plug.

15. Install the one-by-one connector, AE0, in slot 23, pin 332. Pin 332 is located in the lower left-hand corner of slot 23. (This connector is part of the H600-174 cable.) AE0 provides the signal lead indicating which CC is on line.

Make this connection for both unduplicated and duplicated systems.

*Installation of the H600-174, CC/ADU cable at the CC backplane is now complete.*

16. Install the ADU rear connector panel, number 846152650, (unduplicated or duplicated) on the back left side of the CC cabinet.

If possible, install the connector panel in the second connector panel position from the bottom. Run the cables that are attached to the panel through the cabinet opening (inside the cabinet) before mounting the connector panel. (This is the H600-177 ADU cable referred to in the next procedure.)

(If this is the second pass on a duplicated CC system, the connector panel is already in place.)

17. Attach the H600-177 ADU cable to the H600-174 CC/ADU cable as follows:

Attach the H600-177 cable's connector, JADUA0/1, to the H600-174 cable's connector, marked PADUA.

- If this is a duplicated system, associate the H600-174 cable connected to either CC0 or CC1, with the appropriately numbered H600-177 cable connector, JADUA0 or JADUA1.
- If this is an unduplicated system, only one of the H600-177 cable's JADUA connectors is used.

**Note regarding H600-174 group 1 and H600-177 group 1 cables:**

- *H600-174 cable*

For field retrofit of the DTS unit in a duplicated system, the H600-174 cable is furnished with connectors labeled PADUA and PADUB. (Recall that the CC backplane connections for the H600-174 cable are the one-by-one connector, AE0, and the 2x12 paddleboard connector installed earlier.)

One H600-174 cable connects to one individual CC. For duplicated systems, this implies two identical H600-174 group 1 cables.

- *H600-177 cable*

The H600-177 cable is furnished with connectors labeled JADUA0, JADUA1, JADUB0, and JADUB1. In both duplicated and unduplicated systems, only one H600-177 cable is used.

Opposite the H600-177 cable's JADU<sub>x</sub> connectors is the H600-177 cable's KS23008, L4 connector (403558695) which is stamped "ADU".

18. If you are connecting Manager II via the programmable processor gateway (PPG) ports of the TN563, choose one of the following two options. These options determine cable connections from the H600-177 ADU cable to the H600-174 CC/ADU cable and must, therefore, be chosen now. Manager II can be connected:
- to the DTS using an ADU interface
  - to the wall field through the ADU rear connector panel

**NOTE:** Manager II may also be connected to the TN492C ports, H2 and H3, at the rear of the CC cabinet with the following considerations:

- Only port H2 has a tip and ring for network connection via CO line.
- Data rate for the TN492C is limited to 1200 bps.
- The DTS cannot download the Switch Support Base (SSB) used for Manager II *enhanced mode* operation if connected via the TN492C remote port. Enhanced mode operation provides Electronic Flip Charts (EFCs) and expanded information resources for administration.

- Manager II can be used from an off-site location by dialing up to a TN492C remote interface port.
- Connecting Manager II prior to loading the DEFINITY Communications System software results in *basic mode* operation. When in basic mode, Manager II emulates a MAAP panel.

Figures later in this chapter show Manager II connection through both the PPG and RMATS ports.

19. Choose one of the following two procedures depending on your chosen TN563 (PPG) connection option:
  - If you are connecting the ADU to the DTS using ADU interface(s), install the PADUB four-pin connector to the DTS below the "ALM" plug. The connector position on the DTS is labeled "ADU". Leave connector JADUB without a connection in this configuration.
  - If you are connecting the ADU through the wall field, connect JADUB to PADUB. Note that channel A (PADUA) is always cut down to the wall field while channel B (PADUB) runs to either DTS or cross connect field.

*The rear of the DTS unit is equipped with a removable filter cover. When dressing cables around the DTS rear fan area, leave room for removal of these filters. This filter should be changed once every three months.*

20. Install the static discharge wire, H600-226, G1, to the DTS faston which is located directly below the DTS power termination. Use the fast-on without the piggyback assembly. See the note below if a fast-on is not visible.
21. Attach the other end of the static discharge wire to the fast-on located on the right rear edge of the fan unit, J58889V. If a wire is already attached (for an unduplicated CC), disconnect that wire, attach the static discharge wire, and then reattach the first wire to the piggyback on the discharge wire connector.

**NOTE:** In some DTS units, static discharge is accomplished without the static discharge wire. These units are not equipped with the DTS fast-on.

22. Turn on the DTSU/HCMR breaker.
23. Ensure that the DTS fan is running. If it is not, you may have reversed the power lines.
24. Perform the DTS power-on test by observing the following:

Once the DTS is powered-up, check the red LED on the front of the disk drive unit.

- If the LED lights for a few seconds, blinks a few times, and then goes out, the DTS is functioning properly. Go to the next numbered step.
  - If the disk drive LED stays on, a problem may exist - usually in the SCSI cables. Ensure that all SCSI connections are made properly and that the TN563 SCSI Interface circuit pack has been installed and seated in slot 20.
25. Properly insert the *source-version* customer upgrade tape into the DTS tape drive. (Chapter 2 provides details on the customer upgrade tape.) The target-version tape is *not* loaded at this time.

*Ensure you insert the cartridge with the metal portion to the left, and with the tape opening pointing up.*

The green LED should light. The tape should then rewind, whirr and click. The green LED should then go out.

- If the green light goes out, the DTS is functioning properly. Proceed to the section titled "Performing CC Microdiagnostics."
- If the green light does not go out, verify once again that all SCSI cabling is properly installed.

### Performing CC Microdiagnostics

The following section summarizes running CC microdiagnostics once DEFINITY Communications System CC hardware is installed. Refer to the *AT&T System 85 Maintenance Service Manual* (555-103-108, DEFINITY Communications System) for complete information and detailed instructions.

After the hardware is upgraded, run microdiagnostic tests 0 through 15 using the procedures outlined below.

With the exception of Test 0, each test uses circuits tested by the previous test. Tests 10 and 15 use Manager II as an output device. Although tests 3 through 6 and test 13 are spares, they must be run as part of the microdiagnostic test sequence.

1. Set the microdiagnostic TEST SELECT dial to 0.
2. Set the HALT/GO switch to GO.
3. Start the test by pressing the RESET button, then pressing the ENABLE switch.
4. When the PASS LED lights, increment the microdiagnostic TEST SELECT switch and repeat step 3. Repeat this step for all the tests, which are as follows:

Test 0 - diagnostic processor circuit pack demand test  
Test 1 - maintenance bus demand test  
Test 2 - alarm interface circuit pack demand test  
Test 3 - spare (reserved for future use)  
Test 4 - spare (reserved for future use)  
Test 5 - spare (reserved for future use)  
Test 6 - spare (reserved for future use)  
Test 7 - 501CC processor circuit packs demand test  
Test 8 - system bus and buffered bus demand test  
Test 9 - 501CC instruction set demand test  
Test 10 - DTS / tape subsystem demand test  
Test 11 - main memory system demand test

**NOTE:** On duplicate CC systems, if the switch starts to load at the end of test 11 instead of continuing with test 12 (indicated when the red LEDs for MAJOR, PROC, and TAPE light), halt the processor and continue the remaining tests.

Test 12 - memory protect circuit pack demand test  
Test 13 - spare (reserved for future use)  
Test 14 - cache memory circuit demand test  
Test 15 - abbreviated test and a forced load

*The switch should load, and the PASS LED should stabilize.*

If any of the tests fail, refer to the troubleshooting information in the appropriate version of the *AT&T System 85 Maintenance Service Manual*. Refer to *Reference documents* in the *About This Document* section of this book for the appropriate version-dependent order number.

5. If this is the first pass on a duplicate CC system, turn the CC Select switch to OFF and halt the active CC. This forces a "hard switch" of the current off-line and on-line CC's allowing upgrade of the second CC. After the "hard switch" occurs, turn the CC Select switch to the now active CC. Repeat the upgrade procedure for the now off-line CC starting with steps 1-24 of "Installing DTS".
6. If this is a single CC system or the second pass on a duplicate CC system, proceed to the next numbered step.
7. Clear the alarm history (refer to the flipchart for PROC 600 and 612 for this procedure).
8. If this is a duplicate CC system, turn both the Emergency Transfer switch and the CC Select switch to OFF.
9. If this is a duplicate CC system, perform a "soft switch" (PROC 613) between the two CCs five to seven times to ensure duplication works with the new hardware.
10. Perform operational tests on the console, switch, and critical circuits.

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## CONFIGURING RMATS AND PPG PORTS FOR SYSTEM MANAGEMENT

System management adjuncts are connected to the switch using the two RS232C-compatible RMATS ports provided by the TN492C circuit pack or through the two Asynchronous Data Unit (ADU) compatible PPG ports on the TN563 circuit pack. The sections below outline connection options using these four ports. These options are as follows:

- RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access
- RMATS 1: Switched Analog Dial Access
- PPG 0: Switched Analog Dial Access
- PPG 1: Non-Switched Direct Access

Functionality, usage, equipment requirements (including Price Element Codes), and connectivity diagrams for each port are detailed in the following sections.



## **RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access**

### **Functionality**

This port provides access to the system through the Diagnostic Processor (DP). The DP allows access to both the on-line and off-line processors in a duplicated system. This port also provides improved FASTMAAP performance. It does not provide access to the DTS and Switch Support Base (SSB).

Because a non-switched dedicated trunk is used in this configuration, the DP circuit pack can be accessed for maintenance even if the system is down.

### **Usage**

This port is used for alarm origination to INADS or ACCUMASTER Trouble Tracker (TT), and remote maintenance by AT&T services personnel.

### **Equipment Requirements**

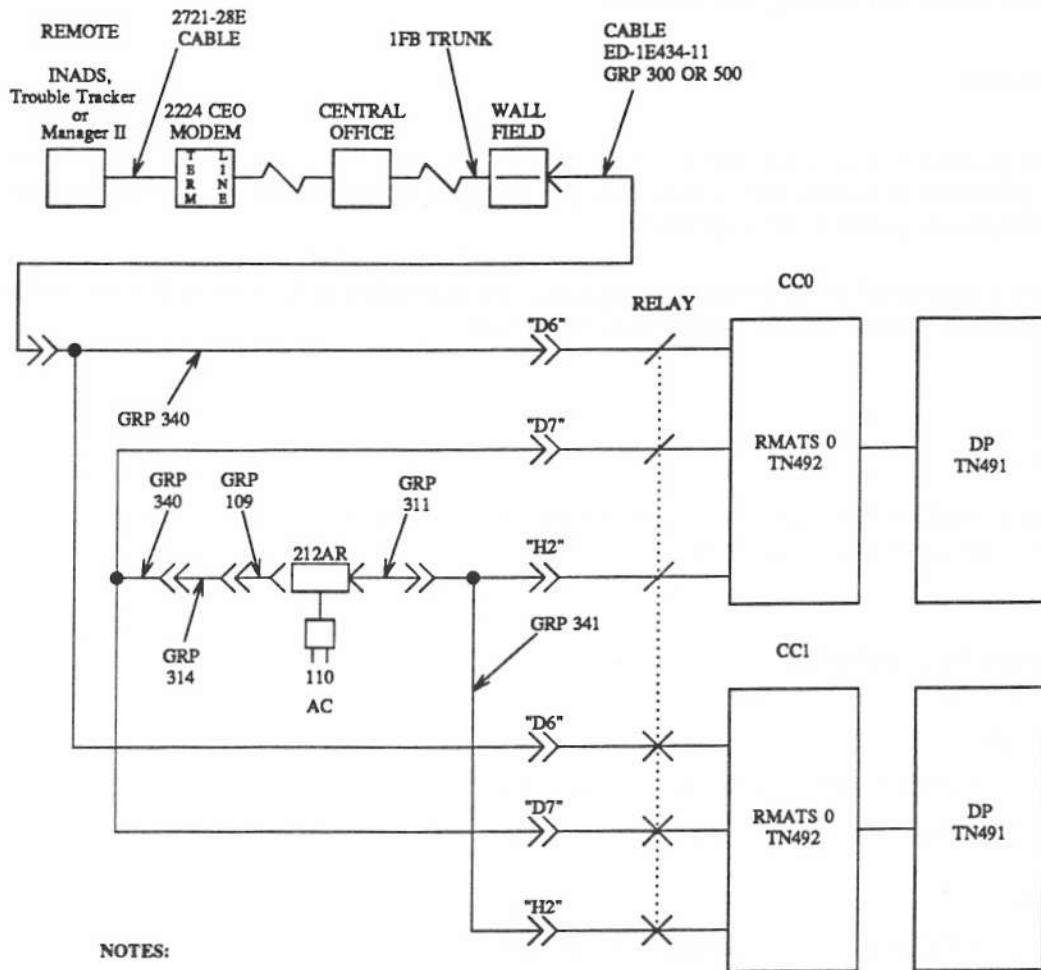
#### Adjunct-side:

- PEC 2224 CEO modem (includes power transformer)
- PEC 2721-28E cable

#### System-side:

- 1FB-type trunk
- PEC 2126-212 212AR Modem (includes power transformer)
- PEC 21474 Stand-alone housing for 212AR Modem
- ED-1E434-11 Group 109, 300 (with old wall field, or group 500 with new wall field), 311, 314, 340 (2), and 341 cables for duplicated system, and Group 109, 300 (with old wall field, or group 500 with new wall field), 311 and 314 cables for unduplicated system

Figure 3-4 shows the Non-Switched Dedicated Trunk Analog Dial Access configuration for RMATS 0.



**NOTES:**

1. Set 8 switches on front of 2224-CEO modem for adjunct-side down.  
Set 30 switches on 212AR modem for system-side as follows:
  - 5 switches on front of modem NOT pushed in
  - 1 screw switch inside modem fully open
  - 2 plug-in straps between terminals E1 and E2, and E3 and E4 inside modem
  - 22 switches inside modem as indicated in the table below, where O means open and C, closed.

	1	2	3	4	5	6	7	8	9
S1	C	O	C						
S2	C	O	O	O	O	C	C	O	O
S3	C	O	C	O	O	O	C	O	
S5	O	O							

2. For unduplicated systems, ignore connections to CC1 ( don't use Group 340 and 341 cables).

**Figure 3-4. RMATS 0: Non-Switched Dedicated Trunk Analog Dial Access**

## **RMATS 1: Switched Analog Dial Access**

### **Functionality**

This port provides access to the system through the DP. The DP allows access to both the on-line and off-line processors in a duplicated system. This port also provides improved FASTMAAP performance. It does not provide access to the DTS and SSB.

Because this port is not used for remote maintenance, a non-switched dedicated analog trunk connection is not necessary. Thus a switched analog trunk is provided.

### **Usage**

This port is used primarily for local or remote traffic polling by Monitor I and secondarily for local or remote system administration by Manager II, III, or IV.

### **Equipment Requirements**

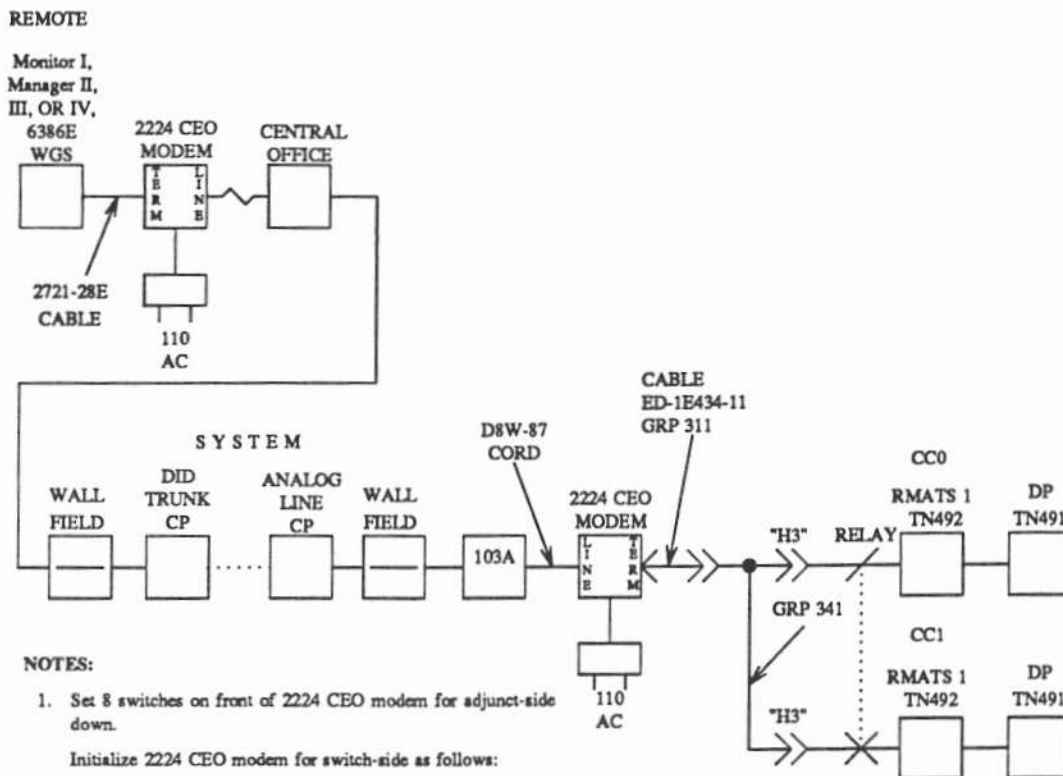
#### **Adjunct-side:**

- PEC 2224 CEO modem (includes power transformer)
- PEC 2721-28E cable

#### **System-side:**

- PEC 2224 CEO modem (includes power transformer)
- PEC 2725-07G D8W-87 cord
- PEC 2750-D08 103A connecting block
- ED-1E434-11 Group 311 and 341 cables for duplicated system and only Group 311 for unduplicated system
- Analog line circuit packs:
  - TN742: 8-port OPS/OPX analog line circuit pack (Universal Module)
  - SN229: 8-port analog line circuit pack (Traditional Module)
- DID Trunk circuit packs:
  - TN753: 8-port DID trunk circuit pack (Universal Module)
  - SN232B: 4-port DID trunk circuit pack (Traditional Module)

Figure 3-5 shows the Switched Analog Dial Access configuration for RMATS 1.



**NOTES:**

1. Set 8 switches on front of 2224 CEO modem for adjunct-side down.

Initialize 2224 CEO modem for switch-side as follows:

- Connect the modem to COM1 port on the 6286 WGS PC (see figure 3-7 for PPG1) using the 2721-28E cable.
- On PC type 'imodem 2224ceo.mnp' and set 8 switches on front of 2224 CEO modem per instructions (see Manager II MS-DOS Version Operation Manual 555-104-505).

2. The Local Manager II, III or IV shown in the figure 3-6 for PPG 0 could connect to RMATS 1 via analog line CP.
3. For unduplicated systems, ignore the connections to CC1 (don't use Group 341 cable).

**Figure 3-5. RMATS 1: Switched Analog Dial Access**

## PPG 0: Switched Analog Dial Access

### Functionality

This port provides access to the system through the Disk Tape System (DTS). This port also offers access to the Switch Support Base (SSB) on the DTS and the best FASTMAAP performance. It does not provide access to the DP or the offline processor in a duplicated system.

Because this port is accessed for remote maintenance of the SSB files, a switched analog connection is used.

### Usage

This port is used primarily for local or remote administration by Manager II, III, and IV, and secondarily for remote maintenance of SSB files.

### Equipment Requirements

#### Adjunct-side:

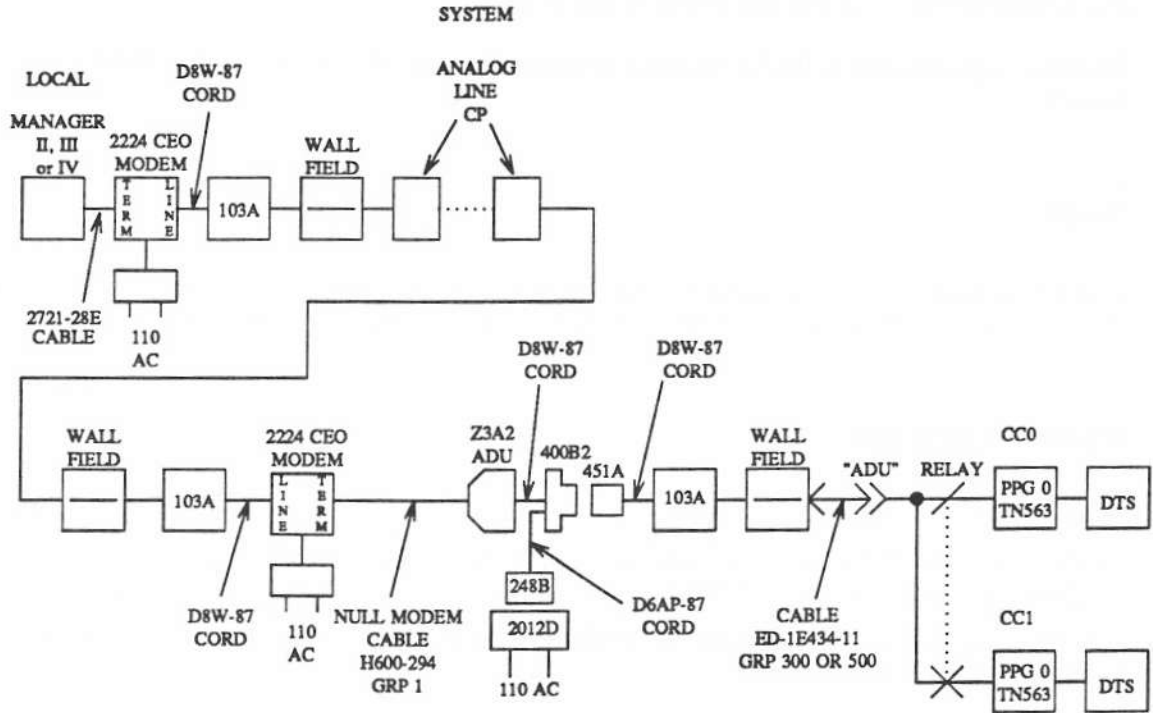
- PEC 2224 CEO modem
- PEC 2721-28E cable
- PEC 2725-07G D8W-87 cord
- PEC 2750-D08 103A connecting block

#### System-side:

- PEC 2224 CEO modem (includes power transformer)
- H600-294 Group 1 Null Modem cable
- PEC 2169-002 Z3A2 ADU (see *Z3A Asynchronous Data Unit Product Manual 555-401-708*)
- PEC 21691 ADU power consisting of 2012D power transformer, 248B adapter, 400B2 adapter, and D6AP-87 power cord
- PEC 2750-A30 451A adapter
- PEC 2725-07G D8W-87 cords (3)
- PEC 2750-D08 103A connecting block (2)

- ED-1E434-11 Group 300 cable with old wall field, or group 500 cable with new wall field. (This cable also appears in figure 3-7 for PPG 1.)
- Analog line circuit packs:
  - TN742: 8-port OPS/OPX analog line circuit pack (Universal Module)
  - SN229: 8-port analog line circuit pack (Traditional Module)

Figure 3-6 shows the switched analog dial access configuration for PPG 0.



**NOTES:**

1. Set 8 switches on front of 2224 CEO modem for adjunct-side down.  
Initialize 2224 CEO modem for switch-side as follows:
  - Connect the modem to COM1 port on the 6286 WGS PC (see figure 3-7 for PPG1) using the 2721-28E cable.
  - On PC type 'imodem 2224ceo.mnp' and set 8 switches on front of 2224 CEO modem per instructions (see Manager II MS-DOS Version Operation Manual 555-104-505).
2. The Remote Manager II, III, or IV shown in figure 3-5 for RMATS 1 could connect to PPG 0 via a DID trunk and CP.
3. See figure 3-8 for the actual pin-to-pin connections between the 103A connecting block, wall field and ADU connector.
4. For unduplicated systems, ignore connections to CC1.

**Figure 3-6. PPG 0: Switched Analog Dial Access**

## PPG 1: Non-Switched Direct Access

### Functionality

This port provides access to the system through the DTS. This port offers access to SSBs on the DTS and to broadcast messages from the DTS as well as improved FASTMAAP performance. It also provides access to the offline processor via the non-switched direct connection to the second PPG 1 port in a duplicated system. It does not provide access to the DP.

Because this port is used to display broadcast messages from the DTS, a non-switched direct connection is used.

### Usage

This port is used for local administration and maintenance of the system by Manager II. The Manager II PC comes with the switch and can be shared by both the customer and AT&T services personnel.

### Equipment Requirements

#### Adjunct-side:

- PEC 2169-004 Z3A4 ADU consisting of Z3A2 ADU and M8AJ-87 cord (see *Z3A Asynchronous Data Unit Product Manual 555-401-708*).
- PEC 21691 ADU power consisting of 2012D power transformer, 248B adapter, 400B2 adapter, and D6AP-87 power cord
- PEC 2750-A30 451A adapter
- PEC 2725-07G D8W-87 cord (2)
- PEC 2750-D08 103A connecting block

Note: Two of each of the above items are required for a duplicated system.

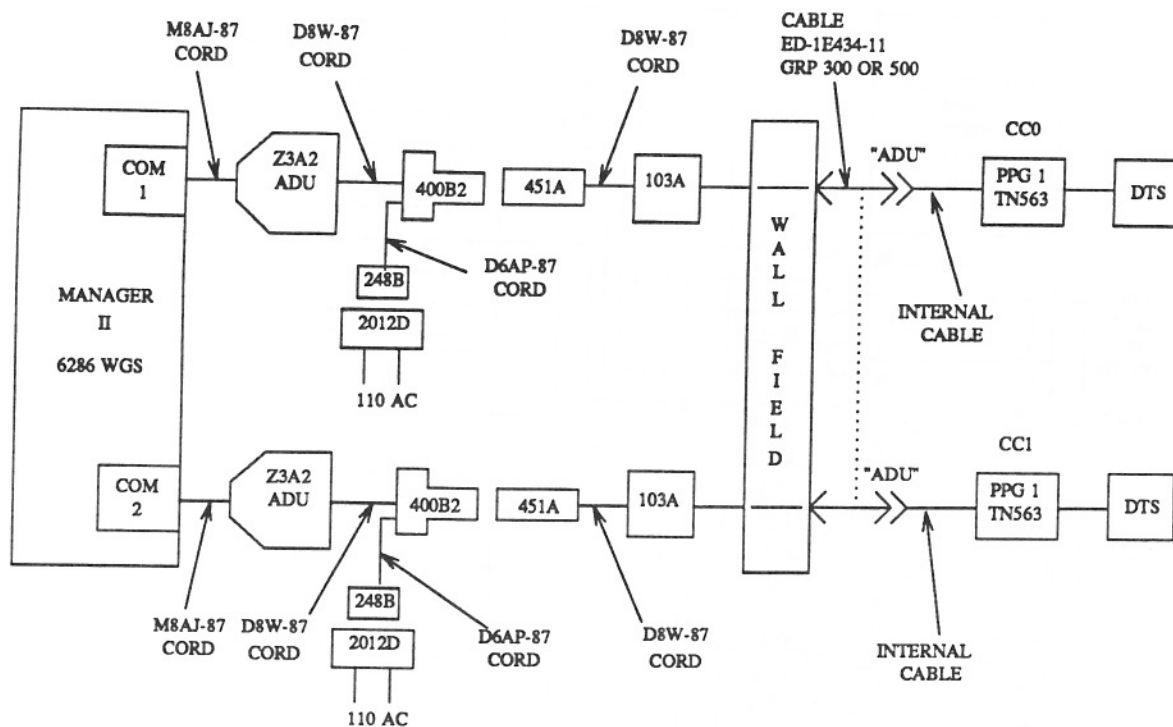
- PEC 3709-243: 6286 WGS PC with 1MB RAM, 20MB hard disk, 3 1/2" floppy disk drive, VDC-400 CGA adapter, monochrome monitor (color optional but preferred), keyboard and one serial port. For duplicated systems, a second serial port board (COMCODE 405660457) is required. MS-DOS™ Version 3.2 or 3.3, Manager II MS-DOS Version 0.12 or later (PEC 1204-100), and SSB Version 1.0 (PEC 65511 must be installed on the PC. *Manager II MS-DOS Version Operations Manual, 555-104-505*, explains installing Manager II and SSB files.

#### System-side:

- ED-1E434-11 Group 300 cable with old wall field, or group 500 cable with new wall field for a duplicated or unduplicated system. (This cable also appears in figure 3-6 for PPG 0.)

Figure 3-7 shows the non-switched direct access configuration for PPG 1.





## NOTES:

1. See figure 3-8 for the actual pin-to-pin connections between the 103A connecting block, wall field and ADU connector.
2. Connect PPG 1 to "ADU" connector by connecting "JADUB" connector to "PADUB" connector as noted in step 19 of Installing the DTS earlier in this chapter.
3. For unduplicated systems, ignore connections from COM2 to CC1.

Figure 3-7. PPG 1: Non-Switched Direct Access

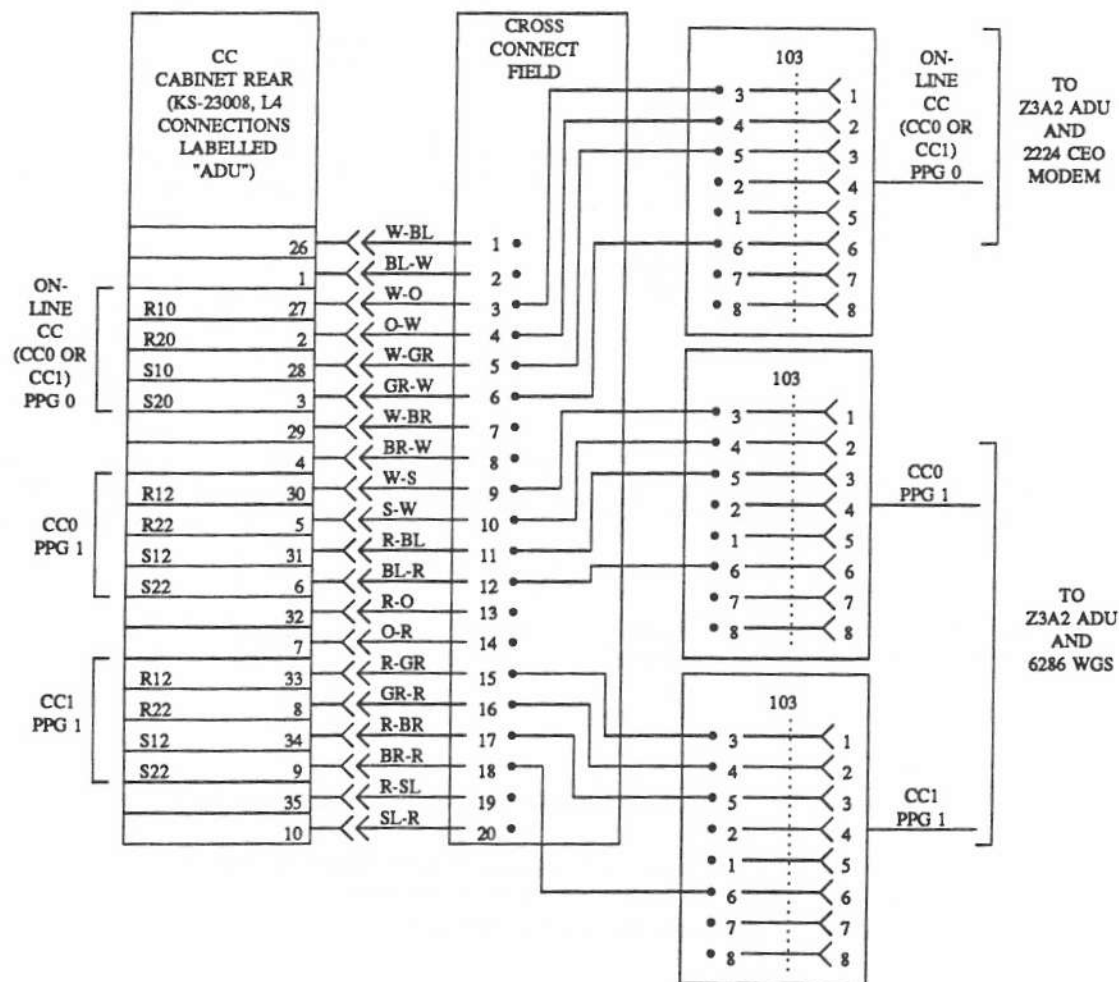


Figure 3-8. ADU Rear Connector and 103 Connections at Cross Connect Field: Duplicated System

### Verifying Manager II System Connectivity

After connecting the Manager II PC to the system and installing the Manager II software, verify that the Manager II can be used to administer and maintain the system by completing the following procedures:

#### Unduplicated Systems:

1. Power-up the PC.
2. Start Manager II by typing *mgrii*.
3. Log into Manager II by typing *tech*.
4. Connect to the system by typing *con cc0*.
5. Set the administration, maintenance, and tape switch modes by typing *I23*.

6. Access Procedure 600 to display alarms by typing *p600 x*.
7. Disconnect from the system by typing *disc*.
8. Exit Manager II by typing *quit*.

**Duplicated Systems:**

1. Power-up the PC.
2. Start Manager II by typing *mgrii*.
3. Log into Manager II by typing *tech*.
4. Connect to the first common control in the system by typing *con cc0*.
5. Set the administration, maintenance, and tape switch modes by typing *123*.
6. Access Procedure 600 to display alarms on CC0 by typing *p600 x*.
7. Connect to the second common control in the system by typing *con cc1*.
8. Set the administration, maintenance, and tape switch modes by typing *123*.
9. Access Procedure 600 to display CC1 alarms by typing *p600 x*.
10. Disconnect from both common controls by typing *disc* twice.
11. Exit Manager II by typing *quit*.

**NOTE:** Enter commands from the keyboard exactly as written in these procedures.

This completes the DEFINITY Communications System hardware upgrade procedure. Notify the CSSO and the customer that this portion of the system upgrade is complete. The next step is the software upgrade procedure described in Chapter 4.

*Upgraded hardware must run alarm-free before you upgrade the software.*

**Reactivating Feature Translations**

Refer to *Feature Translation Updates* in chapter 4 for a list of the features requiring reactivation or reprogramming after the hardware upgrade.

**NOTE:** If you are upgrading the hardware and software concurrently, do not update the feature translations until after completing the software upgrade procedures. Refer to chapter 4 for both software upgrades and feature translations.



## 4. DEFINITY GENERIC 2 AND SYSTEM 85 SOFTWARE UPGRADES

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Before proceeding with the software portion of the system upgrade, you must have completed the following:

- The translation recovery procedure described in chapter 2.
- All prescribed CNs

NOTE

CN 286DR (SN441-V20, comcode 105460257), which may not be listed in the Index, must be completed before you load and upgrade the software.

- An inventory of the documentation and equipment listed in the corresponding hardware upgrade procedure
- An upgrade of the switch hardware, running alarm free. Refer to chapter 3 for hardware upgrade procedures.
- Verification of the software PECs for the respective upgrade (PEC 65464 for R2V2, PEC 65465 for R2V3, PEC 65466 for R2V4, or PEC 65567A for G2)

There are two software upgrade procedures: one for single common control (CC) systems and one for duplicate CC systems. These procedures are similar for all R2 versions, therefore they are described only once with version-specific changes noted as necessary. Refer to the *System 85 R2 Software Upgrade Procedure Flowchart* in Appendix C for a graphic representation of this procedure.

Do *not* try to shorten the process. Run all prescribed tests and microdiagnostics. Clear alarms as you go and do not hesitate to escalate problems when results are unsatisfactory.

### CHECKING FOR SOFTWARE FIELD UPDATES

Use PROC 490 to determine if there are field updates installed on the system to be upgraded. These field updates are created to correct particular software problems. They are later incorporated into subsequent software loads. If there are field updates on the current tape, they must be included in the target-version customer upgrade tape. The factory provides the most current issue of the target-version tape without software field updates. TAC must arrange to have the field updates reinstalled after the software upgrade is complete if the field updates have not been incorporated in the target version software.

System specific information regarding field updates can be found in the EDI and ISCN documentation for your system. Contact your AT&T account team representative for EDI and ISCN document information.

## SWITCH/212 DATA SET CONSIDERATIONS

The following switch settings are the only options that can be used on the 'INADS' 212 data set. Deviations from these options may result in common-control hard switches.

TABLE 4-1. 212 AR Data Set Switch Settings

SWITCH 1	1	2	3						
	C	O	C						
SWITCH 2	1	2	3	4	5	6	7	8	9
	C	O	O	O	O	C	C	O	O
SWITCH 3	1	2	3	4	5	6	7	8	
	C	O	C	O	O	O	C	O	
SWITCH 5	1	2							
	O	O							

C = Closed

O = Open

Descriptions of these switch setting are located on the underside of each 212 data set module.

## SWITCH SUPPORT BASE INSTALLATION

1. Install MANAGER II on the personal computer (PC) - (if appropriate).  
See DEFINITY™ Manager II MS-DOS® Version Operation Manual (555-104-505).
2. Load EFC data onto hard disk of MANAGER II vehicle - (if appropriate).

**NOTE**

The command "get" may be used to update the SSB via the PPG port. See the DEFINITY Manager II Operations Manual (555-104-505) for more information.

- Using your MANAGER II vehicle (PC), define a DOS variable named "SSB" that points to the directory where you want the SSB files to be installed. You may wish to place the declaration in your autoexec.bat file.
- Insert the first floppy diskette in an available drive. Make that drive the current drive.
- Change the default drive to the diskette drive that has diskette #1 loaded. Assuming the current drive is C: and diskette #1 is inserted in A, type (A) and press (RETURN)
- To install the new SSB from diskettes, type (ssbmg) and press (RETURN)  
This will invoke the SSB Manager. This process replaces the old SSB installation process.
- From SSB Manager's Main Menu, press (F1) to begin the installation of the new SSB.
- After the installation of the new SSB has completed, press (F8) to terminate the SSB Manager.

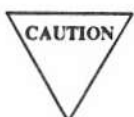
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## MANAGER II

Ensure that Manager II is connected to the switch. See *Installation and Upgrade* manuals 555-104-104 Issue 1 or greater.

## UPGRADE PROCEDURE FOR SINGLE CC SYSTEMS

Notify the customer that during the upgrade process their System 85 service will be impaired. Arrange for alternate service, if requested. Also, advise the serving TSC of the upgrade.



If the following procedure is not followed precisely, the switch will not be initialized correctly.

1. Save the current translations by executing a RUNTAPE on both the currently installed system tape and the backup tape. Ensure the RUNTAPE executes alarm-free on both tapes.

*This is an extremely critical step because it provides backup tapes in case of a failure when you load the target-version software.*

2. When each RUNTAPE is successful, remove the tape copy from the drive and store it.
3. Access the Mode Procedure, if necessary, to give control to the local Manager II. Set fields 1, 2 and 3 to 1.
4. Insert the target-version software tape cartridge into the disk/tape subsystem (DTS) drive.
5. Depending upon whether the switch has traditional or universal modules, load the target-version software into switch memory. Use the appropriate procedure below.

### If The Switch Does Not Have Universal Modules

- a. Run microdiagnostics 9, 12 and 15 in the common-control.

The contents of the tape will be automatically loaded into the common-control memory when microdiagnostic 15 is run.

- b. Wait until the common-control has had a normal pass lamp for a **minimum of five minutes** before proceeding to Step 6, Clear Alarm History.

### If The Switch Has Universal Modules

The following steps must be performed for correct initialization of status memory and the TN590s.

- a. Turn **OFF** the carrier converters for sixty seconds in the common-control, then turn them back on **in descending order** (i.e., CB3, CB2, CB1).

When there is a normal pass lamp, (approximately 5 minutes), service will be restored.

The cold start initialization, due to the loss of power, will result in a service outage for **approximately five minutes**. The service disruption is necessary in order for the following to occur:



- TN590s upgraded. During the upgrade of the TN590s, the pass lamp on the common-control will halt and the green LED on the TN590s will flash green for approximately 2 minutes. The common-control will then resume normal initialization.
  - Common-control memory updated from disk.
  - Status memory initialized.
- b. Ensure that the TN590s have been upgraded correctly.
- The firmware vintage of the downloaded firmware can be examined in Procedure 621 Test 5:
- Access Procedure 621, Test 5 via MANAGER II.
  - Enter the equipment location of the TN590 in fields 3-5 and enter "DISPLAY" "EXECUTE".
  - The module processor firmware vintage (fields 15 and 16) and the main memory firmware image vintage (fields 17 and 18) should be the same.
6. Clear the alarm history. Use Procedure 612 to clear all maintenance data from the PMIDS error log. Record and investigate each entry before you delete the data.
- Use the MAAP to access Procedure 612, Test 1 (Initialization Causes).
  - Enter "99" in field 1.
  - Enter "CLEAR DATA" "EXECUTE" to delete all maintenance data from the PMIDS error log.
  - The "WAIT" indicator appears on your screen until the data is cleared.
  - When the process has completed, field 10 will contain a zero and all the other fields will be dashed. All lighted fault indicators and the MAJOR, MINOR, and WARNING alarm indicators are turned off.
7. Translation Checks. After the target-version software has been loaded, the customer may want to make changes that have occurred during the freeze interval. After any changes have been made do another RUNTAPE.

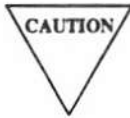
**NOTE**

Systems that have a large number of terminals with headsets and prime line preference or a large number of auto-available agents may experience slow dial tone for the first few minutes after the upgrade.

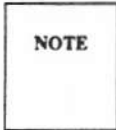
If the upgrade cannot be completed due to problems experienced or if problems are experienced after completing the upgrade, follow the standard technical escalation procedure.

**UPGRADE PROCEDURE FOR DUPLICATE CC SYSTEMS**

Notify the customer that during the upgrade their System 85 service will be impaired. Arrange for alternate service, if requested. Also, advise the serving TSC of the upgrade.



Follow the procedures below exactly or the system will not be initialized correctly.



During the upgrade of a duplicated common control switch with CMS, administration modifications via the CMS terminals must be prevented. Any modifications made during the upgrade can result in an ERROR CODE 99 or a memory mismatch.

Administration changes can be blocked by doing one of the following:

1. Busy out the CMS link. (This will result in a loss of CMS data for the duration of the upgrade).
2. Log off the CMS terminals. (This will not cause a loss of data, however, no administration changes can be done for the duration of the upgrade).



During the upgrade procedure, the system will not process calls for up to five minutes while the CC is updating its status memory from the module processors. All calls will be dropped if any universal modules are present.

1. Save current translations by executing RUNTAPE on both the currently installed system tapes (for both CCs). Ensure that the RUNTAPE executes alarm free on all tapes.

**This is an extremely critical step because it provides backup tapes in case of a failure when you load the target-version customer upgrade tape.**

2. When the RUNTAPE is successful, remove the tapes from the drive and store them.
3. Access the Mode Procedure, if necessary, to give control to the local (ON-LINE) Manager II. Set fields 1, 2 and 3 to 1.
4. If CC0 is not currently online, soft switch into CC0.
5. Prepare to re-load CC1 memory by inserting the target-version software tape cartridge into the DTS associated with the CC1 common-control. Using the LOCK ON LINE switch, lock CC0 online by setting the switch to CC0 common-control online.
6. Run microdiagnostics 9, 12 and 15 on the CC1 common-control.

The contents of the tape will automatically be loaded into the CC1 memory when microdiagnostic 15 is run.

Wait until the CC1 common-control has had a normal pass lamp for a minimum of five minutes. This allows for complete initialization of the system.

In the steps below (7 through 15), steps 8 and 9 apply to universal modules only. If the system contains traditional modules only, skip steps 8 and 9.

## NOTE

Steps 7 through 15 must be performed for correct initialization of status memory and TN590s: Since this will cause a service disruption, read all the steps before continuing:

7. Once the CC1 common-control has been loaded, and has had a normal pass lamp for a minimum of five minutes, switch the LOCK ON LINE switch to the CC1 common-control and HALT the CC0 common-control.
8. Turn OFF the carrier converters for sixty seconds in the CC1 common-control, then turn them back on in descending order (i.e., CB3, CB2, CB1).

When there is a normal pass lamp, (approximately five minutes), service will be restored.

The cold start initialization, due to the loss of power, will result in a service outage for approximately five minutes. The service disruption is necessary in order for the following to occur:

- TN590s upgraded. During the upgrade of the TN590s the pass lamp on the common-control will halt and the green LED on the TN590s will flash green for approximately 2 minutes. The common-control will then resume normal initialization.
- CC1 common-control memory updated from disk.
- Status memory initialized.

9. Ensure that the TN590s have been upgraded correctly.

The firmware vintage of the downloaded firmware can be examined in Procedure 621 Test 5.

- Access Procedure 621 Test 5, via MANAGER II
- Enter the equipment location of the TN590 in fields 3-5 and enter "DISPLAY" "EXECUTE".
- The module processor firmware vintage, (fields 15 and 16), and the main memory firmware image vintage, (fields 17 and 18), should be the same.

10. Return the HALT/GO switch to the go position on the CC0 common-control.

## NOTE

Systems that have a large number of terminals with headsets and prime line preference or a large number of auto-available agents may experience slow dial tone for the first few minutes after the upgrade.

11. Insert a target-version tape into the DTS associated with the CC0 common-control.
12. Run microdiagnostics 9, 12 and 15 in the CC0 common-control

The contents of the tape will automatically be loaded into the CC0 common-control memory when microdiagnostic 15 is run.

13. Wait until the CC0 common-control has had a normal pass lamp for a minimum of five minutes. This allows for complete initialization of the system.
14. Switch the LOCK ON-LINE switch to the OFF position.
15. If the error lamp is lit as a result of a memory mismatch during the initial load of the target-version tape, extinguish the lamp using the following procedure:

- 
- Use Manager II to access PROCEDURE 614 Test 1 (MEMORY READ/MEMORY MATCH TEST).
  - Type 'NEXT FAULT' until failure code 1 (MEMORY MISMATCH) appears in field 8.
  - Use 'CLEAR DATA' to retire the alarm.

If no other problems exist with the system's memory, the error lamp will remain extinguished. If the error re-appears, investigate the cause of the failure.

16. Clear the alarm history. Use Procedure 612 to clear all maintenance data from the PMIDS error log. Record and investigate each entry before you delete the data.
  - Use the MAAP to access Procedure 612, Test 1 (Initialization Causes).
  - Enter "99" in field 1.
  - Enter "CLEAR DATA" "EXECUTE" to delete all maintenance data from the PMIDS error log.
  - The "WAIT" indicator appears on your screen until the data is cleared.
  - When the process has completed, field 10 will contain a zero and all the other fields will be dashed. All lighted fault indicators and the MAJOR, MINOR, and WARNING alarm indicators are turned off.
17. Translation Checks. After the target-version software has been loaded, the customer may want to make changes that have occurred during the freeze interval. After any changes have been made do another RUNTAPE.



## **5. SYSTEM 75/GENERIC 1 H/W UPGRADES TO DEFINITY GENERIC 2**

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This chapter presents specific hardware upgrade procedures for upgrading a System 75 R1V1,2,3 or Generic 1 large cabinet system to a DEFINITY® Communications System Generic 2 universal module.

**NOTE:** System 75 and Generic 1 XE, System 75 and Generic 1 small cabinet configurations require a full cabinet change out. Port Carriers, port circuit packs and power units can, however, be reused.

The following sections provide specific procedures for each of these upgrades. In addition, the process for initiating these upgrades is described.

### **THE UPGRADE PROCESS: AN OVERVIEW**

Two upgrade arrangements exist: field upgrades and retrofit center upgrades at the Denver Service Center. Upgrading through the retrofit center is the recommended arrangement. Retrofit center upgrades provide the following advantages over converting the equipment in the field:

- Upgraded universal modules are built and tested before they are installed in the field
- Provides duplicate service for customers with systems in multiple locations or for critical service areas
- Provides standard Methods and Procedures for all upgraded modules
- Makes possible a more efficient and more timely on-site installation
- Ensures that no additional charge is incurred for duplicate service, provided that the equipment is returned within ten days.

### **Retrofit Center Upgrade Process**

All System 75 and Generic 1 upgrades to Generic 2 are built, tested, and shipped from the Denver Service Center. The customer must provide the equipment, (if that equipment is not in service) to be upgraded before the process can begin. If the equipment is in service, the customer must agree to ship the upgraded system to the Denver Service Center within ten days after the upgrade is complete. In addition, the customer must ensure that all equipment is maintained in working order, that all equipment is returned to AT&T, and must pay for shipping equipment to the retrofit center in Denver.

The Network Operations Group will inventory the cabinet to be upgraded before the cabinet is de-installed and crated for shipping. This inventory must agree with the upgrade configuration.

All System 75 and Generic 1 equipment removed and not re-installed as part of the upgrade becomes the property of AT&T.

The target interval for systems shipped from the Denver Service Center is six weeks.

### Field Upgrade Process

The overall process for upgrading an AT&T System 75 to an AT&T DEFINITY Communications System module from the field is the same. It includes the following general steps:

1. Marketing places a Delivery Operating Support System (DOSS) order for both the hardware and software upgrade Price Element Codes (PECs).
2. Once notified of the order, services checks the *Reference Guide for Change Notices and Circuit Pack Vintages* for any outstanding change notices (CNs). If there are one or more unimplemented CNs, services orders the required materials and completes them.
3. Field Service Operations (FSO) receives the order, verifies that all the components defined by the upgrade PECs for both hardware and software are included in the order, and resolves any discrepancies.
4. FSO performs the version-specific hardware upgrade procedures as described in the following sections.

All hardware replaced by upgraded hardware must be returned to the Material Management Services Organization (MMS). The cost of the upgrade assumes the return of these parts.

5. FSO performs the software upgrade procedures as described in chapter 4.

Hardware upgrade procedures for both retrofit center and field upgrades are described in detail in the following subsections.

*Do not try to shorten the process. Run all prescribed tests and microdiagnostics. Clear alarms as you go and do not hesitate to escalate problems when results are unsatisfactory.*

---

**UPGRADING SYSTEM 75 R1V1,V2,V3 TO DEFINITY COMMUNICATIONS SYSTEM**

1. Ensure that all applicable CNs listed in the "Reference Guide for Change Notices and Circuit Pack Vintages" are complete. Contact your CSSO CN coordinator with any questions before proceeding.
2. Is the system powered up? If not, skip this section.
3. If the system is powered, ensure that it is running alarm free.

Proceed with the upgrade by taking inventory of the following items:

- Required documentation and equipment
- Hardware and software PECs

Required documentation and equipment, and the actual System 75 hardware upgrade procedure, are described in the following subsections.

**Required Documentation and Equipment**

The following documentation and equipment must be on site before you upgrade the System 75 hardware:

- One copy of *AT&T System 75 Wiring* (555-200-111)
- One copy of *AT&T System 75 Upgrades and Additions* (555-200-106)
- One copy of *DEFINITY Communications System Generic 2 and System 85 Installation* (555-104-104) Issue 1

**SYSTEM 75 R1V1,V2,V3 HARDWARE UPGRADES TO DEFINITY Generic 2**

The following sections present the steps necessary for upgrading an AT&T System 75 R1V1, R1V2, or R1V3 to DEFINITY Communications System.

The first section presents *unduplicated to unduplicated* system upgrades while the second presents *unduplicated to duplicated*.

Only Generic 1 allows the two cabinet system scenario. Therefore, only the Generic 1 section addresses upgrades *from* a duplicated common control configuration.

**Unduplicated to Unduplicated**

Figure 5-1 shows Universal Module cabinet configuration and carrier levels.



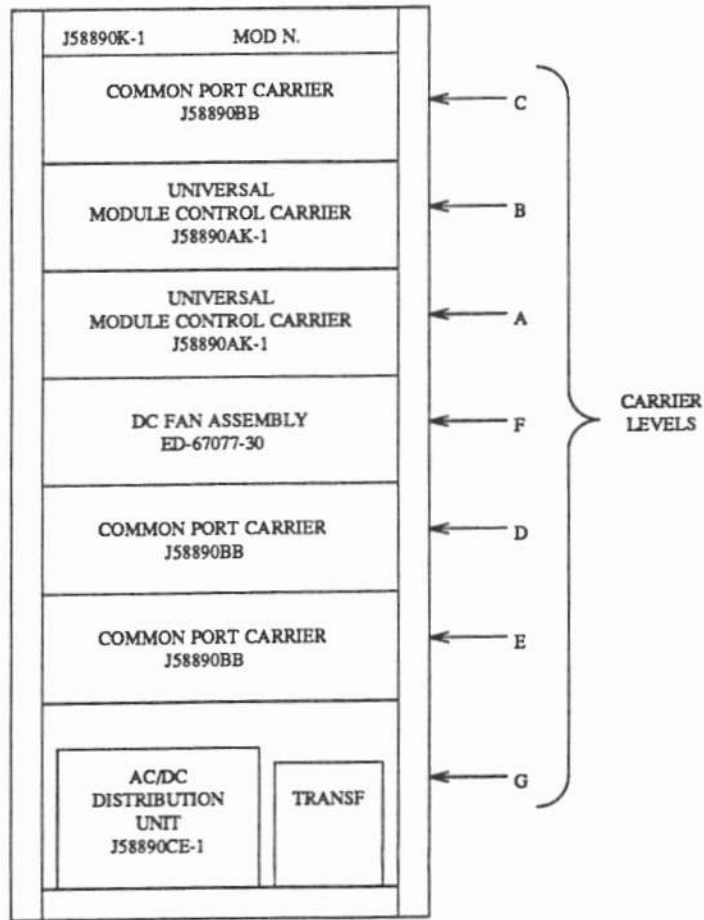


Figure 5-1. Universal Module Cabinet Configuration

1. For field upgrades, advise the serving CSSO of the upgrade.
2. For field upgrades, power off the system as follows:
  - A. At the maintenance board, set the EMERGENCY TRANSFER CONTROL switch to ON. This locks the system in the transfer mode.
  - B. At the power distribution unit, set the main AC circuit breaker to OFF.
  - C. Disconnect the System 75 main power plug.
  - D. Disconnect the batteries as follows:
    1. At power distribution unit, disconnect battery charger power cord.
    2. Loosen and remove battery door retaining screw.
    3. Open battery door.
    4. Disconnect all battery leads.
3. Determine whether batteries need to be replaced; if so, arrange for replacement batteries.
4. For field upgrades, remove all 25 pair I/O cables from the backplanes of carrier positions A and B. These cables will be used by ports at other carrier levels.
5. Remove cabinet back panels.
6. Remove TDM and HCMR tape drive interface cables (a 50-pin conductor ribbon cable), associated paddleboards, and AHF1 terminators from all carrier levels. Ensure that you have removed every paddleboard from all carriers.
7. Remove either the Removable Mass Storage System (RMSS) or High Capacity Mini-Recorder (HCMR) by following the appropriate procedures detailed below:

Figures 5-2 and 5-3 show the location of both an RMSS and an HCMR in a 75 cabinet.

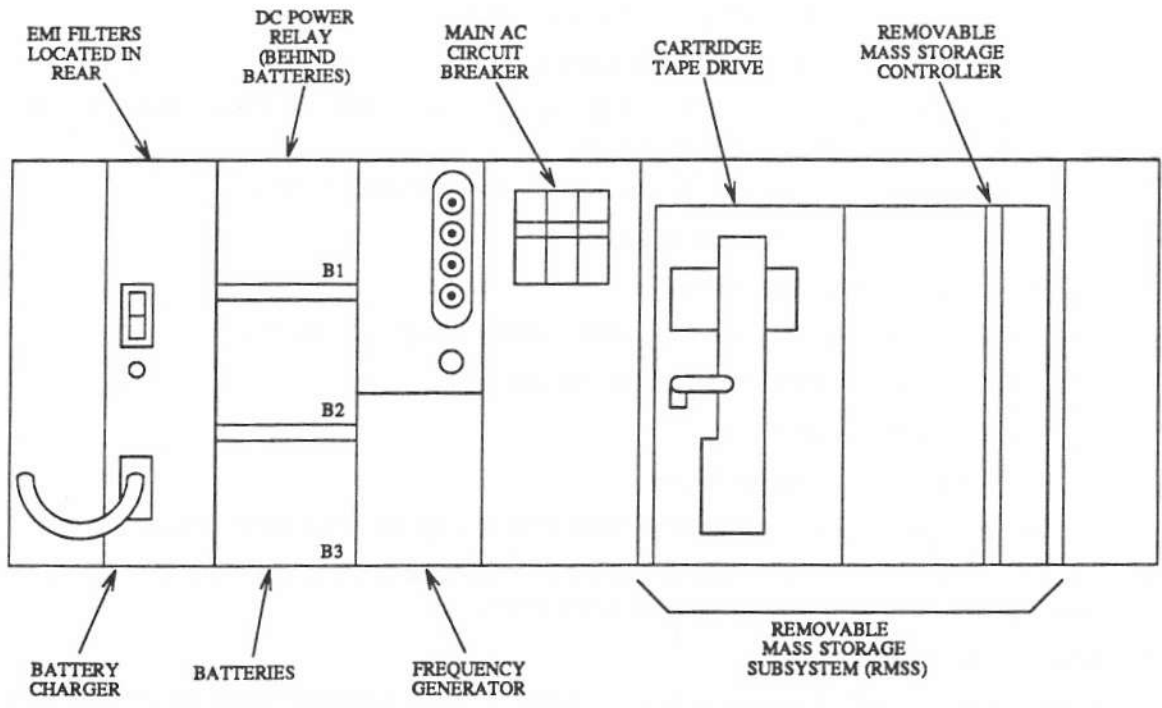


Figure 5-2. Power Distribution Unit (Cover Removed) - With RMSS

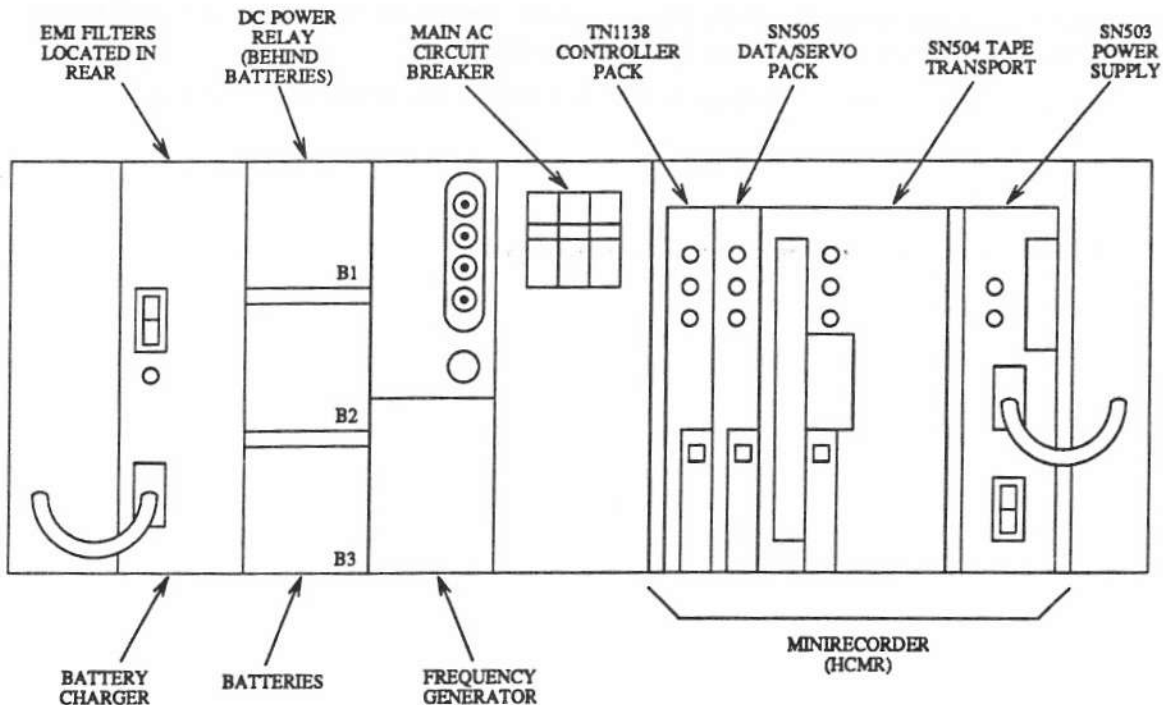


Figure 5-3. Power Distribution Unit (Cover Removed) - With HCMR

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*Removing the RMSS From a System 75 Cabinet*

- A. Disconnect RMSS power cable as follows:
  1. Remove the J3 (red wire) connector from the rear of the control carrier at slot 22, pins 341, 342, and 343. To ensure you have located the correct connector, look for a gap at pin 344 between the black wire and red wire connectors J2 and J3.
  2. Remove the J2 (black wire) connector from the rear of the control carrier at slot 22, pins 345, 346, and 347.
  3. At the RMSS, disconnect the J1 connector from the CBH1 (P4) connector.
- B. Remove the RMSS ribbon signal cable. This cable runs between the RMSS and the AHF4 connector at slot 07 of the control carrier rear.
- C. Place loose RMSS cables in a secure location.
- D. Remove the RMSS mounting screws and store them with the RMSS cables.
- E. Slide out RMSS unit and place it in a secure location.

*This completes the RMSS removal procedure.*

*Removing the HCMR From a System 75 Cabinet*

- A. Disconnect the other end of the HCMR ac power cord from the connecting block (slip on connectors) and completely remove cord.
- B. Remove the front and rear mounting screws from the bottom of HCMR mounting brackets.
- C. Remove the HCMR mounting brackets, located at the rear of the cabinet.

*This completes the HCMR removal procedure.*

8. Remove nomenclature panels from all carriers.
9. Remove power units for carrier levels A and B.
10. Remove all port circuit packs and control packs not required for G2, based on your configuration document. Remove these packs from *all* carrier levels.

Remove all existing port circuit packs from carrier levels A and B.

Take precautions against static damage to circuit packs when removing and replacing them. Store circuit packs in anti-static bags if possible.

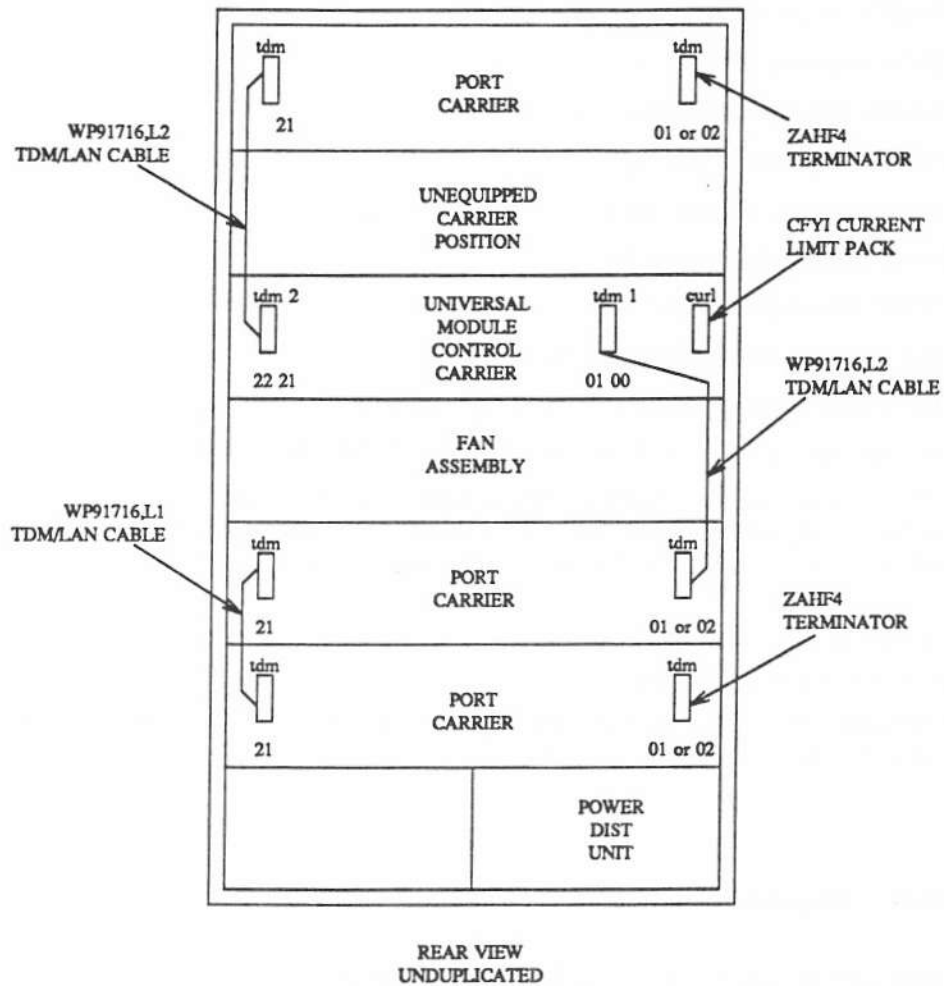
11. Disconnect P1 and P2 cables from control carrier (level A) and port carrier (level B).
12. Disconnect ground straps between carrier levels A and B, B and C, and A and D. Leave ground straps attached to the D-level carrier. Eight ground straps are associated with both levels.
13. Remove J58890AA Control Carrier in level A and replace it with J58890AK module control carrier .

14. Remove and relocate J58890BB port carrier located in carrier level B to carrier levels C, D, or E.
  - *Installing additional port carriers:*

If all existing port slots are used, install a new J58890BB port carrier in the first available carrier level.

**NOTE:** *Port capacity of universal module cabinets:*

The DEFINITY Communications System module cabinet supports up to three J58890BB port carriers. Again, if port capacity beyond three levels is required, install an additional J58890K universal module cabinet using the instructions in *DEFINITY Communications System Generic 2 and System 85 Installation, 555-104-104*. A multi-module system requires a TMS.
15. Replace nomenclature panels and carrier labels where required.
16. If necessary, remove and clean or replace fan filters between carriers prior to installing the new carriers.
17. Reconnect P1 and P2 cables for Universal Module control carrier in level A and P1 connector for re-located or added J58890BB port carrier(s).
18. Reconnect ground straps for all carriers affected.
19. Add new WP91112 (or 91716) TDM/LAN buss cables and ZAHF4 terminators to all appropriate carrier levels.



**Figure 5-4.** TDM/LAN Buss Terminators and Current Limiter Placement

For older port backplanes, gently seat the connectors into position on the backplanes. Take care not to seat the connectors further than 1/4 inch onto the backplane pins. Do not attempt to press the connectors flush with the backplane panel.

20. Add new Current limiter pack CFY1 to the rear of module control carrier 0 at level A, designated CURL, at the far right side of the the backplane.

Install only one CFY1 pack per cabinet. **Install this circuit pack in carrier level A only.**

21. Install the following new module control circuit packs:

**NOTE:** Attach your wrist strap before handling circuit packs and replace the covers on the carriers after inserting the new packs.

- TN401B control channel (1)
  - TN441 intermodule data (1)
  - TN444B maintenance interface (1)
  - TN445 TSI program store (1)
  - TN446 time slot interchanger (1)
  - TN481 light guide interface (1)
  - TN580 module processor (1)
  - UN154 hybrid module processor (1)
22. Add port circuit packs as specified in your configuration document.
  23. Add and relocate I/O cables to level A and new level(s) for port carrier(s).
  24. For field upgrades, add DEFINITY Communications System Common Control and TMS cabinets and install cabling and ductwork between cabinets. These procedures are the same as for new installations, which are described in *DEFINITY Generic 2 and System 85 Installation, 555-104-104*.
  25. Replace System 75 console with DEFINITY Communications System Generic 2 console. This requires recabling to the console.

This completes the System 75 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete.

### Unduplicated to Duplicated

1. For field upgrades, advise the serving CSSO of the upgrade.
2. For field upgrades, power off the system as follows:
  - A. At the maintenance board, set the EMERGENCY TRANSFER CONTROL switch to ON. This locks the system in the transfer mode.
  - B. At the power distribution unit, set the main AC circuit breaker to OFF.
  - C. Disconnect the System 75 main power plug.
  - D. Disconnect the batteries as follows:
    1. At power distribution unit, disconnect battery charger power cord.
    2. Loosen and remove battery door retaining screw.
    3. Disconnect all battery leads.
3. Determine whether batteries need to be replaced; if so, arrange for replacement batteries.
4. For field upgrades, remove all 25 pair I/O cables from the backplanes of carrier positions A and B. These cables will be used by ports at other carrier levels.
5. Remove cabinet back panels.

6. Remove TDM and HCMR tape drive interface cables (a 50-pin conductor ribbon cable), associated paddleboards, and AHF1 terminators from all carrier levels. Ensure that you have removed every paddleboard from all carriers.
7. Remove either the Removable Mass Storage System (RMSS) or High Capacity Mini-Recorder (HCMR) by following the appropriate procedures detailed below:

Figures 5-5 and 5-6 show the location of both an RMSS and an HCMR in a 75 cabinet.

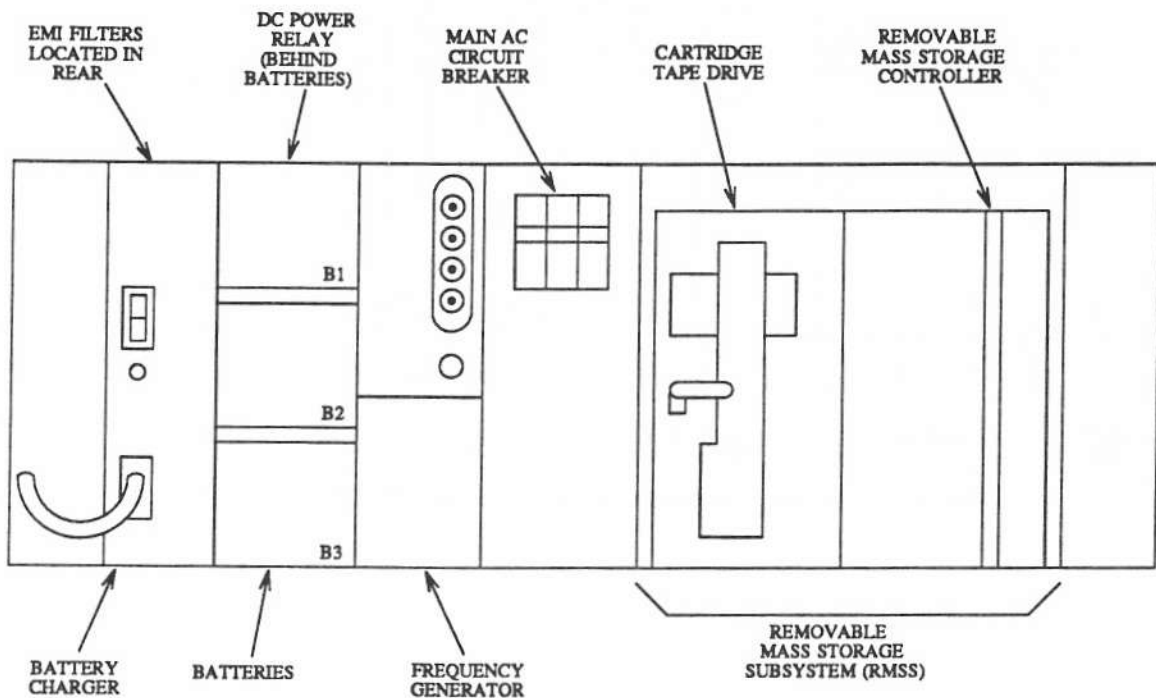


Figure 5-5. Power Distribution Unit (Cover Removed) - With RMSS



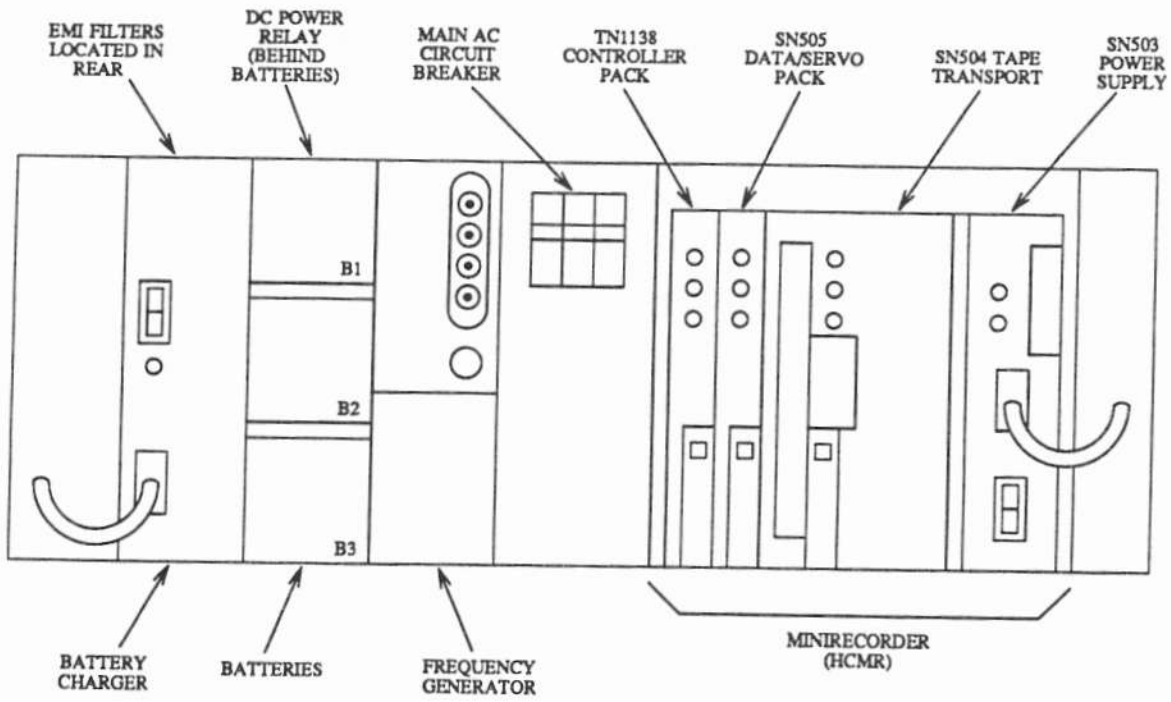


Figure 5-6. Power Distribution Unit (Cover Removed) - With HCMR

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*Removing the RMSS From a System 75 Cabinet*

- A. Disconnect RMSS power cable as follows:
  1. Remove the J3 (red wire) connector from the rear of the control carrier at slot 22, pins 341, 342, and 343. To ensure you have located the correct connector, look for a gap at pin 344 between the black wire and red wire connectors J2 and J3.
  2. Remove the J2 (black wire) connector from the rear of the control carrier at slot 22, pins 345, 346, and 347.
  3. At the RMSS, disconnect the J1 connector from the CBH1 (P4) connector.
- B. Remove the RMSS ribbon signal cable. This cable runs between the RMSS and the AHF4 connector at slot 07 of the control carrier rear.
- C. Place loose RMSS cables in a secure location.
- D. Remove the RMSS mounting screws and store them with the RMSS cables.
- E. Slide out RMSS unit and place it in a secure location.

*This completes the RMSS removal procedure.*

*Removing the HCMR From a System 75 Cabinet*

- A. Disconnect the other end of the HCMR ac power cord from the connecting block (slip on connectors) and completely remove cord.
- B. Remove the front and rear mounting screws from the bottom of HCMR mounting brackets.
- C. Remove the HCMR mounting brackets, located at the rear of the cabinet.

*This completes the HCMR removal procedure.*

8. Remove nomenclature panels from all carriers.
9. Remove power units for carrier levels A and B.
10. Remove all port circuit packs and control packs not required for G2, based on your configuration document. Remove these packs from *all* carrier levels.

Remove all existing port circuit packs from carrier levels A and B.

Take precautions against static damage to circuit packs when removing and replacing them. Store circuit packs in anti-static bags if possible.

11. Disconnect P1 and P2 cables from control carrier (level A) and port carrier (level B).
12. Disconnect ground straps between carrier levels A and B, B and C, and A and D. Leave ground straps attached to the D-level carrier. For a duplicated system, leave ground straps attached to the C-level carrier as well. Eight ground straps are associated with both levels.
13. Remove J58890AA Control Carrier in level A and replace it with J58890AK Module Control carrier .

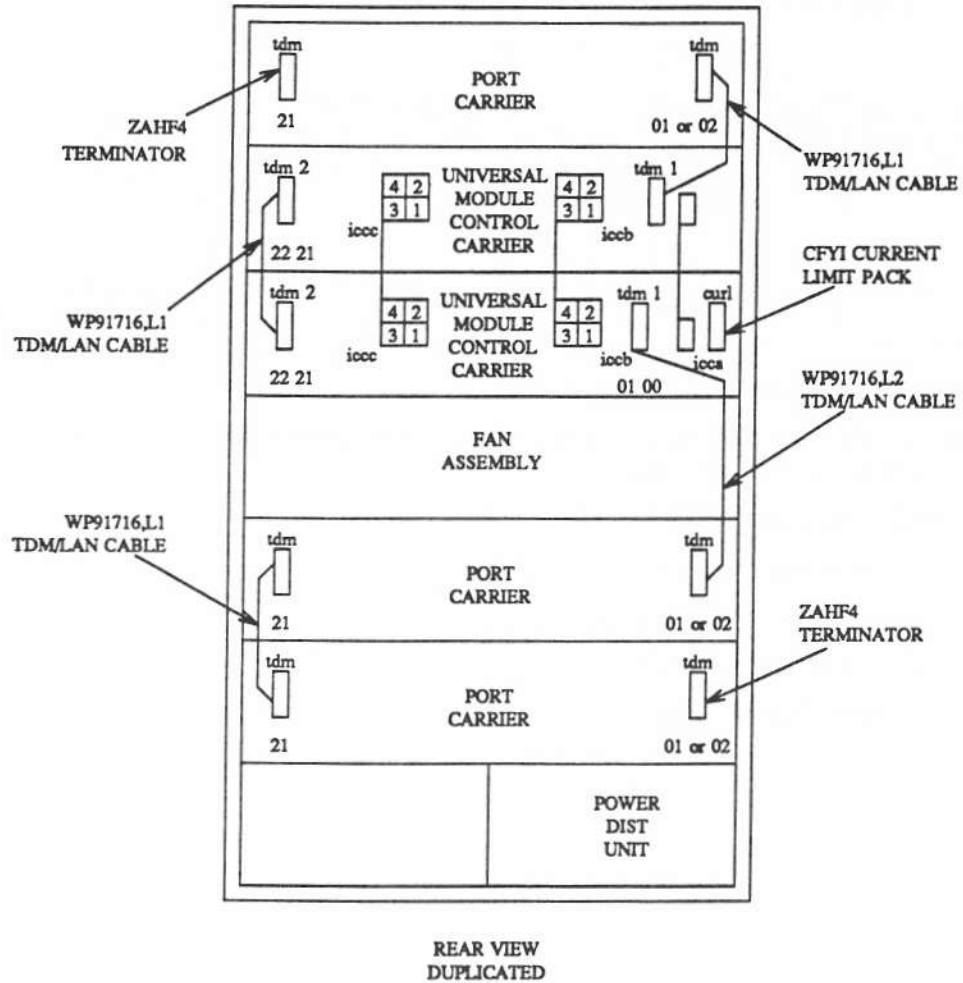
14. Remove and relocate J58890BB port carrier located in carrier level B to carrier levels C, D, or E.
  - *Installing additional port carriers:*

If all existing port slots are used, install a new J58890BB port carrier in the first available carrier level.

**NOTE:** *Port capacity of universal module cabinets:*

The DEFINITY Communications System module cabinet supports up to three J58890BB port carriers. Again, if port capacity beyond three levels is required, install an additional J58890K universal module cabinet using the instructions in *DEFINITY Communications System Generic 2 and System 85 Installation, 555-104-104*. A multi-module system requires a TMS.
15. Add second J58890AK Module Control carrier in level B.
16. Replace nomenclature panels and carrier labels where required.
17. If necessary, remove and clean or replace fan filters between carriers prior to installing the new carriers.
18. Reconnect P1 and P2 cables for Universal Module control carrier in level A and P1 connector for re-located or added J58890BB port carrier(s), and module control carrier in level B.
19. Reconnect ground straps for all carriers affected.
20. Add new WP91112 (or 91716) TDM/LAN buss cables and ZAHF4 terminators to all appropriate carrier levels.

The following figure shows TDM/LAN buss, current limiter, and duplicated cable terminations.



**Figure 5-7.** TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations

For older port backplanes, gently seat the connectors into position on the backplanes. Take care not to seat the connectors further than 1/4 inch onto the backplane pins. Do not attempt to press the connectors flush with the backplane panel.

21. Add new Current limiter pack CFY1 to the rear of module control carrier 0 at level A, designated CURL, at the far right side of the the backplane.  
Install only one CFY1 pack per cabinet. Install this circuit pack in carrier level A only.
22. Install duplication cables as shown in the table below.

**TABLE 5-1. P/O Backplane Universal Module Control 0,1 (Rear View)**

FROM :				TO :		
UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG	CABLE	UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG
0	A	ICCA (1)	H600-198,G1	1	B	ICCA (1)
		ICCB (1) (2) (3) (4)	ED-1E434,G1  ED-1E434,G14			ICCB (1) (2) (3) (4)
		ICCC (1) (2)	ED-1E434,G2 ED-1E434,G1			ICC (2) (1) CAUTION: NOTE CABLE CROSSOVER

## 23. Install the following new module control circuit packs:

**NOTE:** Attach your wrist strap before handling circuit packs and replace the covers on the carriers after inserting the new packs.

- TN401B control channel (2)
- TN441 intermodule data (2)
- TN444B maintenance interface (2)
- TN445 TSI program store (2)
- TN446 time slot interchanger (2)

- TN456 remote module interface (2)
  - TN481 light guide interface (2)
  - TN580 module processor (2)
  - UN154 hybrid module processor (2)
  - TN541 duplication channel (2)
24. Add port circuit packs as specified in your configuration document.
  25. Add and relocate I/O cables to levels A and B, and new level(s) for port carrier(s).
  26. For field upgrades, add DEFINITY Communications System Common Control and TMS cabinets and install cabling and ductwork between cabinets. These procedures are the same as for new installations, which are described in *DEFINITY Generic 2 and System 85 Installation, 555-104-104*.
  27. Replace System 75 console with DEFINITY Communications System Generic 2 console. This requires recabling to the console.  

This completes the System 75 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete.

#### **DUPLICATED TO DUPLICATED**

This arrangement does not apply to System 75 R1V1 through V3.

#### **DEFINITY G1 TO DEFINITY G2 HARDWARE UPGRADE PROCEDURE**

Generic 1 can be a two cabinet configuration. Each cabinet is individually upgraded to a Generic 2 universal module just as System 75 R1V1-V3 cabinets are upgraded in the previous sections. The only difference is associated with the "Duplicated to Duplicated" arrangement, which applies only when upgrading from Generic 1.

#### **UNDUPLICATED TO UNDUPLICATED**

Figure 5-8 shows Universal Module cabinet configuration and carrier levels.

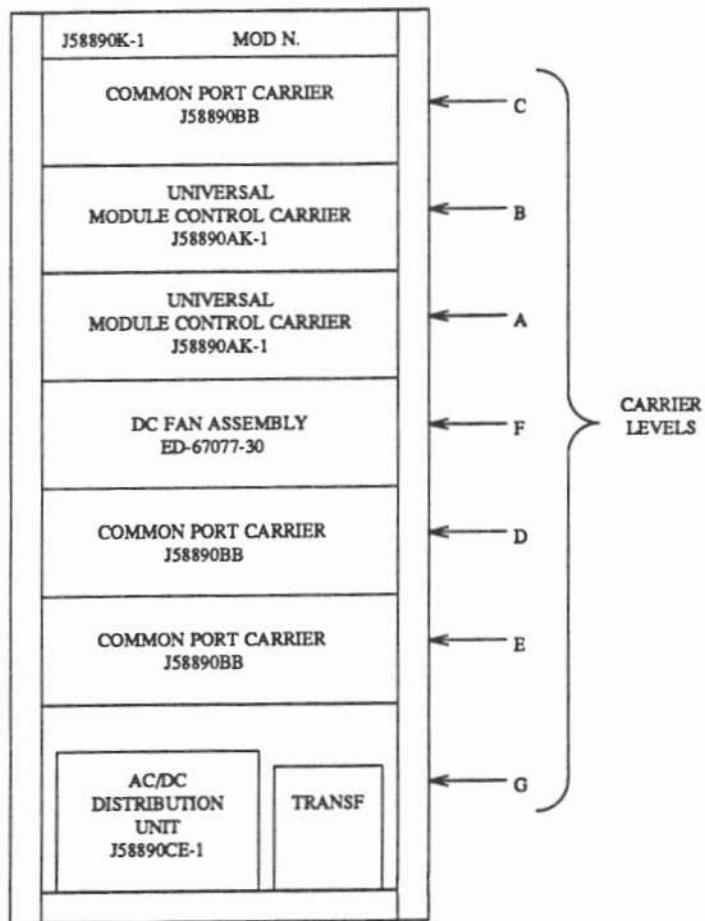


Figure 5-8. Universal Module Cabinet Configuration

1. For field upgrades, advise the serving CSSO of the upgrade.
2. For field upgrades, power off the system as follows:
  - A. At the maintenance board, set the EMERGENCY TRANSFER CONTROL switch to ON. This locks the system in the transfer mode.
  - B. At the power distribution unit, set the main AC circuit breaker to OFF.
  - C. Disconnect the System 75 main power plug.
  - D. Disconnect the batteries as follows:
    1. At power distribution unit, disconnect battery charger power cord.
    2. Loosen and remove battery door retaining screw.
    3. Open battery door.
    4. Disconnect all battery leads.
3. Determine whether batteries need to be replaced; if so, arrange for replacement batteries.
4. Open rear cabinet doors.
5. Remove fiber cables and transceivers, if applicable.
6. For field upgrades, remove all 25 pair I/O cables from the connector panels of carrier positions A and B. These cables will be used by ports at other carrier levels.
7. Remove TDM/LAN cables from carrier levels A and B.
8. Remove nomenclature panels from carrier levels A and B.
9. Remove power units for carrier levels A and B.
10. Remove all port circuit packs and control packs not required for G2, based on your configuration document. Remove these packs from *all* carrier levels.

Remove all existing port circuit packs from carrier levels A and B.

Take precautions against static damage to circuit packs when removing and replacing them. Store circuit packs in anti-static bags if possible.
11. Disconnect P1 and P2 cables from control carrier (level A) and port carrier (level B).
12. Disconnect ground straps between carrier levels A and B, B and C, and A and D. Leave ground straps attached to the D-level carrier. For a duplicated system, leave ground straps attached to the C-level carrier as well. Eight ground straps are associated with both levels.
13. Remove J58890AH or AF carrier in level A and replace it with J58890AK module control carrier
14. Remove and relocate J58890BB port carrier located in carrier level B to carrier levels C, D, or E.
  - *Installing additional port carriers:*

If all existing port slots are used, install a new J58890BB port carrier in the first available carrier level.



**NOTE:** *Port capacity of universal module cabinets:*

The DEFINITY Communications System module cabinet supports up to three J58890BB port carriers. Again, if port capacity beyond three levels is required, install an additional J58890K universal module cabinet using the instructions in *DEFINITY Communications System Generic 2 and System 85 Installation*, 555-104-104. A multi-module system requires a TMS.

15. Replace nomenclature panels and carrier labels where required.
16. If necessary, remove and clean or replace fan filters between carriers prior to installing the new carriers.
17. Reconnect P1 and P2 cables for Universal Module control carrier in level A and P1 connector for re-located or added J58890BB port carrier(s).
18. Reconnect ground straps for all carriers affected.
19. Install WP91112 (or 91716) TDM/LAN buss cables and ZAHF4 terminators to all appropriate carrier levels.

The following figure shows TDM/LAN buss terminator current limiter placement locations.

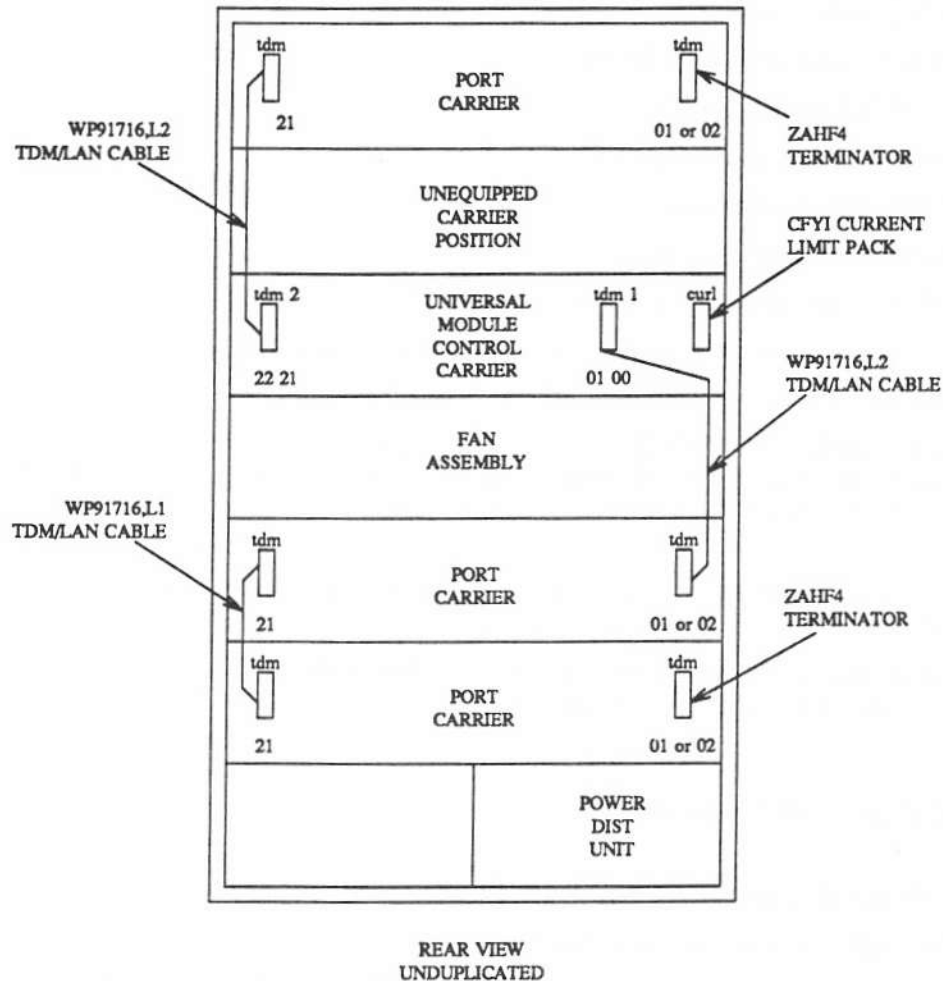


Figure 5-9. TDM/LAN Buss Terminators and Current Limiter Placement

For older port backplanes, gently seat the connectors into position on the backplanes. Take care not to seat the connectors further than 1/4 inch onto the backplane pins. Do not attempt to press the connectors flush with the backplane panel.

20. Reinstall current limiter pack CFY1 to the rear of module control carrier 0 at level A, designated CURL, at the far right side of the the backplane.

Install only one CFY1 pack per cabinet. Install this circuit pack in carrier level A only.

21. Install the following new module control circuit packs:

**NOTE:** Attach your wrist strap before handling circuit packs and replace the covers on the carriers after inserting the new packs.

- TN401B control channel (1)
  - TN441 intermodule data (1)
  - TN444B maintenance interface (1)
  - TN445 TSI program store (1)
  - TN446 time slot interchanger (1)
  - TN481 light guide interface (1)
  - TN580 module processor (1)
  - UN154 hybrid module processor (1)
22. Add port circuit packs as specified in your configuration document.
  23. Add and relocate I/O cables to level A and new level(s) for port carrier(s).
  24. For field upgrades, add DEFINITY Communications System Common Control and TMS cabinets and install cabling and ductwork between cabinets. These procedures are the same as for new installations, which are described in *DEFINITY Generic 2 and System 85 Installation, 555-104-104*.
  25. Replace System 75 console with DEFINITY Communications System Generic 2 console. This requires recabling to the console.

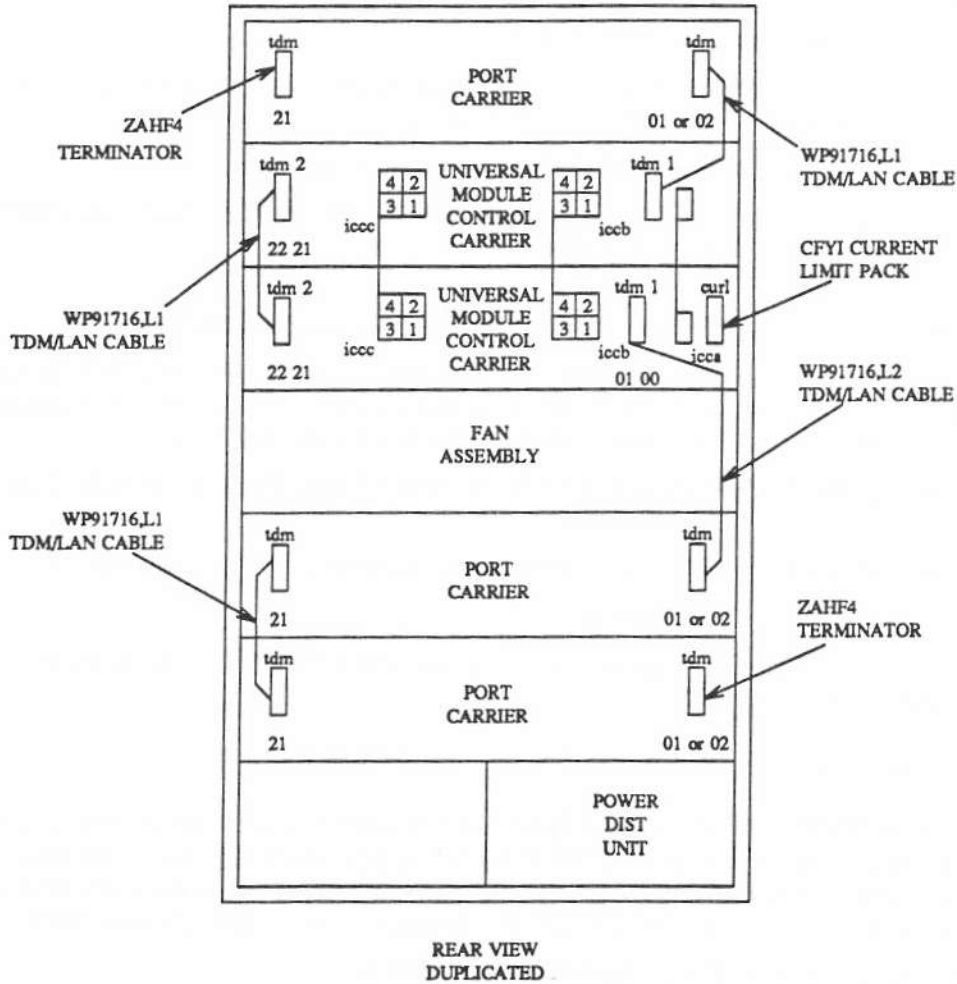
This completes the System 75 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete.

#### UNDUPLICATED TO DUPLICATED

1. For field upgrades, advise the serving CSSO of the upgrade.
2. For field upgrades, power off the system as follows:
  - A. At the maintenance board, set the EMERGENCY TRANSFER CONTROL switch to ON. This locks the system in the transfer mode.
  - B. At the power distribution unit, set the main AC circuit breaker to OFF.
  - C. Disconnect the System 75 main power plug.
  - D. Disconnect the batteries as follows:
    1. At power distribution unit, disconnect battery charger power cord.
    2. Loosen and remove battery door retaining screw.
    3. Disconnect all battery leads.
3. Determine whether batteries need to be replaced; if so, arrange for replacement batteries.
4. Open rear cabinet doors.
5. For field upgrades, remove all 25 pair I/O cables from the connector panels of carrier positions A and B. These cables will be used by ports at other carrier levels.
6. Remove fiber cables and transceivers from cabinet, if applicable.

7. Remove TDM/LAN cables from carrier levels A and B.
8. Remove nomenclature panels from carrier levels A and B.
9. Remove power units for carrier levels A and B.
10. Remove all port circuit packs and control packs not required or G2, based on your configuration document. Remove these packs from *all* carrier levels.  
Remove all existing port circuit packs from carrier levels A and B.  
Take precautions against static damage to circuit packs when removing and replacing them. Store circuit packs in anti-static bags if possible.
11. Disconnect P1 and P2 cables from control carrier (level A) and port carrier (level B).
12. Disconnect ground straps between carrier levels A and B, B and C, and A and D. Leave ground straps attached to the D-level carrier. For a duplicated system, leave ground straps attached to the C-level carrier as well. Eight ground straps are associated with both levels.
13. Remove J58890AH or AF carrier in level A and replace it with J58890AK Module Control carrier.
14. Remove and relocate J58890BB port carrier located in carrier level B to carrier levels C, D, or E.
  - *Installing additional port carriers:*  
If all existing port slots are used, install a new J58890BB port carrier in the first available carrier level.  
  
**NOTE:** *Port capacity of universal module cabinets:*  
  
The DEFINITY Communications System module cabinet supports up to three J58890BB port carriers. Again, if port capacity beyond three levels is required, install an additional J58890K universal module cabinet using the instructions in *DEFINITY Communications System Generic 2 and System 85 Installation, 555-104-104*. A multi-module system requires a TMS.
15. Add second J58890AK Module Control carrier in level B.
16. Replace nomenclature panels and carrier labels where required.
17. If necessary, remove and clean or replace fan filters between carriers prior to installing the new carriers.
18. Reconnect P1 and P2 cables for Universal Module control carrier in level A and P1 connector for re-located or added J58890BB port carrier(s), and module control carrier in level B.
19. Reconnect ground straps for all carriers affected.
20. Install WP91112 (or 91716) TDM/LAN buss cables and ZAHF4 terminators to all appropriate carrier levels.

The following figure shows TDM/LAN buss terminator, current limiter, and duplicated cable termination locations.



**Figure 5-10.** TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations

For older port backplanes, gently seat the connectors into position on the backplanes. Take care not to seat the connectors further than 1/4 inch onto the backplane pins. Do not attempt to press the connectors flush with the backplane panel.

21. Reinstall current limiter pack CFY1 to the rear of module control carrier 0 at level A, designated CURL, at the far right side of the the backplane.  
Install only one CFY1 pack per cabinet. Install this circuit pack in carrier level A only.
22. Install duplication cables as shown in the table below.

**TABLE 5-2. P/O Backplane Universal Module Control 0,1 (Rear View)**

FROM:				TO:		
UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG	CABLE	UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG
0	A	ICCA (1)	H600-198,G1	1	B	ICCA (1)
		ICCB (1) (2) (3) (4)	ED-1E434,G1  ED-1E434,G14			ICCB (1) (2) (3) (4)
		ICCC (1) (2)	ED-1E434,G2 ED-1E434,G1			ICC (2) (1) CAUTION: NOTE CABLE CROSSOVER

23. Install the following new module control circuit packs:

**NOTE:** Attach your wrist strap before handling circuit packs and replace the covers on the carriers after inserting the new packs.

- TN401B control channel (2)
- TN441 intermodule data (2)
- TN444B maintenance interface (2)
- TN445 TSI program store (2)
- TN446 time slot interchanger (2)

- TN456 remote module interface (2)
  - TN481 light guide interface (2)
  - TN580 module processor (2)
  - UN154 hybrid module processor (2)
  - TN541 duplication channel (2)
24. Add port circuit packs as specified in your configuration document.
  25. Add and relocate I/O cables to levels A and B, and new level(s) for port carrier(s).
  26. For field upgrades, add DEFINITY Communications System Common Control and TMS cabinets and install cabling and ductwork between cabinets. These procedures are the same as for new installations, which are described in *DEFINITY Generic 2 and System 85 Installation, 555-104-104*.
  27. Replace System 75 console with DEFINITY Communications System Generic 2 console. This requires recabling to the console.

This completes the System 75 hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete.

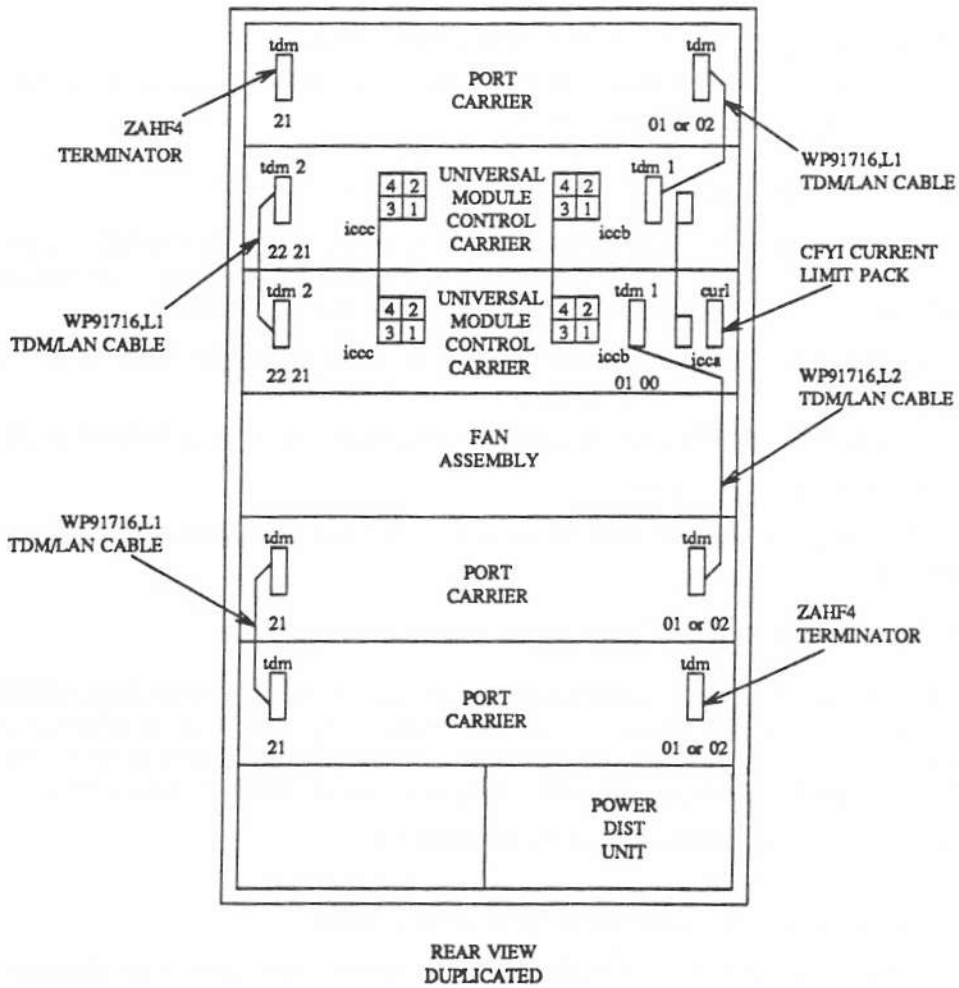
#### **DUPLICATED TO DUPLICATED**

1. For field upgrades, advise the serving CSSO of the upgrade.
2. For field upgrades, power off the system as follows:
  - A. At the maintenance board, set the EMERGENCY TRANSFER CONTROL switch to ON. This locks the system in the transfer mode.
  - B. At the power distribution unit, set the main AC circuit breaker to OFF.
  - C. Disconnect the System 75 main power plug.
  - D. Disconnect the batteries as follows:
    1. At power distribution unit, disconnect battery charger power cord.
    2. Loosen and remove battery door retaining screw.
    3. Disconnect all battery leads.
3. Determine whether batteries need to be replaced; if so, arrange for replacement batteries.
4. Open rear cabinet doors.
5. For field upgrades, remove all 25 pair I/O cables from the connector panels of carrier positions A and B. These cables will be used by ports at other carrier levels.
6. Remove fiber cables and transceivers from cabinet, if applicable.
7. Remove TDM/LAN cables from carrier levels A and B.
8. Remove nomenclature panels from carrier levels A and B.
9. Remove power units for carrier levels A and B.

10. Remove all port circuit packs and control packs not required or G2, based on your configuration document. Remove these packs from *all* carrier levels.  
Remove all existing port circuit packs from carrier levels A and B.  
Take precautions against static damage to circuit packs when removing and replacing them. Store circuit packs in anti-static bags if possible.
11. Disconnect P1 and P2 cables from carriers in levels A and B.
12. Disconnect ground straps between carrier levels A and B, B and C, and A and D. Leave ground straps attached to the D-level carrier. For a duplicated system, leave ground straps attached to the C-level carrier as well. Eight ground straps are associated with both levels.
13. Remove J58890AH, AF, and AJ carriers in levels A and B and replace them with J58890AK universal module control carrier.
14. Remove and relocate J58890BB port carrier located in carrier level B to carrier levels C, D, or E.
  - *Installing additional port carriers:*  
If all existing port slots are used, install a new J58890BB port carrier in the first available carrier level.  
  
**NOTE:** *Port capacity of universal module cabinets:*  
  
The DEFINITY Communications System module cabinet supports up to three J58890BB port carriers. Again, if port capacity beyond three levels is required, install an additional J58890K universal module cabinet using the instructions in *DEFINITY Communications System Generic 2 and System 85 Installation*, 555-104-104. A multi-module system requires a TMS.
15. Add second J58890AK Module Control carrier in level B.
16. Replace nomenclature panels and carrier labels where required.
17. If necessary, remove and clean or replace fan filters between carriers prior to installing the new carriers.
18. Reconnect P1 and P2 cables for Universal Module control carrier in level A and P1 connector for re-located or added J58890BB port carrier(s).
19. Reconnect ground straps for all carriers affected.
20. Install WP91112 (or 91716) TDM/LAN buss cables and ZAHF4 terminators to all appropriate carrier levels.



The following figure shows TDM/LAN terminators and current limiter placement.



**Figure 5-11. TDM/LAN Buss, Current Limiter, and Duplicated Cable Terminations**

For older port backplanes, gently seat the connectors into position on the backplanes. Take care not to seat the connectors further than 1/4 inch onto the backplane pins. Do not attempt to press the connectors flush with the backplane panel.

21. Reinstall current limiter pack CFY1 to the rear of module control carrier 0 at level A, designated CURL, at the far right side of the the backplane.  
Install only one CFY1 pack per cabinet. **Install this circuit pack in carrier level A only.**
22. Install duplication cables as shown in the table below.

TABLE 5-3. P/O Backplane Universal Module Control 0,1 (Rear View)

FROM :				TO :		
UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG	CABLE	UNIVERSAL MOD CONT	EQPT LEVEL	CONN DESIG
0	A	ICCA (1)	H600-198,G1	1	B	ICCA (1)
		ICCB (1) (2) (3) (4)	ED-1E434,G1  ED-1E434,G14			ICCB (1) (2) (3) (4)
		ICCC (1) (2)	ED-1E434,G2 ED-1E434,G1			ICC (2) (1) CAUTION: NOTE CABLE CROSSOVER

23. Install the following new module control circuit packs:

**NOTE:** Attach your wrist strap before handling circuit packs and replace the covers on the carriers after inserting the new packs.

- TN401B control channel (2)
- TN441 intermodule data (2)
- TN444B maintenance interface (2)
- TN445 TSI program store (2)
- TN446 time slot interchanger (2)

- TN456 remote module interface (2)
  - TN481 light guide interface (2)
  - TN580 module processor (2)
  - UN154 hybrid module processor (2)
  - TN541 duplication channel (2)
24. Add port circuit packs as specified in your configuration document.
  25. Add and relocate I/O cables to levels A and B, and new level(s) for port carrier(s).
  26. For field upgrades, add DEFINITY Communications System Common Control and TMS cabinets and install cabling and ductwork between cabinets. These procedures are the same as for new installations, which are described in *DEFINITY Generic 2 and System 85 Installation, 555-104-104*.
  27. Replace System 75 console with DEFINITY Communications System Generic 2 console. This requires recabling to the console.

This completes the hardware upgrade. Notify the CSSO and the customer that this portion of the system upgrade is complete.

## SYSTEM 75 TO DEFINITY COMMUNICATIONS SYSTEM REMOTE MODULES

The initial upgrade procedure for a remote module is identical to that for upgrading a System 75 R1 to a central module covered in previous sections. The remoting capabilities are achieved by adding the optical fiber cabling, the TN456 interface circuit pack, and a fiber optic transceiver (4A or 4B) depending on the distance from the central module. The same hardware must be added to the central module if it is a DEFINITY Communications System Generic 2 module.

## GENERIC 1 SINGLE CARRIER CABINET H/W UPGRADES TO GENERIC 2

The following procedures detail single carrier cabinet hardware upgrades to the Generic 2 single carrier cabinet. Where necessary, illustrations supplement these procedures to help you perform the upgrade. Complete single carrier cabinet connectivity and initial installation procedures are contained in *DEFINITY® Communications System Generic 2 and System 85 Installation, 555-104-104, Issue 1*. You may find it helpful to have both books handy as you upgrade the single carrier cabinet.

### Single Carrier Cabinet Upgrade Considerations

When upgrading a System 75 single carrier cabinet to a G2 remote module, the following information applies:

If R1V3 cabinets are being re-used for the upgrade, a stacked configuration requires one or more new cabinet covers. This is because you cannot use the slot in the rear shelf to route the TDM/LAN bus cables (WP91716L-3) between port cabinets. The cables are now routed between the connector panel

and the rear shelf.

For a two-cabinet stack you will need to replace the bottom cover for the second cabinet. For a three-cabinet stack you will need to replace the bottom and top covers for the second cabinet and the bottom cover for the third cabinet. For a four-cabinet stack you will need to replace the bottom and top covers for the second and third cabinets and the bottom cover for the fourth cabinet. Comcodes for the replacement covers are:

- Top cover 846 307 825
- Bottom cover 846 307 817

Route and connect the new TDM/LAN bus cables (WP91716L-3) according to the following steps:

1. Facing the rear of the cabinet, loosen the two screws on the left of the connector panel. Then remove the two screws on the right of the connector panel.
2. Slide the cable between the connector panel and the rear shelf (not through the existing hole in the shelf). Connect the TDM/LAN bus cable to the backplane. Route the cable along the bottom of the cabinet.
3. Replace and tighten the connector panel screws.
4. Repeat the above steps for each cabinet in the stack.
5. Replace existing top and bottom covers with new covers as needed (see comcodes above).

The System 75/Generic 1 single carrier cabinet is upgraded onsite, just as upgrades to versions within Generic 2 are performed. System upgrades are explained fully in chapter 6.

### **Single Carrier Cabinet Hardware Upgrade Procedures**

Perform these procedures in the order listed; use the accompanying illustrations to ensure that all cables, ground wires, cabinet clips, and bus terminators are removed before cabinets are de-stacked.

1. Power down the entire system.
2. Remove all power cables and ground wires. Figures 5-12 and 5-13 show power cable and ground wire connections for AC systems.

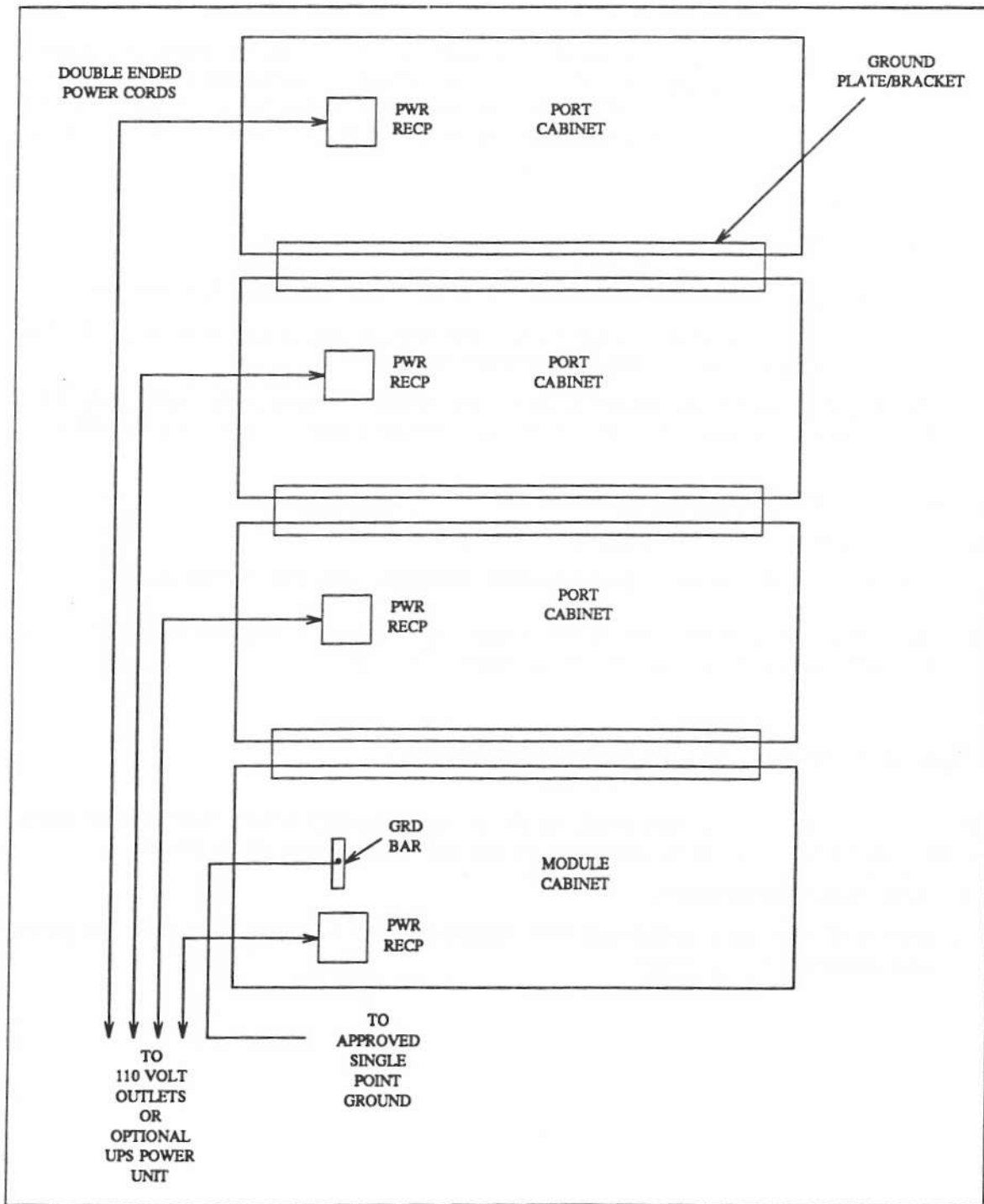


Figure 5-12. AC Power Scheme

3. Remove power supply and cables if cabinets are to be rearranged.
4. Remove I/O cables.
5. Remove rear cabinet covers.
6. Remove TDM LAN bus terminators and cables from all cabinets. Figure 5-14 shows TDM LAN bus terminator and cable locations for the System 75 XE, and figure 5-15 shows TDM LAN connectivity for the upgraded system.

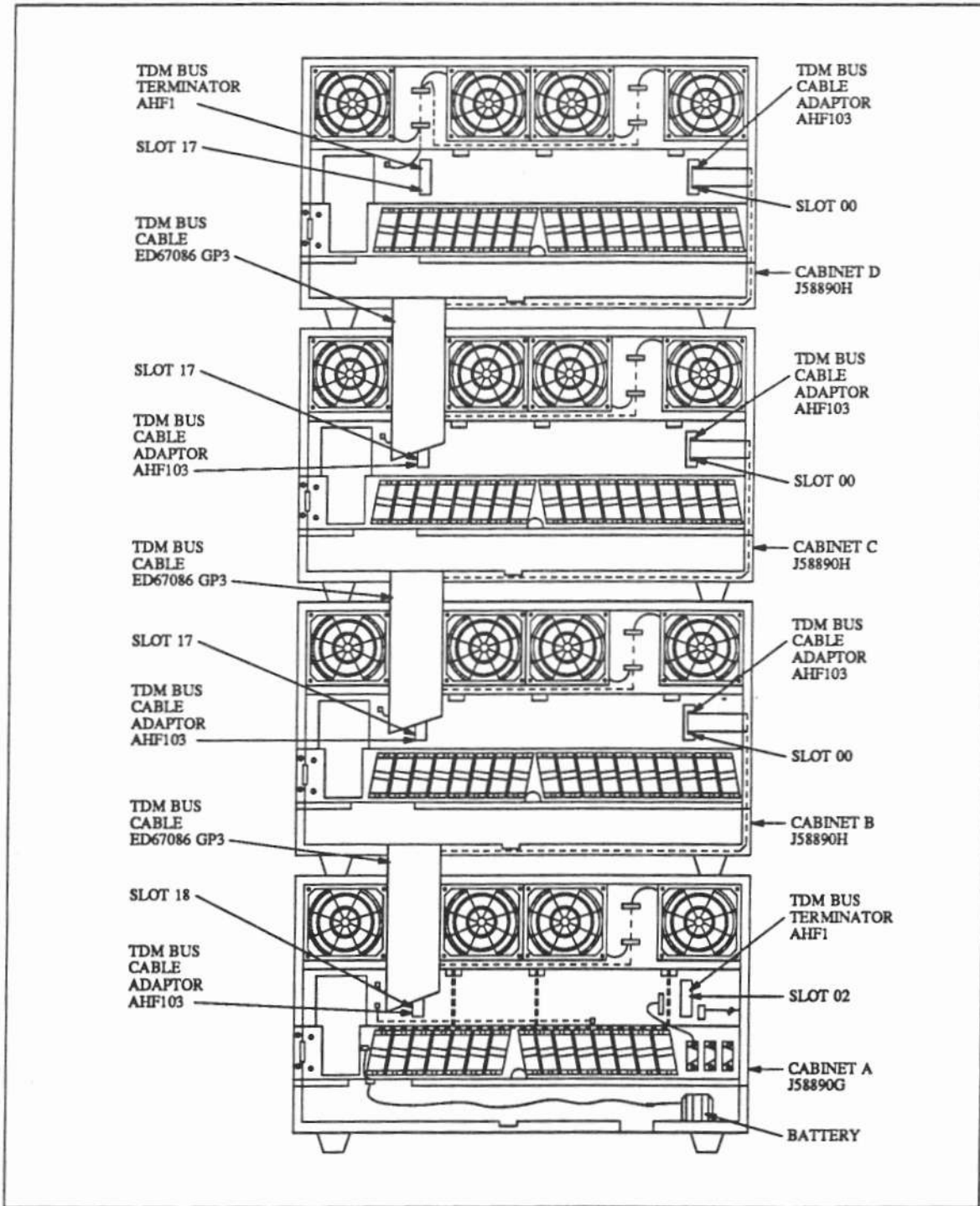


Figure 5-13. System 75 XE Four-Cabinet System (Rear View)

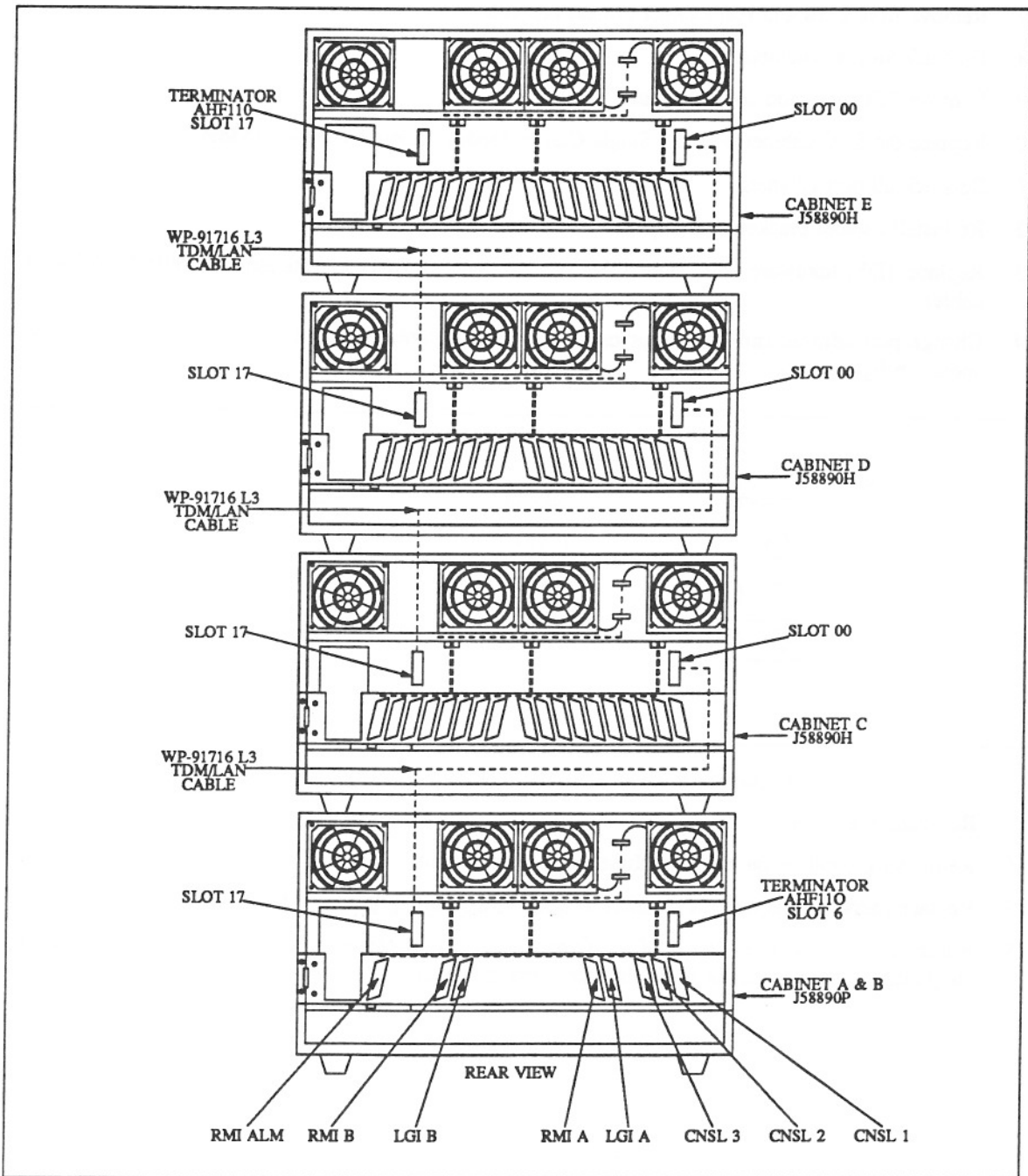
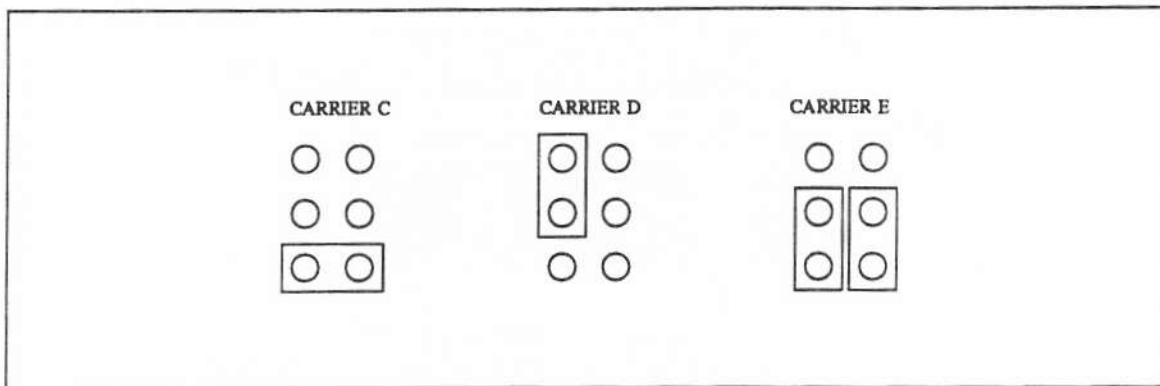


Figure 5-14. Single Carrier Cabinet Stack (Rear View)



7. Remove front clips and rear cabinet ground brackets.
8. De-stack all port cabinets.
9. Remove SCC common control cabinet.
10. Replace the SCC cabinet with the Single Carrier Module Control Cabinet, J58890P.
11. Re-stack all port cabinets.
12. Re-install cabinet brackets and clips.
13. Replace TDM hardware with TDM LAN bus hardware (AHF110 terminator and WP91716 List 3 cable).
14. Change port address shorting straps on port cabinet backplanes at carrier levels C, D, and E, as shown in figure 5-16.



**Figure 5-15.** Port Address Shorting Strap Connections

15. Re-install rear covers.
16. Re-install I/O cables on all port cabinets. See figure 5-14.
17. Replace carrier labels on port cabinets to agree with shorting plugs on backplane.
18. Ensure that TN768 is in slot 1 of the C and D level port cabinets. Table 5-4 provides complete single carrier cabinet circuit pack placement requirements.

**TABLE 5-4.** Single Carrier Module Control Circuit Pack Placement

Slot	Circuit Pack	Remarks
PWR	ACX535	Always required for AC powered modules
1	TN588	Always required
2	TN512B	Test board, not shipped with System (See Note 2)
3	TN541	Required only when duplicated modules are equipped
4	TN590	Always required
5	TN444B	Always required
6	UN154B	Always required
7	TN445	Always required
8	TN446	Always required
9	TN441	Always required
10	TN481	Always required
11	TN456	Always required
12	TN588	Always required for duplicated module control
13	TN512B	Test board, not shipped with System (See Note 2)
14	TN541	Required only when duplicated modules are equipped
15	TN590	Always required for duplicated module control
16	TN444B	Always required for duplicated module control
17	UN154B	Always required for duplicated module control
18	TN445	Always required for duplicated module control
19	TN446	Always required for duplicated module control
20	TN441	Always required for duplicated module control
21	TN481	Always required for duplicated module control
22	TN456	Always required for duplicated module control
PWR	ACX535	Always required for AC powered duplicated modules

**NOTES:**

1. All unused circuit pack slots must be equipped with a blank faceplate cover (158B).
2. Slots 2 and 13 must be equipped with a 0.50 inch blank faceplate cover (158A).

19. Re-install power cables and ground wires.
20. Power-up the system. *DEFINITY® Communications System Generic 2 and System 85 Installation, 555-104-104*, provides a detailed power-up sequence.

## 6. SYSTEM 85 UPGRADES FROM R1 TO R2

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This chapter contains the instructions necessary to upgrade an existing R1 (301CC) System 85 to an R2 (501CC) System 85. It is primarily for technicians trained in the installation and connection of telephone switching equipment. The chapter requires that you have a Customer System Document (CSD) prepared for the changed system and be familiar with its contents.

Chapter 6 in *AT&T System 85 and DEFINITY™ Communications System Upgrades* replaces all previous issues of *In Service Upgrades From R1 (301CC) to R2 (501CC)* (555-101-111). The reason for this new structure is to incorporate all AT&T System 85 upgrade information into a convenient single point of reference. Information taken directly from 555-101-111 will be refined in future editions of this document.

### OVERVIEW

This chapter provides a "start-to-finish" sequence to the installation process. Block diagrams, wiring tables, and line drawings are used to describe and illustrate the interfacing of system components.

This chapter is arranged in the suggested installation sequence. This sequence may be revised as needed by individual job requirements.

System 85 R1 to R2 switch upgrades are offered in the following system configurations:

- Unduplicated common control (301CC) and module control to unduplicated common control (501CC) and module control
- Duplicated common control (301CC) and module control to duplicated common control (501CC) and module control
- Unduplicated common control (301CC) and module control to duplicated common control (501CC) and unduplicated module control

Each of the three upgrade configurations is covered in a separate section. Each section covers the details necessary to install a particular configuration.

### GETTING STARTED

Survey the area where switch is located to familiarize yourself with the existing equipment. Use the floor plan to verify that any additional customer provided equipment, such as ac power receptacles are in place.

If the system is equipped with an applications processor (AP), the AP must be upgraded to the R2 version as the R2 switch is not compatible with an R1 AP.

All in-service equipment removed as a result of the upgrade should be returned to the local Material Logistics Organization (MLO) for reuse.

## INVENTORY

Inventory equipment required for the upgrade. The "Equipment List" section of the CSD contains a detailed equipment summary of all items ordered for the upgrade. Any missing equipment must be requisitioned at this time.

In addition to normal installation tools, specialized tools are required during certain phases of the installation.

TABLE 6-1. Tool and Test Equipment Inventory

Tasks	Equipment Required	Recommended Type
Unpacking Cabinets	Tin Snips	
	Utility Knife	
	Adjustable Wrench	6- or 8-inches
	Ratchet	1/2-inch drive
	Sockets	5/16- and 9/16-inch
	Pinch Bar	3-feet
	Two Boards (For Cabinets Without Wheels)	4 x 6 x 30-inches
Installing Cabinets and Earthquake Mounting	Electric Drill	1/2-inch impact type
	Masonry Bit	1/2-inch
	Drill Bit (For Wood Floors Only)	1/4-inch
	Drill Bit (For Computer Floors Only)	5/8-inches
	Carpenter's Level	30-inches or longer
	Chalk Line	
	Measuring Tape	30-inches or longer
	Adjustable Wrench	6- or 8- inches
	Ratchet	1/2-inch drive
	Sockets	5/16- and 9/16-inch
Install Cable Ducts	Adjustable Wrench	6- or 8-inches
	Screwdrivers	8- and 18-inch flat blade
	Nutdrivers	3/8- and 5/16-inches
Final Cabinet Installation	Off-Set Screwdriver	Flat blade
System Test	MAAP, J58889J-1,L2	
	MAAP Flipcharts, 844179267	
	XRAY Service Manual 555-101-105IS	
	XRAY Tape J58889TS-1,L1	
Power Test	Digital Multimeter	KS-20599
Cutdown of 110-type hardware	Single-Pair Insertion/Cutoff tool	788D

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## FLOOR PLAN

The floor plan is revised when an additional common control cabinet is required for the unduplicated 301CC to duplicated 501CC upgrade. The new common control cabinet is moved into the most convenient position in the cabinet lineup. The cabinet must be located within 200 cable feet of the module control cabinet.

The floor plan ensures that all system components will be located according to agreements made with the customer. It is used as a site inspection guide to ensure customer provided electrical and mechanical facilities are correct and agree with plant requirements and electrical codes before starting installation.

## UPGRADE UNDUPLICATED 301CC TO 501CC

This part contains the step-by-step procedures required to upgrade the unduplicated 301CC and module control to an unduplicated 501CC and module control.

If the module control cabinet is presently equipped with a J58888B module control carrier, that carrier must be replaced by a J58888M module control carrier. Also, if the module control cabinet is powered by an F-Spec (F-61506/F-61591) power supply, that power supply must be replaced by a 309/310-type power supply.

If the module control cabinet is already equipped with a J58888M module control carrier and a 309/310-type power supply, no changes are required in this cabinet.

If the system is equipped with the standby power system (extended battery reserve), there are no power supplies to be changed out.

The existing system must be removed from service while the system upgrade is being carried out.

To upgrade the system, proceed as follows:

### Power System Down

To remove power from the system:

1. At alarm panel, set GO/HALT to HALT.
2. At common control carrier, set memory holdover switch (on 311A) to OFF.
3. At 309/310-type power supplies in module control and port cabinets, set AC INPUT circuit breaker to OFF.
4. At auxiliary cabinet power supply (if provided), set AC INPUT switch to OFF.
5. At ac load center, set all circuit breakers to OFF. AP breakers may be left on at the discretion of the local I & M personnel.
6. Set ac disconnect switch to OFF.

### At Module Control Cabinet

1. Open rear of cabinet by removing covers or opening doors as appropriate.
2. At module control carrier (J58888B), label and disconnect all flat (ribbon) cables.
3. Remove ground (GRDD) straps between the module control carrier and adjacent carriers.

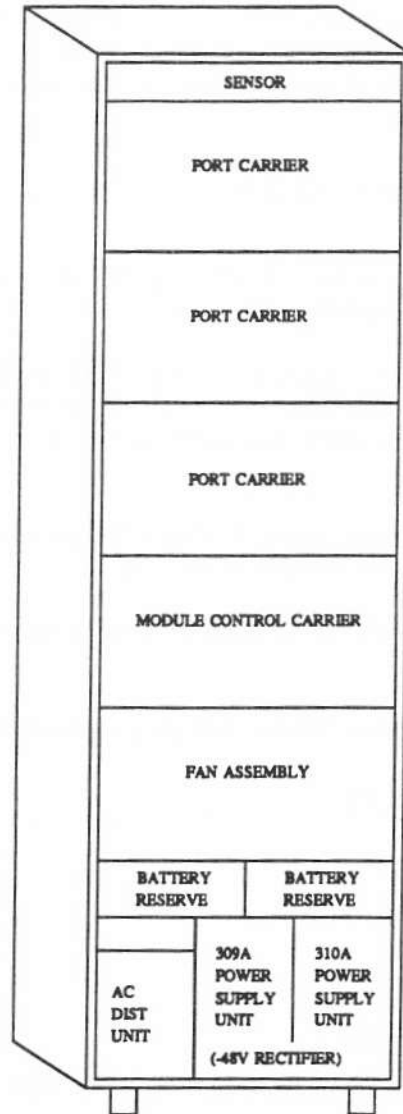


Figure 6-1. Module Control Cabinet

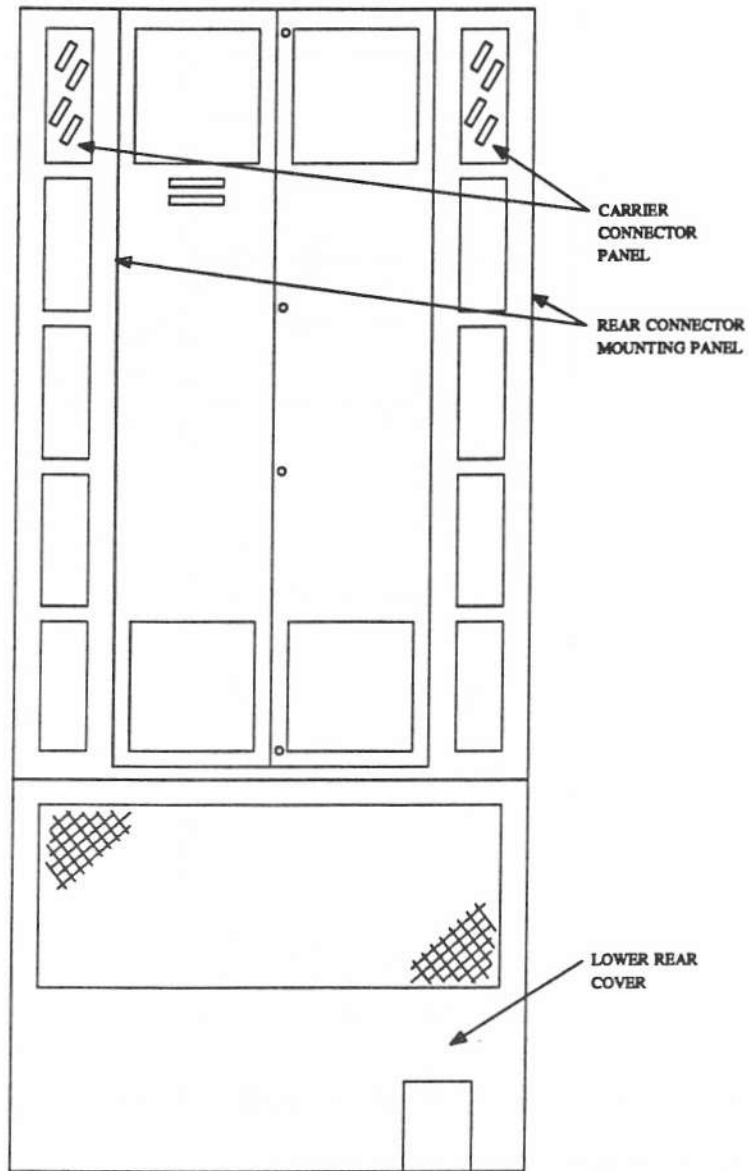
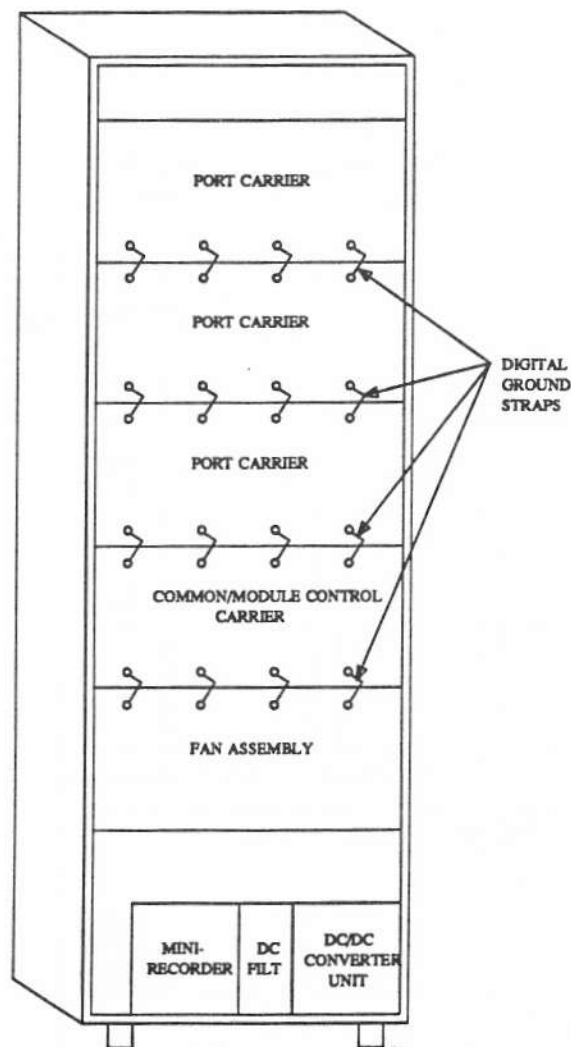


Figure 6-2. Rear View of Typical Cabinet

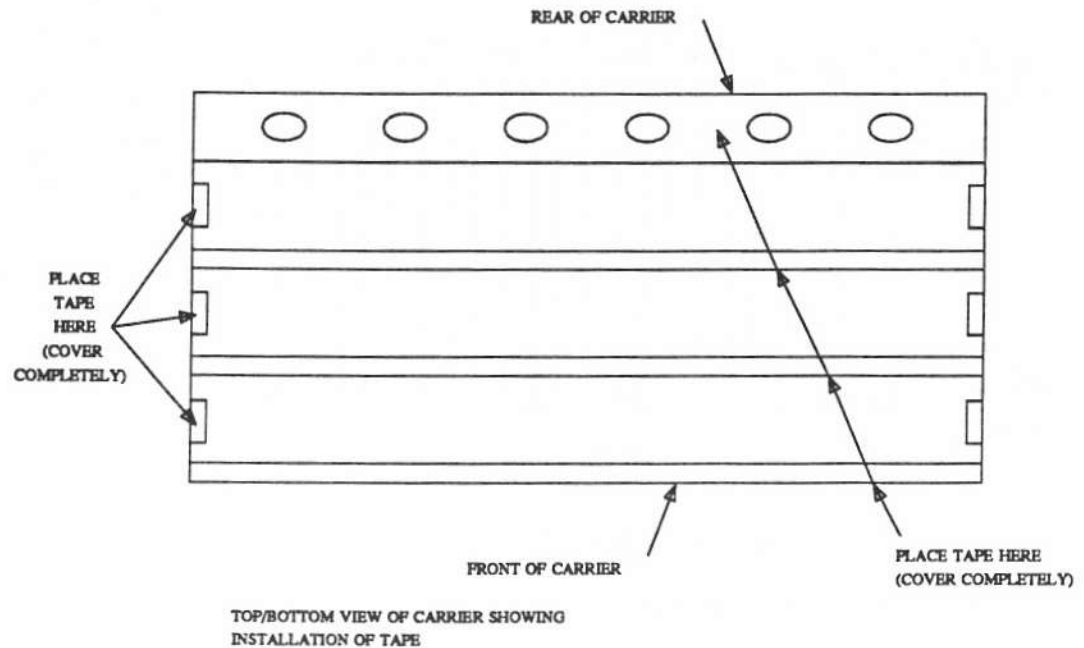




**Figure 6-3. Rear View of Cabinet Showing Digital Ground (GRDD) Straps**

4. Label and disconnect all remaining wiring attached to module control carrier.
5. Open front door of the cabinet.
6. Remove plastic cover from front of module control carrier. A grounded wrist strap, in contact with the skin, must be worn any time circuit packs are being installed or removed from the carrier.
7. Remove circuit packs from module control carrier.
8. Loosen plastic mounting screws and slide module control carrier out of the cabinet.
9. Remove carrier slide brackets from cabinet frame. Discard insulators located between slide brackets and carrier frame. When the new module control carrier (J58888M) is being installed in a J58886B-1, List 1 module control cabinet, it must not be allowed to physically contact adjacent equipment.
10. If the new carrier is not factory taped, insulate the carrier by placing the yellow tape provided (Scotch Vinyl 35) at any place around the top and bottom of the carrier where it could possibly

contact adjacent equipment.



**Figure 6-4. Top/Bottom View of Carrier Showing Application of Tape**

11. Before installing new carrier, clean out the threads of each cabinet mounting hole with a self-tapping screw of the appropriate size. Sheets of paper should be used to completely cover the top of the equipment below the holes being threaded to keep metal particles from falling into the equipment.
12. On new carrier, loosen screws attaching circuit breaker panel and move circuit breaker panel aside to provide access to carrier mounting bracket.

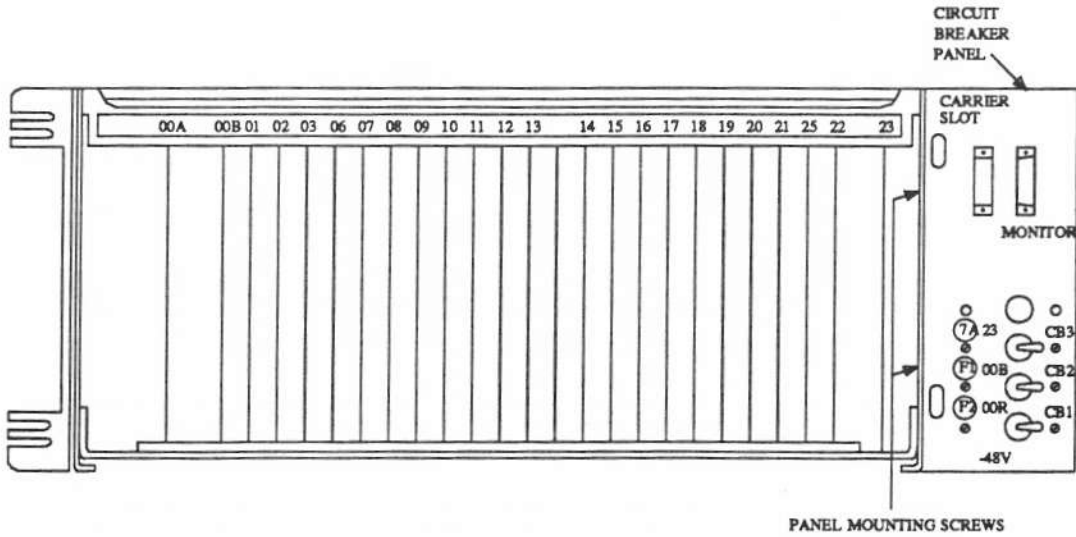


Figure 6-5. J58888M Module Control Carrier

13. Slide new carrier into place and secure by tightening mounting screws.
14. Secure circuit breaker panel to carrier.
15. Before connecting any cables to the carrier use a multimeter to check for continuity between carrier and adjacent equipment. Meter should read **INFINITY**.
16. Connect ground (GRDD) straps to adjacent carriers or no carrier adapters.
17. Connect battery and ground leads to bus bar.
18. Connect flat cables to carrier.
19. Locate new 4 mHz cable assembly (ED-1E434-11, G84).
20. Connect leg C of 4 mHz cable assembly to module control carrier connector BO2

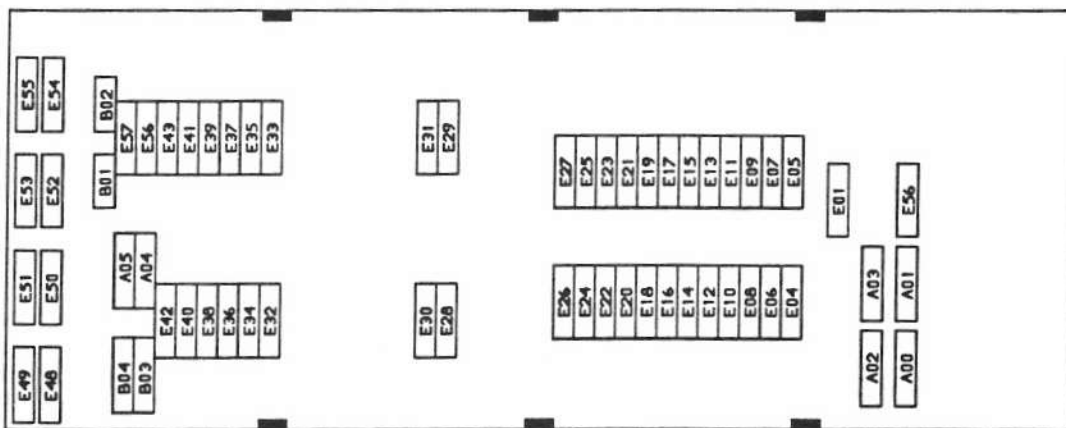


Figure 6-6. Rear view of Module Control Carrier

- 
21. Coil and store unused legs ( A, B, and D) of cable in the overhead cable duct.
  22. Route 4 mHz cable to common control cabinet in the enclosed overhead cable duct.
  23. Leave common control end of cable loose at this time.
  24. Install the following new circuit packs in the module control carrier:
    - TN380B
    - TN440B(s)
    - TN444B
    - TN460CSave static protection bags that the new circuit packs are shipped in for use later.
  25. Install the remaining circuit packs removed from previous carrier into the new carrier.
  26. Pack remaining circuit packs in static protection bags.
  27. Replace plastic cover on front of carrier.

If cabinet is equipped with an F-61506/F-61591 power supply, the power supply must be replaced by a 309/310-type power supply. To replace power supply:

1. Loosen mounting hardware securing the power supply to cabinet.
2. Install new power supply in cabinet.
3. Secure power supply using the hardware previously removed.
4. Connect cables to new power supply.

### At Common Control Cabinet (J58886A)

1. Unplug cabinet line cord.
2. Label and unplug all connector cables at rear of cabinet.
3. Remove wire cover plate from rear of cabinet.
4. Loosen screw and remove braided bonding strap from rear of cabinet.

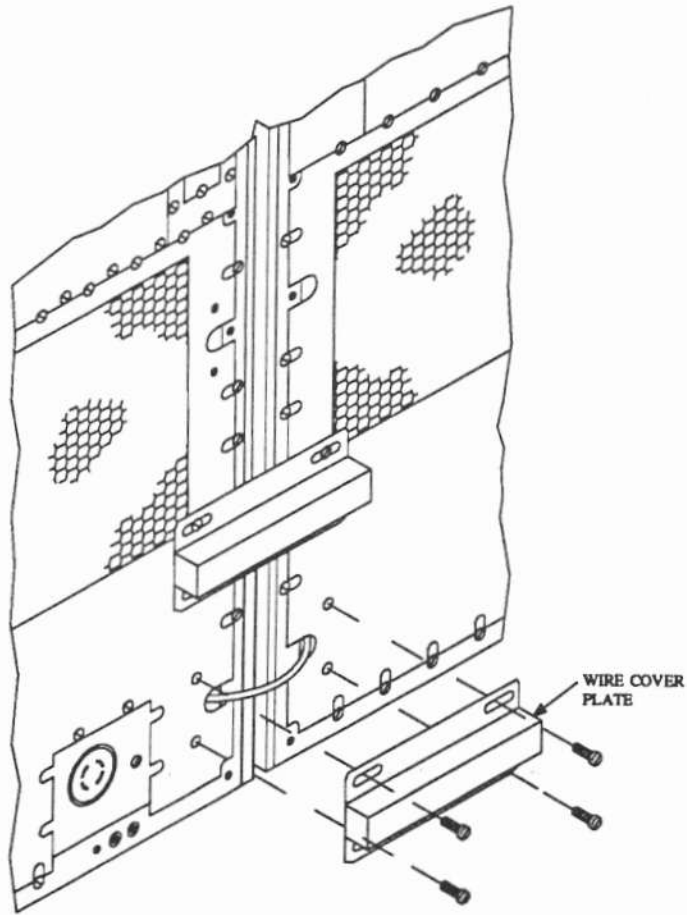
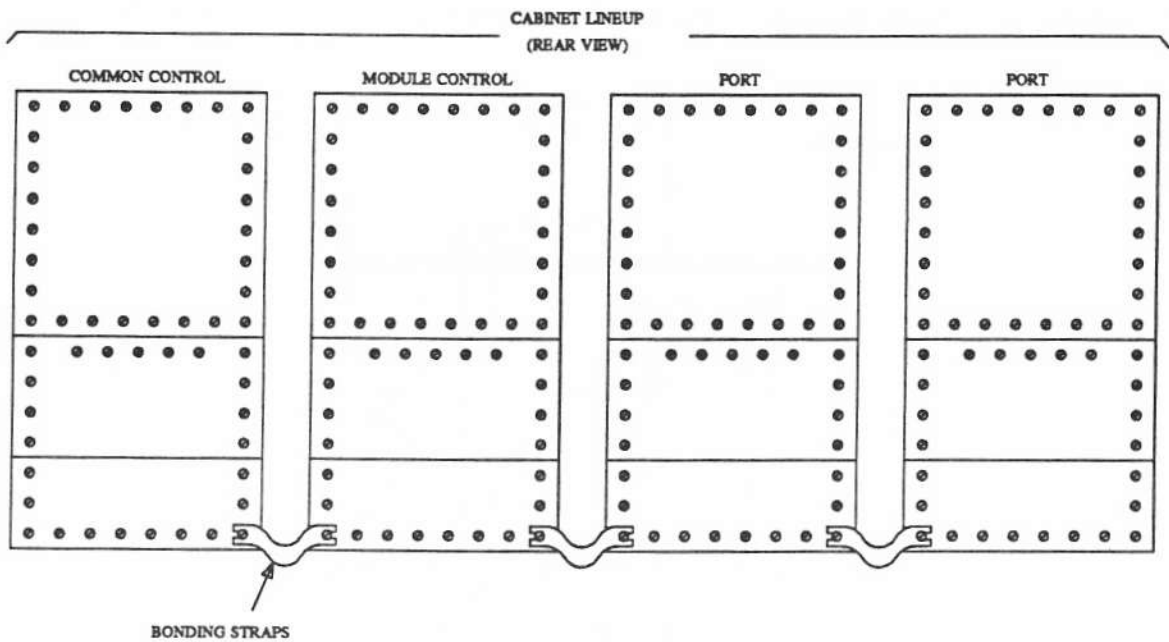


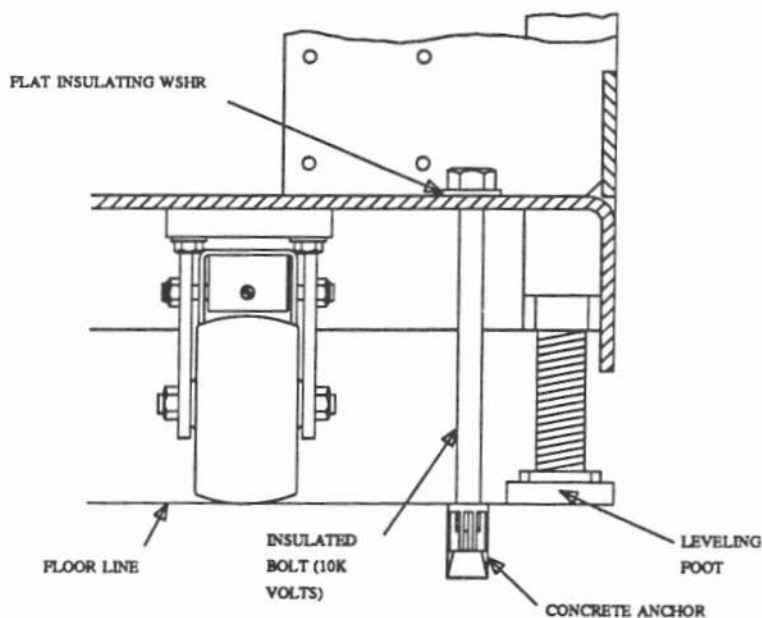
Figure 6-7. Attachment/Removal of Wire Cover Plate



**Figure 6-8. Bonding Strap Location**

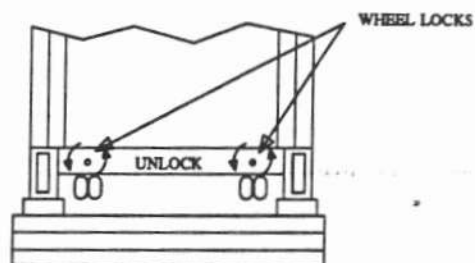
5. Open rear of cabinet by removing covers or opening doors as appropriate.
6. Label and disconnect cabinet ground wiring.
7. Remove covers from top of shielded cable duct.
8. At port carrier(s), label and disconnect all flat (ribbon) cables.
9. Pull loose flat cables up through top of cabinet and lay loose ends out of the way.
10. Remove and retain hardware attaching cable ductwork to top of cabinet.
11. Remove ground straps (GRDD) between each port carrier (four straps to carrier/fan assembly below and four to carrier above).
12. Label and disconnect all remaining wiring (battery, ground, etc.) attached to cabinet.
13. Open front door of cabinet.
14. Remove plastic cover from front of carrier. Any time circuit packs are being installed or removed from the carrier, a grounded wrist strap, in contact with the skin, must be worn to prevent electrostatic damage to circuit packs.
15. Remove circuit packs from carrier, as required. Set circuit packs aside for use later.
16. Remove and retain screws attaching port carrier connector panel to rear connector mounting panel.
17. If carrier connector panel will not come loose after screws are removed, loosen screws attaching the rear connector mounting panel.
18. Loosen mounting screws and slide each port carrier out of cabinet.
19. Remove carrier slide brackets from cabinet. Discard insulator located between slide bracket and cabinet frame. Set brackets aside for use later.

20. If cabinet is earthquake mounted, remove and retain hardware securing the cabinet to the floor.



**Figure 6-9. Earthquake Mounting**

21. Raise leveling feet so cabinet will roll easily over the floor.
22. Loosen wheel locking bolts and roll cabinet out of the way.



**Figure 6-10. Location of Wheel Locking Bolts**

### **Remove Document File Assembly (If mounted on CC cabinet)**

Remove document file assembly from side of cabinet. Proceed as follows:

1. Open document file door to gain access to bottom cabinet holder.
2. Loosen attaching bolt and rotate holder until hook clears bottom of cabinet.
3. Lift document file up and off cabinet.
4. Set document file aside for use later.

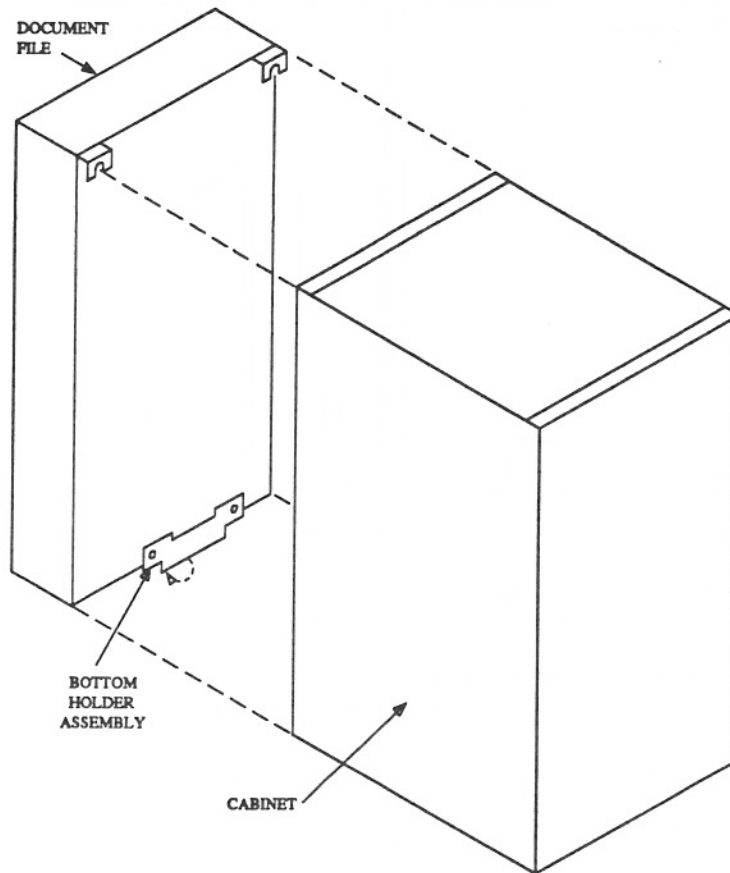


Figure 6-11. Document File Assembly

### Install New Common Control Cabinet (J58886J, L1)

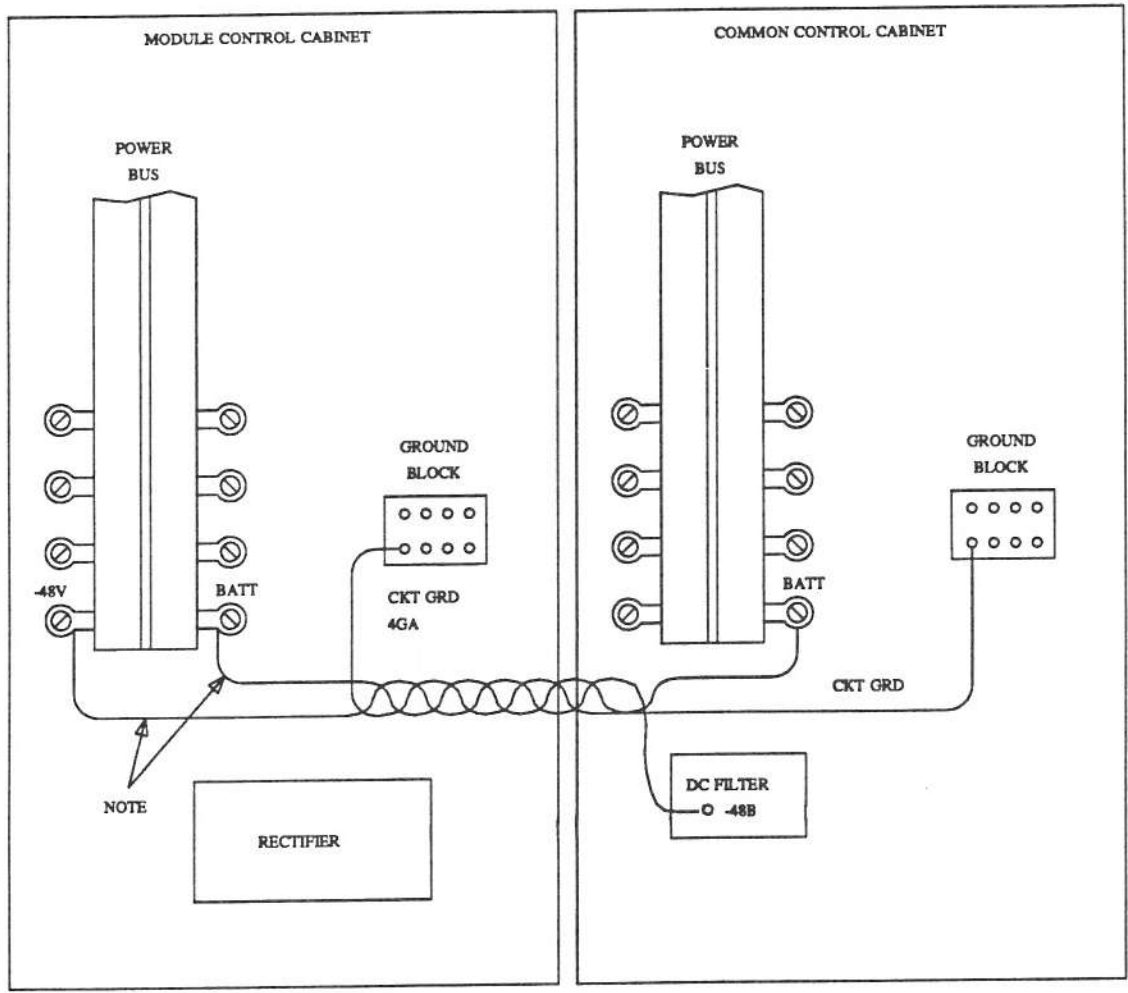
The new common control cabinet goes in the same position in the cabinet lineup as the cabinet that was removed. If the existing ductwork to cabinet bracket is different from the new bracket (844176925) provided, replace it with the new bracket reusing the mounting hardware.

To install cabinet, see Section entitled "UNPACKING AND INSTALLING CABINET."

After cabinet is secured in the lineup, proceed as follows:

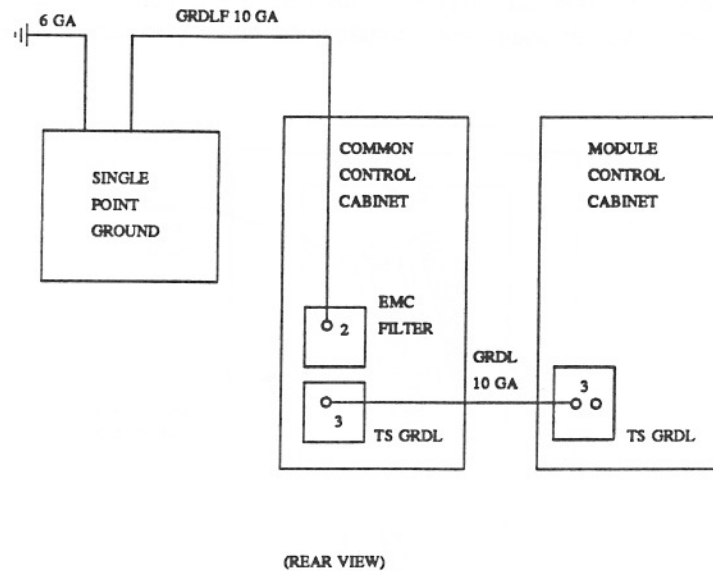
1. Using hardware removed previously, attach cable ductwork to top of cabinet.
2. Connect cabinet to ground wires removed from previous cabinet.





**NOTE:**  
THESE WIRES ARE THE SAME COLOR AND ARE MARKED TO ENSURE CORRECT TERMINATION. ROUTE THROUGH UPPER DUCT ON LOWER REAR OF CABINETS.

**Figure 6-12. Circuit Ground Connections**



**Figure 6-13. Lightning Ground Connections for Single Common Control**

3. Connect braided bonding strap to cabinet.
4. Connect alarm cable.

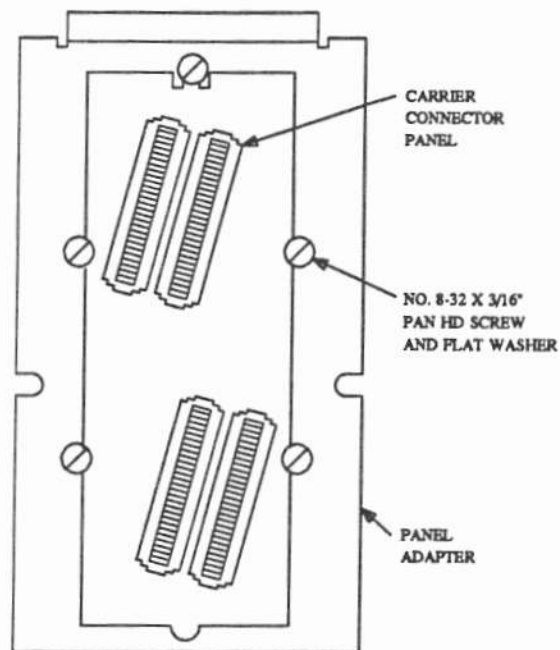
**TABLE 6-2. Alarm Cable Connections for Single Common Control**

From	Cabinet	Cable Name	Cable Type*	Conn Desig	To	Cabinet	Cable Name	Conn Desig
310A Power Unit	Module Control	PRCTA	ED-1E434, GRP86	J11	AEH4	Common Control	PRCT0	JRCT0

\* Route through upper shielded duct on lower rear of cabinets.

5. The port carriers may have a different grounding scheme than the 501CC cabinet. If the port carrier(s) are J5888A-2, L1, L21, the grounding schemes are compatible and no additional insulation is required. If the port carrier(s) are J5888A-2, L1, the grounding schemes are incompatible. In this situation, the top port carrier must not come in physical contact with the alarm panel or no-carrier adapter. The bottom port carrier must not come in physical contact with the 501CC carrier. A roll of Scotch Vinyl 35 tape is provided to be used as insulation. Adjacent port carriers with the same list numbers need not be insulated.
6. Before installing new carrier, clean out the threads of each cabinet mounting hole with a self-tapping screw of the appropriate size. Sheets of paper should be used to completely cover the top of the equipment below the holes being threaded to keep metal particles from falling into the equipment.
7. Install the port carrier(s) in the common control cabinet using the mounting and insulating (if applicable) hardware previously removed. When installing the J5888A, L1 port carrier, replace the nylon shoulder washers with the new washers (900546540) provided.
8. Attach port carrier I/O connector panels to rear connector panels of the common control cabinet with existing hardware. If the carrier I/O panels are too narrow, use the adapter (ED-1E479) and mounting hardware provided.

9. If insulated J58888A-2, L1 port carrier(s) were installed, use a multimeter to measure continuity between carrier(s) and adjacent equipment (including dissimilar port carriers). Meter should read **INFINITY**.



**Figure 6-14. ED-1E479 Connector Panel Adapter**

10. Place GRDD (digital ground) straps between carriers.
11. Connect "ringing voltage" daisy-chain between port carriers. Reuse the ED-1E434-11, G16 cable (taken from 301CC cabinet) between the frequency generator and the lowest port carrier backplane (B00).
12. Connect alarm, battery and ground leads for each port carrier.

TABLE 6-3. Port Carrier Connections

Lead Color	Conn Desig	Port Carrier Terminal
BK		* PL00
R-BL		* PL02
R		* PL04
R		* PL05
BK-W		* PL08
R		† PL10
BK		† PL11
R-BL		† PL13
R		† PL15
3-G	FALM	PL16
2-BL	CNVALM	PL17
2-BK	GRDALM	PL18
2-S	FGNALM	PL19
BK	GRD Y	PL20
R-BK	B01	* B00
* Located on right side of carrier.		
† Located on left side of carrier.		

13. Route flat (ribbon) cables down through top of cabinet.
14. Connect flat cables, etc., disconnected from previous cabinet. Use the following extender cables as required:
  - Station message detail recorder (SMDR) extender cable; ED-1E434-11, G102
  - System management terminal (SMT) extender cable; ED-1E434-11, G105
  - Maintenance and administration panel (MAAP) extender cable; ED-1E434-11, G105
15. Connect 4 mHz cable to connector E9 located on common control carrier.

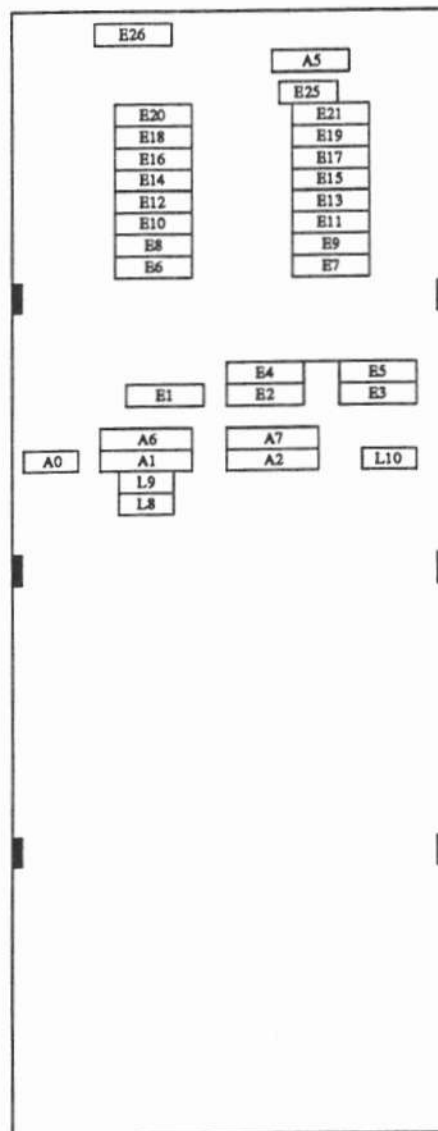


Figure 6-15. Rear View of Common Control Carrier

16. Connect RMATS data cable **H1** to **H2** connector on the common control cabinet. A new ED-1E434-11, G311 cable is provided as required.
17. Connect AP data cable **H2** to **H3** connector on the common control cabinet.
18. Connect 25-pair I/O connector cables disconnected from previous cabinet.
19. Connect **EXT/ALM (J7)** cable to **MISC/ALM (D1)** connector. The **-48PX** and **GRD -48** connections must be relocated.

**TABLE 6-4. Emergency Transfer -48V & GRD Wiring**

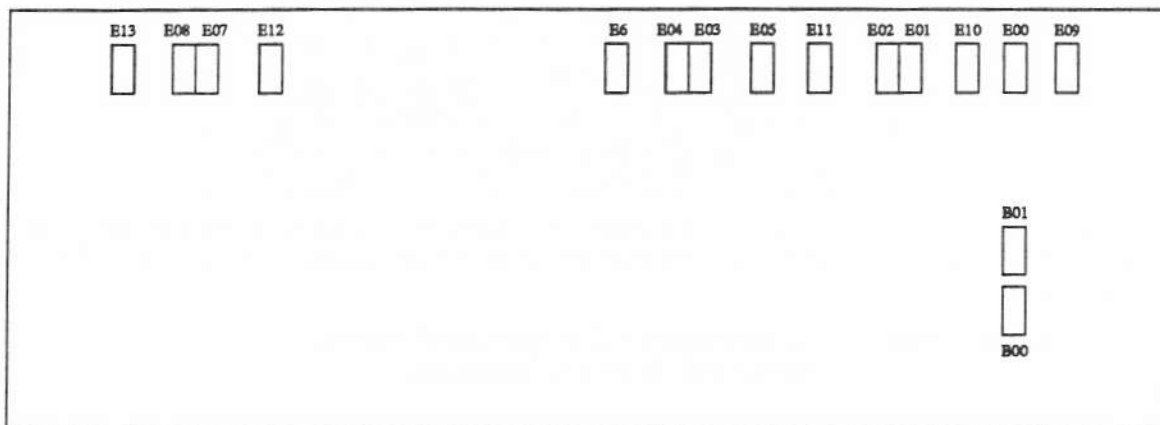
301CC					501CC					
EXT/ALM (J7)					MISC/ALM (D1)					
-48 PX	22	23	24	25	32	33	34	47	48	49
GRD-48	47	48	49	50	7	8	9	22	23	24

20. Connect DCIU "F" cable(s) to common control F connector(s). If common control connectors begin with 0: connect cable F1 to connector F0, cable F2 to connector F1, and cable F3 to connector F2, etc..
21. Connect sense lead between common control and module control cabinets.

**TABLE 6-5. Sense Lead Connections**

From Common Control Cabinet		Cable Type	To Module Control Cabinet	
Unit	Conn Desig		Unit	Conn Desig
J87462A*	SNS	ED-1E434, G101	310A	SNS
J87462A **	SNS	ED-1E434, G103	310A	SNS
			J87462A	SNS
* For module control cabinet not equipped with nominal holdover.				
** For module control cabinet equipped with nominal holdover.				

22. Connect peripheral I/O (TN403) "D" cable.
23. At rear of cabinet, install wire cover plate.
24. Install circuit packs previously removed from port carrier(s).
25. Replace the SN253/253B circuit pack with a SN253C. If the system is not equipped with an SN253/253B, the SN253C must be installed in any powered port carrier slot as long as it meets pairing requirements.
26. If the system is equipped with automatic identified outward dialing (AIOD), the SN242 circuit pack(s) located in slots (00-02) of the first port carrier must be replaced with SN244 circuit packs. Also, the automatic number identification (ANI) cable (ED-1E434-11, G56) must be removed from the rear of the port carrier.



**Figure 6-16. Rear View of Port Carrier**

Pack remaining circuit packs in the static protection bags.

27. At any vacant port carrier slot, install an SN261 circuit pack. Any powered port carrier slot in the system may be used as long as it meets pairing requirements. Administer in an unused class of service plus PROCs 051 and 052.
28. Replace plastic cover on front of carrier.
29. Replace covers on cable duct.

#### **Install Document File Assembly (If Removed)**

Install document file assembly (previously removed) on the side of a cabinet at the end of the cabinet line up or on the wall. If the document file assembly is a G1, it will fit on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L1 Port
- J58886G, Auxiliary
- J58886H, SMDR

The G1 document file assembly will not fit on new J58886J, L1 cabinet.

If document file assembly is a G2, it can be mounted on wall or on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L7 Port
- J58886F, L1 TMS
- J58886G, L24 Auxiliary
- J58886H, L6 SMDR

Install document file assembly as appropriate.

**At SMT Interface**

Remove SMT interface from wall field and replace it with an ED-1E434, G17 SMT interface bypass cable assembly.

**At Auxilliary Cabinet(s)**

1. At first auxiliary cabinet, remove J58889L alarm origination unit (Silent Knight) and its associated wiring.
2. Install ED-1E447-10, G2 alarm distribution unit in each auxiliary cabinet.
3. Connect alarm distribution units.

The Silent Knight is replaced by the TN492C in the 501CC. Rewire the automatic alarm origination feature external alarms.



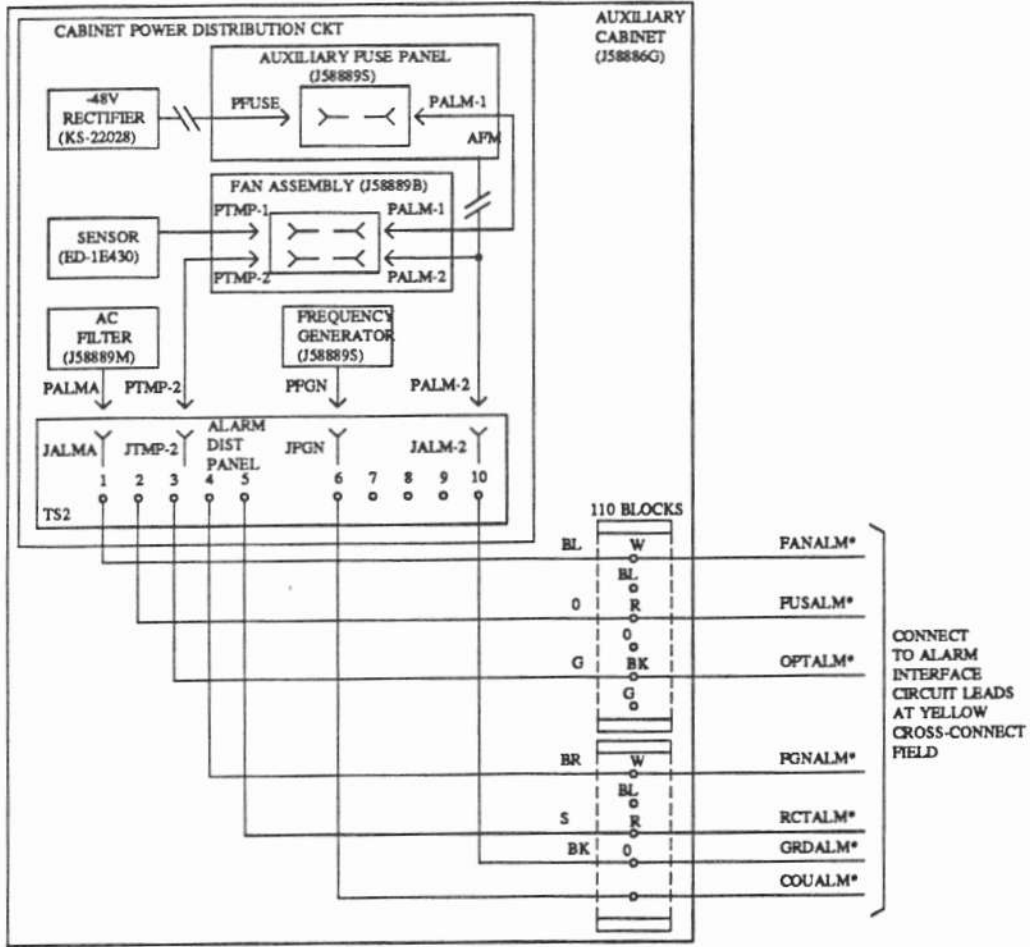
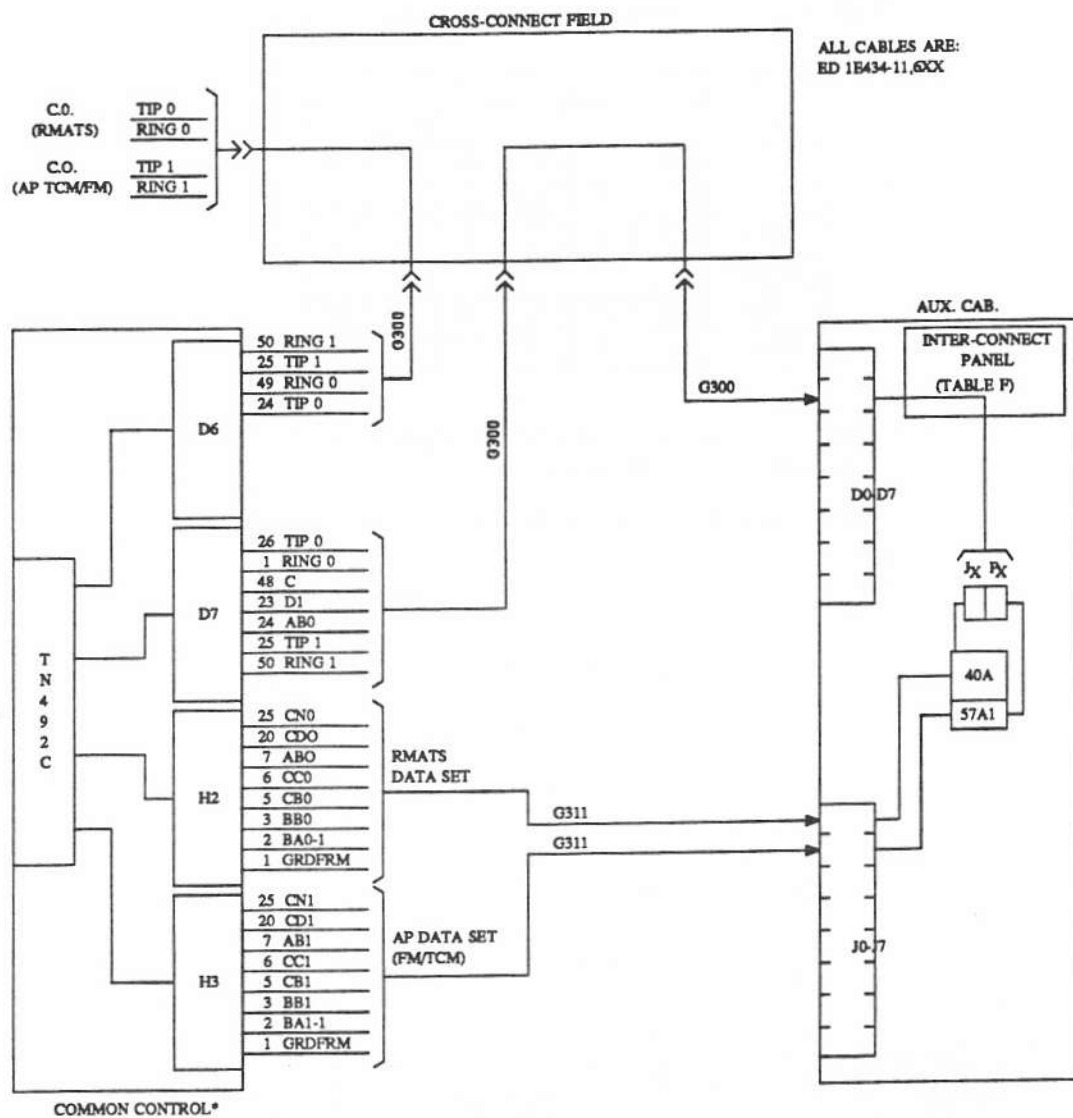


Figure 6-17. Connections for Alarm Distribution Units



\* WITH DUPLICATED COMMON CONTROL, TWO G72 \*Y\* CABLES ARE PROVIDED TO BRIDGE THE COO & CC1, H2 AND H3 CONNECTORS AND TWO G19 \*Y\* CABLES ARE PROVIDED TO BRIDGE THE COO & CC1, D6 AND D7 CONNECTORS.

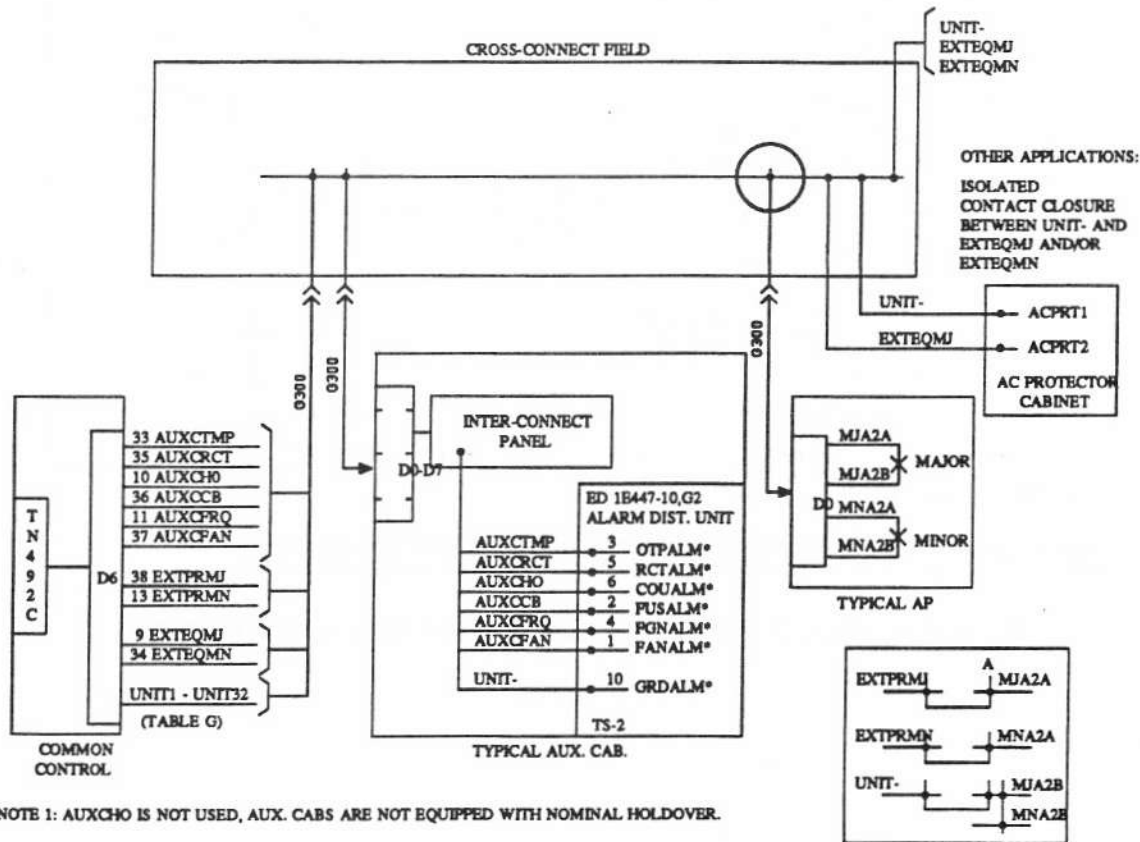
Figure 6-18. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet

TABLE 6-6. Connections for Auxiliary Cabinet Slot 40A

SLOT*	1	2	3	4	5	6
40A	J1		J2			
C	14	8	35	46	47	14
D1	11	5	10	21	22	11
TDG†	2	2	2	2	2	2
57A1	P3					
TIP	26	27	28	29	30	31
RING	1	2	3	4	5	6

\* The C, D1, TDG data set control and Tip & Ring leads are unique per 40A slot position.

† TDG is identified as ABO at the TN492C in the 501CC.



NOTE 1: AUXCHO IS NOT USED, AUX. CABS ARE NOT EQUIPPED WITH NOMINAL HOLDOVER.

Figure 6-19. External Alarm Connections

TABLE 6-7. Unit Lead Connections

Backplane		Connector		Lead Designation *
Slot	Pin	Desig	Pin	
32	120	D6	26	UNIT20
	021		1	UNIT19
	119		27	UNIT22
	020		2	UNIT21
	118		28	UNIT24
	019		3	UNIT23
			29	
	018		4	UNIT25
	116		30	UNIT27
	017		5	UNIT26
	115		31	UNIT29
	016		6	UNIT28
	114		32	UNIT31
	015		7	UNIT30
	053		33	AUXCTMP
	014		88	UNIT32
	052		34	EXTEQMN
	152		9	EXTEQMJ
	051		35	AUXCRCT
	151		10	AUXCHO
	050		36	AUXCCB
	150		11	AUXCFRQ
	049		37	AUXCFAN
			12	
			38	EXTPRMJ
			13	EXTPRMN
			39	UNIT2
			14	UNIT1
			40	UNIT4
			15	UNIT3
			41	UNIT6
			16	UNIT5
			42	UNIT8
			17	UNIT7
			43	UNIT10
			18	UNIT9
			44	
			19	UNIT11
			45	UNIT13
			20	UNIT12
			46	UNIT15
			21	UNIT14
			47	UNIT17
			22	UNIT16
			48	
			23	UNIT18
			49	RING0
	24	TIP0		
	50	RING1		
	25	TIP1		

\* The "UNIT" lead is unique per auxiliary cabinet and originates as "GRDALM\*" @ the alarm distribution unit (connection 10 on TS2). Unit 1 should be provided from auxiliary cabinet 1 unit 2 from auxiliary cabinet 2, etc.

### At all cabinets

1. At 309/310-type power supply, set **AC INPUT** circuit breaker to **OFF**.
2. At power supply (if provided) in auxiliary cabinet(s), set **AC INPUT** power switch to **OFF**.
3. Verify that:
  - **RMATS** data set options are set.
  - Circuit pack options are set as required by **CSD**.
  - Circuit packs are fully seated in correct slots.
  - dc-dc converters are fully seated and their switch latch is closed.
  - Fuse holders are equipped with correct fuses.
  - Connector cables are properly labeled, plugged into the correct connectors, and secured.
  - All foreign materials have been removed from cabinet and cross connect field.
  - Cabinet is properly grounded.
4. Connect cabinet to ac line cord.
5. Set cabinet circuit breakers to **ON** except for **AC INPUT** circuit breaker on 309/310-type power supply in module control and port cabinets and **AC INPUT** switch on auxiliary cabinet power supply.

### Powering Up System

1. At alarm panel:
  - Set **EMERGENCY TRANSFER** to **OFF**.
  - Set **GO/HALT** to **HALT**.
2. Operate nonfusible ac disconnect switch to **ON** position.
3. At 309/310-type power supply, operate **AC INPUT** circuit breaker to **ON**.
4. At common control carrier, operate memory holdover switch to **ON**.
5. At auxiliary cabinet power supply (if provided), operate **AC INPUT** switch to **ON**.
6. Measure rectifier and dc-dc converter output voltages as required. Allow for tolerance of multimeter when making measurements.
7. Set all carrier circuit breakers on reused port carrier(s) and new module control carrier to **ON**.

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**PUT SYSTEM IN SERVICE**
**TABLE 6-8. Rectifier and Converter Voltage Limits**

		<b>Voltage</b>	<b>Maximum</b>	<b>Minimum</b>
<b>Rectifier</b>	<b>BATT</b>	<b>Normal</b>	<b>-46</b>	<b>-52</b>
		<b>Emergency</b>	<b>-41.75</b>	<b>-52.2</b>
		<b>Transient</b>	<b>-41.75</b>	<b>-60</b>
	<b>-48V</b>	<b>Normal</b>	<b>-46</b>	<b>-52</b>
		<b>Emergency</b>	<b>-41.75</b>	<b>-52.2</b>
		<b>Transient</b>	<b>-41.75</b>	<b>-60</b>
<b>dc-dc Converter</b>	<b>490A1</b>	<b>5V</b>	<b>5.3</b>	<b>4.9</b>
	<b>494G1</b>	<b>5V</b>	<b>5.3</b>	<b>4.9</b>
	<b>494H1</b>	<b>12V</b>	<b>12.6</b>	<b>11.4</b>
	<b>495F</b>	<b>5V</b>	<b>5.3</b>	<b>4.9</b>

## **UPGRADE DUPLICATED 301CC TO 501CC**

To upgrade system, proceed as follows:

### **Power System Down**

To remove power from system:

1. At alarm panel, set **GO/HALT** to **HALT**.
2. At common control carrier, set memory holdover switch (on 311A) to **OFF**.
3. At 309/310-type power supplies in module control and port cabinets, set **AC INPUT** circuit breaker to **OFF**.
4. At auxiliary cabinet power supply (if provided), set **AC INPUT** switch to **OFF**.
5. At ac load center, set all circuit breakers to **OFF**. AP breakers may be left on at the discretion of the local I & M personnel.
6. Set ac disconnect switch to **OFF**.

### **At Duplicated Module Control Cabinet**

1. Open rear of cabinet by removing covers or opening doors as appropriate.
2. At each module control carrier (J58888B), label and disconnect all flat (ribbon) cables.
3. Remove each ground (GRDD) strap between the module control carriers and the adjacent carriers.

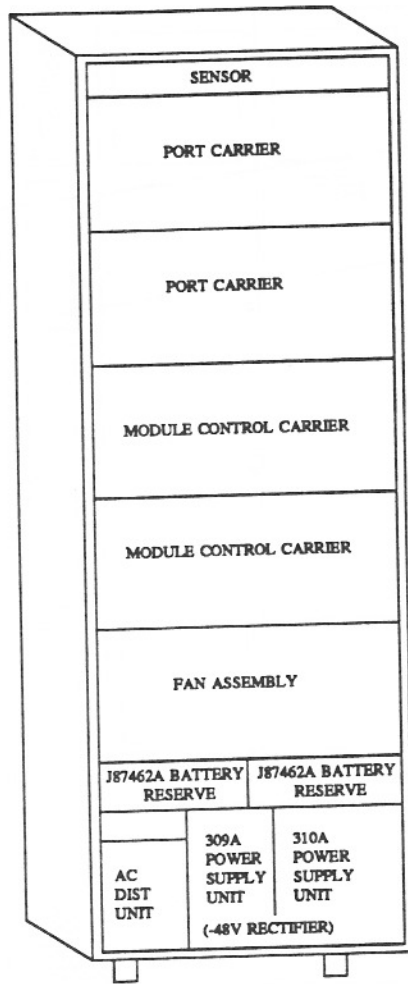


Figure 6-20. Duplicated Module Control Cabinet



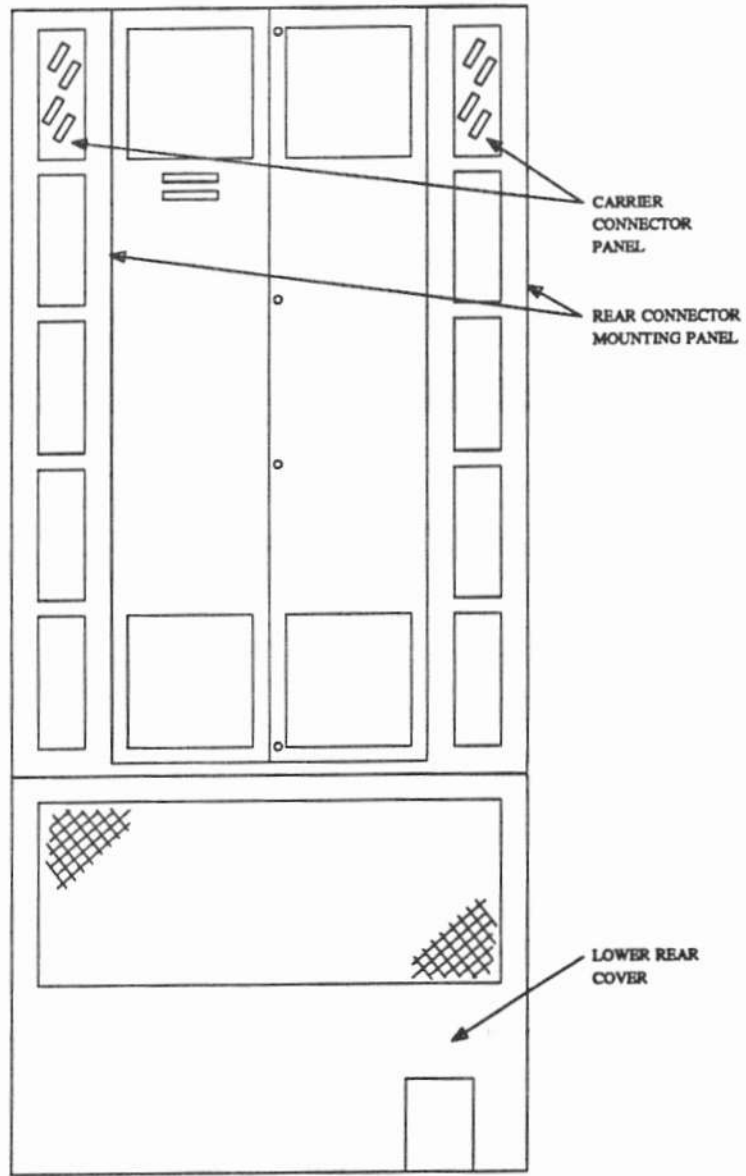


Figure 6-21. Rear View of Typical Cabinet

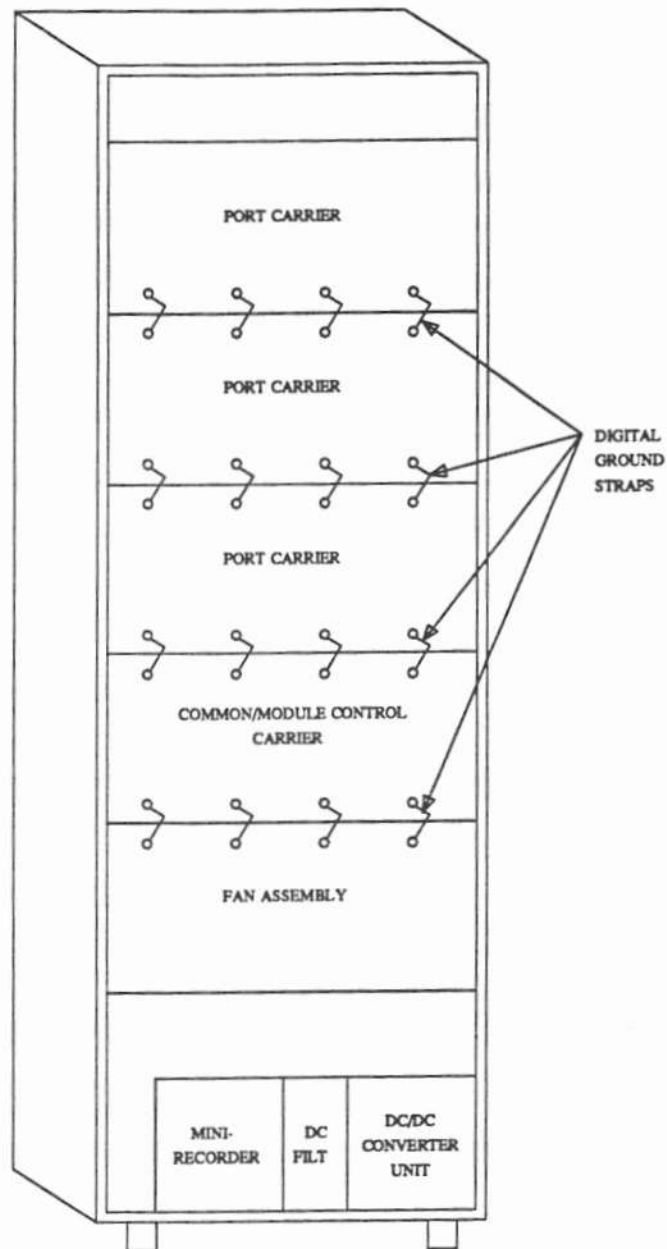
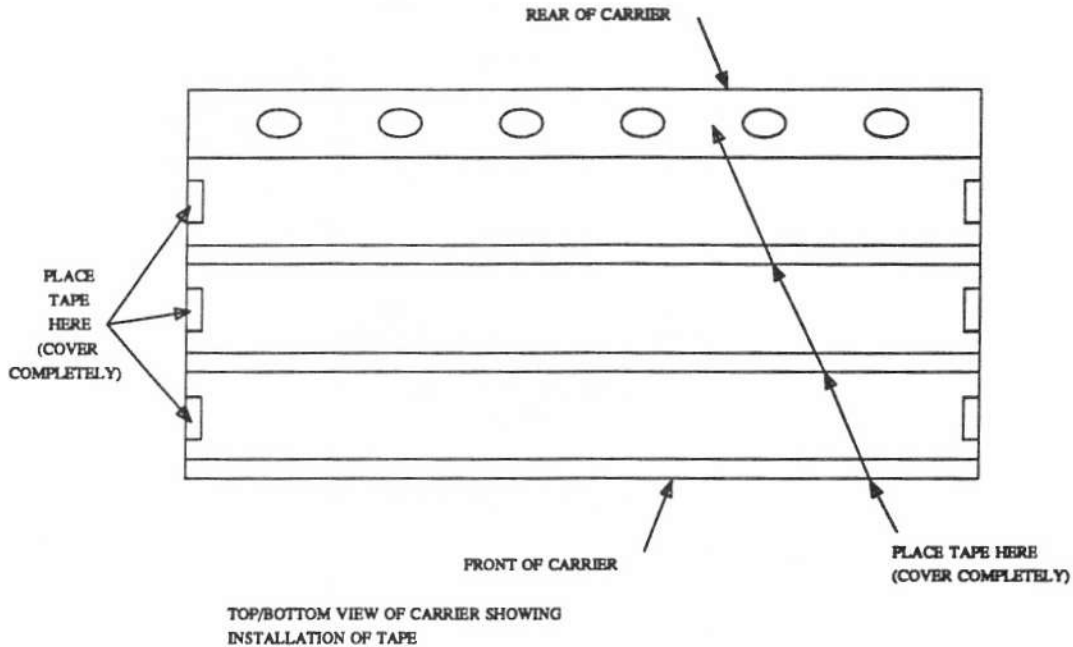


Figure 6-22. Rear View of Cabinet Showing Digital Ground (GRDD) Straps

4. Label and disconnect all remaining wiring attached to each module control carrier.
5. Open front door of cabinet.
6. Remove plastic cover from front of module control carriers. A grounded wrist strap, in contact with the skin, must be worn any time circuit packs are being installed or removed from the carriers.
7. Remove circuit packs from carriers.

8. Loosen plastic mounting screws and slide each carrier out of cabinet.
9. Remove carrier slide brackets from cabinet frame. Discard insulators located between slide brackets and carrier frame. When the new module control carrier (J58888M) is being installed in a J58886B-1, List 1 module control cabinet, it must not be allowed to physically contact adjacent equipment.
10. If the new carriers are not factory taped, insulate each carrier by placing the yellow tape provided (Scotch Vinyl 35) at any place around the top or bottom of the carrier where it could possibly contact adjacent equipment. The new carriers need not be insulated from each other. Basically, tape the top of the top carrier and the bottom of the bottom carrier.



**Figure 6-23. Top/Bottom View of Carrier Showing Application of Tape**

11. Before installing new carrier, clean out the threads of each cabinet mounting hole with a self-tapping screw of the appropriate size. Sheets of paper should be used to completely cover the top of the equipment below the holes being threaded to keep metal particles from falling into the equipment.
12. On each new carrier, loosen screws attaching circuit breaker panel and move circuit breaker panel aside to provide access to carrier mounting bracket.

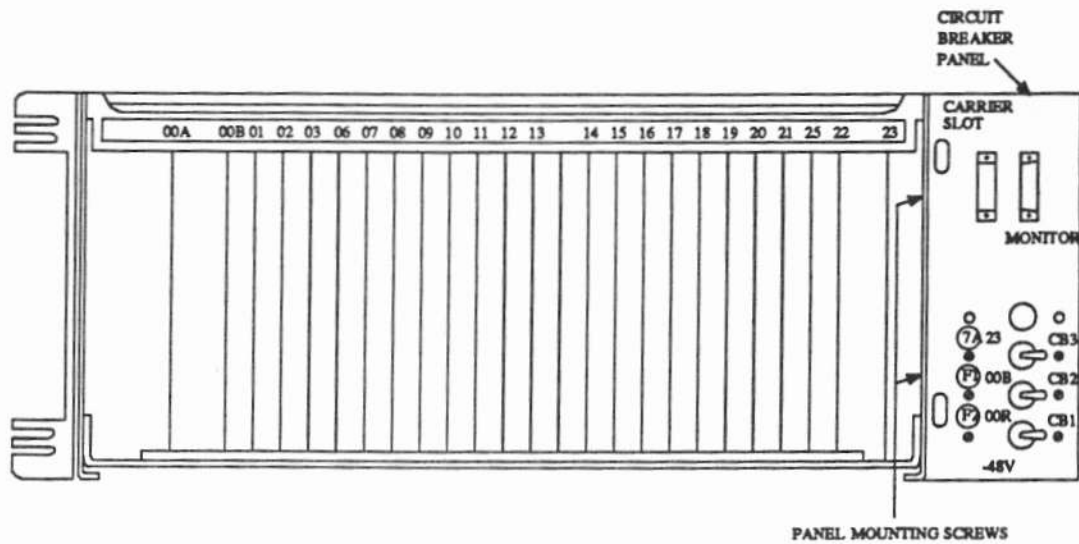
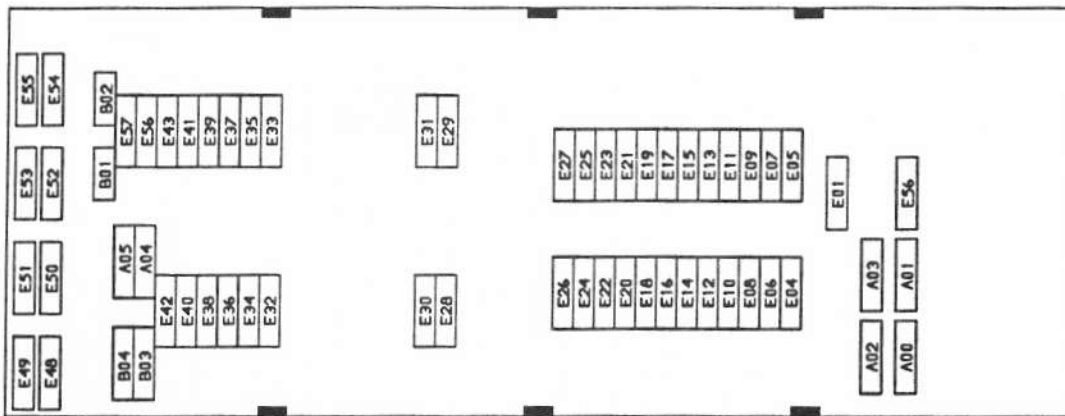


Figure 6-24. J58888M Module Control Carrier

13. Slide each new carrier into place and secure by tightening the mounting screws.
14. Secure circuit breaker panels to each carrier.
15. Before connecting any cables to the carrier use a multimeter to check for continuity between carriers and adjacent equipment. Meter should read **INFINITY**.
16. Connect ground (GRDD) straps to adjacent carriers or no carrier adapters.
17. Connect battery and ground leads to bus bar.
18. Connect flat cables to each carrier.
19. Locate two 4 mHz cable assemblies (ED-1E434-11, G84).
20. Connect legs C and D of first 4 mHz cable assembly to connector B02 on module control carriers 00 and 01, respectively.
21. Connect legs C and D of second 4 mHz cable assembly to connector B02 on module control carriers 00 and 01, respectively.



**Figure 6-25. Rear View of Module Control Carrier**

22. Coil and store the unused legs (A and B) of each cable in overhead cable duct.
23. Route the 4 mHz cables to the common control cabinet via overhead cable duct.
24. Leave the common control leg of each cable loose at this time.
25. Install the following new circuit packs in each of the module control carriers:
  - TN380B
  - TN440B(s)
  - TN444B
  - TN460C

Save static protection bags the new circuit packs are shipped in for use later.

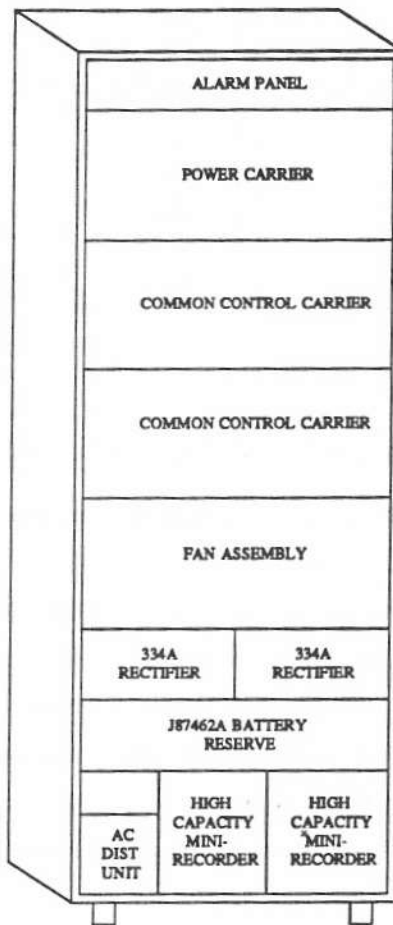
26. Install remaining circuit packs removed from previous carriers into the new carriers.
27. Place remaining circuit packs in static protection bags.
28. Replace plastic covers on front of carriers.

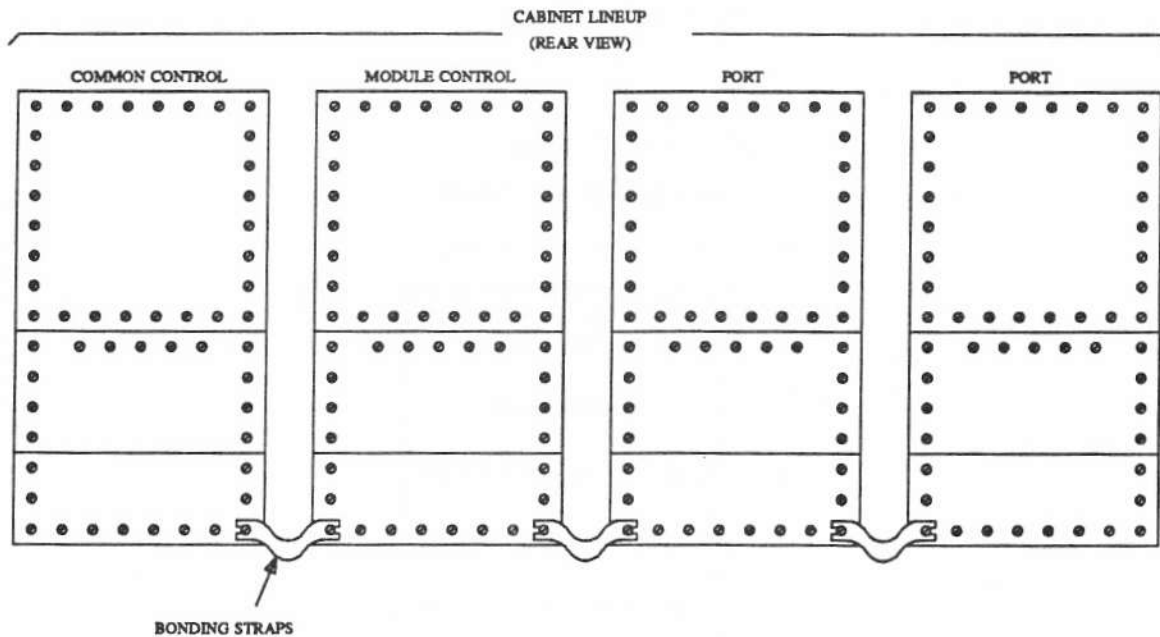
If cabinet is equipped with an F-61506/F-61591 power supply, the power supply must be replaced by a 309/310-type power supply. To replace power supply:

1. Tag and disconnect power supply cables.
2. Loosen mounting hardware securing power supply to the cabinet.
3. Slide power supply out of cabinet.
4. Install new power supply in cabinet.
5. Secure power supply using the hardware previously removed.
6. Connect cables to new power supply.

**At Duplicated Common Control Cabinet (J58888D)**

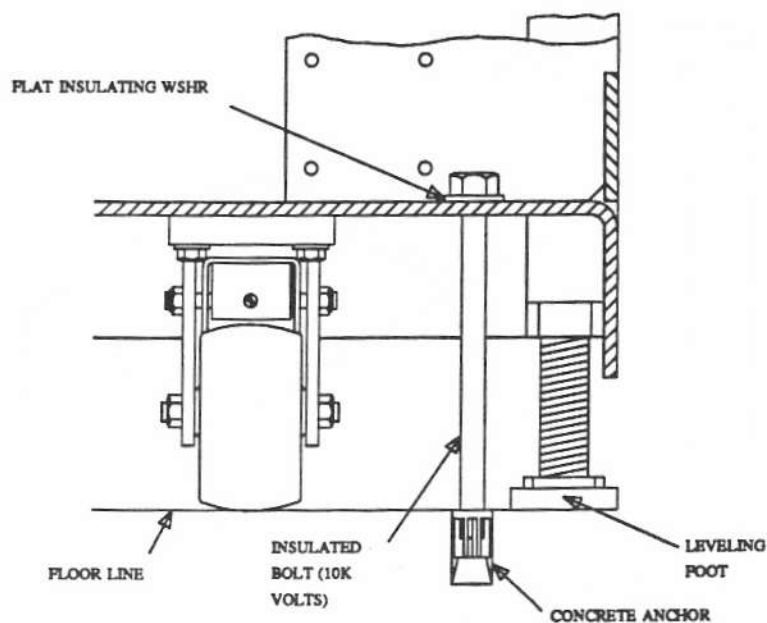
1. Unplug cabinet line cord.
2. Label and unplug all connector cables at rear of cabinet.
3. Loosen screw and remove braided bonding strap from cabinet.

**Figure 6-26. Duplicated Common Control Cabinet**



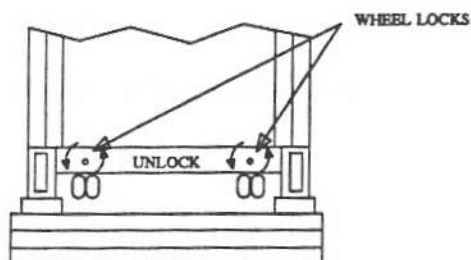
**Figure 6-27. Bonding Strap Location**

4. Open rear of cabinet by removing covers or opening doors as appropriate.
5. Remove covers from top of shielded cable duct.
6. At common control carriers, label and disconnect all flat (ribbon) cables running out of cabinet.
7. Pull loose flat cables up through top of cabinet and lay the loose ends out of the way.
8. Remove and retain hardware attaching cable ductwork to top of cabinet.
9. Label and disconnect all remaining wiring (battery, ground, etc.) attached to cabinet.
10. Open cabinet front door.
11. If cabinet is earthquake mounted, remove and retain hardware securing cabinet to the floor.



**Figure 6-28. Earthquake Mounting**

12. Raise leveling feet so cabinet will roll easily over floor.
13. Loosen wheel locking bolts and roll cabinet out of the way.



**Figure 6-29. Location of Wheel Locking Bolts**

#### **REMOVE DOCUMENT FILE ASSEMBLY (IF MOUNTED ON CC CABINET)**

Remove document file assembly from side of cabinet. Proceed as follows:

1. Open document file door to gain access to bottom cabinet holder.
2. Loosen attaching bolt and rotate holder until hook clears bottom of cabinet.
3. Lift document file up and off cabinet.
4. Set document file aside for use later.



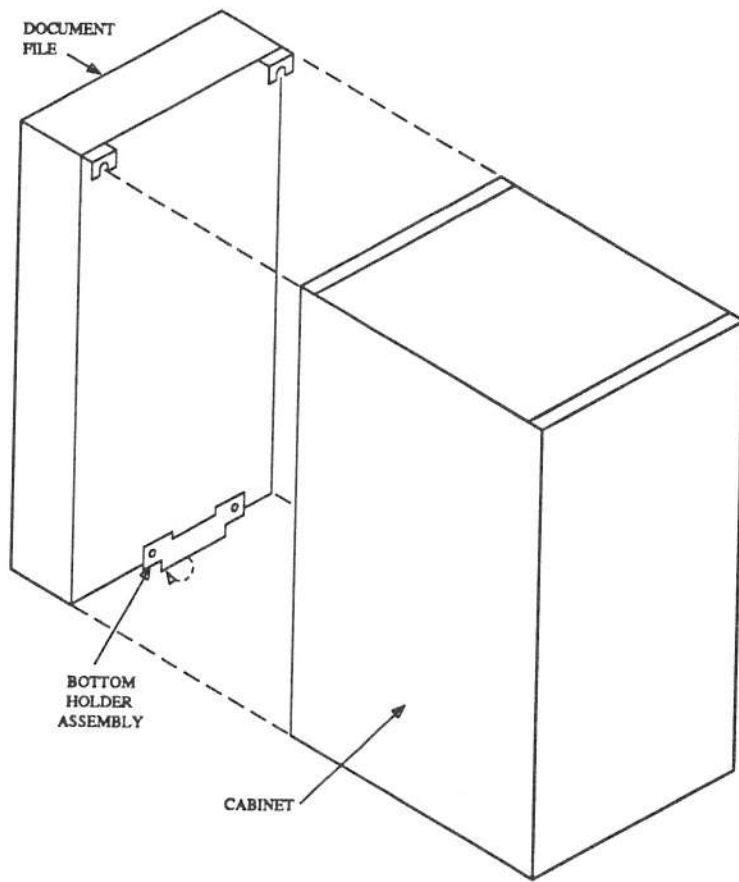


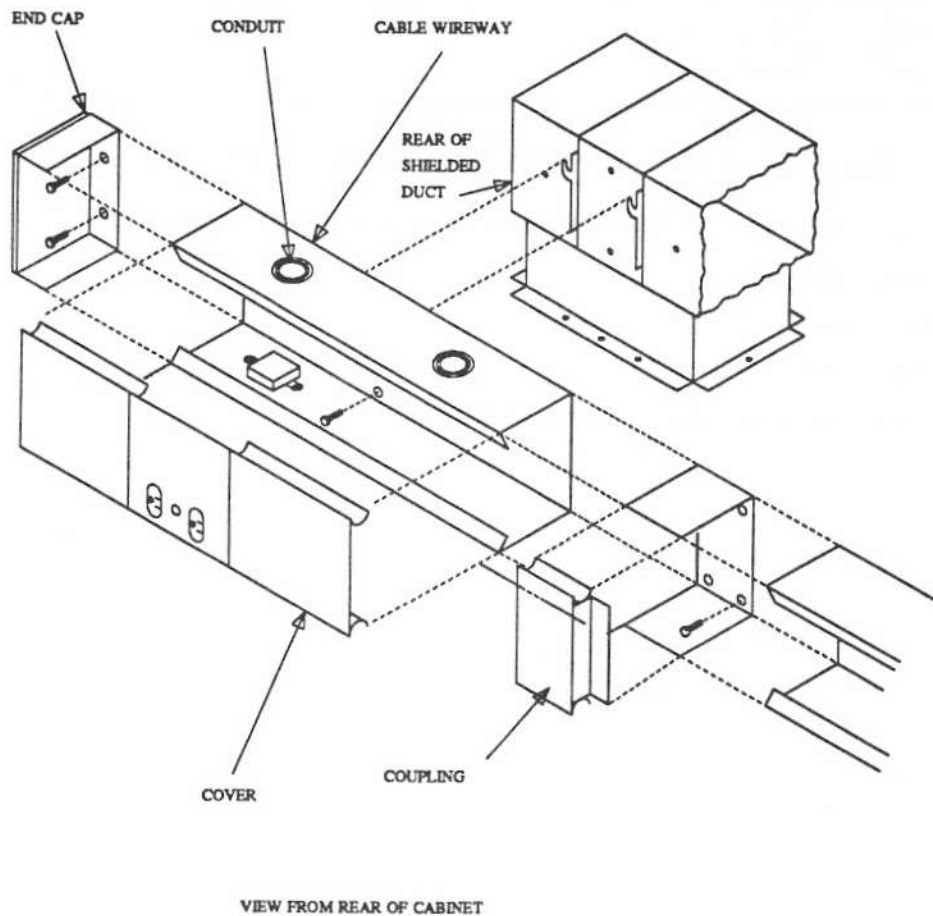
Figure 6-30. Document File Assembly

### To Install New Duplicated Common Control Cabinet (J58886K, L1)

The cabinet goes in same position in the cabinet lineup as cabinet that was removed.

The ac cable wireway located behind the cabinet must be removed and replaced with an ED-1E465-70, G15 cable wireway. To remove wireway:

1. Remove covers from wireway.



**Figure 6-31. Cable Wireway Located Behind Common Control Cabinet**

2. Remove end cap from wireway. Conduit and ac wiring installation and removal must be done by qualified electricians.
3. Remove and retain hardware attaching wireway to coupling.
4. Remove and retain screw attaching wireway to rear of shielded duct.
5. Lift wireway off hangers at rear of shielded duct. Dispose of wireway per local instructions.

### Install new ED-1E465-70, G15 Wireway

1. Install two No. 2310 twistlock receptacles in new wireway.

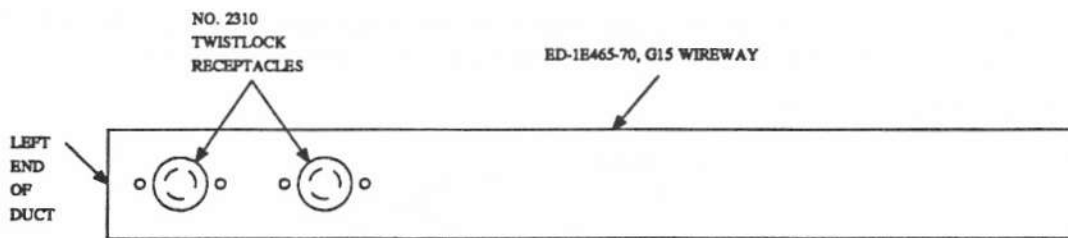


Figure 6-32. Bottom view of ED-1E465-70, G15 Wireway

2. Hang wireway on hangers on rear of shielded duct and secure with screw previously removed.
3. Attach wireway to coupling.
4. Fasten conduit to wireway.
5. Attach end cap to wireway.
6. The ac wiring should be connected to the ac load center.

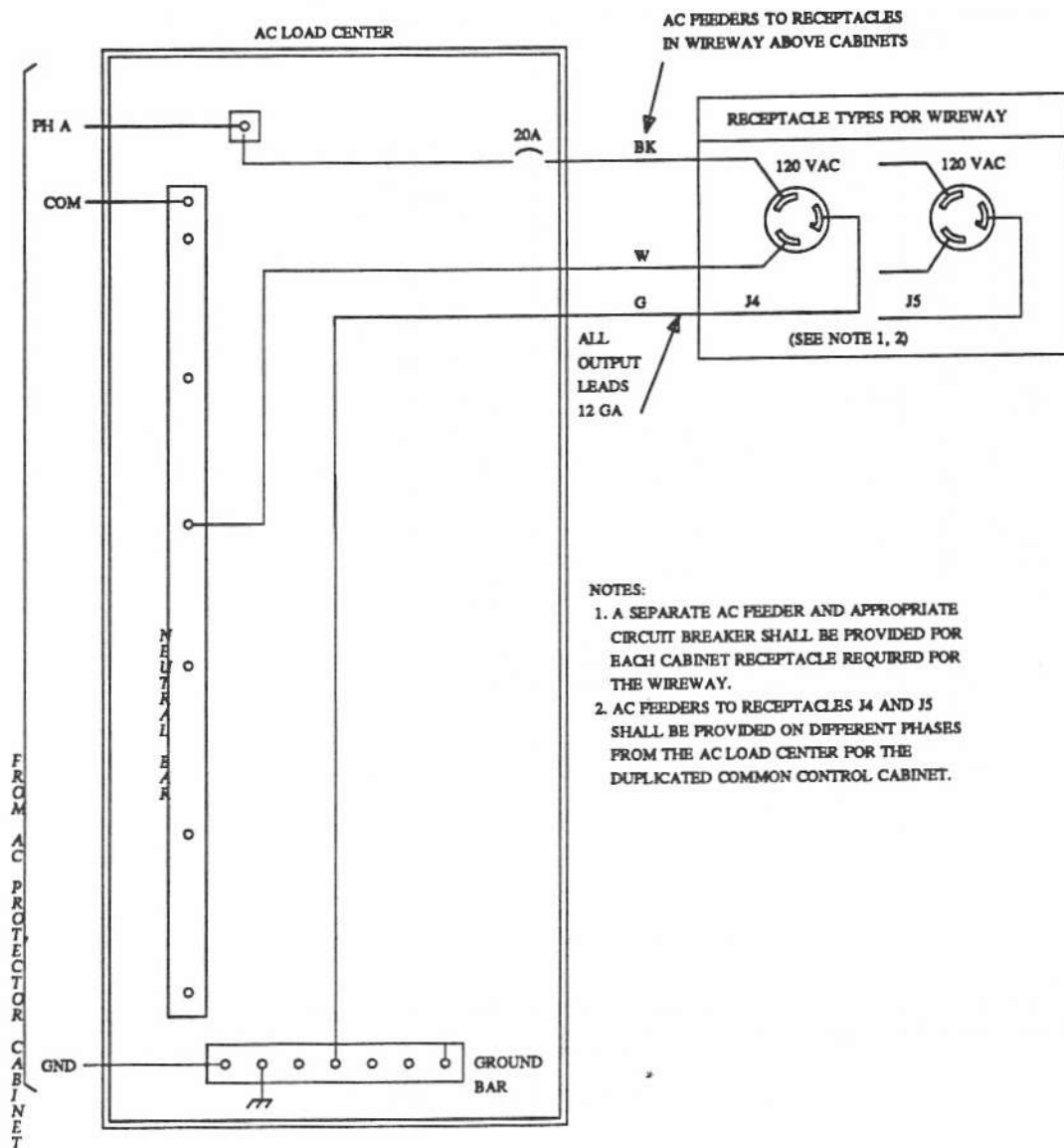


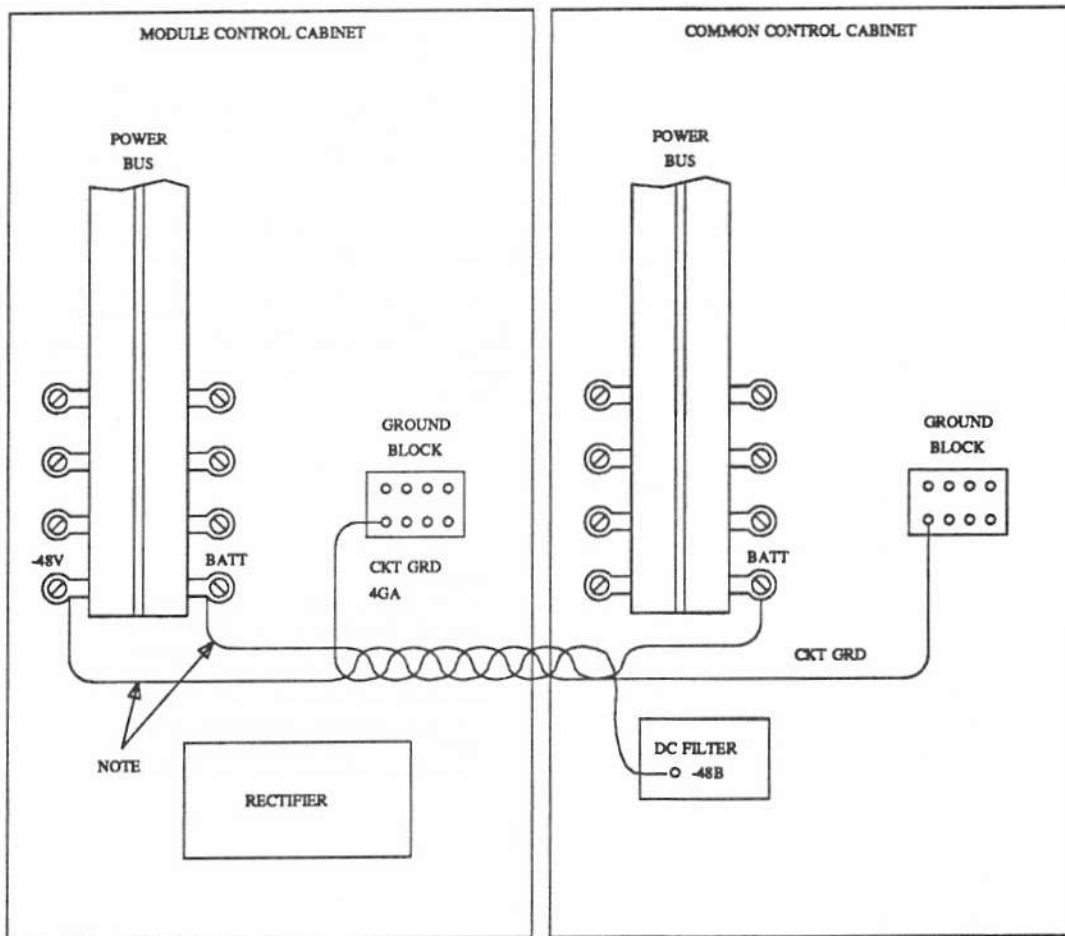
Figure 6-33. AC Connections for Duplicated Common Control

7. At wireway, install cover.
8. If the existing ductwork to cabinet bracket is different from the new bracket (844176925) provided, replace it with the new bracket reusing the mounting hardware.

To install the new common control cabinet, see section entitled "UNPACKING AND INSTALLING CABINET."

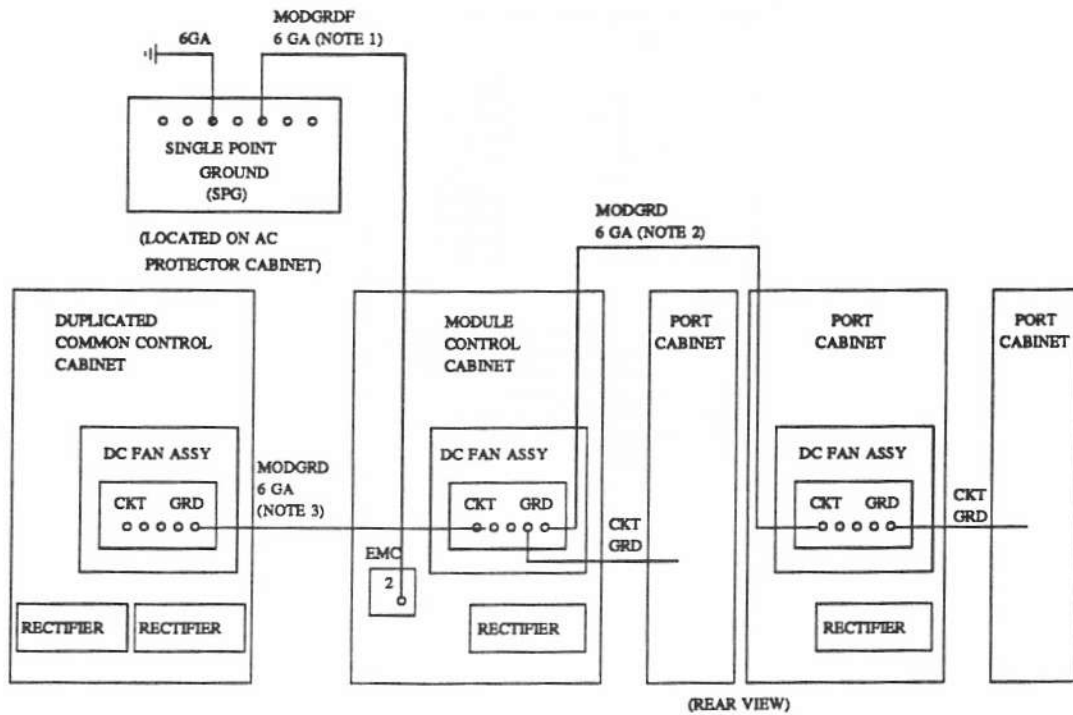
After cabinet is secured in lineup, proceed as follows:

1. Using hardware removed previously, attach cable ductwork to top of cabinet.
2. Connect cabinet to ground wires removed from previous cabinet.



**NOTE:**  
THESE WIRES ARE THE SAME COLOR AND ARE MARKED TO ENSURE CORRECT TERMINATION. ROUTE THROUGH UPPER DUCT ON LOWER REAR OF CABINETS.

**Figure 6-34. Circuit Ground Connections**



NOTES:

1. THE MODGRDF WIRE EXITS THE CABINET USING THE HOLE ASSIGNED TO CONNECT BUS BARS TOGETHER. IT RUNS UP THE REAR OF CABINET AND DRESSES INTO THE I/O DUCT CARRYING THE TIP AND RING CABLES.
2. IF PORT CABINETS ARE PLACED CROSS AISLE FROM THE MODULE CONTROL CABINET, MODGRD IS CONNECTED FROM THE GROUND BLOCK IN THE MODULE CONTROL CABINET, ROUTED THROUGH THE SHIELDED FLAT CABLE DUCT, TO THE GROUND BLOCK IN THE FIRST CROSS AISLE PORT CABINET WITH A RECTIFIER. GRDL AND MODGRD MUST BE SEPARATED AS MUCH AS POSSIBLE.
3. RUN THROUGH THE SMALL DUCT ON LOWER REAR OF CABINET WHEN CABINETS ARE LOCATED SIDE BY SIDE.

Figure 6-35. Ground Connections for Duplicated Common Control

3. Connect braided bonding strap to cabinet.
4. Route flat (ribbon) cables down through top of cabinet.
5. Connect flat cables, etc., disconnected from the previous cabinet. Use the following extender cables as required:
  - SMDR extender cable; ED-1E434-11, G102
  - SMT extender cable; ED-1E434-11, G105
  - MAAP extender cable; ED-1E434-11, G105
6. Connect first 4 mHz cable (from module control carriers connector B02) to connector E9 located on common control carrier 00.
7. Connect second 4 mHz cable (from module control carriers connector B01) to connector E9 located on common control carrier 01.

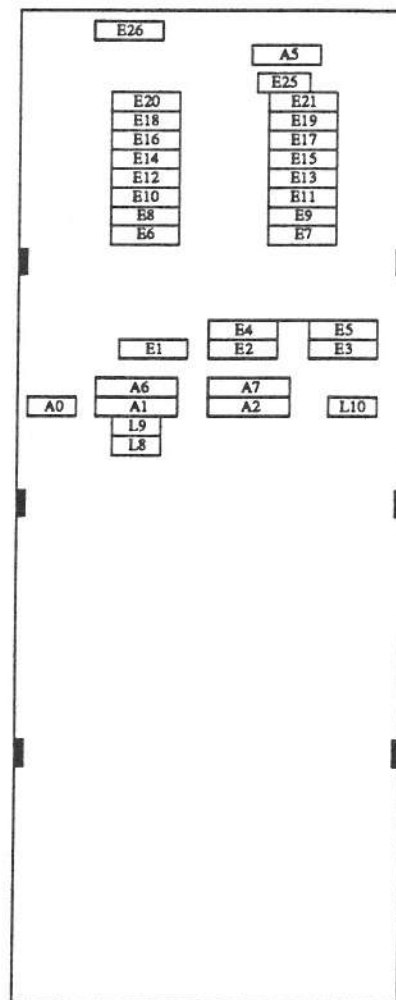


Figure 6-36. Rear View of Common Control Carrier

8. Connect RMATS data cable H1 to H2 connector on the common control cabinet. A new ED-1E434-11, G311 cable is provided as required.
9. Connect AP data cable H2 to H3 connector on the common control cabinet.
10. Connect 25-pair I/O connector cables disconnected from previous cabinet.
11. Connect EXT/ALM (J7) cable to MISC/ALM (D1) connector. The -48PX and GRD -48 connections must be relocated.

**TABLE 6-9. Emergency Transfer -48V & GRD Wiring**

301CC					501CC					
EXT/ALM (J7)					MISC/ALM (D1)					
-48 PX	22	23	24	25	32	33	34	47	48	49
GRD-48	47	48	49	50	7	8	9	22	23	24

12. Connect DCIU "F" cable(s) to common control F connector(s). If common control connectors begin with 0: connect cable F1 to connector F0, cable F2 to connector F1, and cable F3 to connector F2, etc..
13. Connect sense lead between common controls.

**TABLE 6-10. Sense Lead Connections**

From Common Control Cabinet		Cable Type	To Module Control Cabinet	
Unit	Conn Desig		Unit	Conn Desig
J87462A*	SNS	ED-1E434, G101	310A	SNS
J87462A **	SNS	ED-1E434, G103	310A J87462A	SNS SNS
* For module control cabinet not equipped with nominal holdover. ** For module control cabinet equipped with nominal holdover.				

14. Connect peripheral I/O (TN403) "D" cable.
15. Replace covers on cable duct.

### Install Document File Assembly (If Removed)

Install document file assembly (previously removed) on side of a cabinet at end of cabinet line up or on wall. If document file assembly is a G1, it will fit on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L1 Port
- J58886G, Auxiliary
- J58886H, SMDR

The G1 document file assembly will not fit on new J58886J, L1 cabinet.

If document file assembly is a G2, it can be mounted on wall or on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L7 Port



- J58886F, L1 TMS
- J58886G, L24 Auxiliary
- J58886H, L6 SMDR

Install document file assembly as appropriate.

### **At Port Carrier**

Replace SN253/253B circuit pack with an SN253C. If system is not equipped with an SN253/253B, the SN253C must be installed in any powered port carrier slot as long as it meets pairing requirements.

If system is equipped with automatic identified outward dialing (AIOD), SN242 circuit pack(s) located in slots (00-02) of the first port carrier must be replaced with SN244 circuit packs. Also, the ANI cables, ED-1E434-11, G53 and G55, must be removed from the rear of the port carrier (connectors E00 and E9, respectively).

At any vacant port carrier slot, install an SN261 analog and digital test circuit pack. Any powered port slot in the system may be used as long as it meets pairing requirements. Administer in an unused class of service plus PROCs 051 and 052.

### **At SMT Interface**

Remove SMT interface from the wall field and replace it with an ED-1E434, G17 SMT interface bypass cable assembly.

### **At Auxillary Cabinet(s)**

1. At first auxiliary cabinet, remove J58889L alarm origination unit (Silent Knight) and associated wiring.
2. Install ED-1E447-10, G2 alarm distribution unit in each auxiliary cabinet.
3. Connect alarm distribution units.

The Silent Knight is replaced by the TN492C in the 501CC. Rewire the automatic alarm origination feature external alarms.

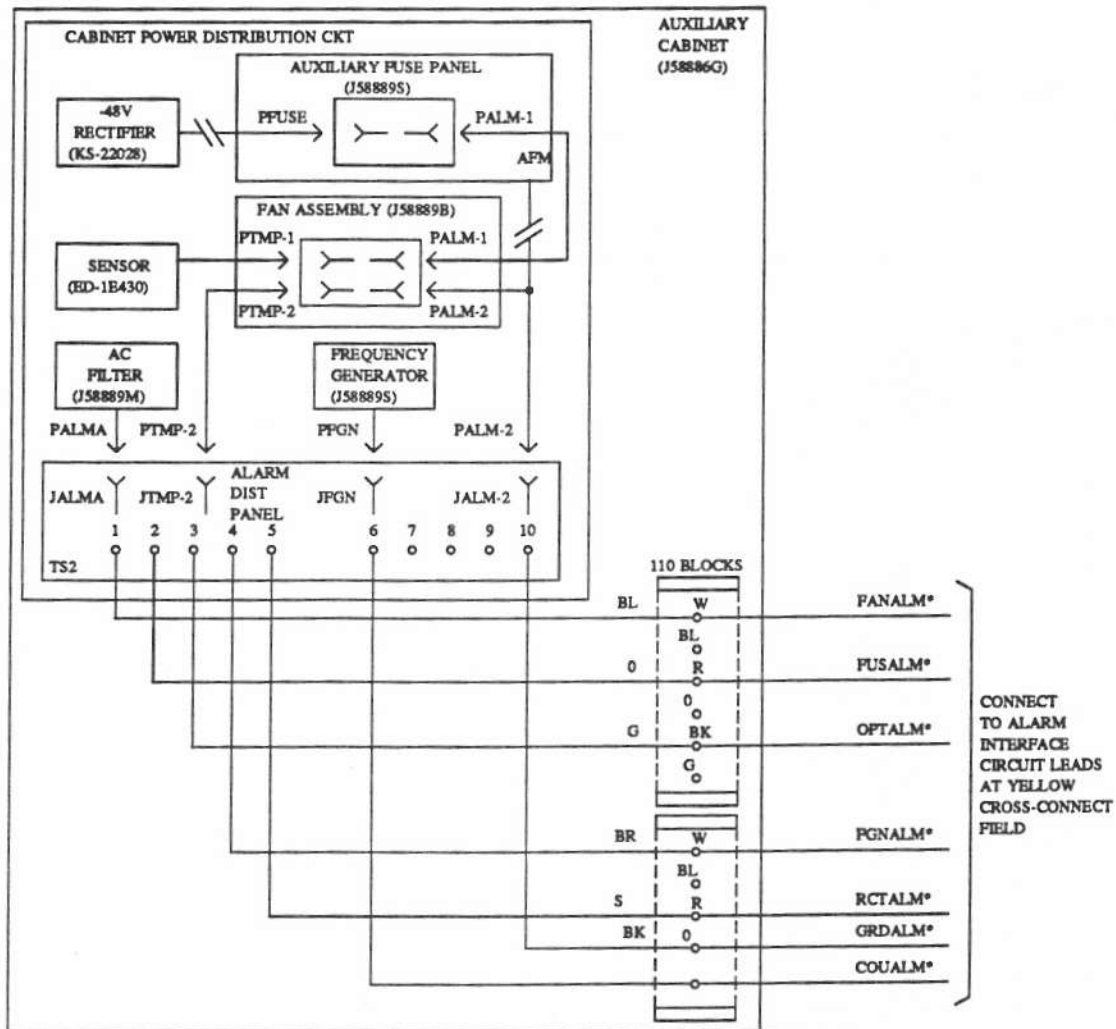
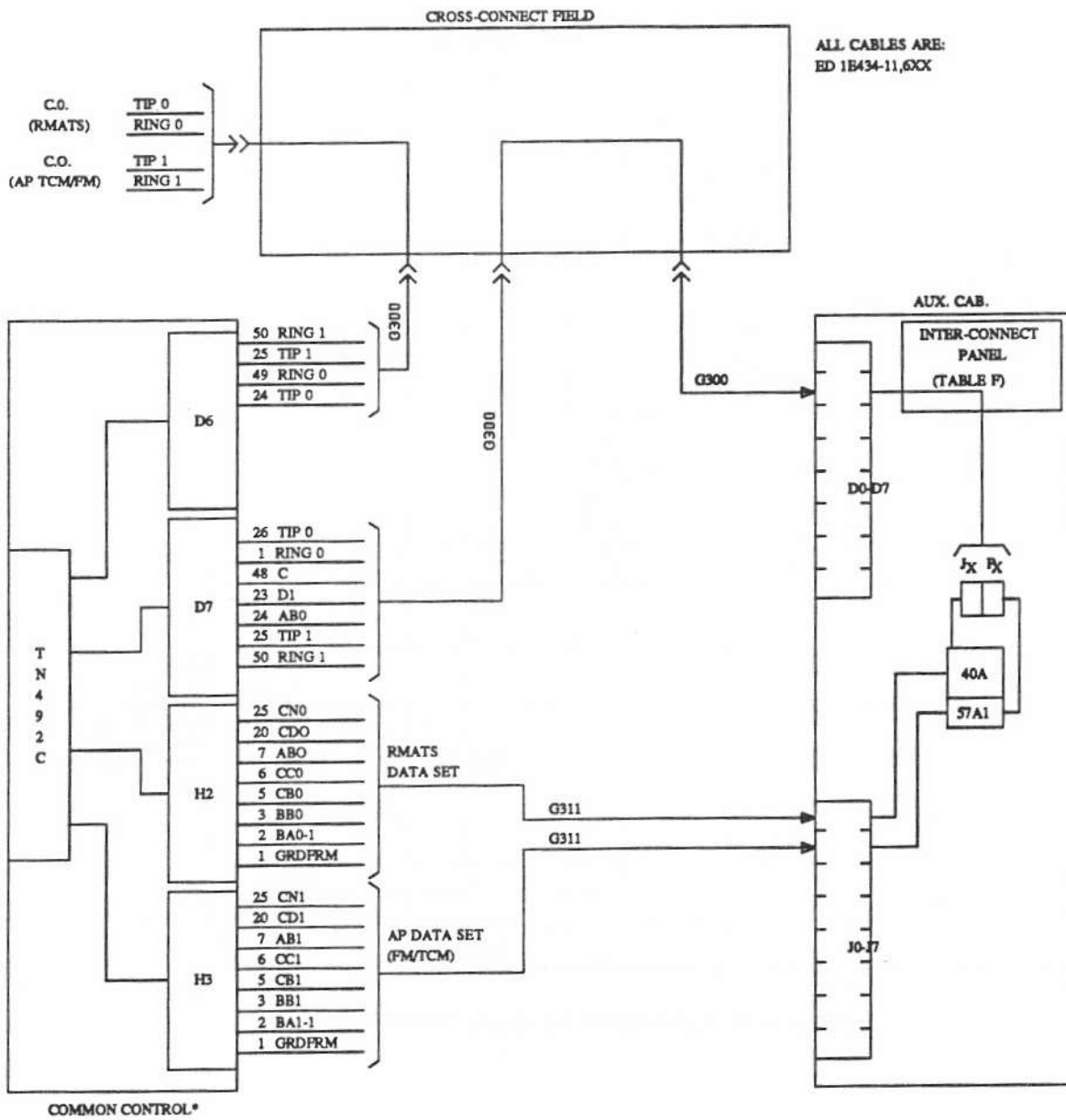


Figure 6-37. Connections for Alarm Distribution Units



\* WITH DUPLICATED COMMON CONTROL, TWO G72 "Y" CABLES ARE PROVIDED TO BRIDGE THE CC0 & CC1, H2 AND H3 CONNECTORS AND TWO G19 "Y" CABLES ARE PROVIDED TO BRIDGE THE CC0 & CC1, D6 AND D7 CONNECTORS.

Figure 6-38. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet

TABLE 6-11. Connections for Auxiliary Cabinet Slot 40A

SLOT*	1	2	3	4	5	6
40A	J1		J2			
C	14	8	35	46	47	14
D1	11	5	10	21	22	11
TDG†	2	2	2	2	2	2
57A1	P3					
TIP	26	27	28	29	30	31
RING	1	2	3	4	5	6

\* The C, D1, TDG data set control and Tip & Ring leads are unique per 40A slot position.

† TDG is identified as ABO at the TN492C in the 501CC.

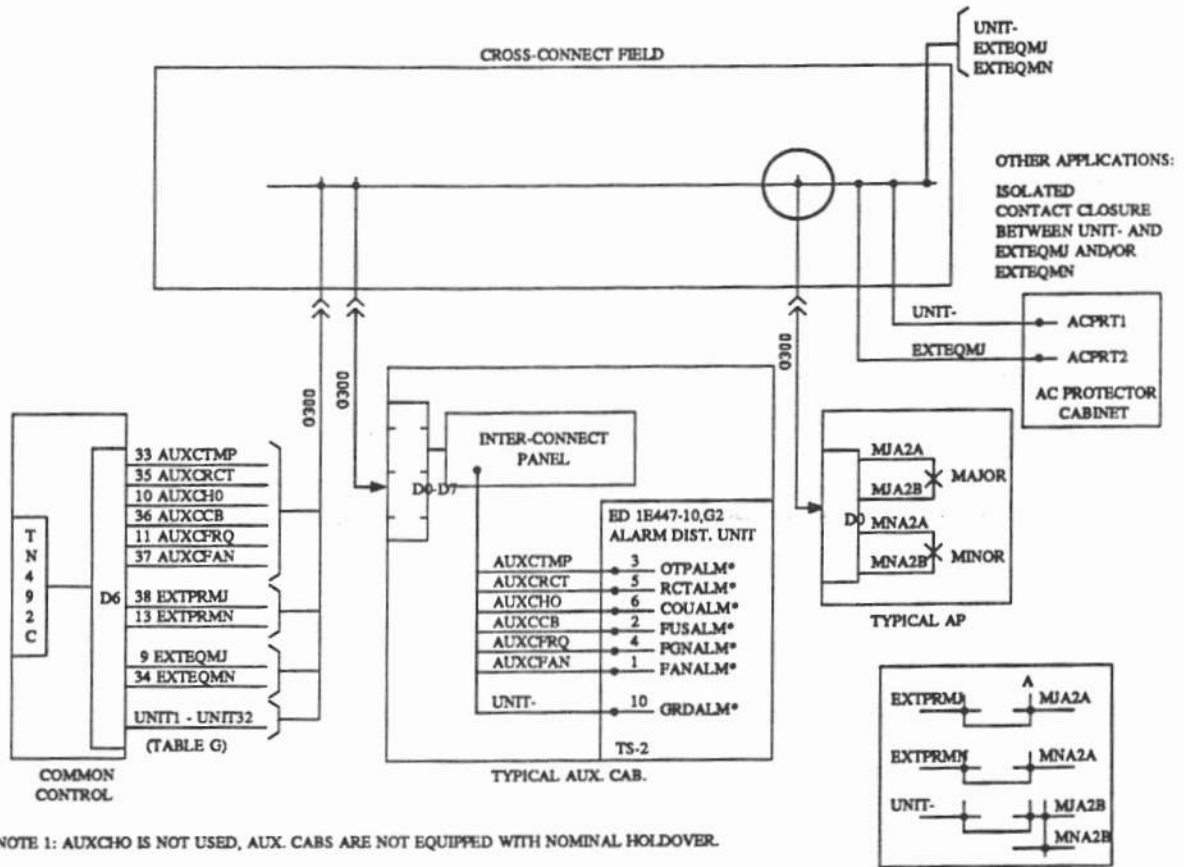


Figure 6-39. External Alarm Connections

TABLE 6-12. Unit Lead Connections

Backplane		Connector		Lead Designation *	
Slot	Pin	Desig	Pin		
32	120	D6	26	UNIT20	
	021		1	UNIT19	
	119		27	UNIT22	
	020		2	UNIT21	
	118		28	UNIT24	
	019		3	UNIT23	
			29		
	018		4	UNIT25	
	116		30	UNIT27	
	017		5	UNIT26	
	115		31	UNIT29	
	016		6	UNIT28	
	114		32	UNIT31	
	015		7	UNIT30	
	053		33	AUXCTMP	
	014		88	UNIT32	
	052		34	EXTEQMN	
	152		9	EXTEQMJ	
	051		35	AUXCRCT	
	151		10	AUXCHO	
	050		36	AUXCCB	
	150		11	AUXCFRQ	
	049		37	AUXCFAN	
	TN492C			12	
			048	38	EXTPRMJ
			148	13	EXTPRMN
			047	39	UNIT2
			147	14	UNIT1
			044	40	UNIT4
			144	15	UNIT3
			352	41	UNIT6
			253	16	UNIT5
			351	42	UNIT8
			252	17	UNIT7
			350	43	UNIT10
			251	18	UNIT9
				44	
			250	19	UNIT11
			348	45	UNIT13
			249	20	UNIT12
347		46	UNIT15		
248		21	UNIT14		
346		47	UNIT17		
247	22	UNIT16			
	48				
246	23	UNIT18			
205	49	RING0			
305	24	TIP0			
203	50	RING1			
303	25	TIP1			

\* The "UNIT" lead is unique per auxiliary cabinet and originates as "GRDALM\*" @ the alarm distribution unit (connection 10 on TS2). Unit 1 should be provided from auxiliary cabinet 1 unit 2 from auxiliary cabinet 2, etc.

---

**At all cabinets**

1. At 309/310-type power supply, set **AC INPUT** circuit breaker to **OFF**.
2. At power supply (if provided) in auxiliary cabinet(s), set **AC INPUT** power switch to **OFF**.
3. Verify that:
  - **RMATS** data set options are set as shown in the "Installation Service Manual" (555-101-104IS).
  - Circuit pack options are set as required by **CSD**.
  - Circuit packs are fully seated in correct slots.
  - dc-dc converters are fully seated and their switch latch is closed.
  - Fuse holders are equipped with correct fuses.
  - Connector cables are properly labeled, plugged into the correct connectors, and secured.
  - All foreign materials have been removed from cabinet and cross connect field.
  - Cabinet is properly grounded.
4. Connect cabinet to ac line cord.
5. Set cabinet circuit breakers to **ON** except for **AC INPUT** circuit breaker on 309/310-type power supply in module control and port cabinets and **AC INPUT** switch on auxiliary cabinet power supply.

**Powering Up System**

1. At the alarm panel:
  - Set **EMERGENCY TRANSFER** to **OFF**.
  - Set **COMMON CONTROL** to **OFF**.
  - Set **GO/HALT** to **HALT**.
2. Operate the nonfusible ac disconnect switch to the **ON** position.
3. At 309/310-type power supply, operate **AC INPUT** circuit breaker to **ON**.
4. At common control carrier, operate memory holdover switch to **ON**.
5. At auxiliary cabinet power supply (if provided), operate **AC INPUT** switch to **ON**.
6. Measure rectifier and dc-dc converter output voltages as required. Allow for tolerance of multimeter when making measurements.
7. Set all carrier circuit breakers on the new module control carriers to **ON**.

**To put System In Service****TABLE 6-13. Rectifier and Converter Voltage Limits**

		Voltage	Maximum	Minimum
Rectifier	BATT	Normal	-46	-52
		Emergency	-41.75	-52.2
		Transient	-41.75	-60
	-48V	Normal	-46	-52
		Emergency	-41.75	-52.2
		Transient	-41.75	-60
dc-dc Converter	490A1	5V	5.3	4.9
	494G1	5V	5.3	4.9
	494H1	12V	12.6	11.4
	495F	5V	5.3	4.9

**UPGRADE UNDUPLICATED 301CC TO DUPLICATED 501CC**

This part contains the step-by-step procedures required to upgrade the unduplicated 301CC to a duplicated 501CC.

A 501CC cabinet is added to the system and the existing 301CC cabinet is converted to a port cabinet. Additional ductwork must be added for the new cabinet. The 501CC cabinet may be installed anywhere in the equipment room as long as it is within 200 cable feet of the module control cabinet. This upgrade duplicates the common control only. The module control carrier is not duplicated.

If the module control cabinet is presently equipped with a J58888B module control carrier, that carrier must be replaced by a J58888M module control carrier. Also, if the module control cabinet is powered by an F-Spec (F-61506/F-61591) power supply, that power supply must be replaced by a 309/310-type power supply.

If the module control cabinet is already equipped with a J58888M module control carrier and a 309/310-type power supply, no changes are required in this cabinet.

If the system is equipped with the standby power system (extended battery reserve), there are no power supplies to be changed out.

The existing system must be removed from service while the system upgrade is being carried out.

To upgrade system, proceed as follows:

### **Power System Down**

To remove power from the system:

1. At alarm panel, set **GO/HALT** to **HALT**.
2. At common control carrier, set memory holdover switch (on 311A) to **OFF**.
3. At 309/310-type power supplies in module control and port cabinets, set **AC INPUT** circuit breaker to **OFF**.
4. At auxiliary cabinet power supply (if provided), set **AC INPUT** switch to **OFF**.
5. At ac load center, set all circuit breakers to **OFF**. AP breakers may be left on at the discretion of the local I & M personnel.
6. Set ac disconnect switch to **OFF**.

### **At Module Control Cabinet**

1. Open rear of cabinet by removing covers or opening doors as appropriate.
2. At module control carrier (J58888B), label and disconnect all flat (ribbon) cables.
3. Remove ground (GRDD) straps between module control carrier and adjacent carriers.



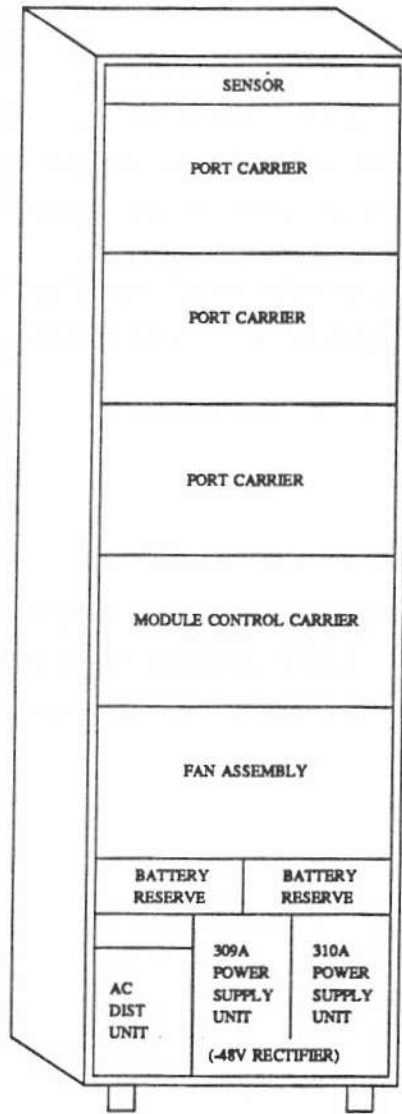


Figure 6-40. Module Control Cabinet

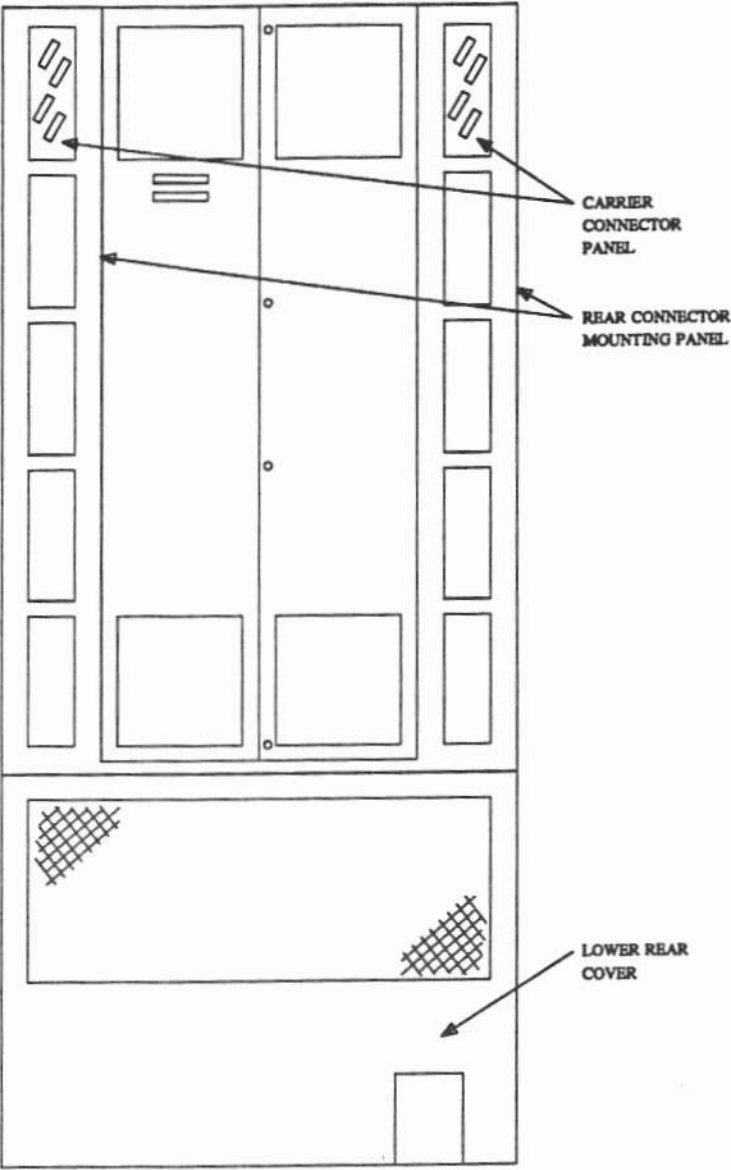
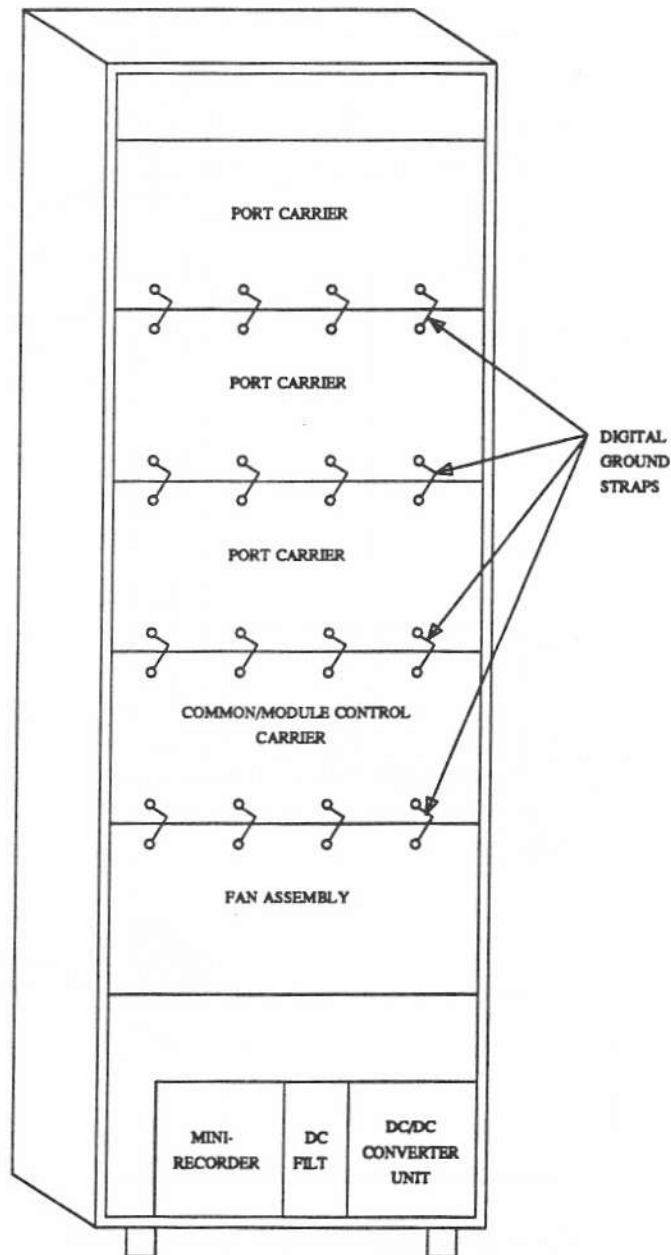


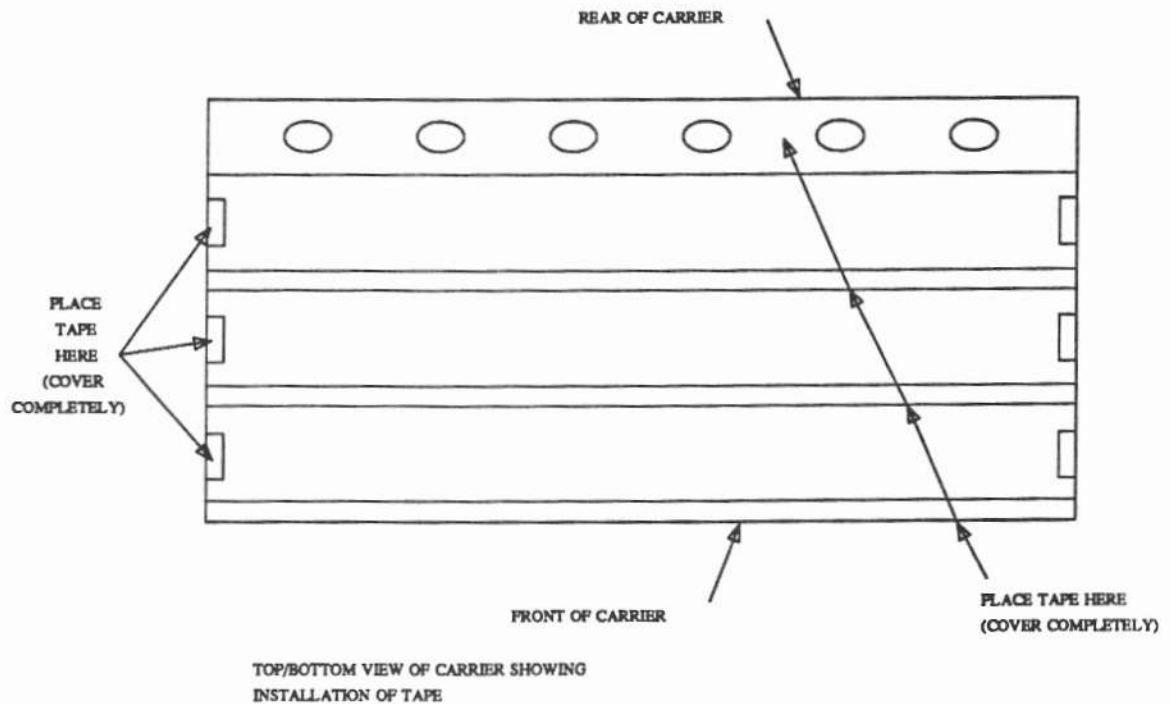
Figure 6-41. Rear View of Typical Cabinet



**Figure 6-42. Rear View of Cabinet Showing Digital Ground (GRDD) Straps**

4. Label and disconnect all remaining wiring attached to the module control carrier.
5. Open front door of cabinet.
6. Remove plastic cover from front of module control carrier. A grounded wrist strap, in contact with the skin, must be worn any time circuit packs are being installed or removed from the carrier.
7. Remove circuit packs from carrier.

8. Loosen plastic mounting screws and slide carrier out of cabinet.
9. Remove carrier slide brackets from cabinet frame. Discard insulators located between slide brackets and carrier frame. When the new module control carrier (J58888M) is being installed in a J58886B-1, List 1 module control cabinet, it must not be allowed to physically contact adjacent equipment.
10. If the new carrier is not factory taped, insulate the carrier by placing the yellow tape provided (Scotch Vinyl 35) at any place around the top and bottom of the carrier where it could possibly contact adjacent equipment.



**Figure 6-43. Top/Bottom View of Carrier Showing Application of Tape**

11. Before installing new carrier, clean out the threads of each cabinet mounting hole with a self-tapping screw of the appropriate size. Sheets of paper should be used to completely cover the top of the equipment below the holes being threaded to keep metal particles from falling into the equipment.
12. On new carrier, loosen screws attaching circuit breaker panel and move circuit breaker panel aside to provide access to carrier mounting bracket.

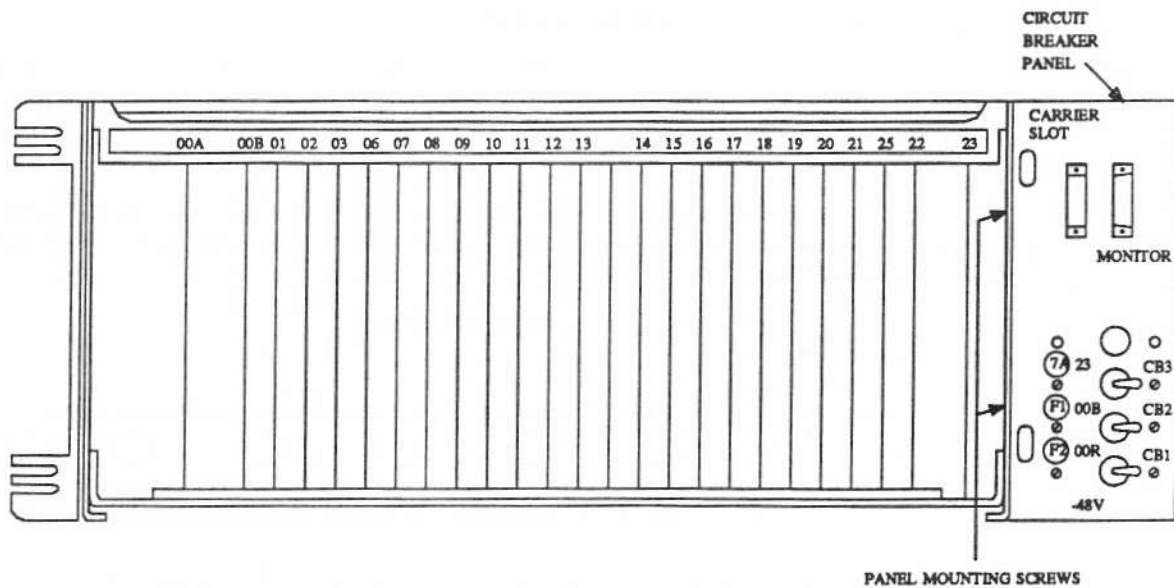


Figure 6-44. J58888M Module Control Carrier

13. Slide new carrier into place and secure by tightening mounting screws.
14. Secure circuit breaker panel to carrier.
15. Before connecting any cables to the carrier, use a multimeter to check for continuity between carrier and adjacent equipment. Meter should read **INFINITY**.
16. Connect ground (GRDD) straps to adjacent carriers or no carrier adapters.
17. Connect battery and ground leads to bus bar.
18. Connect flat cables to carrier.
19. Locate two 4 mHz cable assemblies (ED-1E434-11, G84).
20. Connect leg C of first 4 mHz cable assembly to module control carrier connector. **BO2**
21. Connect leg C of second 4 mHz cable assembly to module control carrier connector. **BO1**

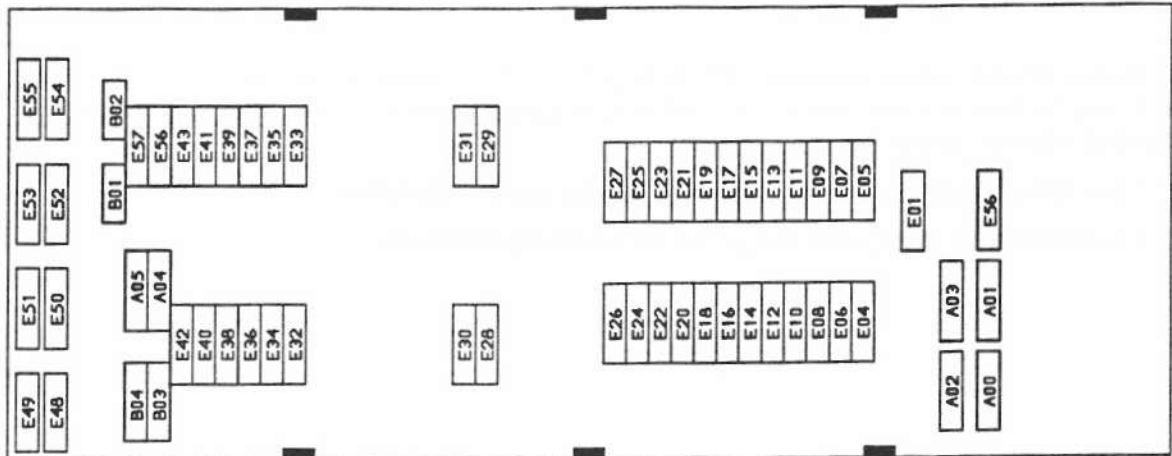


Figure 6-45. Rear view of Module Control Carrier

22. Coil and store unused legs ( A, B, and D) of each cable in overhead cable duct.
23. Route 4 mHz cables to common control cabinet via overhead cable duct.
24. Leave common control end of each cable loose at this time.
25. Install the following new circuit packs in module control carrier:
  - TN380B
  - TN440B(s)
  - TN444B
  - TN460C

Save the static protection bags the new circuit packs are shipped in for use later.

26. Install remaining circuit packs removed from previous carrier into new carrier.
27. Replace plastic cover on front of carrier.
28. Place remaining circuit packs in static protection bags.

If cabinet is equipped with an F-61506/F-61591 power supply, the power supply must be replaced by a 309/310-type power supply. To replace power supply:

1. Tag and disconnect power supply cables.
2. Loosen mounting hardware securing power supply to the cabinet.
3. Slide power supply out of cabinet.
4. Install new power supply in cabinet.
5. Secure the power supply using the hardware previously removed.
6. Connect cables to new power supply.

**At Common Control Cabinet (J58886A)**

The current common control cabinet will be left in position. The port carriers will be left in the cabinet and it will be used as a port cabinet. Do not remove cabinet power or ground wiring or any wiring associated with port carriers.

1. Open rear of cabinet by removing covers or opening doors as appropriate.
2. Disconnect alarm panel power and ground leads from cabinet bus bar.

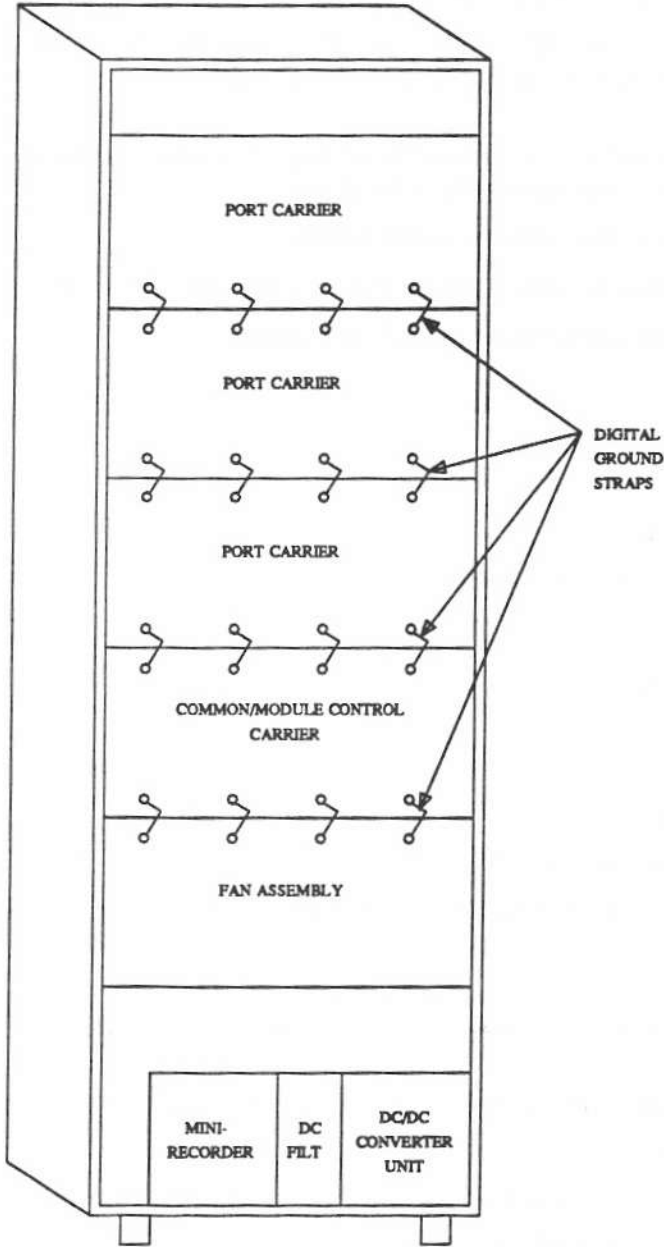


Figure 6-46. Unduplicated Common Control Cabinet



3. Disconnect common control carrier power and ground leads from cabinet bus bar.
4. Install six insulated tab caps (402992523) on cabinet bus bar power and ground terminals previously used by alarm panel and common control carrier. The tab caps are furnished as part of the upgrade.
5. Open front door of cabinet. A grounded wrist strap, in contact with the skin, must be worn while the circuit packs are being removed from the carrier.
6. Remove circuit packs from common control carrier.
7. The plastic cover must be replaced on the front of carrier after circuit packs are replaced.
8. Remove the following circuit packs from dc-dc converter:
  - 311A
  - 490A Type
  - 494 Type
  - 495 Type
9. Place removed circuit packs in static protection bags.

### **Remove Minirecorder**

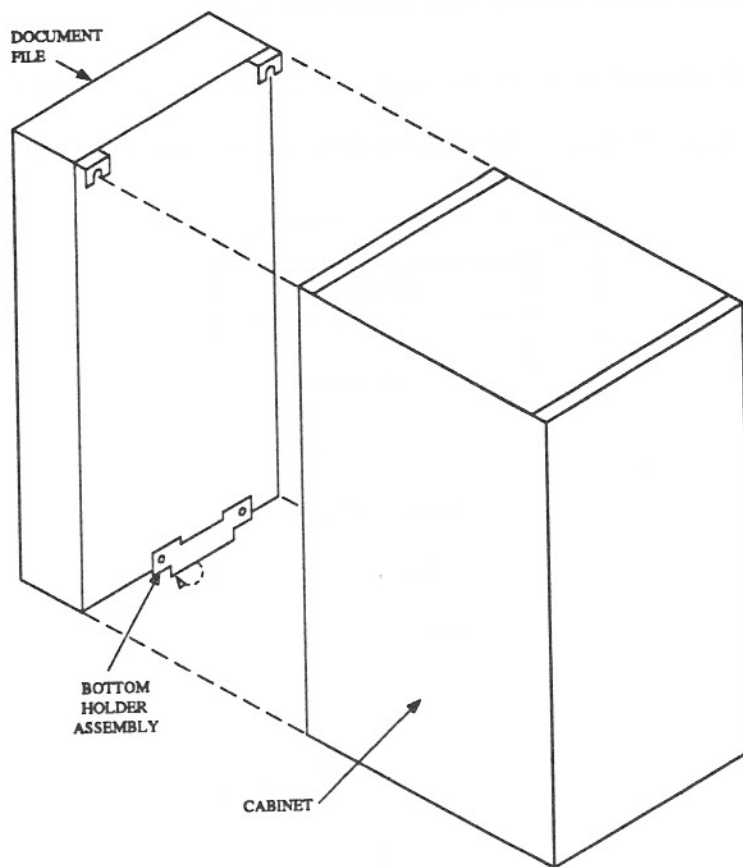
Remove minirecorder as follows:

1. Remove tape from minirecorder.
2. Unplug cables from rear of minirecorder.
3. Loosen hardware and remove minirecorder and its mounting brackets from cabinet.

### **Remove Document File Assembly**

If it is necessary to remove the document file assembly from the side of the cabinet, proceed as follows:

1. Open document file door to gain access to bottom cabinet holder.
2. Loosen attaching bolt and rotate holder until hook clears bottom of cabinet.
3. Lift document file up and off cabinet.
4. Set document file aside for use later.

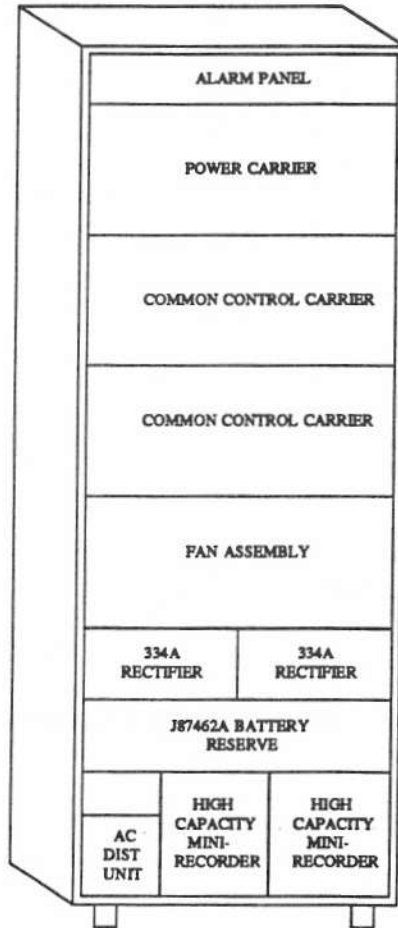


**Figure 6-47. Document File Assembly**

**To Install Duplicated Common Control Cabinet (J58887K, L1)**

The new common control cabinet will be located in the position shown on the revised floor plan.

To install cabinet, see Section entitled "UNPACKING AND INSTALLING CABINET."

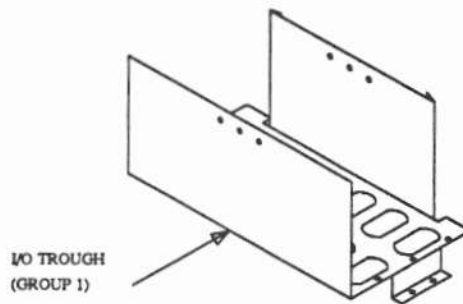


**Figure 6-48. Duplicated Common Control Cabinet**

## Install Cable Ductwork.

Cable ductwork must be installed to serve the added cabinet.

1. Install cable ductwork on top of cabinet as follows:
  - Remove end plates/caps from ductwork over adjacent cabinet.
  - Install I/O trough on top of cabinet.
  - Install shielded intercabinet ductwork on top of cabinet.



ATTACH I/O TROUGH TO CABINET USING 3/16" 24 X 5/16" THREAD FORMING SCREWS.

Figure 6-49. I/O Trough Installation

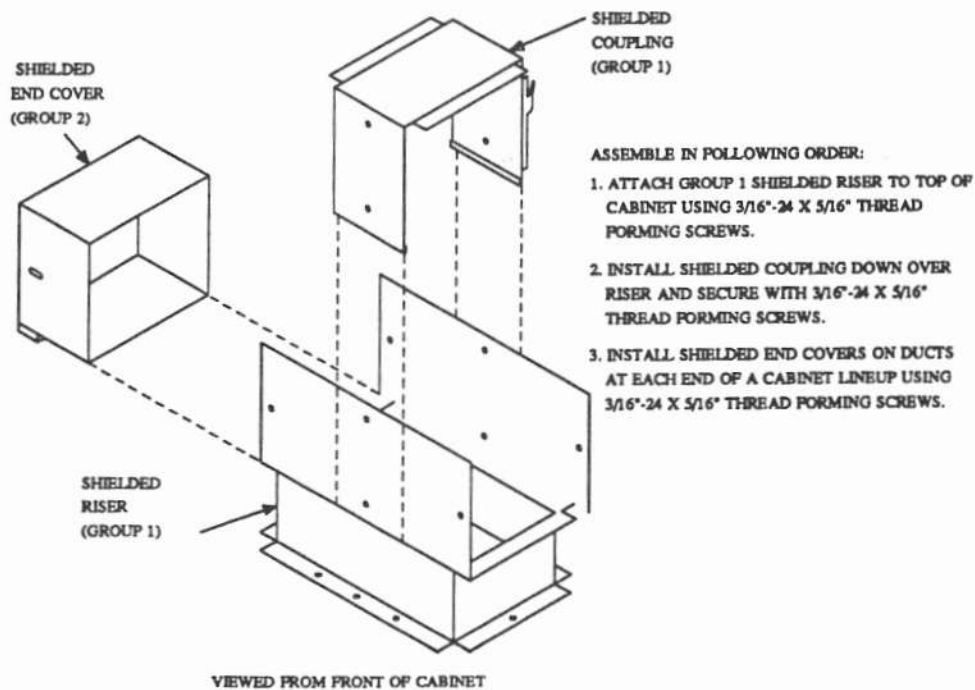
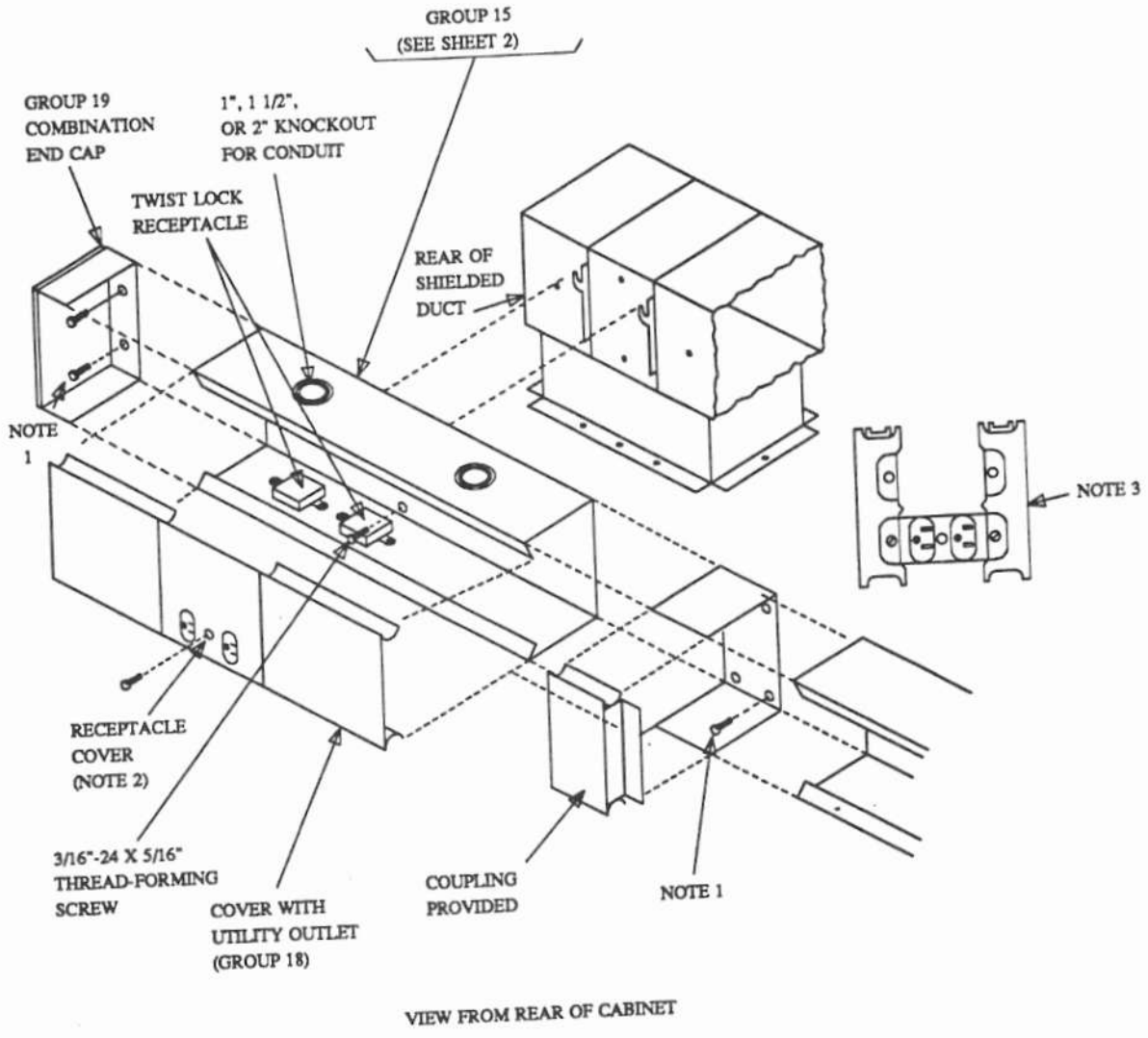


Figure 6-50. Installation of Shielded Intercabinet Ductwork

If system is equipped with the standby power system (extended battery reserve), it is not necessary to install and connect the ac power duct and ac receptacles.

- Install ac power duct and ac receptacle on top of cabinet.
  - Install end plates/caps removed from cabinet previously on the end of the cabinet lineup.
- Conduit and ac wiring installation must be done by qualified electricians.
2. AC wiring must be connected.
  3. At ac cable duct, install cover.
  4. Connect braided bonding strap to adjacent cabinet.
  5. Connect cabinet ground wiring.
  6. If system is equipped with standby power system (extended battery reserve):
    - Ground the cabinet.
    - Connect battery plant to cabinet.
    - Make alarm connections between battery plant and cabinet.



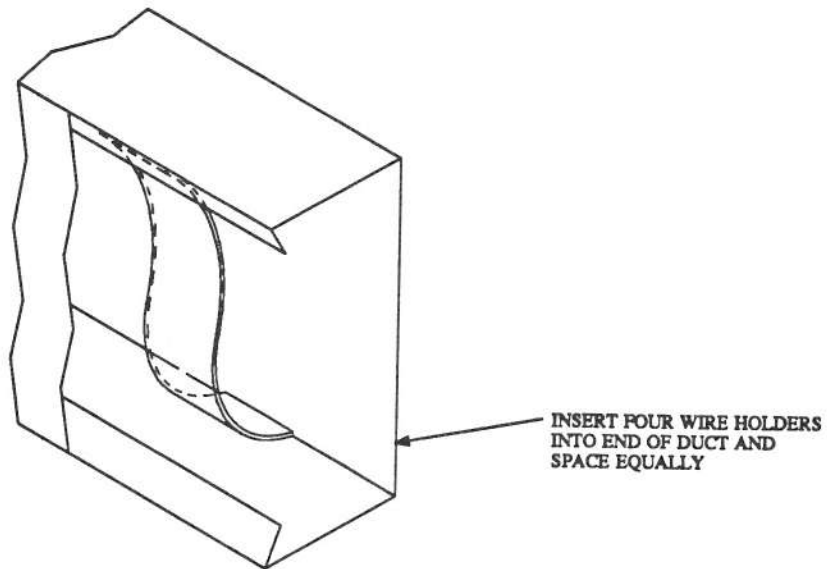
**NOTES:**

1. Round head machine screws used as set screws.
2. Receptacle cover must be put on before duct cover.
3. Slide in the end of the AC duct.
4. Insert wire holders per sheet 2.

**ASSEMBLE IN FOLLOWING ORDER:**

1. Hang AC power duct (Group 15) on back of shielded duct and anchor in place using one thread forming screw.
2. Interconnect ducts with coupling provided using four round head machine screws.
3. Slide in receptacle unit to center of duct from the end. Attach receptacle cover with one screw.
4. Mount Group 18 (AC cover) by snapping into place.
5. Attach Group 19 (combination end cap) by using two round head machine screws.

**Figure 6-51. Installation of AC Power Ductwork and AC Receptacle**



**Figure 6-52. Installation of AC Power Ductwork and AC Receptacle (Contd)**

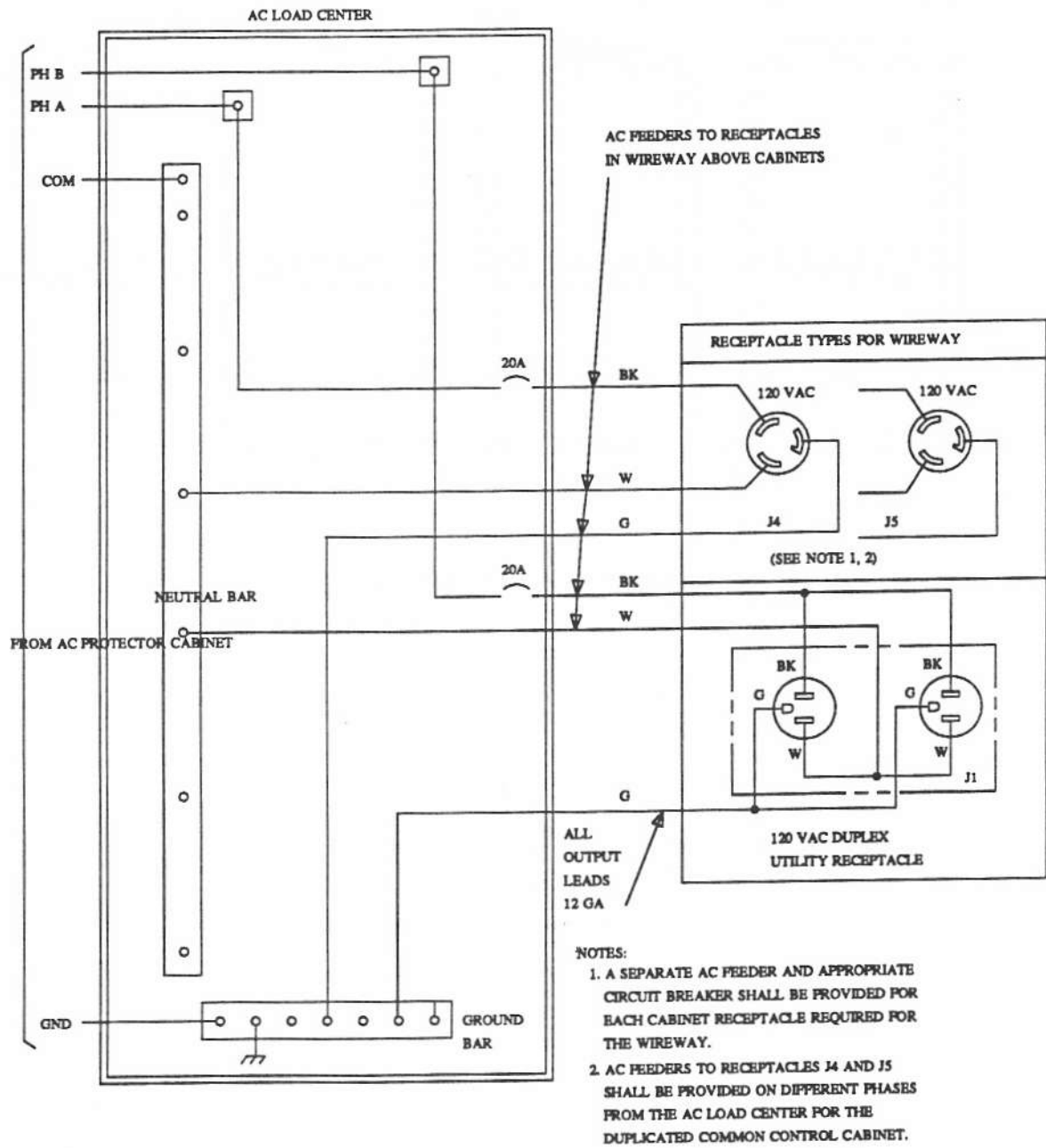


Figure 6-53. AC Connections for Added Cabinet



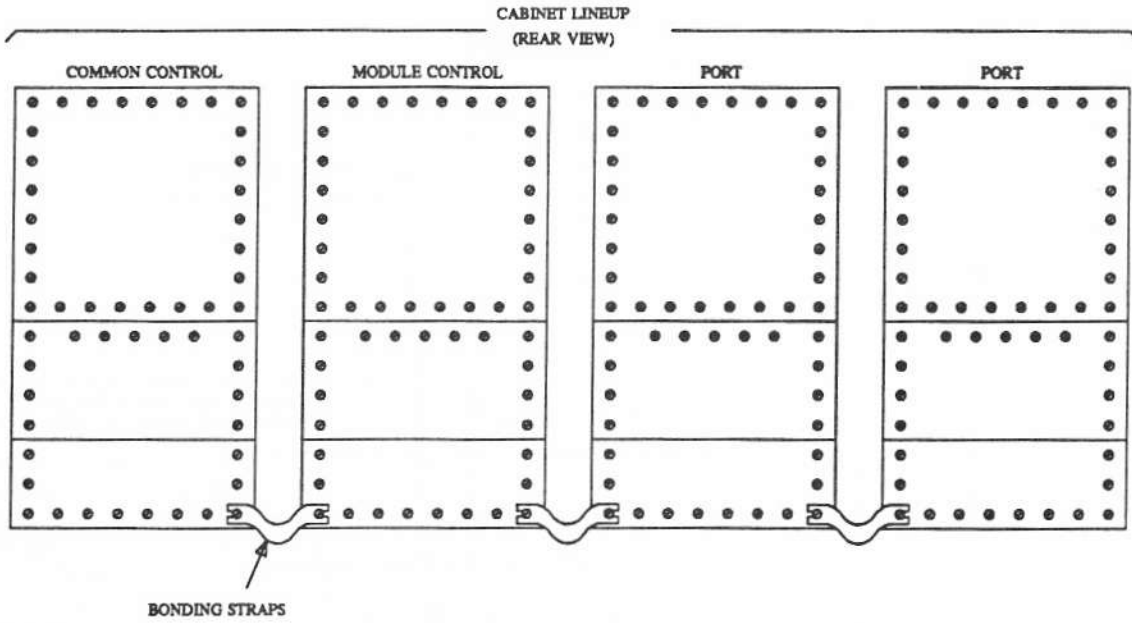
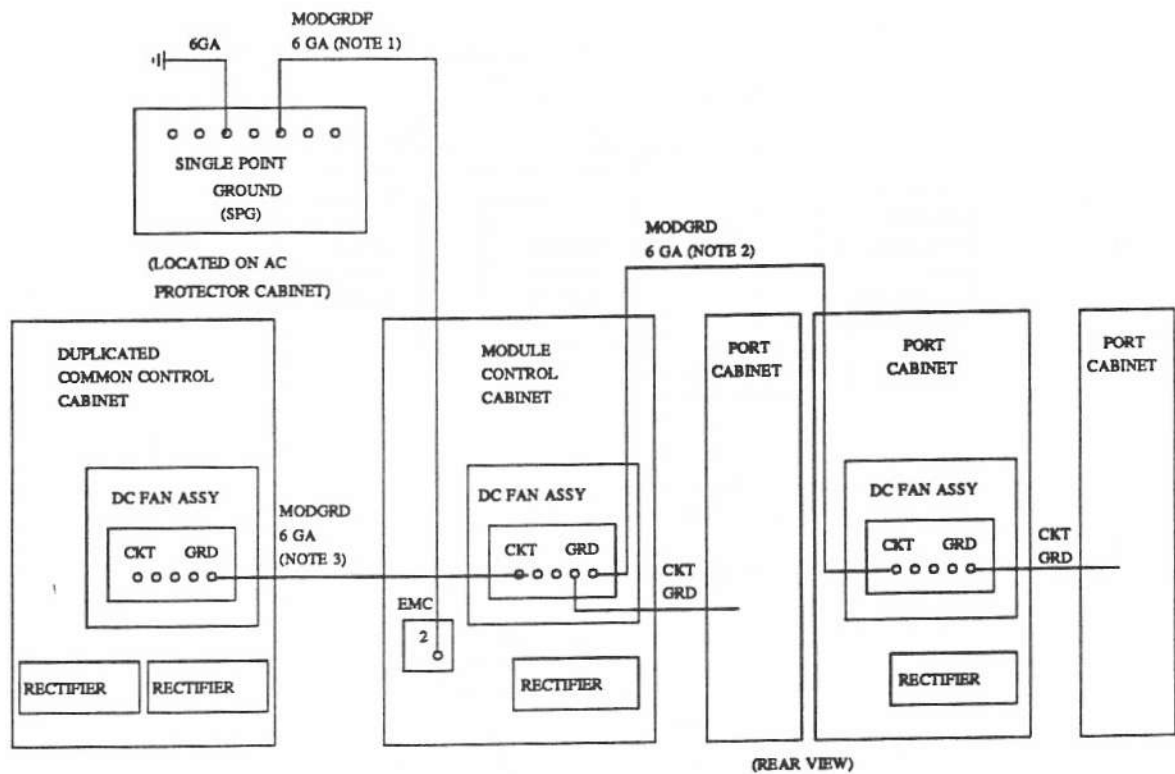


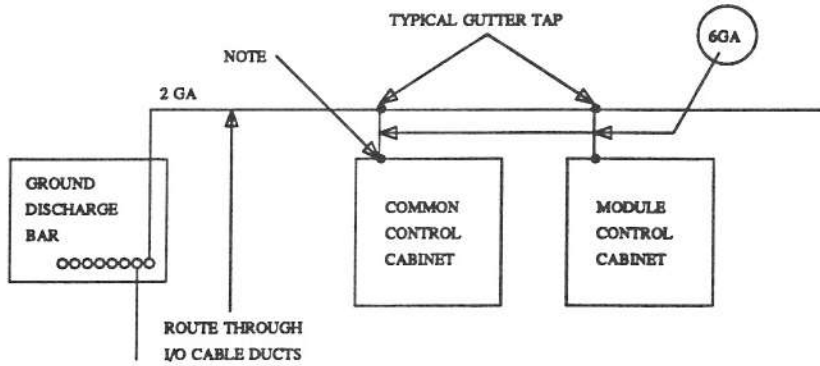
Figure 6-54. Bonding Strap Location



## NOTES:

1. THE MODGRDF WIRE EXITS THE CABINET USING THE HOLE ASSIGNED TO CONNECT BUS BARS TOGETHER. IT RUNS UP THE REAR OF CABINET AND DRESSES INTO THE I/O DUCT CARRYING THE TIP AND RING CABLES.
2. IF PORT CABINETS ARE PLACED CROSS AISLE FROM THE MODULE CONTROL CABINET, MODGRD IS CONNECTED FROM THE GROUND BLOCK IN THE MODULE CONTROL CABINET, ROUTED THROUGH THE SHIELDED FLAT CABLE DUCT, TO THE GROUND BLOCK IN THE FIRST CROSS AISLE PORT CABINET WITH A RECTIFIER. GRDL AND MODGRD MUST BE SEPARATED AS MUCH AS POSSIBLE.
3. RUN THROUGH THE SMALL DUCT ON LOWER REAR OF CABINET WHEN CABINETS ARE LOCATED SIDE BY SIDE.

**Figure 6-55. Ground Connections for Duplicated Common Control Cabinet**



NOTE:  
 CONNECT 6 GA CABLE TO TOP REAR OF CABINET.  
 MAKE SURE CONNECTION IS A GOOD ELECTRICAL GROUND.

Figure 6-56. Ground Connection for Extended Battery Reserve

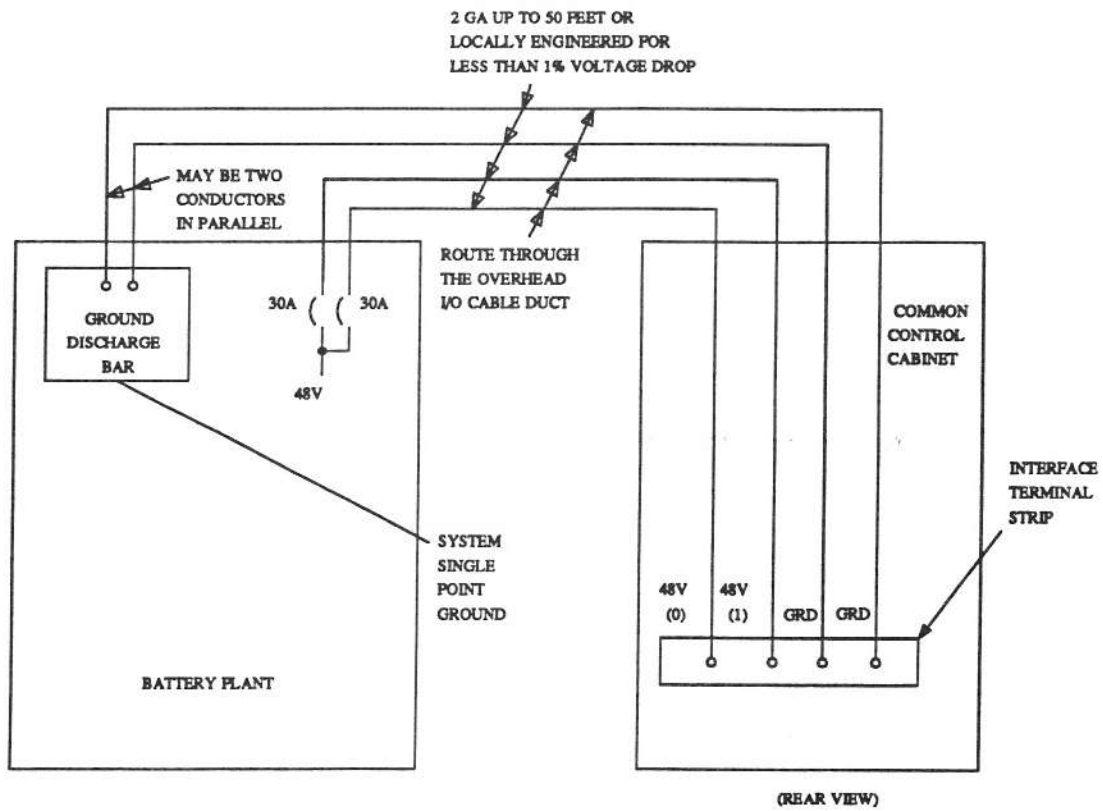
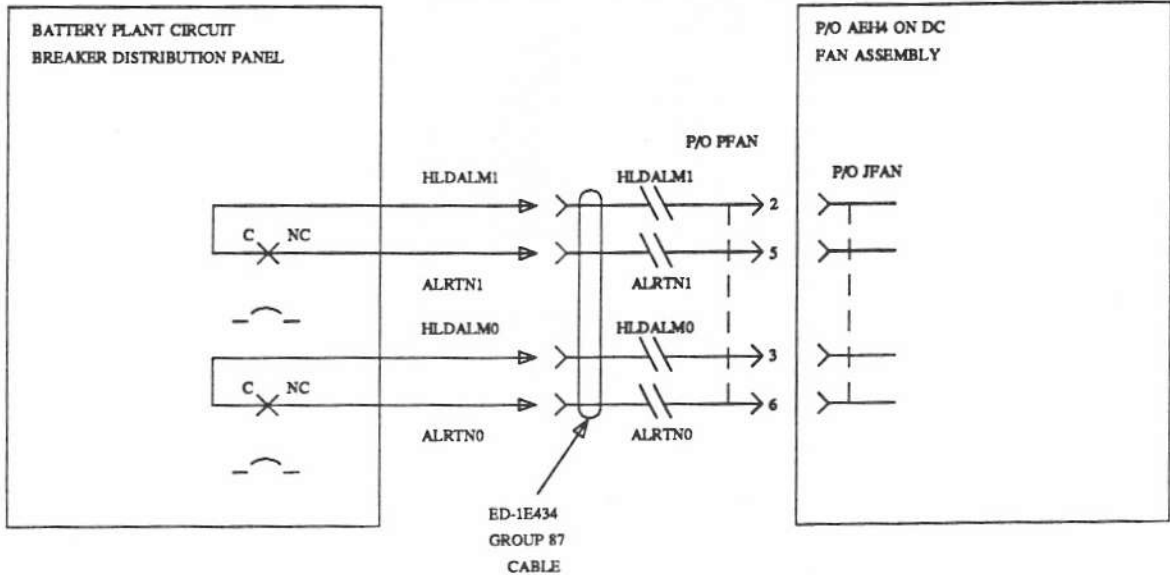


Figure 6-57. Battery Plant Connections to Common Control Cabinet



**Figure 6-58. Alarm Connections Between Battery Plant and Cabinet**

7. Connect first 4 mHz cable (from module control carrier connector **BO2**) to connector **E9** located on common control carrier **00**.
8. Connect second 4 mHz cable (from module control carrier connector **B01**) to connector **E9** located on common control carrier **01**.

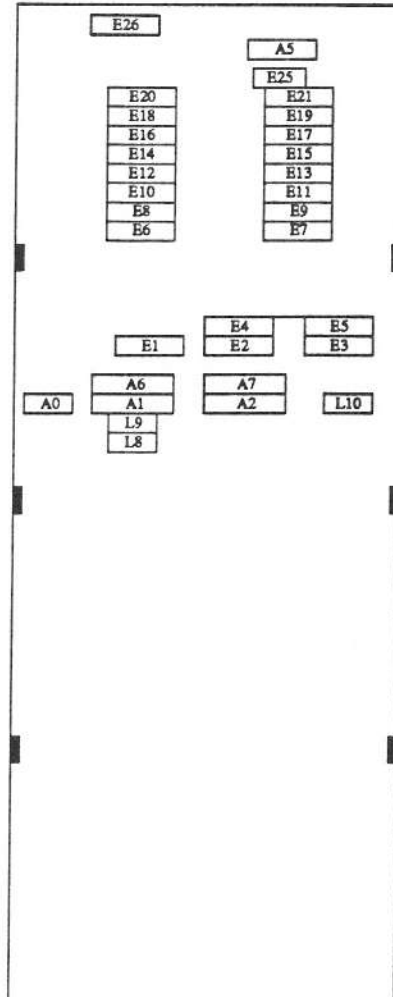


Figure 6-59. Rear View of Common Control Carrier

9. Connect sense lead between common control and module control cabinets.
10. Connect station message detail recorder (SMDR) cables, if required.

TABLE 6-14. Sense Lead Connections

From Common Control Cabinet		Cable Type	To Module Control Cabinet	
Unit	Conn Desig		Unit	Conn Desig
J87462A*	SNS	ED-1E434, G101	310A	SNS
J87462A**	SNS	ED-1E434, G103	310A	SNS
			J87462A	SNS

\* For module control cabinet not equipped with nominal holdover.  
 \*\* For module control cabinet equipped with nominal holdover.

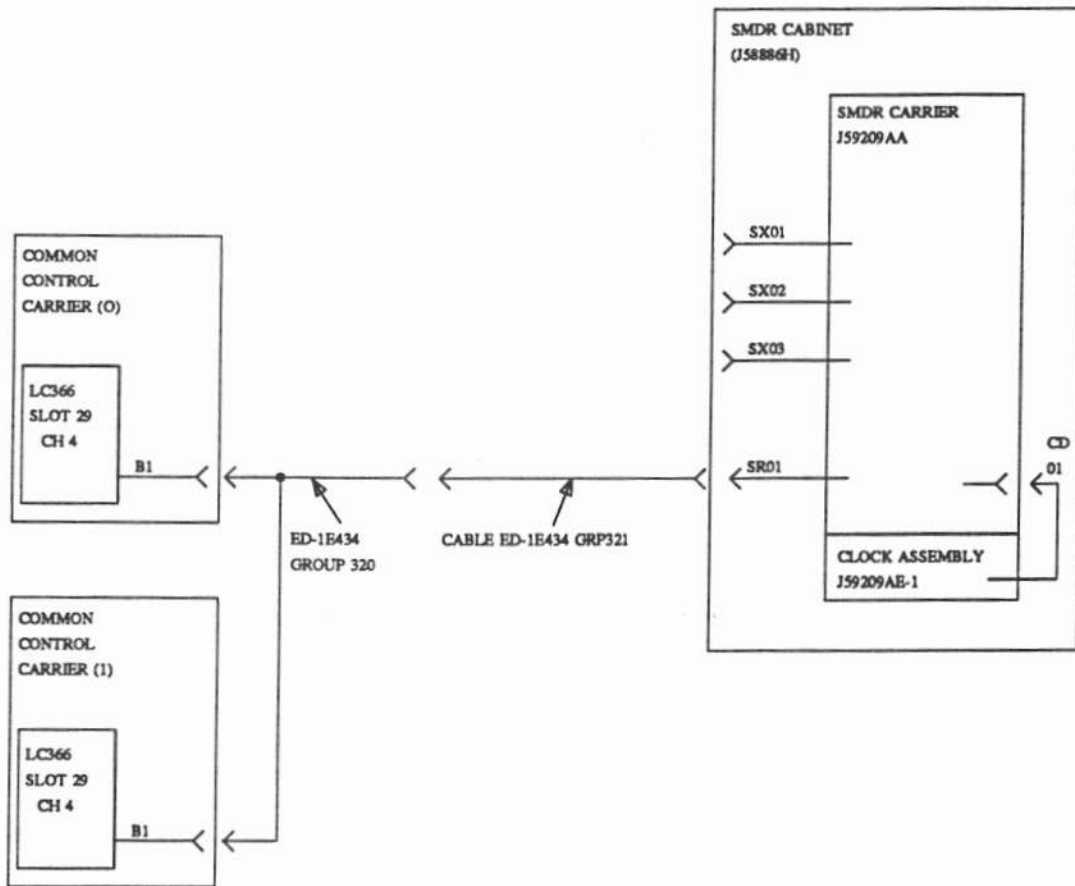


Figure 6-60. SMDR Connections for Duplicated Common Control

11. Connect remote maintenance, administration, and traffic system (RMATS) cables, if required. Cable H1 connects to connector H2 on the common control cabinet.
12. Connect the AP data cable (H2) to connector H3 on the common control cabinet. All "Y" cables are provided as required.

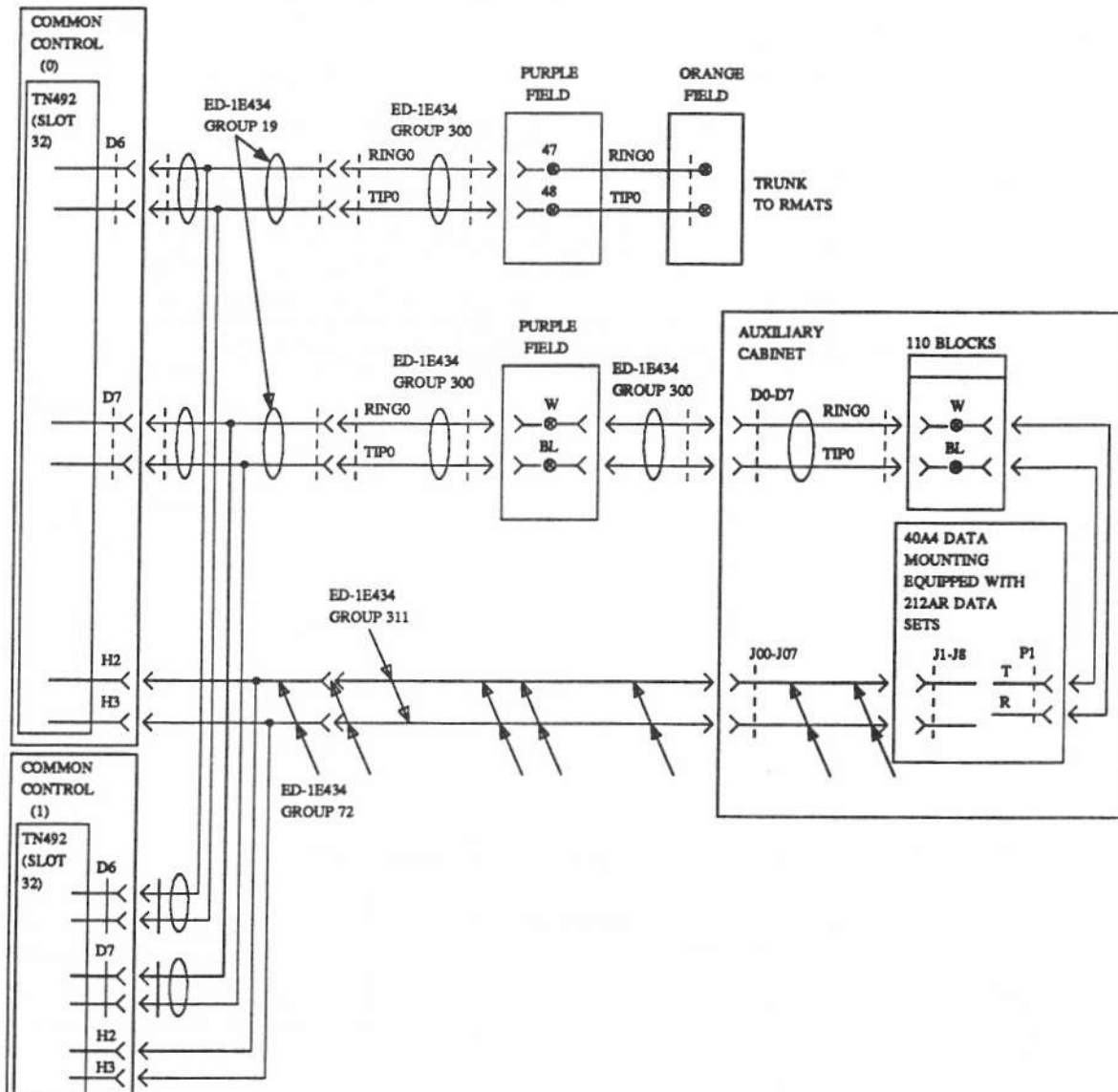


Figure 6-61. RMATS Connections for Duplicated Common Control

13. Connect data communications interface unit (DCIU) cables, if required. If common control connectors begin with 0: connect cable F1 to connector F0, cable F2 to connector F1, and cable F3 to connector F2, etc..

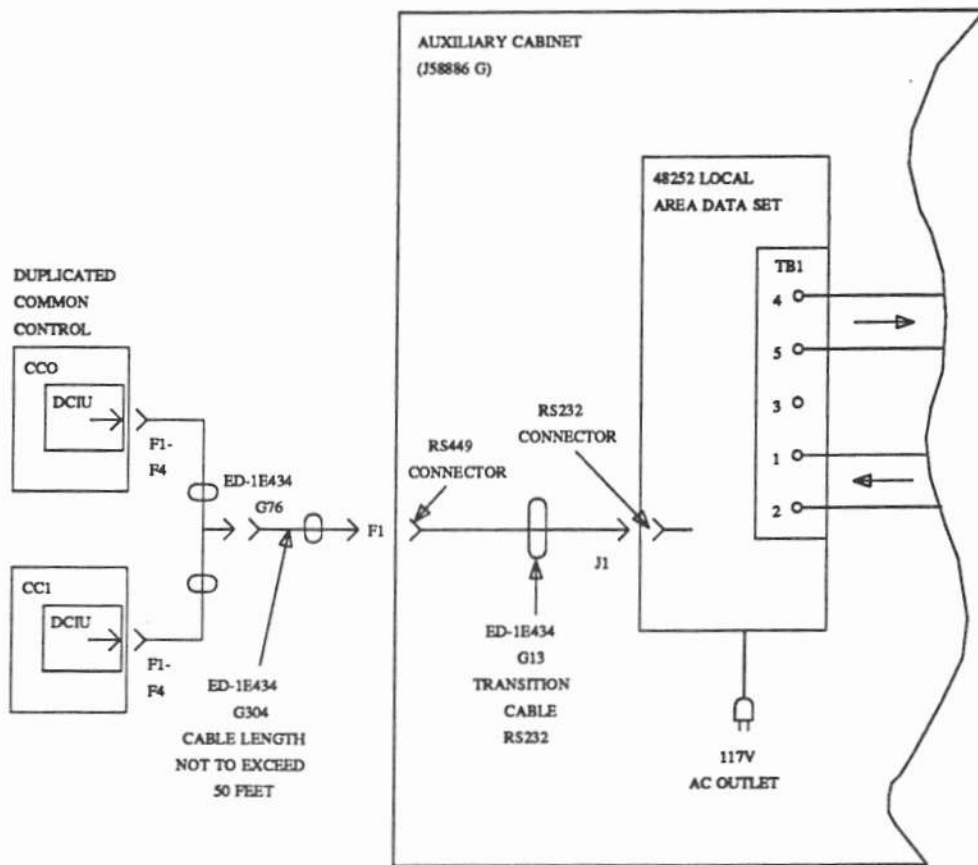


Figure 6-62. DCIU Connections for Duplicated Common Control

14. At cross-connect field, install additional connecting blocks as required.
15. Connect EXT/ALM (J7) cable to MISC/ALM (D1) connector. The -48PX and GRD -48 connections must be relocated.

TABLE 6-15. Emergency Transfer -48V & GRD Wiring

	301CC					501CC				
	EXT/ALM (J7)					MISC/ALM (D1)				
-48 PX	22	23	24	25	32	33	34	47	48	49
GRD-48	47	48	49	50	7	8	9	22	23	24

16. Reroute and connect 25-pair connector cables that were removed from previous common control cabinet.
17. Install additional connector cables as required.



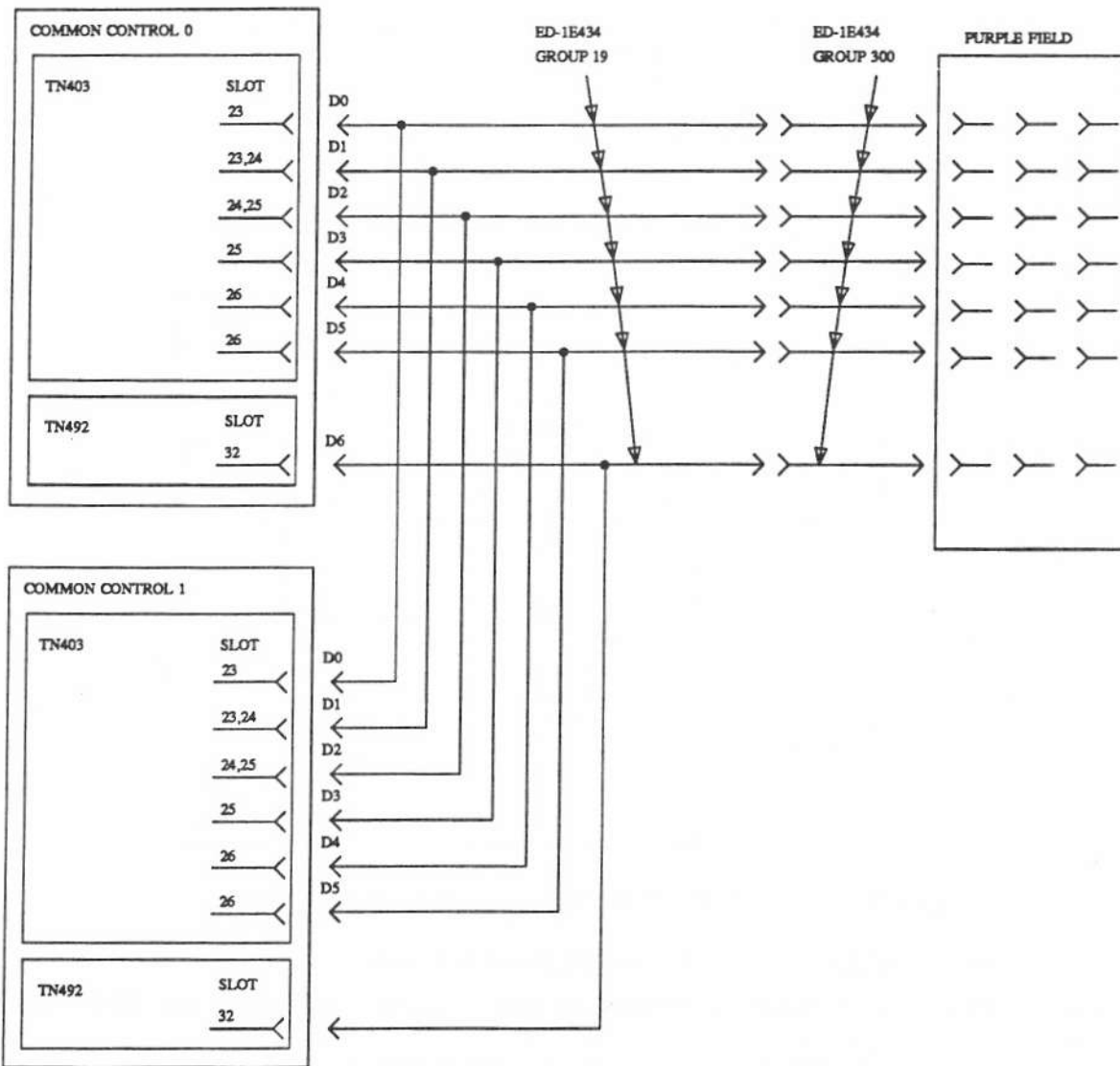


Figure 6-63. Connectors, Slots, and Cables for TN403 and TN492 Circuit Packs used with Duplicated Common Control

18. Replace covers on cable duct.

**Install Document File Assembly (If removed)**

Install document file assembly (previously removed) on the side of a cabinet at the end of the cabinet line up or on wall. If the document file assembly is a G1, it will fit on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L1 Port

- J58886G, Auxiliary
- J58886H, SMDR

The G1 document file assembly will not fit on the new J58886J, L1 cabinet.

If document file assembly is a G2, it can be mounted on the wall or on any of the following cabinets:

- J58886B, L1 Module control
- J58886C, L7 Port
- J58886F, L1 TMS
- J58886G, L24 Auxiliary
- J58886H, L6 SMDR

Install document file assembly as appropriate.

#### **At Port Carrier**

Replace SN253/253B circuit pack with an SN253C. If system is not equipped with an SN253/253B, the SN253C must be installed in any powered port carrier slot as long as it meets pairing requirements.

If system is equipped with automatic identified outward dialing (AIOD), the SN242 circuit pack(s) located in slots (00-02) of the first port carrier must be replaced with SN244 circuit packs. Also, the ANI cable (ED-1E434-11, G56) must be removed from the rear of the port carrier (Connector E00).

At any vacant port carrier slot, install an SN261 analog and digital test circuit pack. Any powered port slot in the system may be used as long as it meets pairing requirements. Administer in an unused class of service plus PROCs 051 and 052.

#### **At SMT Interface**

Remove SMT interface from wall field and replace it with an ED-1E434, G17 SMT interface bypass cable assembly.

#### **At Auxiliary Cabinet(s)**

1. At first auxiliary cabinet, remove J58889L (Silent Knight) alarm origination unit and associated wiring.
2. Install ED-1E447-10, G2 alarm distribution unit in each auxiliary cabinet.
3. Connect alarm distribution units.

The Silent Knight is replaced by the TN492C in the 501CC. Rewire the automatic alarm origination feature external alarms.

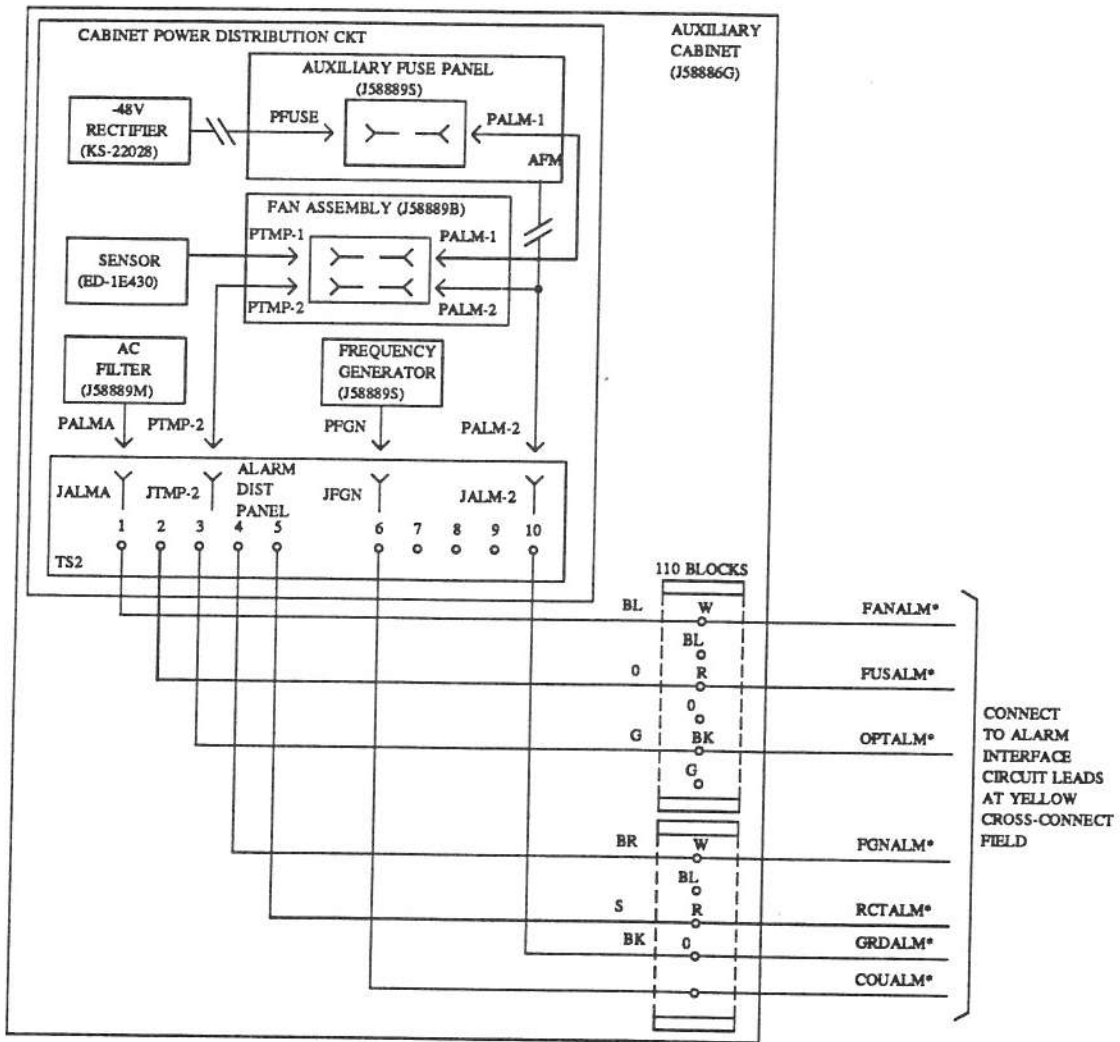
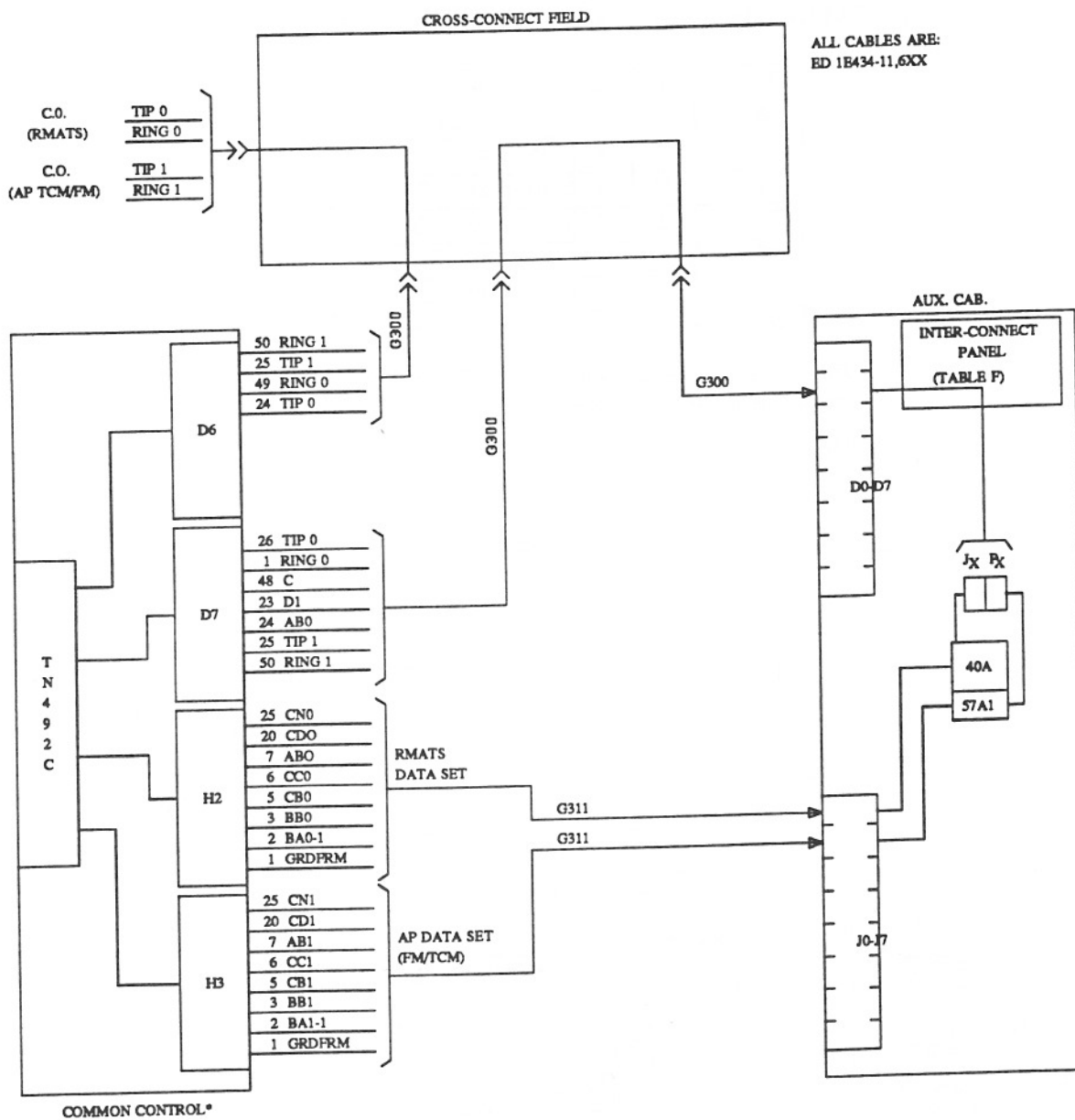


Figure 6-64. Connections for Alarm Distribution Units



\* WITH DUPLICATED COMMON CONTROL, TWO G72 \*Y\* CABLES ARE PROVIDED TO BRIDGE THE CCO & CC1, H2 AND H3 CONNECTORS AND TWO G19 \*Y\* CABLES ARE PROVIDED TO BRIDGE THE CCO & CC1, D6 AND D7 CONNECTORS.

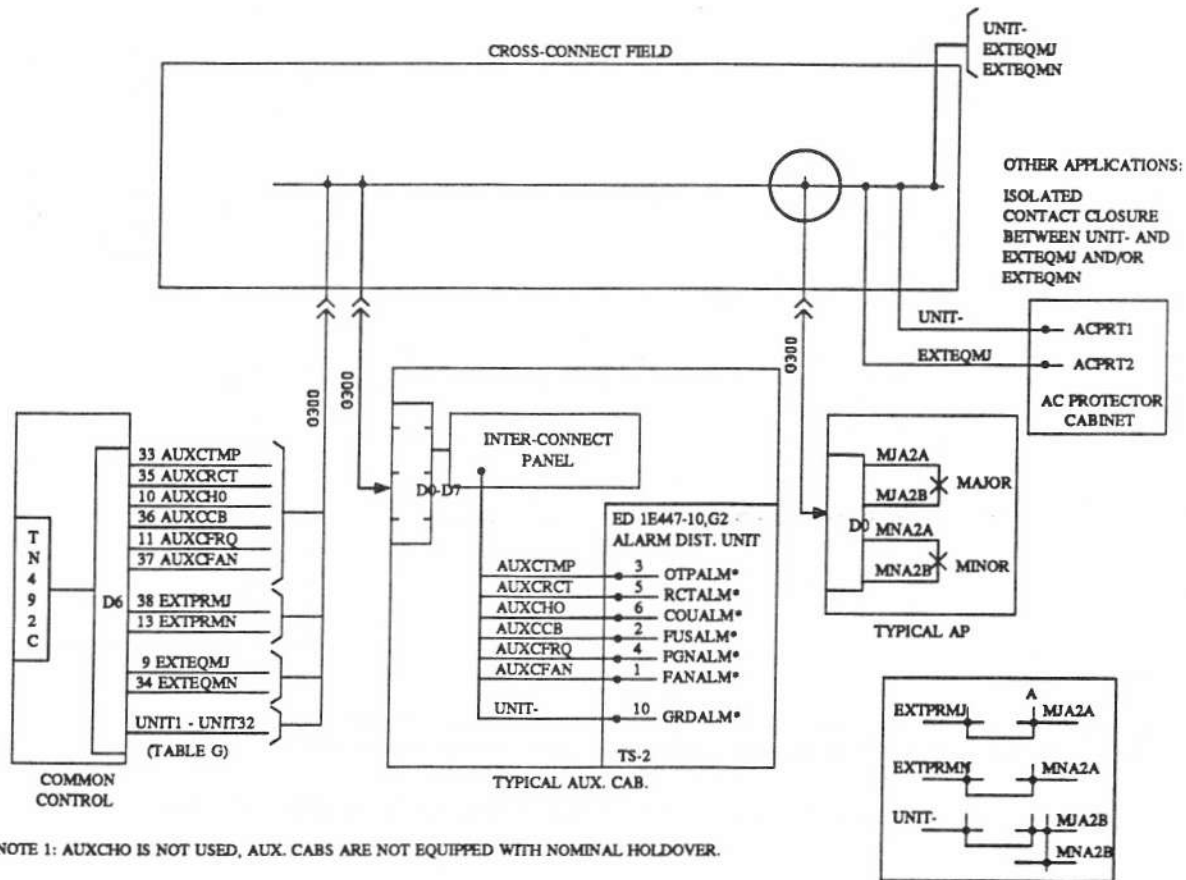
Figure 6-65. RMATS Data Set and TCM/FM Data Set in Auxiliary Cabinet

TABLE 6-16. Connections for Auxiliary Cabinet Slot 40A

SLOT*	1	2	3	4	5	6
40A	J1		J2			
C	14	8	35	46	47	14
D1	11	5	10	21	22	11
TDG†	2	2	2	2	2	2
57A1	P3					
TIP	26	27	28	29	30	31
RING	1	2	3	4	5	6

\* The C, D1, TDG data set control and Tip & Ring leads are unique per 40A slot position.

† TDG is identified as ABO at the TN492C in the 501CC.



NOTE 1: AUXCHO IS NOT USED, AUX. CABS ARE NOT EQUIPPED WITH NOMINAL HOLDOVER.

Figure 6-66. External Alarm Connections

TABLE 6-17. Unit Lead Connections

Backplane		Connector		Lead Designation *	
Slot	Pin	Desig	Pin		
32	120	D6	26	UNIT20	
	021		1	UNIT19	
	119		27	UNIT22	
	020		2	UNIT21	
	118		28	UNIT24	
	019		3	UNIT23	
			29		
	018		4	UNIT25	
	116		30	UNIT27	
	017		5	UNIT26	
	115		31	UNIT29	
	016		6	UNIT28	
	114		32	UNIT31	
	015		7	UNIT30	
	053		33	AUXCTMP	
	014		88	UNIT32	
	052		34	EXTEQMN	
	152		9	EXTEQMJ	
	051		35	AUXCRCT	
	151		10	AUXCHO	
	050		36	AUXCCB	
	150		11	AUXCFRQ	
	049		37	AUXCFAN	
	TN492C			12	
			048	38	EXTPRMJ
			148	13	EXTPRMN
			047	39	UNIT2
			147	14	UNIT1
			044	40	UNIT4
			144	15	UNIT3
			352	41	UNIT6
			253	16	UNIT5
			351	42	UNIT8
			252	17	UNIT7
			350	43	UNIT10
			251	18	UNIT9
				44	
			250	19	UNIT11
			348	45	UNIT13
			249	20	UNIT12
			347	46	UNIT15
			248	21	UNIT14
346		47	UNIT17		
247	22	UNIT16			
	48				
246	23	UNIT18			
205	49	RING0			
305	24	TIP0			
203	50	RING1			
303	25	TIP1			

\* The "UNIT" lead is unique per auxiliary cabinet and originates as "GRDALM\*" @ the alarm distribution unit (connection 10 on TS2). Unit 1 should be provided from auxiliary cabinet 1 unit 2 from auxiliary cabinet 2, etc.

### At all cabinets

1. At 309/310-type power supply, set **AC INPUT** circuit breaker to **OFF**.
2. At power supply (if provided) in auxiliary cabinet(s), set **AC INPUT** power switch to **OFF**.
3. Verify that:
  - **RMATS** data set options are set as shown in the "Installation Service Manual" (555-101-104IS).
  - Circuit pack options are set as required by **CSD**.
  - Circuit packs are fully seated in correct slots.
  - dc-dc converters are fully seated and their switch latch is closed.
  - Fuse holders are equipped with correct fuses.
  - Connector cables are properly labeled, plugged into the correct connectors, and secured.
  - All foreign materials have been removed from cabinet and cross connect field.
  - Cabinet is properly grounded.
4. Connect cabinet to ac line cord.
5. Set cabinet circuit breakers to **ON** except for **AC INPUT** circuit breaker on 309/310-type power supply in the module control and port cabinets and **AC INPUT** switch on the auxiliary cabinet power supply.

### Powering Up System

1. At alarm panel:
  - Set **EMERGENCY TRANSFER** to **OFF**.
  - Set **COMMON CONTROL** to **OFF**.
  - Set **GO/HALT** to **HALT**.
2. Operate nonfusible ac disconnect switch to **ON** position.
3. At 309/310-type power supply, operate **AC INPUT** circuit breaker to **ON**.
4. At common control carrier, operate memory holdover switch to **ON**.
5. At auxiliary cabinet power supply (if provided), operate **AC INPUT** switch to **ON**.
6. Measure rectifier and dc-dc converter output voltages as required. Allow for tolerance of multimeter when making measurements.
7. Set all carrier circuit breakers on the new module control carriers to **ON**.

### To Put System In Service

See Section entitled "INITIAL SYSTEM TEST."

Additional software translations are required to reflect the newly duplicated common control. The following steps must be taken after the switch is operating with the new Release 2 software;

1. Using PROC 250; add translations for second command control carrier (module/cabinet/carrier: 99/0/1 - carrier type 1).
2. Using PROC 275, Word 1; change field 10 to "1" (duplicated common control).
3. Perform "Run Tape" operation.
4. Add these translations to all system tapes.



**TABLE 6-18. Rectifier and Converter Voltage Limits**

		Voltage	Maximum	Minimum
Rectifier	BATT	Normal	-46	-52
		Emergency	-41.75	-52.2
		Transient	-41.75	-60
	-48V	Normal	-46	-52
		Emergency	-41.75	-52.2
		Transient	-41.75	-60
dc-dc Converter	490A1	5V	5.3	4.9
	494G1	5V	5.3	4.9
	494H1	12V	12.6	11.4
	495F	5V	5.3	4.9

## UNPACKING AND INSTALLING CABINET

The cabinet is shipped in a polyethylene bag enclosed inside a cardboard container. It is fastened to a wood/styrofoam pallet by four 3/8-inch carriage bolts. The cardboard container is strapped to the pallet by two metal bands.

Perform the following steps to install the cabinet: Exercise care to avoid injury while cutting and removing metal bands.

1. Cut and remove metal bands. Deep knife penetration may damage cabinet.
2. Cut one corner of cardboard container from top to bottom.
3. Remove all cardboard, tape and plastic. Each cabinet may weigh as much as 750 pounds.
4. Move cabinet to its assigned location.
5. Open front door of cabinet.
6. Remove lower rear cover from cabinet.
7. Remove carriage bolts located at each corner of cabinet.
8. Be certain that leveling feet are extended approximately halfway.
9. Drive carriage bolts downward until they clear cabinet frame.
10. Roll cabinet off the pallet.

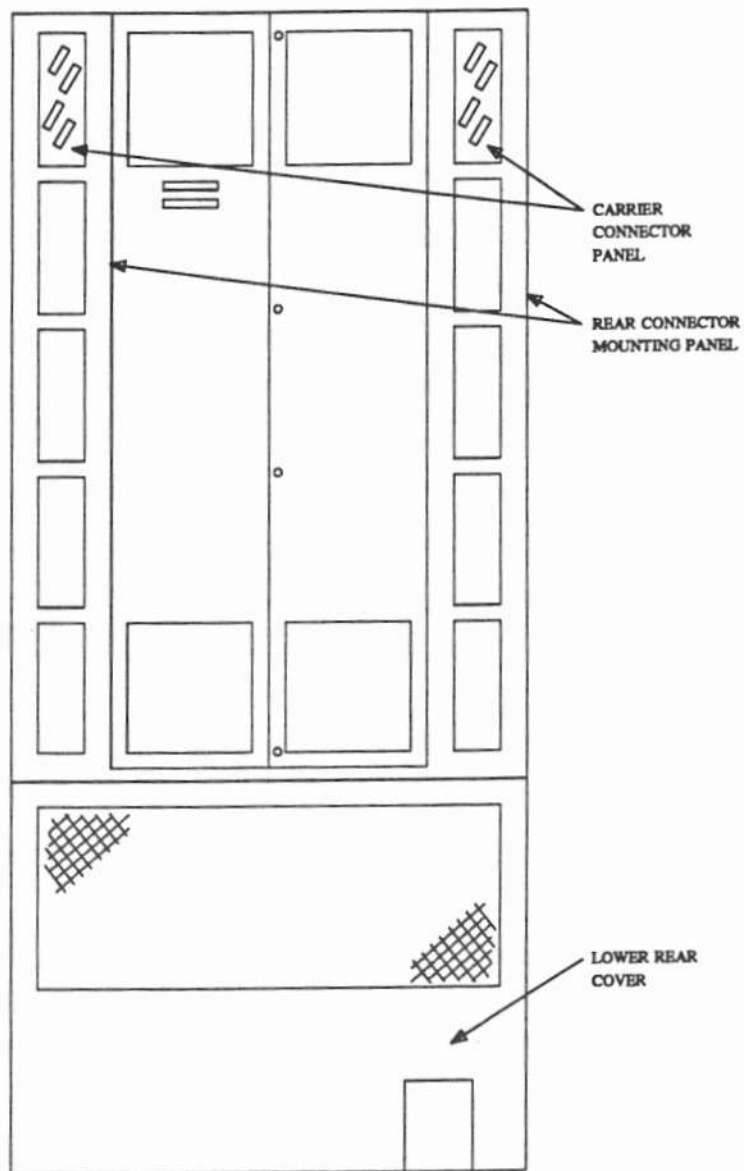


Figure 6-67. Rear View of Typical Cabinet

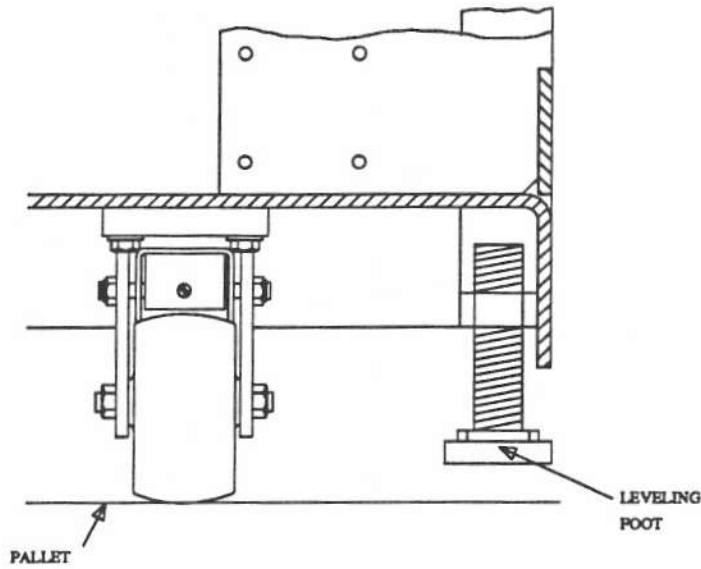


Figure 6-68. Location of Cabinet Mounting Feet

### Cabinet Not Earthquake Mounted

If cabinet is not to be earthquake mounted:

1. Move cabinet into position.
2. Tighten cabinet wheel locks.

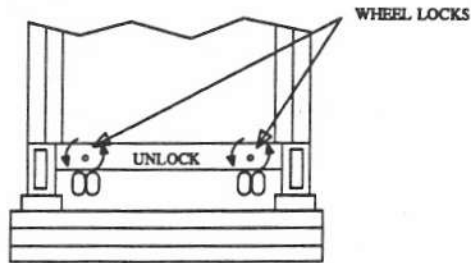


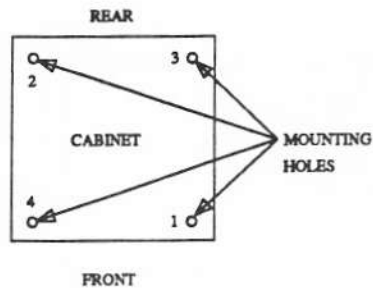
Figure 6-69. Location of Wheel Locking Bolts

3. Adjust cabinet leveling feet until cabinet is level.

### If Previous Cabinet was Earthquake Mounted

1. Move cabinet into position.
2. Align cabinet mounting holes directly over holes in floor.

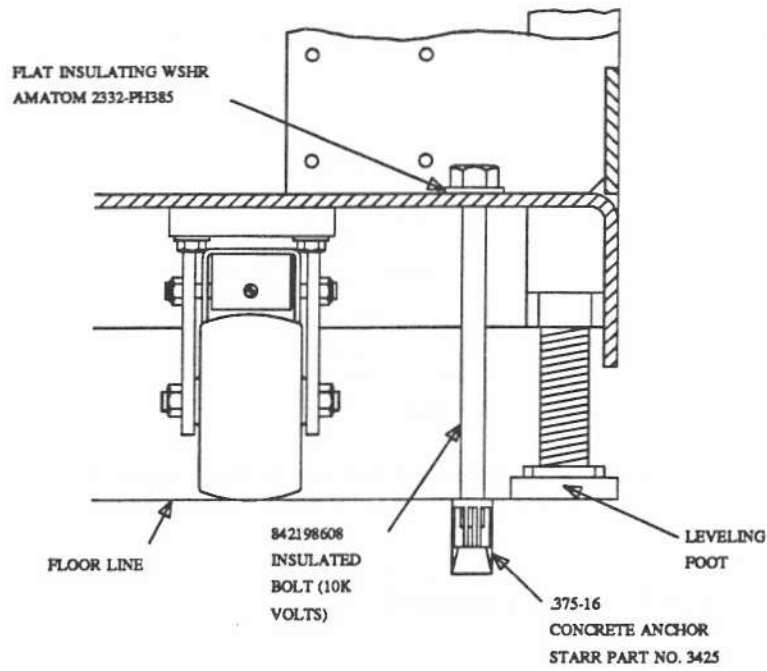
3. Adjust leveling feet until cabinet is level.
4. Fasten cabinet to floor using hardware removed from previous cabinet.
5. Tighten mounting bolts.



**Figure 6-70. Mounting Bolt Tightening Sequence**

#### **Added Cabinet Is to be Earthquake Mounted**

1. Move cabinet into position.
2. Insert a pencil through mounting holes in bottom of cabinet and mark floor directly under each hole.
3. Roll cabinet out of way and drill holes for anchors. Size of hole depends on the type of floor involved:
  - Computer floor 5/8-inch hole
  - Concrete floor 1/2-inch hole
  - Wood floor 1/4-inch hole
4. If floor is concrete, insert anchors in holes.



**Figure 6-71. Earthquake Mounting**

5. Roll cabinet back in place and align cabinet mounting holes directly over holes in floor.
6. Adjust leveling feet until cabinet is level.

7. Install hardware for securing cabinet to floor according to floor type. Anchor bolts must not contact building steel.
  - Computer floor 1/2-inch bolt with flat washer and nut
  - Concrete floor 3/8-inch lag bolt with flat washer
  - Wood floor 3/8-inch lag bolt with flat washer
8. Tighten mounting bolts.

## **INITIAL SYSTEM TEST**

The initial testing of the upgraded system is performed after power is applied to the system. The first tests are the microdiagnostic tests. This is a series of 15 test programs used by the processor for fault detection within the processor and associated components. With the exception of Test 0, each microdiagnostic test uses circuits tested by the previous tests. Therefore, the tests must be run in sequence, starting with Test 0 and progressing through Test 9. A tape is then inserted in the minirecorder and Tests 10 through 14 are run. Test 15 is the TAPE LOAD procedure. It is run after the microdiagnostic tests have been completed and any fault conditions cleared.

After the microdiagnostic tests have been completed, the next series of tests are to be performed with the X-RAY tape installed in the minirecorder and the Maintenance and Administration Panel (MAAP) connected to the system. Procedures for conducting these tests are found in the service manual titled "AT&T System 85 - X-RAY TESTS." This manual is furnished with the X-RAY tape. When the X-RAY tests are completed, the X-RAY tape is removed from the minirecorder and the program tape is installed. The system is then initialized. Initialization loads the memory within the parameters of the system identified in the CSD.

### **6.10.1 Test Procedures**

#### **Microdiagnostics**

Perform microdiagnostic tests 0 through 14.

#### **X-RAY Tests**

Perform X-RAY tests.

TABLE 6-19. Microdiagnostic Test Procedures

Test Select	Procedure	Pass Lamp Lights	Pass Lamp Fails to Light or Fail Lamp Lights
0	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	Refer to Service Manual Entitled AT&T System 85 MAINTENANCE
1	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
2	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
3	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
4	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
5	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
6	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
7	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
8	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
9	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
10	Connect MAAP to MAAP connector with the common control being tested. Insert program tape or X-Ray tape in minirecorder. Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
11	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
12	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
13	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Proceed to next test	
14	Depress <input type="button" value="RESET"/> , <input type="button" value="ENABLE"/>	Remove tape from mini-recorder	

---

### System Initialization

1. Insert system program tape in minirecorder.
2. Set **TEST SELECT** switch to **15**.
3. Set **GO/HALT** switch to **GO**.
4. Depress **RESET, ENABLE**.
5. Wait for tape to load (approximately 2 minutes) and **PASS** lamp to light. If **PASS** lamp fails to light after tape is fully loaded or if **FAIL, PROC, MEM, BIT SWAP, and TAPE** lamps light, refer to service manual titled "AT&T System 85 - X-RAY TESTS" for corrective measures.

### Set System Clocks

To set the system clock, the MAAP must be used to administer PROC 253 and PROC 284 in order.

#### PROC 253

To administer PROC 253, depress:

- **PROC NO; 253; ENTER**
- **12; ENTER**
- **DISPLAY, EXECUTE**

If 0-27-0 appears in fields 2 through 4, administer PROC 284. If 0-27-0 does not appear in fields 2 through 4, depress:

- **ENTER**
- **0; ENTER; 27; ENTER; 0; ENTER**
- **1, ENTER**
- **ADD; EXECUTE**

#### PROC 284

To administer PROC 284, depress:

- **PROC NO; 284; ENTER**
- **DISPLAY, EXECUTE**

The time and date appears in fields 1 through 5. To change time or date, depress:

- **CHANGE FIELD**



- Number of field to be changed
- **ENTER**
- New data
- **ENTER**

Repeat procedures for each field to be changed. After all changes have been made, depress **CHANGE, EXECUTE**.

### **Set Software/Hardware Time of Day Clocks**

To set the software and/or hardware Time of Day Clock, administer PROC 652, Test 3.

#### **PROC 652, Test 3**

To administer PROC 652, Test 3, depress:

- **PROC NO; 652; EXECUTE**
- **NEXT TEST; NEXT TEST; EXECUTE**

The contents of PROC 652, Test 3 are displayed.

If fields 2 through 5 are blank, there is no hardware Time of Day Clock. If the fields contain data, there is a hardware Time of Day Clock. If the data in fields 6 through 12 is correct, depress **CLEAR DATA; EXECUTE**. If the data is not correct, depress:

- **CHANGE FIELD**
- Number of field to be changed
- **ENTER**
- New data
- **ENTER**

Repeat procedure for each field to be changed. After all changes are made, depress **CLEAR DATA; EXECUTE**. This sets both clocks in sync with each other. To verify the clocks are in sync, depress **NEXT UNIT**.

## A. SYSTEM CONFIGURATION LIMITS BY VERSION

The following tables provide a quick reference to the limits of DEFINITY™ Generic 2 and System 85 configurations by Version for Release 2. These limits are based on allocated or available memory table space. Each application has a maximum limit, and the system has a limit that further constrains the sum of all applications.

Maximum Line Records:	32,703 (in Release 2, Version 3)
Sum of Line Applications:	62,000
Difference:	29,297 (More Applications than Line Records).

That is, while a specific application may have a limit of its own, say 10,000 Multiappearance Station Sets, the system may not permit that limit to be reached. This is because the sum of related applications (Line Limits) must be less than the total of their combined maximums (in the described case, 29,297 fewer total applications).

Line Limits (Note)					
Application	System 85, Release 2				DEFINITY™
	V1	V2	V3	V4	G2
Analog Station Sets (2500, 7100 Series)	7,000	8,000	32,000	32,000	32,000
Multiappearance Station Sets (7200H Series, 7300H Series, 7400D Series, 7500D Series)	5,000	5,000	10,000	10,000	10,000
Voice Data Stations (7400D Series with data module or cartridge and 7500D Series with ADM-T)	2,500	4,020	8,000	8,000	8,000
Display Stations (7400D or 7500D Series with display, 515 BCT, and 510D)	900	2,000	5,000	10,000	10,000
Line Side Data Modules (DTDM, PDM, TDM, MDM, EIA Ports, etc.) Plus Total Multiappearance Sets	5,000	8,040	16,000	16,000	16,000
Line Records	15,000	19,145	32,703	32,703	32,703
Dedicated Switch Connections (voice and data)	—	—	1023	1023	1023

The Line Records limit is the upper limit of all combinations of the other line applications. The sum of other limits exceeds this figure but the total administered in an installation cannot.

<b>Station Feature Limits</b>					
<b>Application</b>	<b>System 85, Release 2</b>				<b>DEFINITY™</b>
	<b>V1</b>	<b>V2</b>	<b>V3</b>	<b>V4</b>	<b>G2</b>
<b>Abbreviated Dialing:</b>					
-Characters Per Button	20	20	20	20	20
-Characters Per Call	36	36	36	36	36
-Maximum in System List	99	99	9,999	9,999	9,999
-Maximum in a Nonsystem List	30	30	95	95	95
-Number of Nonsystem Lists	2,047	5,118	13,107	52,223	52,224
-Number of Group Lists	500	1,000	9,999	9,999	9,999
-Maximum in All Lists	24,000	65,535	65,535	262,143	262,144
<b>Mnemonic (Keyboard) Dialing:</b>					
-List Entries	—	—	300	1000	1000
-Mnemonic Characters	—	—	10	10	10
-Characters in Number	—	—	20	20	20
<b>Default (Terminal) Dialing:</b>					
-Characters in Number	—	—	20	20	20
Button Table Words*	64,000	220,000	400,000	400,000	476,670
Call Pickup Groups	999	999	999	999	999
Coverage Groups	3,000	4,096	4,096	4,096	4,096
Effective Coverage Groups (Dual Paths Counted as 1)	3,000	3,047	3,047	3,047	3,047
<b>Display—Voice Terminal:</b>					
-Display Names	5,000	8,500	32,767	32,767	32,767
-Average Characters Per Name	22	22	22	22	22
-Maximum Characters Per Name	30	30	30	30	30
-Maximum Characters Per Message (buffer)	40	40	40	40	40
<b>Intercom Records:</b>					
-Auto/Manual	300	300	300	300	300
-Dial	280	280	280	280	280
<b>Last Number Dialed:</b>					
-Maximum Digits	—	—	—	20	20
<b>Line Appearances:</b>					
-Per Extension	12	12	12	12	12
-Images Per Line Appearance	16	16	16	16	16
-Images Per Extension	192	192	192	192	192
Leave Word Calling Messages on the Switch	3,000	6,000	6,000	6,000	6,000
Line Classes-of-Service	63	63	63	63	63
Message Waiting Lamps (Auto)	7500	10,500	32,000	32,000	32,767
Message Waiting Lamps (Auto) Per Extension	3	3	3	3	3

\* See the next table for Button Table Word requirements.

<b>Button Table Word Requirements</b>	
<b>Application</b>	<b>Requirement</b>
2500, 7101A, 7102A, 7103A, and Encore Station Sets	None
Straight Line Sets	1 Word Each Unit
7203H, 7303S, 7401D, 7403D, and 7410D Station Sets	12 Words Each Unit
7205H, 7305S, 7405D, and 7434D Station Sets	36 Words Each Unit
7404D Station Sets	8 Words Each Unit
7406D and 7406D With Display Station Sets	32 Words Each Unit
CallMaster Station Set	30 Words Each Unit
7505D and 7506D Station Sets	18 Words Each Unit
7507D Station Set	41 Word Each Unit
510D Terminal	22 Words Each Unit
515 BCT	23 Words Each Unit
C201A and C401A Call Coverage Modules	20 Words Each Unit
Display Modules	8 Words Each Unit
Data Modules (PDM, TDM, DTDM, MDM, VDT, EIA Port)	3 Words Each Unit
One Button Transfer	1 Word Each Unit
F201A and F401A Function Key Modules	24 Words Each Unit
Manual Message Waiting Button	1 Word Each Unit
Stations Signaled by Station Busy	2 Words Each Unit
Stations Signaled by Manual Signaling	1 Word Each Unit

<b>System Parameters Limits</b>					
<b>Application</b>	<b>System 85, Release 2</b>				<b>DEFINITY™</b>
	<b>V1</b>	<b>V2</b>	<b>V3</b>	<b>V4</b>	<b>G2</b>
<b>ACD (EUCD):</b>					
-Agents	—	512	1024	1024	1024
-Service Observers (Active)	—	—	64	64	64
-Splits	—	30	30	60	60
-Recorded Announcements	—	30	30	60	60
<b>Answer-Back Channels:</b>					
-Call Park and Loudspeaker Paging*	9	9	9	9	9
-Code Calling Access	6	6	6	6	6
<b>Attendant Features:</b>					
-Conference Bridges	13	13	13	13	13
-Console Positions	28	40	40	40	40
-Switched Loops Per Console	6	6	6	6	6
-Switched Loops	168	240	240	240	240
-Remote Console Positions (ORPI)	—	40	40	40	40
-Consoles (100s Groups)	100	100	100	100	100
-Originating Registers (ORs)	28	40	40	40	40
-Voice Terminal Restriction Groups	63	63	63	63	63
<b>Call Forwarding—Follow Me:</b>					
-Off-Net Forwarding Relationships	3200	3200	3200	3200	3,276
<b>Call Vectoring:</b>					
-Number of Vectors	—	—	—	128	128
-Steps per Vector	—	—	—	15	15
-Recorded Announcements	—	—	—	84	84
<b>Calling Number Display Units</b>	20	20	20	20	6
<b>DCIUs:</b>					
-DCIU Links	8	8	8	8	8
-APs per DCIU	7	7	7	7	7
-AUDIX Adjuncts per DCIU	—	4	4	8	8
-DCS Links per DCIU	8	8	8	8	8
-Logical Channels per Link	64	64	64	64	64
<b>Maximum Digits in Dial Access Code</b>	3	3	3	4	4
<b>Dial Access Codes (Feature and Trunk)</b>	175	500	500	500	1104
<b>Dial Pulse and Touch-Tone ORs</b>	246	246	246	246	246
<b>Total ORs</b>	300	300	300	300	300
* The Call Park and Loudspeaker Paging Access features share the same nine answer-back channels.					

System Parameters Limits (Contd)					
Application	System 85, Release 2				DEFINITY™
	V1	V2	V3	V4	G2
<b>DS1:</b>					
-DS1 Circuit Packs Per Switch	255	255	511	511	511
-Circuit Packs Per Universal Carrier					
Line Side	—	—	—	—	20
Trunk Side	—	—	—	—	10
-Line Side DS1 Circuit Packs per DS1 Carrier	11	12	12	12	12
-Trunk Side DS1 Circuit Packs per DS1 Carrier	11	12	12	12	12
-73-Series Port Circuits Per DS1 Port Carrier	—	16	16	16	16
<b>FADS:</b>					
-CAS Display Units	1	1	1	1	1
-UCD Display units	12	—	—	—	—
Listed Directory Numbers (DID)	4	4	9	999	999
Loudspeaker Paging Zones	18	18	18	18	18
Network Modules	18	31	31	31	31
Remote Modules	-	15	30	30	30
<b>Network Cabinets Per Module</b>					
Traditional Module	4	4	4	4	4
Universal Module	—	—	—	—	1
<b>Port Carriers Per Module</b>					
Traditional Module	12	12	12	12	12
Universal Module	—	—	—	—	3
PCC (Processor Communications Ckt.) ckt. packs	—	—	—	3*	3*
<b>Port Circuit Packs:</b>					
-Per Traditional Port Carrier	16	16	16	16	16
-Per Universal Port Carrier	—	—	—	—	21†
Recorded Announcements (Non ACD/EUCD)	2	15	15	15	15
System Status Indicator Lamps	128	168	168	168	168
<b>Tenant Services:</b>					
-Extension Partitions	—	—	—	1000	1000
-Extension Partition Groups	—	—	—	500	500
-Attendant Partitions	—	—	—	41	41
<b>CDR:</b>					
-Number of Data Item Encodes	—	—	—	128	128
-Maximum Record Length	18	18	18	24	24
-Maximum LSUs	2	2	8	8	8
<b>Malicious Call Trace:</b>					
-Maximum Simultaneous Traces	—	—	—	15	15

\* Only *one* PCC port can be used and this port can only be used as a CDR port.

† This includes the service slot which can only accommodate a TN748C Tone Detector.

<b>Trunk Limits (per Switch)</b>					
<b>Application</b>	<b>System 85, Release 2</b>				<b>DEFINITY™</b>
	<b>V1</b>	<b>V2</b>	<b>V3</b>	<b>V4</b>	<b>G2</b>
<b>ACD/DDC/UCD/EUCD:</b>					
-Groups/Splits	28	30	30	60	60
-Members Per Group	40	512	1024	1024	1024
-Assignable Agents	1120	512	1024	1024	1024
<b>ANI Boards</b>	2	2	2	2	2
<b>Contact Interface Boards</b>	34	34	34	34	34
<b>Preselected Call Routing Groups</b>	255	255	255	982	982
<b>Preselected Call Routing Trunks Per Trunk Group</b>	99	99	99	99	99
<b>Personal Central Office Lines (Trunks)</b>	150	150	150	150	150
<b>AIOD Queues</b>	6	6	6	6	6
<b>Trunks, Physical (Including Host Access and Modem Pooling)</b>	2250	5000	6000	6000	6000
<b>Trunk Records, Assignable (Outgoing Trunk Queues, Physical Trunks, and Trunk Intercom Records)</b>	2705	7525	8525	8525	10500
<b>Trunk Records (Total)</b>	3250	7970	8970	8970	11,046
<b>Trunk Groups:</b>					
-Modem Pooling Trunk Groups	175	238	238	982	982
-Host Computer Access Trunk Groups	175	238	238	982	982
-Total (Including Host Access and Modem Pooling)	255	255	255	999*	999*
-Trunk Group Dial Access Codes	255	255	255	999	999
-Trunks Per Trunk Group (Modem Pooling)	99	99	99	99	99
-Trunks Per Trunk Group (Host Computer Access)	99	99	99	99	99
-Trunks Per Trunk Group (Others)	99	255	255	255	255
<b>RLTs (Release Link Trunks):</b>					
-Inward	110	110	110	110	110
-Outward	16	16	16	16	16
-Groups at Main (CAS Branch)	40	40	40	40	40
<b>Remote Access Trunks</b>	45	45	45	6000	6000
<b>Restriction Levels (Code Restriction)</b>	4	4	4	4	4
<b>Route Advance, Trunk Groups Per Pattern</b>	5	5	5	5	5
* The first 17 trunk groups are dedicated to internal service facilities. The amount of trunk groups available for customer use is 982.					



Network Parameter Limits					
Application	System 85, Release 2				DEFINITY™
	V1	V2	V3	V4	G2
<b>AAR:</b>					
-Patterns	255	255	640	640	640
-Trunk Groups Per Pattern	4	4	16	16	16
-Conditional Routing Call Categories	—	—	3	3	3
-Maximum Valid RNXs	780	780	780	780	780
-Maximum Number of Routes	10240	10240	10240	10240	10240
<b>ARS:</b>					
-Patterns	64	64	64	64	64
-Time Dependent Plans	3	3	3	3	3
-Trunk Groups Per Pattern	16	16	16	16	16
-Call Categories for Tenant Services	—	—	—	64	64
-Foreign NPAs (6-Digit Translation)	64	64	160	160	160
-Patterns Per 6-Digit Translation	4	4	10	10	10
-Maximum Number of Routes	1024	1024	1024	1024	1024
<b>Unauthorized Call Control/10- to 7-Digit Conversion:</b>					
-3-Digit NPAs	No Limit	No Limit	No Limit	No Limit	No Limit
-6-Digit NPA-NXX Combinations	500	500	500	500	500
-7-Digit NPA-NXX-X Combinations	2048	2048	2048	2048	2048
-8-Digit NPA-NXX-XX Combinations	2048	2048	2048	2048	2048
-9-Digit NPA-NXX-XXX Combinations	2048	2048	2048	2048	2048
-10-Digit NPA-NXX-XXXX Combinations	2048	2048	2048	2048	2048
<b>Authorization Codes</b>	9,000	9,000	90,000	90,000	90,000
<b>Facilities Restriction Levels</b>	8	8	8	8	8
<b>DCS:</b>					
-Maximum Nodes	12	20	20	63	63
-Maximum ES Nodes	—	—	—	63	63
-Maximum Nodes with Attendants Centralized at One Node	12	20	20	40	40
-Maximum Nodes per AUTOVON Interface	12	20	20	40	40
<b>Maximum Extension Numbers Per Network (5 Digit Dialing)</b>	—	—	—	100,000	100,000
<b>Maximum NPA-NXX Designators</b>	99	99	99	99	99



Network Parameter Limits (Contd)					
Application	System 85, Release 2				DEFINITY™
	V1	V2	V3	V4	G2
<b>ISDN:</b>					
-Codesets	—	—	—	8	8
-Codepoints Per Codeset	—	—	—	1024	1024
-Mappings Per Codeset	—	—	—	—	256
-Codeset Mappings	—	—	—	—	16
-Maximum ISDN Call Records	—	—	—	6,000	15,000
-Maximum Calls on D-channel	—	—	—	23	500
-Maximum D-channels					
BRI:	—	—	—	—	10,000
PRI:	—	—	—	512	512
-Maximum NFAS D-channel Groups	—	—	—	—	255
-Maximum Number for Interface ID	—	—	—	—	32
-Bearer Capability Classes of Service	—	—	—	—	256
<b>SNC:</b>					
-Maximum Number of Tandem Trunk Groups	—	—	—	—	982

## B. FEATURE AVAILABILITY

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Features available for R2V4 are also available for DEFINITY™ Communications System Generic 2 (G2) unless changes or enhancements are specified in the following table. Refer to *AT&T System 85 System Description (555-103-201)* for details on enhanced or changed features. Refer to the *AT&T System 85 Features Reference Manual (555-103-301)* for specific feature information. Software PEC information for DEFINITY™ Communications System Generic 2 will be provided when available.

Changed features for DEFINITY™ Communications System Generic 2 include the following:

- Code Calling Access
- Conference - Attendant Six Party
- Precedence Calling

Enhanced features for DEFINITY™ Communications System Generic 2 include the following:

- Automatic Alternate Routing
- Automatic Route Selection
- Bearer Capability
- Integrated Services Digital Network - Primary Rate Interface (ISDN - PRI)
- Modem Pooling

New features for DEFINITY™ Communications System Generic 2 include the following:

- ISDN - Basic Rate Interface (BRI)
- Look - Ahead Interflow
- Conference - Attendant (universal module)

The following table is a summary of the features available for System 85 R2 V1 through V4 and DEFINITY™ Communications System Generic 2. An "x" indicates that the feature is available for the respective version. Most software features are optional. Those optional features provided for additional cost are indicated by the PEC number instead of an "x". Brief notations are included in the table for changed and enhanced features for DEFINITY™ Communications System Generic 2. Additional information on these features can be found in the *System 85 System Description* (555-103-201) or *System 85 Features Reference Manual* (555-103-301).

TABLE B-1. System 85 Feature Availability

FEATURE	RELEASE 2 VERSION				
	R2V1	R2V2	R2V3	R2V4	G2
Abbreviated Dialing	x	x	x	x	x
ACCUNET Switched 56 Digital Service			x	x	x
Advanced Private Line Termination	x	x	x	x	x
Attendant Auto-Manual Splitting	x	x	x	x	x
Attendant Call Waiting	x	x	x	x	x
Attendant Control of Trunk Group Access	x	x	x	x	x
Attendant DXS/BLF	x	x	x	x	x
Attendant Direct Trunk Group Selection	x	x	x	x	x
Attendant Display	x	x	x	x	x
Attendant Interposition Calling and Transfer	x	x	x	x	x
Attendant Recall	x	x	x	x	x
Attendant Release Loop Operation	x	x	x	x	x
AUDIX (Audio Information Exchange)	retrofit	x	x	x	x
Authorization Codes	x	x	x	x	x
AAR (Automatic Alternate Routing)	1252-ETN	1252-ETN	1252-ET3	1252-ET3	enhanced
AAR/ARS Pattern Queuing			x	x	x
ACD (Automatic Call Distribution)			x	x	x
Automatic Callback	x	x	x	x	x
ACA (Automatic Circuit Assurance)	x	x	x	x	x
Automatic Identification of Outward Dialing	x	x	x	x	x
ARS (Automatic Route Selection)	x	x	x	x	enhanced
ATMS (Automatic Transmission Measurement System)		x	x	x	x
AUTOVON (Automatic Voice Network)	1252-AVN	1252-AVN	1252-AVN	1252-AVN	PEC

FEATURE	RELEASE 2 VERSION				
	R2V1	R2V2	R2V3	R2V4	G2
Bridged Call	x	x	x	x	x
Bearer Capability				x	enhanced
Busy Verification of Lines	x	x	x	x	x
Call Coverage	x	x	x	x	x
Call Detail Recording and Reporting	x	x	x	x	x
Call Forwarding—Busy Don't Answer	x	x	x	x	x
Call Forwarding—Follow Me	x	x	x	x	x
Call Hold	1.5	2.0	x	x	x
Call Management System			x	x	x
Call Park	x	x	x	x	x
Call Pickup	x	x	x	x	x
Call Vectoring				1252-CVG	PEC
Call Waiting	x	x	x	x	x
Centralized Attendant Service	x	x	x	x	x
Centralized SMDR	x	x	x	x	x
Centralized System Management	x	x	x	x	x
Code Calling Access	x	x	x	x	changed
Conference—Attendant					univ.mod.
Conference—Attendant Six Party	x	x	x	x	changed
Conference—Three Party	x	x	x	x	x
Data Call Setup	x	x	x	x	BCCOS
Data Communications Access	x	x	x	x	x
Data Protection	x	x	x	x	x
Dedicated Switch Connection			x	x	x
Dial Access to Attendant	x	x	x	x	x
Dialed No. Ident. Service			x	x	x
Digital Multiplexed Interface		x	x	x	x
DS1 Trunk Interface	x	x	x	x	x
Direct Department Calling	x				
Direct Inward Dialing	x	x	x	x	x
Direct Outward Dialing	x	x	x	x	x
Directory	x	x	x	x	x
Display Message Scrolling			x	x	x
Display—Voice Terminal	x	x	x	x	x
Distributed Comm. System	1252-DCS	1252-DCS	1252-DCS	1252-DCS	
Electronic Doc. Communications	x	x	x		
Enhanced Symmetrical Routing			x	x	x

B-4 FEATURE AVAILABILITY

FEATURE	RELEASE 2 VERSION				
	R2V1	R2V2	R2V3	R2V4	G2
Enhanced Uniform Call Distribution		x			
Facilities Management	x	x	x	with CSM	
Facilities Restriction Level	1252-ETN	1252-ETN	1252-ET3	1252-ET3	PEC
Five Digit Dialing—Partial	x	x	x	x	x
Five Digit Dialing—Full			x	x	x
Force Administration Data System	x	CAS only	CAS only	CAS only	CAS only
Foreign Exchange Access	x	x	x	x	x
Hold	x	x	x	x	x
Host Computer Access	x	x	x	x	x
Host Security Access Manager	x	x	x	x	x
Hot Line Service			analog	digital	digital
Hunting	x	x	x	x	x
Information Systems Network Interface		x	x	x	x
ISDN - PRI				x	enhanced
ISDN - BRI					x
Intercept Treatment	x	x	x	x	x
Intercom—Automatic	x	x	x	x	x
Intercom—Dial	x	x	x	x	x
Intercom—Manual	x	x	x	x	x
Interexchange Carrier Access			x	x	x
Last Extension Dialed	x	x	pre - 1.2		
Last Number Dialed			1.2	x	x
Leave Word Calling	x	x	x	x	x
Line Lockout	x	x	x	x	x
Line/Feature Status Indication	x	x	x	x	x
Look - Ahead Interflow				1.3	x
Loudspeaker Paging Access	x	x	x	x	x
Main/Satellite/Tributary	1252-MP1	1252-MP1	1252-MP3	1252-MP3	PEC
Malicious Call Trace				x	x
Manual Signaling	x	x	x	x	x
Message Center	x	x	x	x	x
Message Waiting—Manual (lamp)	x	x	x	x	x
Message Waiting—Auto (audible)				x	x
Modern Pooling	x	x	x	x	enhanced
Multiappearance Preselection and Preference	x	x	x	x	x
Multidigit Steering	x	x	x	x	x
Multiple Listed Directory Numbers	x	x	x	x	x
Music-On-Hold Access	x	x	x	x	x

FEATURE	RELEASE 2 VERSION				
	R2V1	R2V2	R2V3	R2V4	G2
Off-Premises Data-Only Terminals	x	x	x	x	x
Off-Premises Terminals	x	x	x	x	x
Override	x	x	x	x	x
Personal Central Office Line	x	x	x	x	x
PC/PBX Connection	retrofit	retrofit	retrofit	x	x
Power Failure Transfer	x	x	x	x	x
Precedence Calling	x	x	x	x	changed
Priority Calling	x	x	x	x	x
Privacy—Attendant Lockout	x	x	x	x	x
Privacy—Manual Exclusion	x	x	x	x	x
Queuing	x	x	x	x	x
Radio Paging Access	x	x	x	x	x
Recall Signaling	x	x	x	x	x
Recorded Telephone Dictation Access	x	x	x	x	x
Remote Access	x	x	x	x	x
Remote Groups			x	x	x
Remote Modules	x	x	x	x	x
Remote Module Console		x	x	x	x
Restriction—Atnd Control of Voice Terminals	x	x	x	x	x
Restriction—Code Restriction	x	x	x	x	x
Restriction—Misc. Trunk Restrictions	x	x	x	x	x
Restriction—Toll Restriction	x	x	x	x	x
Restriction—Voice Terminal Restrictions	x	x	x	x	x
Ringing—Abbreviated and Delayed	x	x	x	x	x
Ringing Cutoff	x	x	x	x	x
Ringing—Distinctive	x	x	x	x	x
Ringing Transfer	x	x	x	x	x
Route Advance	x	x	x	x	x
Serial Calls	x	x	x	x	x
800 Service Access	x	x	x	x	x
Service Node Controller					x
Service Observing			x	x	x
Station Message Detail Recording	x	x	x	x	x
Straightforward Outward Completion	x	x	x	x	x
Tenant Service				1252-TNS	PEC
Terminal Busy Indications	x	x	x	x	x
Terminal Change Management	x	x	x		

FEATURE	RELEASE 2 VERSION				
	R2V1	R2V2	R2V3	R2V4	G2
Terminal Emulation	x	x	x	x	x
Through Dialing	x	x	x	x	x
Timed Recall on Outgoing Calls	x	x	x	x	x
Timed Reminder	x	x	x	x	x
Touch-Tone Calling Senderized Operation	x	x	x	x	x
Touch-Tone Dialing	x	x	x	x	x
Transfer	x	x	x	x	x
Traveling Class Mark	1252-ETN	1252-ETN	1252-ET3	1252-ET3	PEC
Trunk Group Busy/Warning Indicators to Atnd	x	x	x	x	x
Trunk Verification—Attendant	x	x	x	x	x
Trunk Verification—Voice Terminal	x	x	x	x	x
Trunk-to-Trunk Connections	x	x	x	x	x
Unattended Console Service—Alternate Console Position	x	x	x	x	x
Unattended Console Service—Call Answer From Any Voice Terminal	x	x	x	x	x
Unattended Console Service—Preselected Call Routing	x	x	x	x	x
Unified Messaging		x	x	x	x
Uniform Call Distribution	x				
Uniform Numbering	1252-ETN	1252-ETN	1252-ET3	1252-ET3	PEC
Variable Format Call Detail Recording				x	x
Visually Impaired Attendant Service	x	x	x	x	x
Wide Area Telecommunications Service Access	x	x	x	x	x

## C. RELATED FORMS AND FLOWCHARTS

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This appendix contains various forms and flowcharts related to upgrading System 85 R2 switches. Among these are:

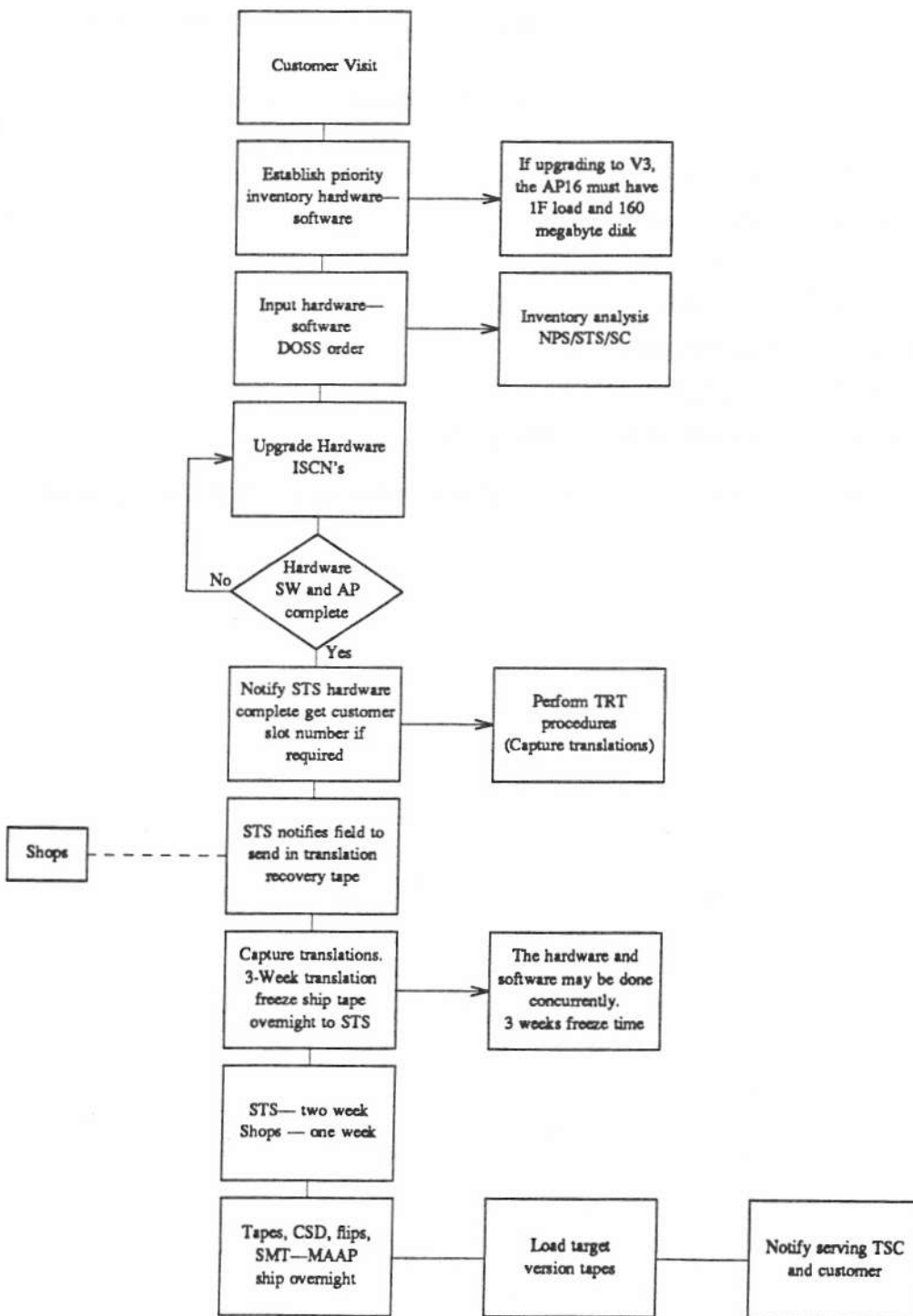
- System 85 R2 Upgrade Overview Flowchart
- System 85 R2 Hardware Upgrade Procedure Flowchart
- System 85 R2 Software Upgrade Procedure Flowchart
- Translation Recovery Process Flowchart
- System 85 R2 Hardware Upgrade PEC Worksheet
- Request for System 85 Tape Retrieval Form

These flowcharts and forms are contained on the following pages.

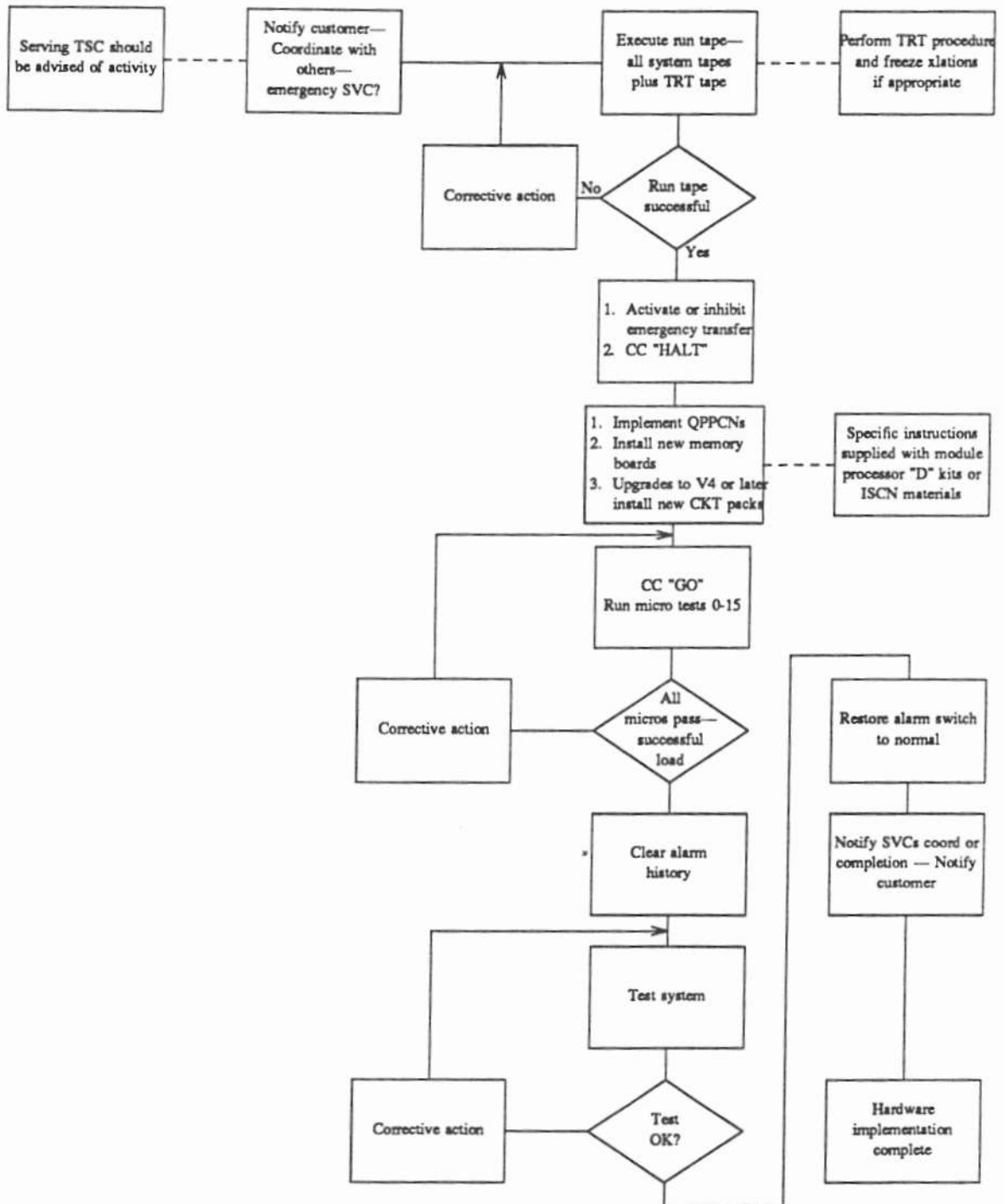
DEFINITY™ Communications System Generic 2 PEC worksheet information will be provided when available.



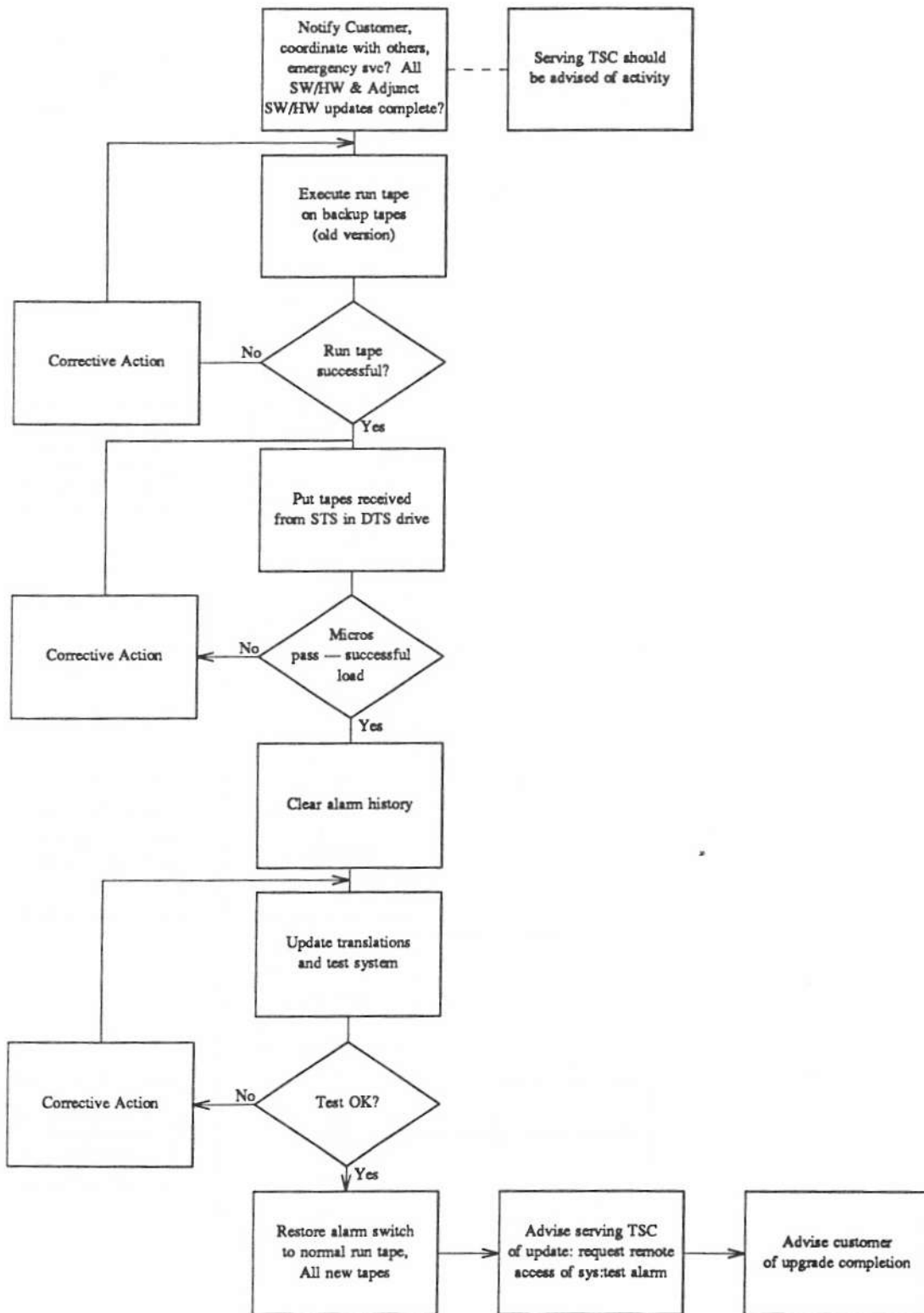
SYSTEM 85 R2 UPGRADE OVERVIEW FLOWCHART



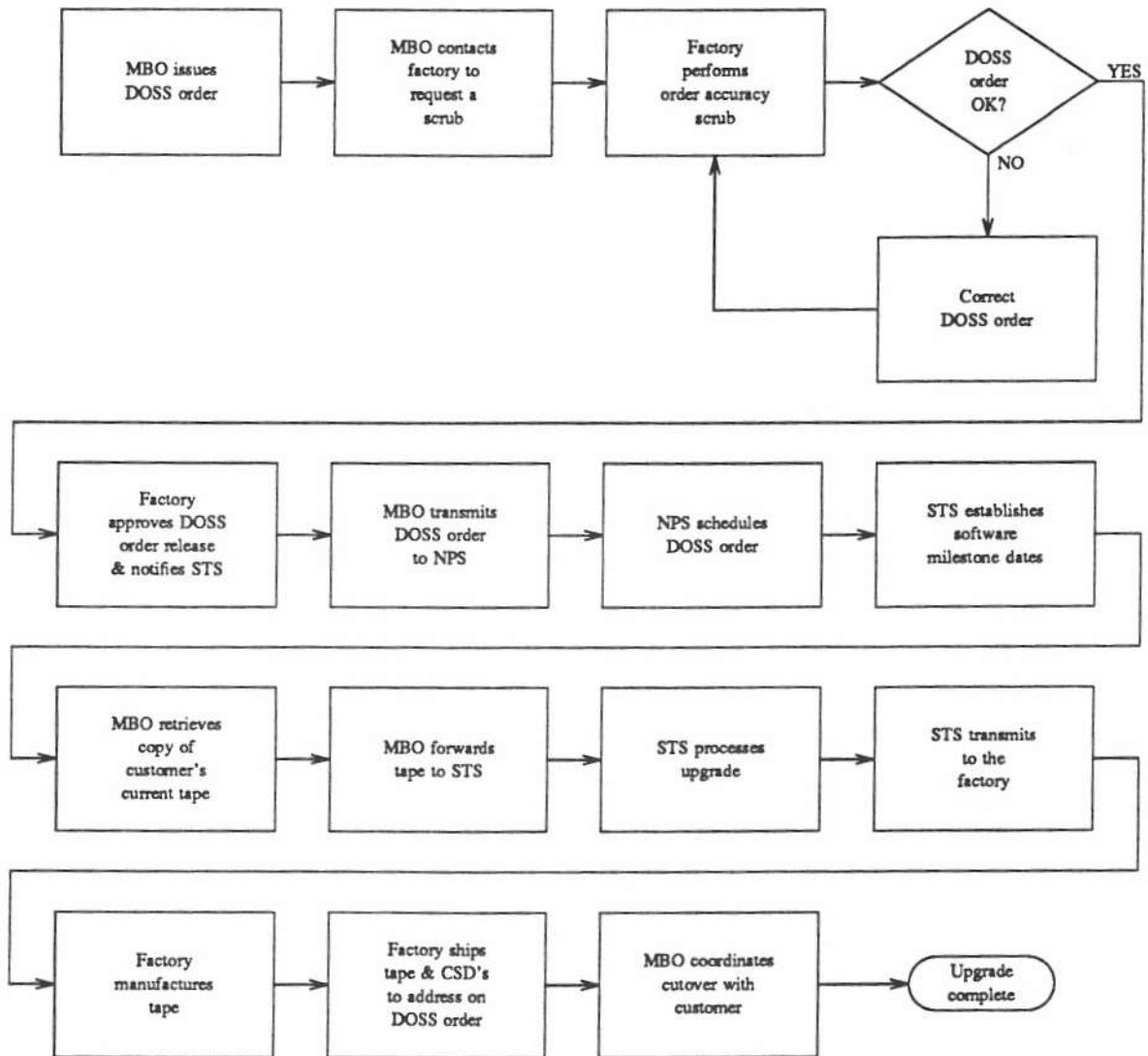
**SYSTEM 85 R2 HARDWARE UPGRADE PROCEDURE FLOWCHART**



**SYSTEM 85 R2 SOFTWARE UPGRADE PROCEDURE FLOWCHART**



**TRANSLATION RECOVERY PROCESS FLOWCHART**





**SYSTEM 85 R2 HARDWARE UPGRADE PEC WORKSHEET**

CUSTOMER: \_\_\_\_\_ DOSS #: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ S. C. \_\_\_\_\_

ADDRESS: \_\_\_\_\_

UPGRADE R2V TO: V2 V3 V4 PHONE #: \_\_\_\_\_

DATE REQUIRED: \_\_\_\_\_ FAX #: \_\_\_\_\_

PRIORITY: E 1 R \_\_\_\_\_

PHONE #s: LDN \_\_\_\_\_ EQUIPMENT ROOM \_\_\_\_\_ SYSTECH \_\_\_\_\_

TRANSLATION RECOVERY TAPE NEEDED: YES NO V1 V2 V3 \_\_\_\_\_

	65322A TN392	65400A TN394	AP16 LOAD REQ	AP16 DISK SIZE	65452A TN370B TN430B TN491B UN152B UN153B	65421A ANN11E	65422A ISDN ANN35	65401A TN474B	65490A ATMS SN261C
R2V1	2 SGL 4 DUP		178DR 12.7.3	40MB			NA	NA	
R2V2	4 SGL 8 DUP		1D.13.3	40MB 160MB			NA	NA	
R2V3	8 SGL 16 DUP		71040 1F.4.3	71000 71020 160NB			NA	NA	
R2V4	NA	3 SGL 6 DUP	NA	NA	1 SET PERCC	2 PER DS1CAR MAX	2 PER DS1CAR MAX	3B2 CDRU	MINIMUM 1PERSYS

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QTY  
REG -----  
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- ALL "B" SUFFIX PACKS WILL REPLACE ALL EARLIER VINTAGES. e.g. A UN152B WILL REPLACE A UN152.
- ALL VERSIONS OF SOFTWARE WILL RUN ON VERSION 4 HARDWARE. VERIFY W/SVCS IF 900 MEMORY PATCH IS NEEDED.

COMMENTS:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_









## GLOSSARY

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<b>ACD</b>	<i>See Automatic Call Distribution</i>
<b>Addition</b>	In the context of an upgrade, addition refers to hardware which is external to the existing system. For example, a system upgrade from AT&T System 75 to DEFINITY™ Communications System Generic 2 may require the <i>addition</i> of a cabinet along with the <i>upgrade</i> of the existing System 75 cabinet. The difference between addition and upgrade are sometimes subtle. Generally, changes <i>not</i> directly associated with the role of existing cabinet and carrier hardware in the target system and are considered additions.
<b>ANSI</b>	American National Standards Institute. ANSI specifies the mechanical, electrical, and functional requirements for SCSI and the command sets for peripheral device types, particularly storage devices.
<b>ATMS</b>	<i>See Automatic Transmission Memory System</i>
<b>Audio Information Exchange</b>	The AT&T voice mail system that allows users to leave, receive, replay, transfer, and broadcast recorded messages.
<b>AUDIX</b>	<i>See Audio Information Exchange</i>
<b>Automatic Call Distribution</b>	A Call Management System (CMS) feature that provides automatic connection of incoming calls to agents that have been administered in hunt groups, or splits.
<b>Automatic Transmission Measurement System</b>	A System Management (SM) feature that automatically measures the transmission characteristics of private and public network trunk facilities.
<b>Basic Rate Interface</b>	A standard ISDN frame format. A BRI runs at a speed of 192 Kbps and supports 2 64-Kbps voice or data B-channels and 1 16-Kbps signaling and data D-channel per port. The remaining 48 Kbps are used for framing and D-channel contention.
<b>BRI</b>	<i>See Basic Rate Interface</i>
<b>Call Detail Recording</b>	A service that records detailed call information for incoming and outgoing calls, and associates these calls with account codes.
<b>Call Management System (CMS)</b>	An adjunct processor that collects data from an Automatic Call Distribution (ACD) unit; generates reports on the status of agents, splits, and trunks; and enables the customer to partially administer the ACD feature for the PBX.
<b>CDR</b>	<i>See Call Detail Recording</i>

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<b>Centralized System Management</b>	An operations support software tool that provides System Management (SM) applications such as Terminal Change Management (TCM), Facilities Management (FM), Traffic Management (TM), and Cost Management (CM). The hub for these applications is an integrated and centralized database containing PBX translation information, user records, and equipment inventory data for AT&T System 85 and DIMENSION® Feature Package 8 (FP8) PBXs. AT&T System 75 has its own fully integrated SM capability, which CSM can access remotely.
<b>CMS</b>	<i>See Call Management System</i>
<b>CSM</b>	<i>See Centralized System Management</i>
<b>DCS</b>	<i>See Distributed Communications System</i>
<b>DEFINITY™ Communications System Generic 1</b>	Refers to the enhanced information controller that is based on the 80286 processor and enhanced AT&T System 75 software.
<b>DEFINITY™ Communications System Generic 2</b>	Refers to the enhanced information controller that is based on the 501CC processor and enhanced AT&T System 85 software.
<b>DEFINITY™ Manager II</b>	A PC-based maintenance and administration tool introduced with DEFINITY Communications System Generic 2.
<b>Digitally Multiplexed Interface</b>	An interface that provides connectivity between a PBX and a host computer or between 2 PBXs using digital service level-1 (DS1) 24th-channel signaling. DMI provides 23 64-Kbps data channels and one common signaling channel over a twisted-pair connection. DMI is offered through 2 capabilities — bit-oriented signaling (DMI-BOS) and message-oriented signaling (DMI-MOS).
<b>Digitally Multiplexed Interface-BOS</b>	DMI signaling in which the signaling in the 24th channel is based on the definitions of single bits. For example, a bit may indicate an on-hook/off-hook condition.
<b>Digital Multiplexed Interface- MOS</b>	DMI signaling in which the signaling in the 24th channel is based on the definitions of strings of bits that form messages. DMI-MOS is equivalent to the PBX-to-PBX ISDN primary rate interface (PRI).
<b>Digital Service Level - 1</b>	A bit-oriented signaling (BOS) interface that multiplexes 24 channels into a single, 1.544 Mbps stream. DS1 can be used for pulse code modulation (PCM) for voice or voice-grade data and for mode 0, 1, 2, and 3 data protocols.
<b>Disk/Tape Subsystem</b>	Functionally replaces the HCMR in its responsibility to load the AT&T System 85 switch, perform translation updates, and administer program patches. With a 140 Mbyte disk drive and a 125 Mbyte streaming tape drive, the DTS offers improved performance over previous storage devices.
<b>Distributed Communications System</b>	A network configuration linking 2 or more PBXs in such a way that selected features appear to operate in the same way as if the network were 1 PBX.
<b>DMI(BOS/MOS)</b>	<i>See Digital Multiplexed Interface</i>
<b>DOSS</b>	Delivery Operation Support System

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<b>DS1</b>	<i>See Digital Service Level - 1</i>
<b>DTS</b>	<i>See Disk/Tape Subsystem</i>
<b>EFC</b>	<i>See Electronic Flip Chart</i>
<b>Electronic Flip Chart</b>	A collection of text files in which each procedure word is a text file. These files are the source of the actual paper flipcharts. EFCs provide the menu-driven interface for DEFINITY™ Communications System administration and maintenance.
<b>Electronic Tandem Network</b>	A virtual private network that is implemented on a customer's private (or sometimes public) facilities. ETNs often span geographic areas and are comprised of private or leased transmission facilities that interconnect the customer's PBXs. An ETN uses the Automatic Alternate Routing (AAR) feature with a uniform numbering plan to address the various PBXs and voice terminals in the ETN.
<b>Electronic Tandem Network Group</b>	A collection of tandem groups that together constitute a single ETN. Multiple ETN groups can reside on a single Service Node Controller (SNC). Facilities (tandems, nodal mains, 4ESS trunk groups, and so on) from 1 ETN group may not be directly connected to facilities in another ETN Group. <i>See also tandem group, ETN.</i>
<b>ELL</b>	<i>See Equipment Line Location</i>
<b>Equipment Line Location</b>	A designated position (address) of a line or a trunk in the PBX hardware.
<b>ETN</b>	<i>See Electronic Tandem Network</i>
<b>HCMR</b>	<i>See High-Capacity Mini Recorder</i>
<b>High-Capacity Mini Recorder</b>	A tape recorder that drives a tape cartridge containing a copy of the programs, parameters, and translations used by the system common control (CC). The HCMR provides nonvolatile system bootstrap and translation storage, and reloads the central processor's memory whenever power to the memory is interrupted or memory is lost.
<b>Hunt Group</b>	A group of extensions that are assigned the Station Hunting feature so that a call to a busy extension will reroute to an idle extension in the group. In the context of Call Management System (CMS), a hunt group is the same as a split.
<b>INADS</b>	<i>See Initialization and Administration System</i>
<b>Integrated Services Digital Network</b>	A public or private network that provides end-to-end digital connectivity to support a wide variety of services, including voice and nonvoice service to which users have access by a limited set of International Telegraph and Telephone Consultative Committee (CCITT)-defined, standard multipurpose user-network interfaces. Such a network, through internationally accepted standard interfaces, provides circuit-switched or packet-switched connectivity within the network and links to other ISDNs to provide national and international digital connectivity. Users have access to this larger network through a limited set of standard multipurpose customer interfaces.
<b>Information Systems Network</b>	A wide area network (WAN) and local area network (LAN) with an open architecture combining host computers, minicomputers, word processors, storage devices, personal computers (PCs), high-speed printers, and nonintelligent terminals into 1 highly productive packet-switching system.

<b>Initialization and Administration System</b>	A software and hardware tool used by Services personnel located at Customer Service Support Organizations (CSSOs) or the National Customer Support Center (NCSC) to initialize, administer, and troubleshoot customer PBXs remotely.
<b>ISCN</b>	Information system change notice
<b>ISDN</b>	<i>See Information Services Digital Network</i>
<b>ISN</b>	<i>See Information Systems Network</i>
<b>MMS</b>	Material Management Services
<b>National Customer Support Center</b>	An AT&T Services group that provides technician support and phone-in help for users of AT&T System 75, AT&T System 85, and AT&T DIMENSION® PBX.
<b>National Software Support Center</b>	An AT&T Services group that provides technician support and phone-in help for users of 3B computers and personal computers (PCs).
<b>NCSC</b>	<i>See National Customer Support Center</i>
<b>NSSC</b>	<i>See National Software Support Center</i>
<b>PPG</b>	<i>See Programmable Processor Gateway</i>
<b>PRI</b>	<i>See Primary Rate Interface</i>
<b>Primary Rate Interface</b>	A standard Integrated Services Digital Network (ISDN) frame format recommended by the Comité Consultatif International Téléphonique et Télégraphique (CCITT). PRI runs at 1.544 Mbps and supports 23 64-Kbps B-channels (voice or data) and 1 64-Kbps D-channel (signaling). The D-channel is the 24th channel of the interface and contains multiplexed signaling information for the other 23 channels.
<b>Programmable Processor Gateway</b>	A feature built into the TN563 SCSI host adapter circuit pack that offers an external serial interface to a DEFINITY™ Manager II PC. In addition, 2 asynchronous data unit (ADU) ports on the TN563 provide access to the processor at speeds up to 19.2 Kbps. These ports provide the same basic communication functionality available on the remote interface/diagnostic processor.
<b>Removable Mass Storage Subsystem</b>	A processor-based tape storage device that replaces the high-capacity minirecorder (HCMR) to provide nonvolatile system bootstrap and translation storage for the AT&T System 75.
<b>RMSS</b>	<i>See Removable Mass Storage Subsystem</i>
<b>Remote group</b>	A feature that allows a group of port circuits (equivalent to 1 or more port carriers but less than 1 module) to be located up to 100 miles from the PBX, over DS1 facilities. Voice and data terminals connected to these circuits operate as if they were installed at the central location. Digital and Electronic Industries Association (EIA) trunk interfaces can be remoted, but local analog trunk interfaces to the Remote Group are not supported. <i>See also Remote Module.</i>
<b>Remote Module</b>	A feature that allows 1 or more network modules to be located up to 13,000 feet from the common control (CC) by using fiber-optic cable. <i>See also Remote Group.</i>
<b>SCSI</b>	<i>See Small Computer System Interface</i>

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<b>Small Computer System Interface</b>	An ANSI-based standard computer I/O bus which is used to connect intelligent peripherals to one or more host computers. The primary objective of the ANSI specification is to provide host computers with device independence (connector compatibility) within a class of devices.
<b>SMT</b>	<i>See System Management Terminal</i>
<b>STS</b>	Software Technical Support
<b>Source customer upgrade tape</b>	The source customer upgrade tape provides pre-upgrade switch data converted to DTS format. This allows upgraded hardware to undergo test an burn-in while running under the old software during upgrades to DEFINITY™ Communications System Generic 2.
<b>System Management Terminal</b>	An administration device for AT&T System 85. The SMT provides limited administration capability to the customer.
<b>System upgrade</b>	A system upgrade is the movement of a given system to a completely new system. For example, a movement from System 75 or System 85 to DEFINITY™ Communications System is termed a <i>System Upgrade</i> .
<b>TRACS</b>	<i>See Translation Recovery Additions and Conversions System</i>
<b>Translations, Recovery, Additions, and Conversion System</b>	An application software program (running on a Digital Equipment Corp. VAX® 11/780 computer using the UNIX® operating system) that allows the customization of a customer's translations for an AT&T System 85. (VAX® is a registered trademark of the Digital Equipment Corp.)
<b>Upgrade</b>	The movement of a System 75, System 85, or DEFINITY™ product to a different version, release or system. This includes hardware and software installation and replacement procedures which bring existing equipment up to the level at which it will perform its role within the target system. Generally, changes directly associated with the role of <i>existing cabinet and carrier hardware</i> in the <i>target system</i> are considered part of the upgrade. If there is policy and pricing in place to support this movement it should be referred to an upgrade. Upgrade may imply addition, but the two terms are <i>not</i> interchangeable. <i>See also Version upgrade, System upgrade, and Addition</i>
<b>Version upgrade</b>	A version upgrade is the movement of a product to a higher version of that individual product. The emphasis is on changes <i>within a given System</i> such as System 85 R2V1 upgrades to System 85 R2V4. This includes software procedures such as tape load and translation recovery as well as hardware procedures such as circuit pack , storage system, and carrier replacement and installation.



## INDEX

---

- 2
- 212 data set 4-2
- 3
- 301CC to 501CC, upgrade, duplicated 6-27
- 301CC to 501CC upgrade, unduplicated 6-3
- 9
- 900 series patches, described 2-2
- A
- ADU, cable *see* H600-177 cable
- ADU connector panel, installation of 3-18
- Alarm wire, SCSI 3-17
- API6 compatibility
  - for Generic 2 3-12
  - for R2V4 3-6
- Audit process, for upgrades 2-3
- B
- Building the TRT, procedures for 2-2
- Button table word requirements A-3
- C
- Cabinet, common control (J58886A), removing 6-10, 6-35, 6-60
- Cabinet installation (J58886K, L1) 6-39
- Cabinet installation (J58887K, L1) 6-64
- Cabinet, module control (J58888B) 6-4, 6-28, 6-53
- Cabinet mounting, for DTS 3-16
- Cable, H600-174 *see* H600-174 cable 3-17
- Cable, H600-177 *see* H600-253 cable 3-18
- Cable, H600-253 *see* H600-253 cable 3-17
- Carrier converters 4-6
- Catalog, for documentation *xiii*
- CC circuit packs, replacing for Generic 2 3-14
- CC/ADU, cable *see* H600-174 cable
- Change notices
  - completing 1-4
  - for Generic 2 3-10
- Changes
  - between versions 1-2
  - hardware and software 1-2
- Checking for software field updates 4-1
- Checking for software patches 2-2
- Circuit pack installation
  - for Generic 2 3-11
  - for R2V3 3-4
  - for R2V4 3-8
- Clocks, system, setting 6-93
- Clocks, time of day, hardware/software 6-94
- CMS 4-5
- CMS
  - busy out the link 4-5
- Cold start initialization 4-6
- Comments, where to send *xvi*
- Common control
  - software upgrades for 4-3
- Common control upgrades
  - to Generic 2 3-11
- Compatibility requirements
  - for AP16 and CSM 3-3
- Connecting Manager II 3-23
- Connections
  - DCIU 6-76
  - determining for Manager II 3-19
  - RMATS, for R1-R2 6-75
  - SMDR 6-74
- Connector panel, ADU *see* ADU connector panel 3-18
- Contents, document *xii*
- CSD *see* Customer System Document (CSD) *xii*
- CSM compatibility
  - for Generic 2 3-12
  - for R2V4 3-6
- Current limiter placement locations 5-9
- Customer System Document (CSD) *xii*



Customer upgrade tape  
  building 2-1  
  defined 2-1  
  producing 2-3  
  turnaround time 2-4  
Customized translations 2-1

## D

DCIU connections 6-76  
DEFINITY Communications System, upgrading to 3-10  
DEFINITY upgrades, documentation required 3-11  
DEFINITY™ Manager™ II, operation xv  
Determining Manager II connections 3-19  
Disk Tape Subsystem  
  described 1-3  
  upgrade requirements for 3-10  
Disk/Tape System (DTS), installation 3-14  
Documentation  
  catalog xiii  
  contents xii  
  ordering xii  
  reference xiii  
  related xii  
Documentation required  
  for Generic 2 3-11  
  for R2V3 upgrades 3-2  
  for R2V4 3-5  
DOSS orders, placing 3-1  
Drawings, schematic xv  
DTS  
  cabinet mounting 3-16  
  upgrade requirements 3-10  
DTS *see* Disk Tape Subsystem 1-3  
DTS, installation *see* Disk/Tape System (DTS), installation  
DTS SCSI, cable *see* H600-253 cable  
Duplicate CC software upgrades 4-4  
Duplication cables, installing 5-15

## E

Earthquake mounting, how to 6-89  
EFCs *see* Electronic Flipcharts xvi  
Electronic Flip Charts (EFCs) *see* Flipcharts xvi  
Ensuring Manager II connections 3-32  
Equipment removal 1-5

Error lamp 4-7  
Error listings, running 2-3  
Executing RUNTAPE 4-3

## F

Feature Limits A-2  
Features, hardware and software 1-1  
Features, reactivating 3-33  
Feedback, on this document xvi  
Field upgrade process, described 5-2  
Flipcharts  
  described xvi  
  for MAAP xvi  
  for Manager II xvi  
  for SMT xvi  
Floor plan 6-3

## G

Generic 2  
  AP16 and CSM compatibility 3-12  
  CC microdiagnostics for 3-21  
  CC upgrade requirements 3-11  
  DTS installation for 3-14  
  optional hardware PECs 3-11  
  price element codes 3-10  
  replacing CC circuit packs 3-14  
  required documentation 3-11  
  saving translations for 3-13  
  software PECs 3-11  
  upgrading to 3-10

## H

H600-174 cable, description of 3-19  
H600-174 cable, installation of 3-17  
H600-177 cable, description of 3-19  
H600-177 cable, installation of 3-18  
H600-253 cable, installation of 3-17  
Hardware features, per version 1-1  
Hardware return process, system upgrades 5-2  
Hardware upgrade planning 1-1  
Hardware upgrade procedure  
  described 3-1  
  Generic 2 3-10  
  R2V3 3-4  
  R2V4 3-7

Hardware upgrade procedure —*Contd*  
 Single Carrier Cabinet 5-30  
 HCMR, removing 5-7  
 History, features *see* features 1-1

## I

Implementing upgrades 1-1  
 INADS 212 data set 4-2  
 Index, ISCN *see* information system change notice (ISCN) 1-4  
 Information system change notice (ISCN) 1-4  
 Initial system test 6-91  
 Installation, cabinet (J58887K, L1) 6-64  
 Installing ED-1E447-10, G2 alarm distribution unit 6-21  
 Installing ED-1E465-70, G15 wireway 6-40  
 Installing the DTS 3-14  
 Intervals, upgrade 1-1  
 ISCN *see* information system change notice (ISCN) 1-4  
 ISDN network parameters A-8

## L

Line Limits, for system configuration A-1

## M

Manager II  
 connection options for 3-23  
 connections for RMATS 1 3-26  
 described 1-3  
 H600-174/177 cable installation 3-19  
 installation 3-23  
 verifying connections for 3-32  
 Memory Table Space A-1  
 Microdiagnostics  
 described 3-21  
 Minirecorder, removing 6-62

## N

National Engineering Center/National Engineering Center-East 1-4  
 NEC *see* National Engineering Center 1-4  
 Negotiating upgrade intervals 1-1  
 Network parameter limits A-7

Network parameters for ISDN A-8  
 Non-switched dedicated trunk analog dial access, described 3-24

## O

Optional PECs, for Generic 2 3-11  
 Ordering documentation *xiii*  
 Organization, document *xii*  
 Overview, upgrade process 1-1

## P

Patches, software *see* Software patches, checking for  
 PEC *see* price element code (PEC) 1-4  
 PECs  
 Generic 2 software 3-11  
 System 85 R2V3 *see* price element codes, System 85 R2V3  
 System 85 R2V4 *see* price element codes, System 85 R2V4  
 System 85 to DEFINITY 3-10  
 Performing CC microdiagnostics, for Generic 2 3-21  
 Performing the RUNTAPE 2-1  
 Plan, floor 6-3  
 Planning for upgrades 1-1  
 Powering up system 6-26  
 PPG port connections, for Manager II 3-23  
 PPG ports, described 1-3  
 Price element code (PEC), described 1-4  
 Price element codes  
 System 85 R2V3 3-2  
 System 85 R2V4 3-5  
 System 85-to-DEFINITY Generic 2 3-10  
 PROC 253, administering 6-93  
 PROC 284, administering 6-93  
 PROC 490, using 2-2  
 PROC 652, test 3, administering 6-94  
 Procedures  
 for software upgrades 4-1  
 for upgrade 1-1  
 test 6-91  
 translation recovery 2-1  
 Producing the upgrade tape 2-3

## Q

QPPCNs, checking for 3-1  
Quality protection plan change notice 1-4

## R

R1V3 cabinet  
cover replacement 5-31  
R2V3  
AP16 requirements 3-3  
CSM requirements 3-3  
documentation required 3-2  
hardware 3-2  
price element codes 3-2  
R2V4  
AP16 and CSM compatibility requirements 3-6  
price element codes 3-5  
required documentation 3-5  
required hardware 3-5  
upgrading to 3-5  
R2V4 hardware upgrade *see* Hardware Upgrade Procedure, R2V4 3-7  
Reactivating features 3-33  
Reader comment cards *xvi*  
Recovering translations 2-1  
Related documentation *xiii*  
Removing HCMR 6-62  
Required documentation, R2V4 3-5  
Requirements, for AP16 and CSM compatibility 3-3  
Resources, for reference *xii*  
Retrofit center upgrade process, described 5-1  
Returning equipment 1-5  
RMATS 0  
connections for Manager II 3-24  
described 3-23  
equipment requirements for 3-24  
RMATS 1  
connections for Manager II 3-26  
described 3-23  
equipment requirements for 3-26  
RMATS connections, for R1-R2 6-75  
RMATS port connections, for Manager II 3-23  
RMSS, removing 5-6  
RUNTAPE  
described 2-1  
executing 4-3

## S

Saving translations, for Generic 2 3-13  
Schematic drawings *xv*  
SCSI *see* Small Computer System Interface 1-3  
Sending comments *xvi*  
Setting systems clocks 6-93  
Shorting straps  
port address 5-36  
Single Carrier Cabinet hardware upgrade 5-30  
Skills and knowledge, required *xii*  
Small Computer System Interface, described 1-3  
SMDR connections 6-74  
Software features, per version 1-1  
Software field updates, checking for 4-1  
Software patches, checking for 2-2  
Software PECs, for Generic 2 3-11  
Software upgrade intervals 1-1  
Software upgrade planning 1-1  
Software upgrade procedures 4-1  
Software upgrades, for duplicate CC 4-4  
Software upgrades, single CC systems 4-3  
SSB file installation 4-2  
Support organizations 1-4  
Switched analog dial access, described 3-26  
System 85 hardware upgrades, described 3-1  
System 85 R2V3, upgrading to 3-2  
System 85 R2V4, upgrading to 3-5  
System clocks, setting 6-93  
System Configuration Limits A-1  
System management, with Manager II 3-23  
System parameter limits A-5  
System test, initial 6-91  
System upgrade planning 1-1  
System upgrades  
described 5-1  
Generic 1 to Generic 2 5-17  
Single Carrier Cabinet 5-30  
System 75 R1V1, V2, V3 to Generic 2 5-3  
System 75 to Generic 2 remote modules 5-30  
unduplicated to duplicated 5-3  
System 75  
single carrier cabinet upgrade 5-30

## T

TAC *see* Technical Assistance Center (TAC)  
1-4

Tape, customer upgrade *see* Customer upgrade tape  
 Tape Shop, address 1-5  
 Tape, source and target upgrade *see* Customer upgrade tape  
 Tape, translation recovery *see* Translation recovery tape  
 TDM/LAN bus cables  
   routing and connecting 5-31  
   routing in R1V3 cabinets 5-31  
 TDM/LAN terminator positions 5-9  
 Technical Assistance Center (TAC) 1-4  
 Test, initial system 6-91  
 Test procedures, system 6-91  
 Tests, X-RAY 6-91  
 Time of day clocks, setting 6-94  
 Translation checks 4-7  
 Translation recovery procedures 2-1  
 Translation recovery tape  
   building 2-1  
   defined 2-1  
 Translations  
   saving 4-5  
 Translations, reactivating 3-33  
 TRT, building *see* Translation recovery tape, building  
 TRT *see* Translation recovery tape  
 Trunk limits A-6

## U

Unduplicated 301CC to duplicated 501CC, upgrading 6-52  
 Upgrade  
   audit process 2-3  
   documentation xv  
   duplicated, 301CC to 501CC 6-27  
   intervals 1-1  
   negotiating intervals 1-1  
   process overview 1-1  
   source and target tapes 2-1  
   unduplicated, 301CC to 501CC 6-3  
   unduplicated 301CC to duplicated 501CC 6-52  
 Upgrade requirements  
   for DTS 3-10  
 Upgrade tape, producing 2-3  
 Upgrades  
   planning for 1-1

Upgrades —*Contd*  
   process described 5-1  
   to Generic 2 3-10  
   to R2V4 3-5  
   to the Single Carrier Cabinet 5-30  
 Upgrading software 4-1  
 Using this document xii

## V

Verifying Manager II connections 3-32  
 Version upgrade planning 1-1

## W

Wireway, ED-1E465-70, G15, installing 6-40

## X

XE Module upgrade  
   *see* Single Carrier Cabinet 5-30  
 X-RAY tests 6-91





