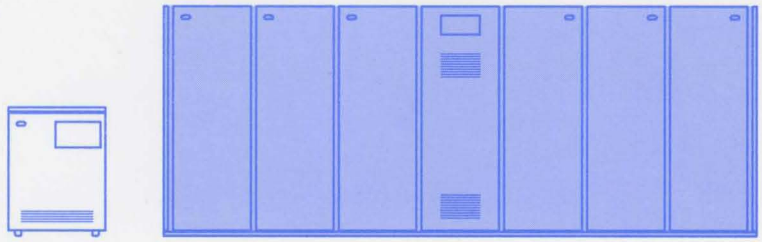
IBM

3745 Communication Controller

SY33-2054-6

Maintenance Information Procedures (MIP)
Part 2



3745
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IBM

IBM 3745 Communication Controller Models 210, 310, 410, and 610

SY33-2054-6

IBM 3746 Expansion Unit Models A11, A12, L13, L14, and L15

Maintenance Information Procedures (MIP) Part 2

Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page xiii.

Seventh Edition (August 1991)

The information contained in this manual is subject to change from time to time. Any such changes will be reported in subsequent revisions.

Changes have been made throughout this edition, and this manual should be read in its entirety.

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Maintenance Information Procedures, Part 2 of 2

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Notices

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Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For Canada, *Canadian Department of Communication Statement,* **GX27-3883, applies.**

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Product Safety Information

General Safety

This product meets IBM safety standards.

For more information, see the: *IBM Telecommunication Products Safety Handbook,* GA33-0126.

Safety Notices

CAUTION

Hazardous voltages are still present in some areas of the 3745 when power is OFF

VORSICHT

Gefährliche Spannungen auch bei ausgeschaltetem Gerät vorhanden

ATTENTION

Presence de tensions dangereuses dans certaines parties du 3745 même lorsque l'unité est hors tension

ATTENZIONE

Tensioni pericolose sono ancora presenté anche se l'unità 3745 é spenta

PRECAUCION

Con la corriente apagada todavia hay voltages peligrosos en algunas areas del 3745

CUIDADO

Voltagen ainda presente em algumas áreas da 3745 mesmo quando desligada

注 意

電源が切れていても、3745のある箇所には、

危険電圧がかかっています。

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Service Inspection Procedures

Introduction

The following procedures help the service personnel check whether the 3745 conforms to IBM safety criteria. They are to be used each time the 3745 safety is suspected.

The 3745 areas and functions checked through these procedures are:

1. External covers
2. Safety labels
3. Safety covers and shields
4. Grounding
5. Circuit breaker and protector rating
6. Input power voltage
7. Power On indicator On
8. Emergency power OFF.

Important Notes:

- The 3746(s) are powered On and Off through the basic frame 3745.

Hazardous voltages are still present in some areas of the 3745 when power is Off.

- Steps 1 through 6 must be performed with the power OFF; that is, on the 3745 and 3746(s):
  - CB1 tripped (switched off) on the 3745, *and*
  - **Customer's power supply switch OFF.** do not remove the power cord in order to maintain the ground protection.

1. **External covers**

   Check that:

   - They are all present on the 3745 and 3746(s).
   - They are locked with two kind of locks: flat blade screw for IBM access area and hex head for customer access area (refer to the *3745 Parts Catalog*).
   - They can be fully opened.
   - Appropriate service clearances and accesses are provided around the frames with external covers opened.

     Leave all external covers opened to allow further safety inspection steps.

2. **Safety labels**

   Check that:

   - All the safety labels are at the places indicated by letters in "Safety Label Locations" on page xx.
   - Each label is of the model corresponding to the letter as shown on "Safety Label Identifications" on page xxii.

3. **Safety covers and shields**

   Referring to FRU location (Chapter 5) check that:

   - All the safety covers are present and secured with screws.
   - All the voltage terminal boards (TBs) are protected by a plastic shield screwed on top of the TB.

4. **Grounding**

   Refer to "Volume 4, page YZ110 to YZ114" for grounding jumper locations

   Check that:

   - **Electrical continuity is assured, within each frame, between the frame ground and the terminals indicated on the ground distribution diagrams.**
   - Electrical continuity is assured between the 3745 and 3746(s), frame grounds and to the premises grounding system, through the 3745 power cord.

5. **Circuit breaker and protector rating**

   Refer to Table 0-2 on page xix for CB and CP locations.

   Check that:

   - All CBs and CPs in the 3745 are rated at the indicated value in Table 0-2 on page xix. If the rating is not indicated, check the part number against the *3745 Parts Catalog, S135-2010.*

6. **Input power voltage**

   The power rating plate indicates the voltage ranges available (200/220/240 or 346/380/415).

   The voltage label (label E) indicates the input voltage for which the 3745 is wired.

   Performing a Power Conversion Inspection.

   - A power conversion inspection must be performed on any 3745 Communication Controller that has been converted from 50 Hz to 60 Hz, from 60 Hz to 50 Hz, from 220 V to 380 V, or from 380 V to 220 V.
   - The following procedure is only used for frame 01 (base frame) which contains the Primary Power Box (PPB). Each component must be inspected as described.
     Refer to Figure 5-2 on page 5-6 to locate the frame 01 and the PPB.
   - Inspection
     - Check against the Table 0-1 on page xviii for the correct primary power part numbers for the specified 50 Hz or 60 Hz use.
     - Check for the correct PS type 8 :
       P/N6495884 for 50 Hz or
       P/N6495898 for 60 Hz
       In case of discrepancy. contact your support structure.

   Refer to Figure 0-1 on page xx for power rating plate location and voltage label and:

   - "Volume 4. page YZ561 to YZ564" for the primary power box voltage adjustment,
   - "Volume 4, page YZ576" for the power box PS Type 6 voltage adjustment and
   - "Volume 4, page YZ578" for the power supply PS Type 8 voltage adjustment.

   Check that:

   - The power rating plate is consistent with the voltage level measured at the customer's power supply. If not, inform your branch office.

   Important Note:

   Since the 3745 can be remotely powered On, all the following procedures must be performed with the Power Control function on the 3745 control panel set to **Local mode**.

7. **Emergency power OFF**

   Ask the customer to connect the power cord to the customer's mains supply, put CB1 On, and power ON the 3745 (Power Control function to Local on the control panel).

   Then operate the EMERGENCY switch to POWER OFF ('0') and check that:

   - The 3745 is powered Off.
   - The diskette and disk drives are stopped.
   - All the fans are stopped, except MOSS.
   - The convenience outlets on the 3745 are not supplied with ac power.

   Relatch the EMERGENCY switch, then power ON the controller.

8. **Power ON Indicator**

   Once the controller is powered On, check that the Power On indicator On on the 3745 control panel is lit. The indicator is located to the right of the Power ON/Reset key, refer to Figure 1-25 on page 1-35.

Table 0-1. Part Numbers		
Primary Power Assembly	**Power Cord**	**Convenience outlet Voltage**
P/N 6495105 US and Canada 208.220,240V 60 Hz	P/N 6495844	117V P/N 357995
P/N 6495106 JAPAN 200.220 50 Hz	P/N 6495845	100V P/N 357995
P/N 65X8688 JAPAN 200.208,240 60 Hz	P/N 6495845	100V P/N 357995
P/N 6495107 All countries 200,220 50 Hz	P/N 6495845	200V P/N 418835
P/N 65X8689 All countries 200,208,220,240 60 Hz	P/N 6495845	220V P/N 418835
P/N 6495688 All countries 380,400,415 50 Hz	P/N 6495846	220V P/N 418835
P/N 65X8690 All countries 380 60 Hz	P/N 6495846	220V P/N 418835

3745 Power Supply CP/CB Reference

Table 0-2. 3745 Power Supply CP/CB Reference

Frame	CB/CP	Location	Rating	PS
Frame 1	CB1	01E	40A/220V	
	CB1	01E	25A/380V	
	CP1	01E	3A	PSTY8
	CP1	01F	1.5A	PSTY6
	CP2	01F	1.5A	PSTY6
	CP3	01F	1.5A	PSTY6
	CP3	01E	6A	PSTY1-A
	CP4	01E	3A	PSTY5/7
	CP5	01E	3A	PSTY3
	CP6	01E	3A	PSTY2
	CP7	01E	6A	PSTY4
	CP8	01E	6A	PSTY1-B
	CP9	01E	3A	Outlet
Frame 2	CP1	02J-A0	6A	PSTY4
	CP2	02J-A0	3A	PSTY3
	CP3	02J-A0	6A	PSTY4
Frame 3	CP	03J-A0	6A	PSTY4
Frame 4	CP1	04A-A0	6A	PSTY5/7
	CP2	04A-A0	6A	PSTY5/7
Frame 5	CP1	05A-A0	6A	PSTY5/7
	CP2	05A-A0	6A	PSTY5/7
Frame 6	CP1	06A-A0	6A	PSTY7
	CP2	06A-A0	6A	PSTY7

Safety Label Locations

On the following figures, labels are designated by letters. A particular wording corresponds to each letter (see "Safety Label Identifications" on page xxii).

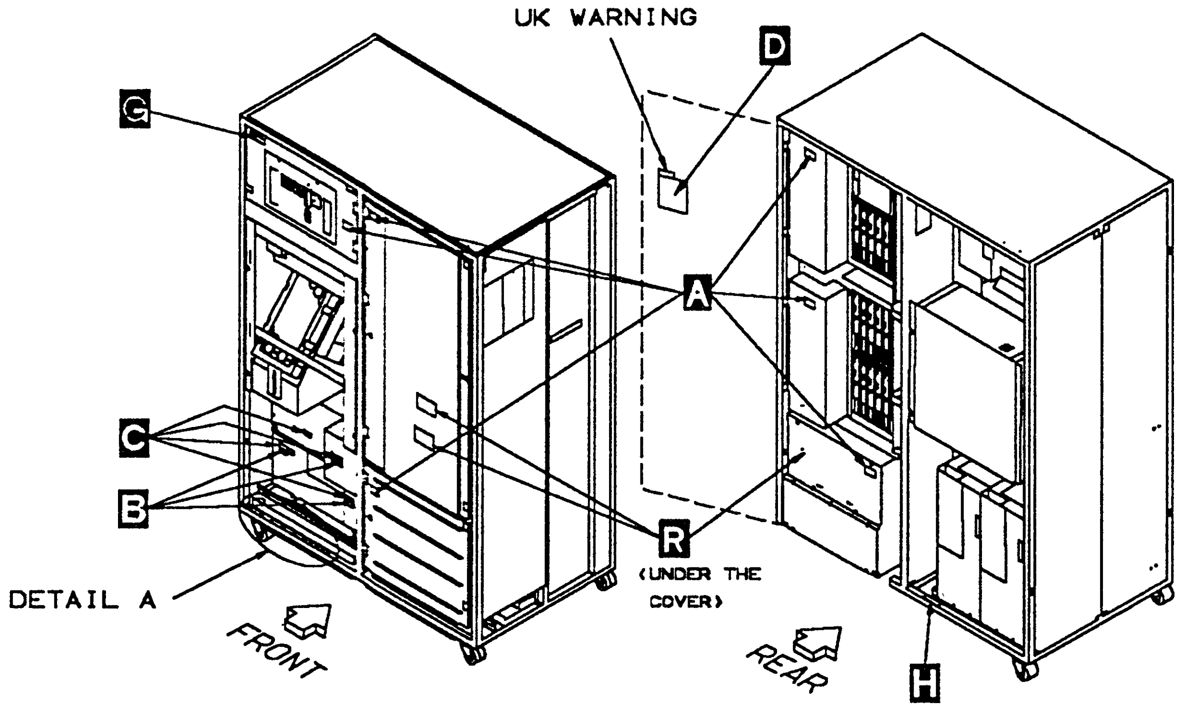

Figure 0-1. 3745 (Basic Frame 01) Label and Power Rating Plate Locations

DETAIL A

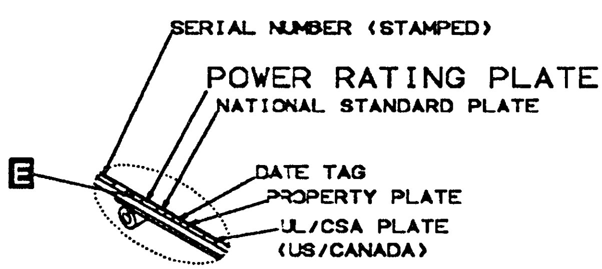

Figure 0-2. 3745 (Basic Frame 01) Label and Power Rating Plate Locations. (Detail).

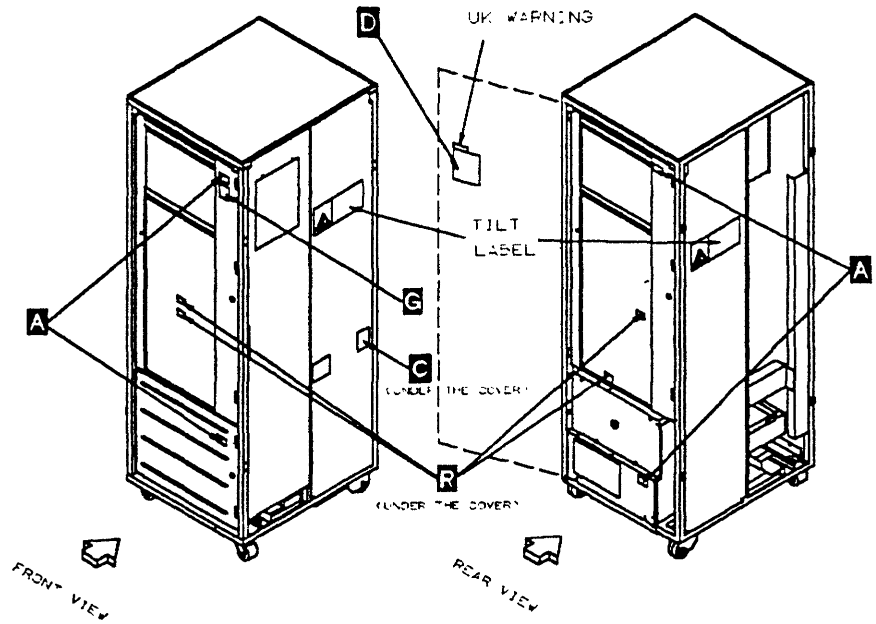

Figure 0-3. 3746-A11 (Frame 02) or 3746-A12 (Frame 03) Label Locations

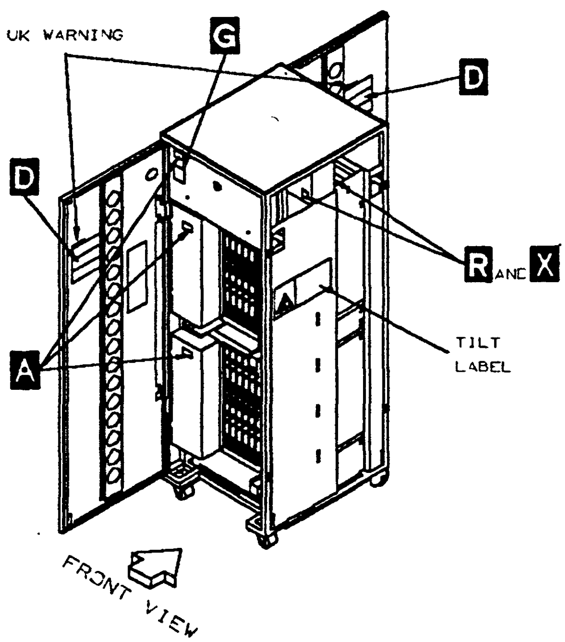

Figure 0-4 (Part 1 of 2). 3746-L13 (Frame 04) 3746-L14 (Frame 05) 3746-L15 (Frame 06) Label Locations

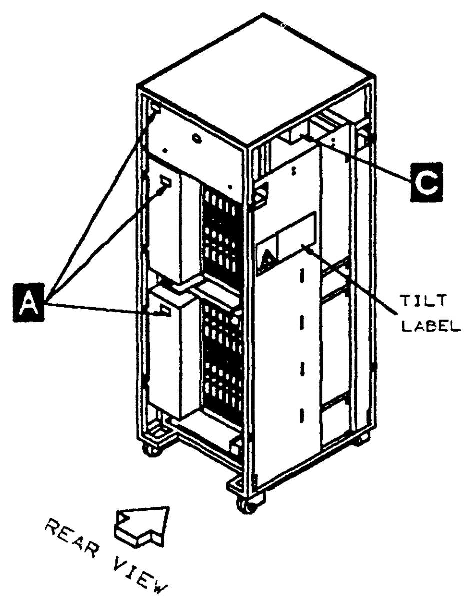

Figure 0-4 (Part 2 of 2). 3746-L13 (Frame 04) 3746-L14 (Frame 05) 3746-L15 (Frame 06) Label Locations

Safety Label Identifications

The safety labels shown in Figure 0-5 are in English. They are also available in other languages. See "Safety Label Part Numbers by Country" on page xxiii for ordering.

LABEL A

HAZARDOUS AREA
TRAINED SERVICE
PERSONNEL ONLY

LABEL G

This equipment has been tested with a class a computing device and has been found to comply with part 15 FFC rules. See instruction manual. Operation in a residential area may cause unacceptable interference to radio and tv reception requiring the operator to take whatever steps are necessary to correct the interference

LABEL B

LINE VOLTAGE
PRESENT WITH
MACHINE POWER
OFF

LABEL H

WARNING
High grounding conductor current. Grounding circuit continuity is vital for safe operation of machine. Never operate machine with grounding conductor disconnected

LABEL C

TURN MAIN
LINE SWITCH
"OFF" BEFORE
REMOVING

TILT LABEL

CAUTION

USE CARE WHEN MOVING
ON ROUGH SURFACES.

DO NOT TIP MORE THAN
10 DEGREES.

DO NOT REMOVE THIS LABEL

LABEL E

THIS MACHINE IS
WIRED FOR V
See logic drawings for
alternate voltage insn

LABEL R

CAUTION

REMOVE PRIMARY POWER
BEFORE REMOVING COVER

UK WARNING

WARNING
CONNECT ONLY APPARATUS COMPLYING
WITH BS 6301 TO THESE PORTS

LABEL D

CAUTION

DUE TO CONNECTED EQUIPMENT
HAZARDOUS VOLTAGES
MAY BE PRESENT AT ANY TIME

LABEL X

TO DISCONNECT THIS
UNIT COMPLETELY,
CB1 ON MAIN FRAME
MUST BE IN
THE OFF POSITION

Figure 0-5. Safety Labels

Safety Label Part Numbers by Country

The following table gives the label group part number for each frame according to the language(s) of the country in which the 3745 is installed.

Table 0-3. Safety Label Numbers by Country

LANGUAGE	FRAME 01 PART NUMBER	FRAME 02 or 03 PART NUMBER	FRAME 04 or 05 PART NUMBER	TILT LABEL PART NUMBER
Danish	03F4314	03F4334	03F4349	03F4462
Dutch	03F4316	03F4336	03F4351	03F4464
English	03F4302	03F4322	03F4337	03F4417
*	03F7770	03F7770	03F7770	
Finnish	03F4305	03F4325	03F4340	03F4453
French	03F4304	03F4324	03F4339	03F4452
French/Dutch	03F4306	03F4326	03F4341	03F4454
French/German/Italian	03F4315	03F4335	03F4350	03F4463
Canadian French	03F4303	03F4323	03F4338	03F4451
German	03F4307	03F4327	03F4342	03F4455
Italian	03F4308	03F4328	03F4343	03F4456
Japanese	03F4313	03F4333	03F4348	03F4461
Norwegian	03F4309	03F4329	03F4344	03F4457
Portuguese	03F4310	03F4330	03F4345	03F4458
Spanish	03F4311	03F4331	03F4346	03F4459
Swedish	03F4312	03F4332	03F4347	03F4460

* UK ONLY

About This Book

Aim of this book

The MIP is a guide for fault isolation and repair of the 3745 Communication Controller. It is expected that the customer has used the *Problem Determination Guide, SA33-0096* prior to calling IBM for service and the MIP does not duplicate the tasks specified by the *Problem Determination Guide*.

The MIP gives the service representative the information needed to:

- Analyze problems or symptoms reported by the system user.
- Restore normal 3745 operation.

Who should read this book

The person using this manual should be:

- Trained to service the 3745 and 3745 Expansion frames.
- Familiar with the configuration of the system to which the 3745 is connected.
- Familiar with the operation of the 3745, as described in *IBM 3745 Communication Controller Maintenance Information Reference, SY33-2056* and *IBM 3745 Communication Controller Service Functions, SY33-2055*, which are part of this Maintenance Library.

The intended audience for this manual are Product-Trained Customer Engineers (PT CE). The Product Support-Trained Customer Engineer (PST CE) is also expected to refer to the manual when he is required to perform the same tasks as the PT CE.

How this book is organized

This manual is organized as follows:

- Safety information is at the start of the manual followed by information about the maintenance library and related documents.
- Chapter 1 gives a general description of the product and its features and also a description of the maintenance philosophy.
- From Chapter 2 through Chapter 5, this manual is designed so that the information is presented to the user in the same order as he will require it for most service calls. The user is told where to go next for each path through this part of the manual.
- At the back of the manual are Appendix A and B, abbreviation list and glossary. This information is for reference purposes.

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Summary of Changes

This revised edition takes into account the new 3745 models: 310 and 610.
Also corrections and improvements relating to the previous edition have been inserted.

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3745 BIBLIOGRAPHY

Service Personnel Definitions

Definition	Uses
Product trained CE (PT CE): hardware CE also able to fix problems in the microcode Also called: CE1 1st Level CE CE Phase 1	RETAIN console 3745 control panel 3745 console MIP Service Functions Installation Guide Parts Catalog Basic Operations Guide Problem Determination Guide Connection and Integration Advanced Operations Guide Wiring Diagrams (YZ Pages)
Product support trained CE (PST CE): hardware CE also able to determine and fix problems in the microcode Also called: CE2 2nd Level CE CE Phase 2 Specialist Support	Same as PT CE, plus: MIR Diagnostic Descriptions Principles of Operation
Hardware Central Service (HCS) May include: Dispatchers PT CEs PST CEs	All 3745 tools and books
Program service representative (PSR) Also called: Program support CE Software CE	Operating systems, access methods, and NCP/EP library

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Customer Information

Supplied with the 3745
(Without binder)

Manual		Order Number
Title	Telecommunication Products Safety Handbook	GA33-0126
Purpose:	Recalls elementary safety principles that must be observed when installing and connecting telecommunication products on a customer site.	
Audience:	(1) Customers (2) IBM CE.	

Volume A
(With binder SX11-8300)

Manual		Order Number
Title	3745 Master Index	SA33-0172
Purpose:	Helps the user find information in the 3745 customer documentation.	
Audience:	(1) Telecommunication network specialist. (2) Network operator, System operator.	
Title	3745 Connection and Integration Guide	SA33-0129
Purpose:	Explains how to install, replace, and remove the LICs, and how to plug and unplug cables for all attachments. Also explains how to integrate the 3745 into a telecommunication network.	
Audience:	(1) Telecommunication network specialist. (2) Network operator, IBM product trained CE.	
Title:	3745 Console Setup Guide	SA33-0158
Purpose:	Explains how to install 3745 consoles.	
Audience:	(1) Telecommunication network specialist. (2) Network operator, IBM product trained CE.	

Volume B
(With binder SX11-8301)

Manual		Order Number
Title:	3745 Advanced Operations Guide	SA33-0097
Purpose:	Describes all maintenance and operator subsystem functions.	
Audience:	(1) Telecommunication network specialist, system programmer. (2) IBM product trained CE.	

Volume C

(With binder SX11-8301)

Manual	Order Number
Title: 3745 Basic Operations Guide Purpose: Provides the basic procedures needed for the daily operation of the 3745. Audience: (1) Operator. (2) Network operator, installation coordinator, IBM product trained CE.	SA33-0098
Title: 3745 Problem Determination Guide Purpose: Provides problem determination procedures. Audience: (1) Network operator, system operator. (2) IBM product trained CE.	SA33-0096

Other Customer Information

Manual	Order Number
Title: 3745 Introduction Purpose: Provides introductory information. Describes highlights of the 3745. Audience: (1) DP management, IBM marketing. (2) Operator, IBM system engineer and service personnel.	GA33-0092
Title: 3745 Configuration Program Purpose: Can be run from an IBM PC, PC convertible, or any equipment of the IBM Personal System/2 to configurate the 3745. Audience: (1) Network DP Manager, IBM marketing representative and system engineer. (2) Other customer users.	GA33-0093
Title: 3745 Preparing for Connection Purpose: Provides plugging sheets and information to prepare the 3745 cable installation. Explains how to fill in the LIC5 configuration sheets. Audience: (1) DP manager, facilities technician, IBM Marketing. (2) IBM system engineer and service personnel.	GA33-0127
Title: System/360, System 370, 4300 Processors Input/Output Equipment IM-PP Purpose: Gives reference information to plan the physical installation of the 3745. Audience: (1) DP manager, facilities technician, IBM Marketing. (2) IBM system engineer and service personnel.	GC22-7064
Title: 3745 Principles of Operation Purpose: Gives an understanding of the 3745 instruction and command set. Audience: (1) System programmer, IBM system engineer and program service representative. (2) System analyst, IBM marketing representative and service personnel.	SA33-0102

Service Information

Supplied with the 3745

Volumes 1-1 and 1-2

(With two binders SX11-8300)

Manual		Order Number
Title:	3745 Service Master Index (SMI)	SY33-2080
Purpose:	Help the user find information in the 3745 models 210 and 410 shipping group documentation.	
Audience:	(1) IBM product trained CE. (2) IBM product support trained CE.	
Title:	3745 Maintenance Information Procedures (MIP)	SY33-2054
Purpose:	From exits from the Problem Determination Guide, or from error information given by the machine, provides procedures for isolating and fixing the 3745 failures.	
Audience:	(1) IBM product trained CE. (2) IBM product support trained CE.	

Volume 2

(Without binder)

Manual		Order Number
Title:	3745 Service Functions	SY33-2055
Purpose:	Describes how the MOSS service functions are used from the 3745 console.	
Audience:	(1) IBM product trained CE. (2) IBM product support trained CE.	

Volume 3

(With binder SX11-8301)

Manual		Order Number
Title:	3745 Installation Guide	SY33-2057
Purpose:	Provides instructions to install or relocate the 3745.	
Audience:	IBM product trained CE.	
Title:	3745 Parts Catalog	S135-2010
Purpose:	Provides reference information for ordering 3745 parts, assemblies, and subassemblies.	
Audience:	(1) IBM product trained CE. (2) IBM part distribution centers.	
Title:	3745 Wiring Diagram (YZ Pages)	Part Numbers (See Note)
Purpose:	Provides detailed schematic information on power wiring, board to board interconnections, locations, card population, jumpering, and interfaces.	
Audience:	(1) IBM product trained CE. (2) IBM product support trained CE and Product Engineering.	

Manual		Order Number
Title:	3745 External Cable Reference	SY33-2075
Purpose:	Describes interface cables and wrap plugs used for connecting the 3745 to the console(s) and lines.	
Audience:	(1) IBM product support trained CE. (2) IBM Product Engineering.	

Note: Manufacturing documents, cannot be ordered from the IBM distribution centers.

Volume 4

(Without binder)

Manual		Order Number
Title:	3745 Diagnostic Descriptions	SY33-2059
Purpose:	Describes the diagnostic programs and the purpose of each routine.	
Audience:	(1) IBM product support trained CE. (2) IBM Product Engineering.	

Volumes 5-1 and 5-2

(Without binder)

Manual		Order Number
Title:	3745 Maintenance Information Reference (MIR)	SY33-2056
Purpose:	Provides reference information to locate failures in the 3745 in complement to the Maintenance Information Procedures.	
Audience:	(1) IBM product support trained CE. (2) IBM Product Engineering.	

Other Service Information

Manual		Order Number
Title:	3745 Channel Adapter On-Line Tests	D99-3745A (See Note 1)
Purpose:	Describes the 3745 channel adapter OLTs and how to run them.	
Audience:	(1) IBM product trained CE. (2) IBM product support trained CE.	

Notes:

1. Shipped from Poughkeepsie with the S/370 channel adapter OLT tape. Cannot be ordered from the IBM distribution centers.

Related Signal Converter Products Information

The following publications relate to IBM signal converter products and are cu~ently available:

- *7861 Description and Planning Guide*, GA33-0122.
- *7861 Setup, User's Guide, and Problem Analysis*, SA33-0123.
- *7861 Maintenance Information and Parts Catalog*, SY33-2062.
- *7868 Guide to Operation*, GA33-0134.
- *5822-10 Guide to Operation*, GA33-0118.
- *5822-18 Guide to Operation*, GA33-0136.
- *5858 Guide to Operation*, GH11-3027.
- *5858 Maintenance Information and Parts Catalog*, SY12-8246.
- *Link Problem Determination Aid*, SY33-2064.
- *Power Supply and Telecommunication Connections*, GA33-0054.

Related NCP Service Information

NCP and EP Reference Summary and Data Areas (LY30-3196 for V4R3.1 only)

NCP and EP Reference Summary and Data Areas (LY30-5603 for V5 only)

These manuals are for system programmers and IBM program service representatives. They provide quick access to often-used diagnostic and debugging information about NCP and EP in PEP environment.

NCP, SSP, and EP Diagnosis Guide (LY30-5591)

This manual is designed to help customers and IBM program service representative isolate and define problem in NCP Version 3, NCP Version 4, NCP V4 Subset, NCP Version 5, and EP in the PEP environment using SSP Version 3. The primary purpose of the manual is to help the user interact with the IBM Support Center to resolve a problem. Procedures in these manuals describe how to:

- Determine whether the problem is in NCP
- Use relevant information to describe the problem
- Gather appropriate documentation about the problem
- Report the problem to the IBM Support Center

In addition, it includes detailed descriptions of how to use the programming tools available with NCP and SSP.

NCP and EP Reference (LY30-5569 for V4R3.1 only)

NCP and EP Reference (LY30-5605 for V5 only)

These manuals contain reference material describing the internal organization and function of the NCP and the EP in PEP environment. These manuals provide information for customization and diagnosis.

Chapter 4. How to Run the 3745 Diagnostics

Table of Contents for Chapter 4

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Diagnostic Description

3745 Diagnostics

A full and detailed description of diagnostics is given in "3745 Service Functions" and "Diagnostic Description".

Two groups of diagnostics run on the 3745:

1. Automatic:

   IML/IPL checkout diagnostics including MOSS diagnostics.

2. Controlled:

   a. Power subsystem tests

   b. Functional area diagnostics

      - Internal Function Tests (IFTs)
      - Wrap tests
      - OLTs.

Diagnostics are run during the installation procedure and when a fault is detected to isolate a field-replaceable unit that caused the failure. They are also executed after a repair is performed, to check that the hardware area is working correctly. They have to be run before and after an EC or MES has been installed in the area concerned.

Diagnostics may be run in offline mode when the 3745 is fully available or in concurrent mode. In concurrent mode, the diagnostic must be selected in the specific area and will run only in configured units. These units must be available at that time.

Errors During Diagnostics

When the MOSS diagnostic program detects a failure, a three-digit code is displayed on the control panel.

When the internal function tests detect an error, a reference code is posted on the 3745 console.

Diagnostics Monitoring

The functional diagnostics are monitored by the Diagnostic Control Monitor (DCM) and the Command Processor (CP).

The diagnostic control monitor is loaded when the diagnostic utility program is selected from the 3745 function menu.

It automatically restricts diagnostic testing to the elements defined in the Configuration Data File (CDF), powered ON and disconnected from the NCP.

Checkout Diagnostics

The checkout diagnostics are designed to test the hardware of the CCU, switch, IOC, channel adapter, CSP part of the line adapter, TIC and the PLC card.

For the CA, LA, and TRA, they are part of the microcode and located in the ROS of the adapter itself. They run automatically every time the power is applied to the respective adapter, that is, at power ON time before IML, or when respective power is started, (power ON reset line).

The PLC checkouts only run when power is applied to the power subsystem and are successful when the power control and service mode indicators are displayed.

For the CCU, switch and IOC, the diagnostics are located on the disk and run during IPL.

For the CA, TSS, and HPTSS they are also automatically run when the internal function tests are started.

For the TIC, the Token-Ring wrap test is automatically run at each TIC Open command from the NCP. This TIC Internal Lobe Media tests the ring up to the local wiring concentrator (IBM 8228), or up to the point where it is unplugged before the 8228.

If an error is detected, the MOSS analyzes the problem and presents a control panel code or a reference code.

MOSS Diagnostics

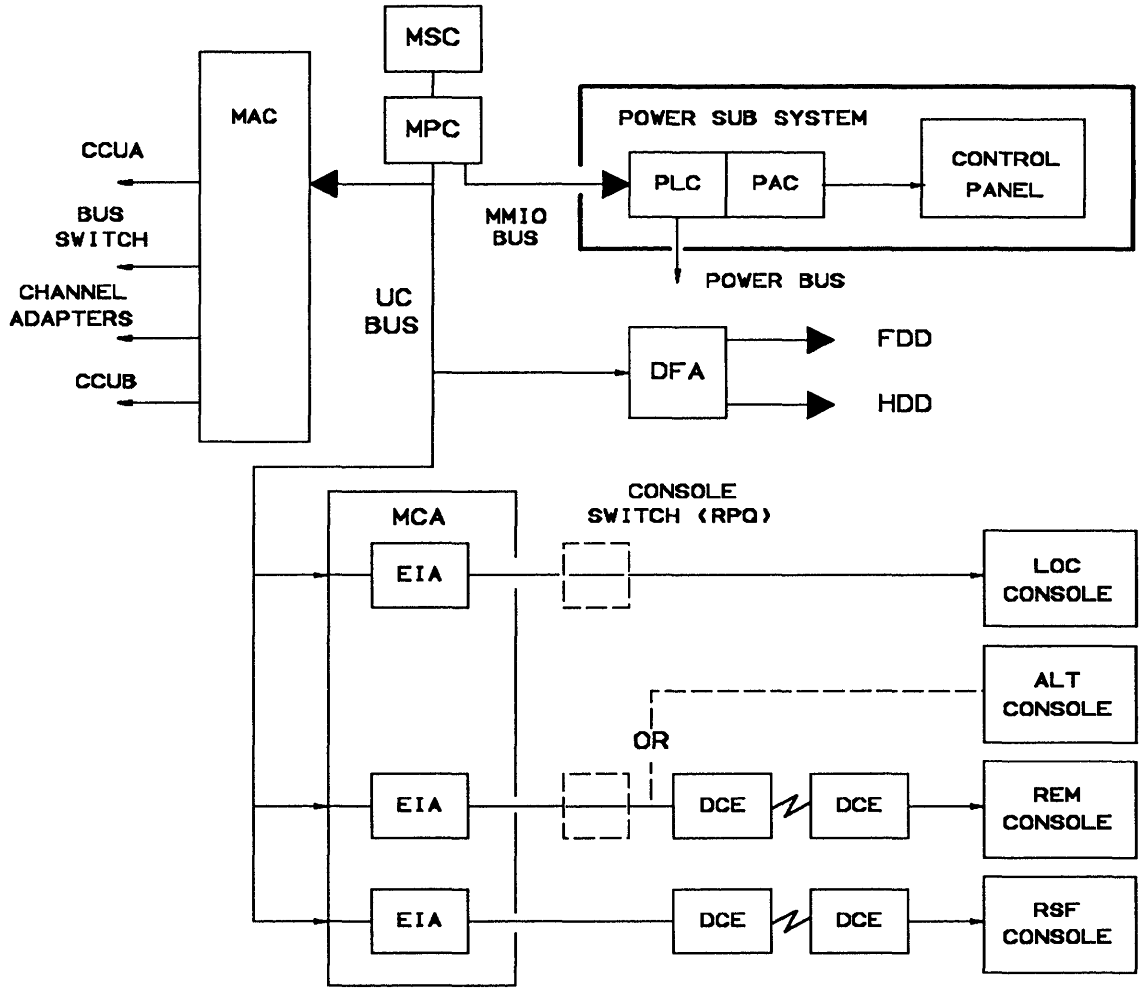


Figure 4-1. MOSS Overview

The MOSS diagnostics can be run in concurrent mode.

1. **Basic MOSS tests**

   They are designed to test the following units:

   - MPC (Moss Processor Card)
   - MSC (Moss Storage Card)
   - MAC/MAC2 (Moss Adapter Card)
   - MCA (Moss Console Adapter Card)
   - DFA (Disk File Adapter Card)
   - HDD (Hard Disk Drive)
   - FDD (Flexible Disk Drive).

   The basic MOSS tests are run whenever the following functions occur:

   - Power ON reset
   - Moss IML
   - General IPL.

   Partial MOSS diagnostics also run for re-IML and for certain other MOSS functions. For example: MOSS dump.

   IF A CRITICAL FAILURE IS DETECTED DURING ANY OF THE MOSS DIAGNOSTICS, A CODE WILL BE DISPLAYED ON THE CONTROL PANEL.

   Refer to "How to Run MOSS Diagnostics" on page 4-19 for execution.

2. **Loop on MOSS diagnostics**

   Refer to "How to Loop MOSS Diagnostics" on page 4-20 for execution.

Basic tests will loop until an error is detected or an exit from this option is performed.

3. **Local/Remote/RSF console link tests**

   Refer to "How to Run the Console Link Test" on page 4-22 for execution.

   They are individually selected tests which will test the hardware connecting the respective consoles.

Power Subsystem Tests

1. **Control panel test**

   This test is designed to ensure that all the keys and displays are working correctly. The control panel bus and the PLC (Power Logic Card) are also partially tested.

   This diagnostic can be run in concurrent mode; refer to "How to Run the Panel Test" on page 4-21 for execution.

2. **Power control bus test**

   The power control bus test function allows the CE to check the interface between the PLC card and the different power supplies of the 3745.

   This function is dedicated to CE use only.

   When the power control subsystem loses the control of a power supply due to an interface problem, a BER is logged by the MOSS. Based on this information, the CE may have to check the power control bus.

This diagnostic can be run in concurrent mode; refer to "How to Run the Power Control Bus Test" on page 4-24 for execution.

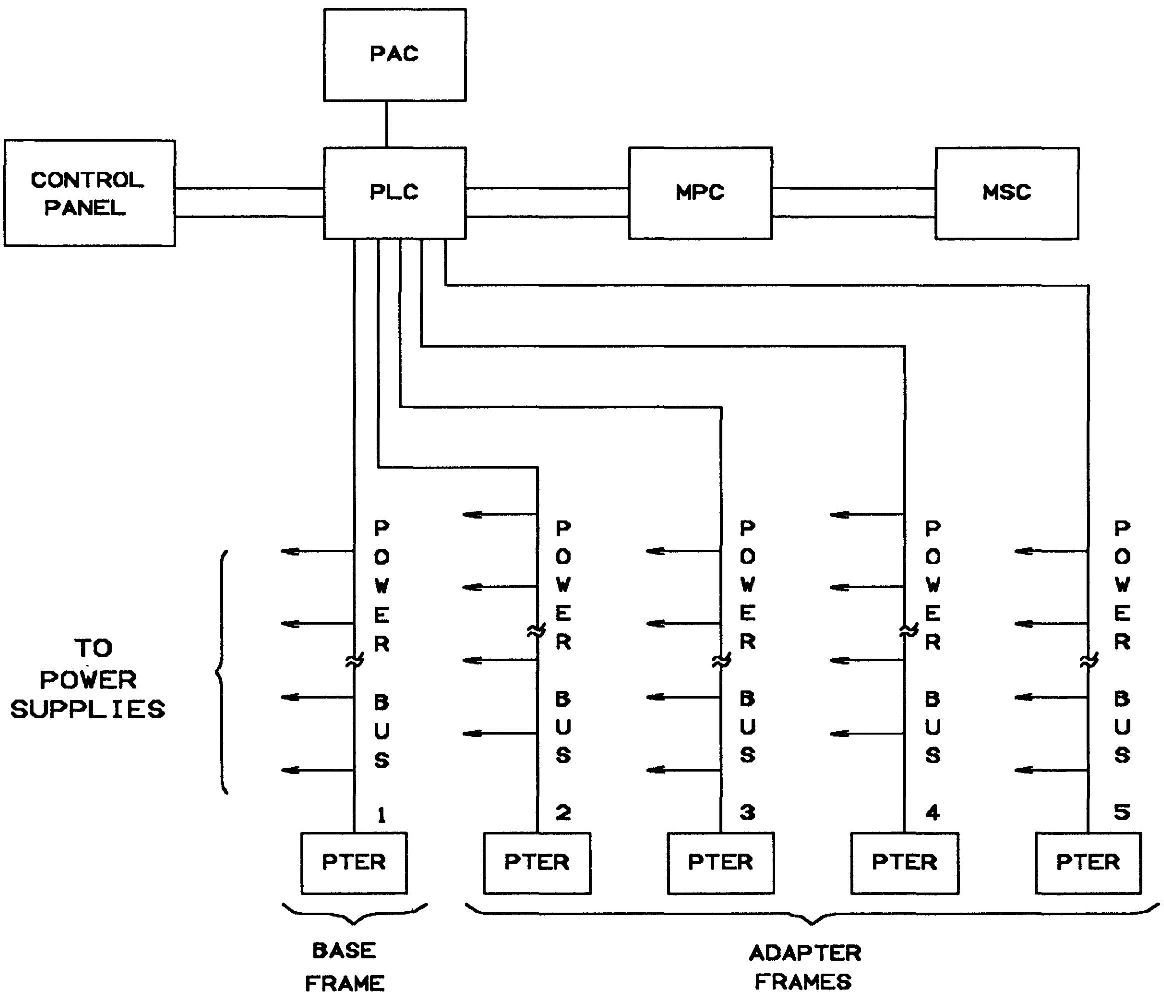


Figure 4-2. Power Control Bus Layout

Functional Area Diagnostics

1. CCU (Central Control Unit)
2. IOC BUS (Input/Output Control)
3. CA (Channel Adapter)
4. TSS (Transmission Subsystem)
5. TRSS (Token-Ring Subsystem)
6. HPTSS (High-Performance Transmission Subsystem).

These tests are stored on the hard disk and are run to detect failures caused by the hardware in the 3745, and to isolate the FRU that caused the failure. They are also used to verify that the machine is working correctly after a repair has been made.

The diagnostics are arranged in groups, internal function tests (IFTs), sections and routines.

Group: Set of IFTs that test a 3745 subsystem (the CA group for example).

IFT: Internal function test often divided into **Sections** that can be loaded and executed one at a time.

Section: Set of routines that test a particular adapter, or a component of a subsystem.

Routine: The shortest executable test.

Diagnostic Identification

The identification contains the IFT number, the section number, and the routine number as follows:

```
• AB 01
• ││ │
• ││ └────► Routine (01)
• │└──────► Section (B)
• └───────► IFT (A)
```

Selecting these diagnostics is accomplished by using the 3745 console.

If a failure is detected by the diagnostics, a reference code is posted at the 3745 console, and the corresponding FRUs can be displayed by the Reference Code Interpretation function. See "Using Reference Codes" on page 2-12.

Refer to "How to Run Internal Function Tests" on page 4-29 for execution.

CCU Diagnostics

The CCU and the switch hardware are tested by automatic checkout during IPL. The IFTs for CCU and Switch mainly check if the different internal functions are working properly.

For components tested, see Figure 4-3.

CCU diagnostics include following IFTs:

IFT A -CCU Operations

IFT B -CACHE

IFT D -SCTL/CCU link

IFT E -SCTL/STORAGE/CACHE link

IFT F -SCTL/DMA link

IFT G -SWITCH diagnostics (IOC driver/receiver are not tested by that diagnostic but by the IOC diagnostics).

IFT H -Functional processor diagnostic

These diagnostics can be run in concurrent mode on one CCU for a model 410 or 610.

AT05 is a manual intervention routine and cannot be run in concurrent mode.

Running time for the whole group is a minimum of 40 minutes per CCU.

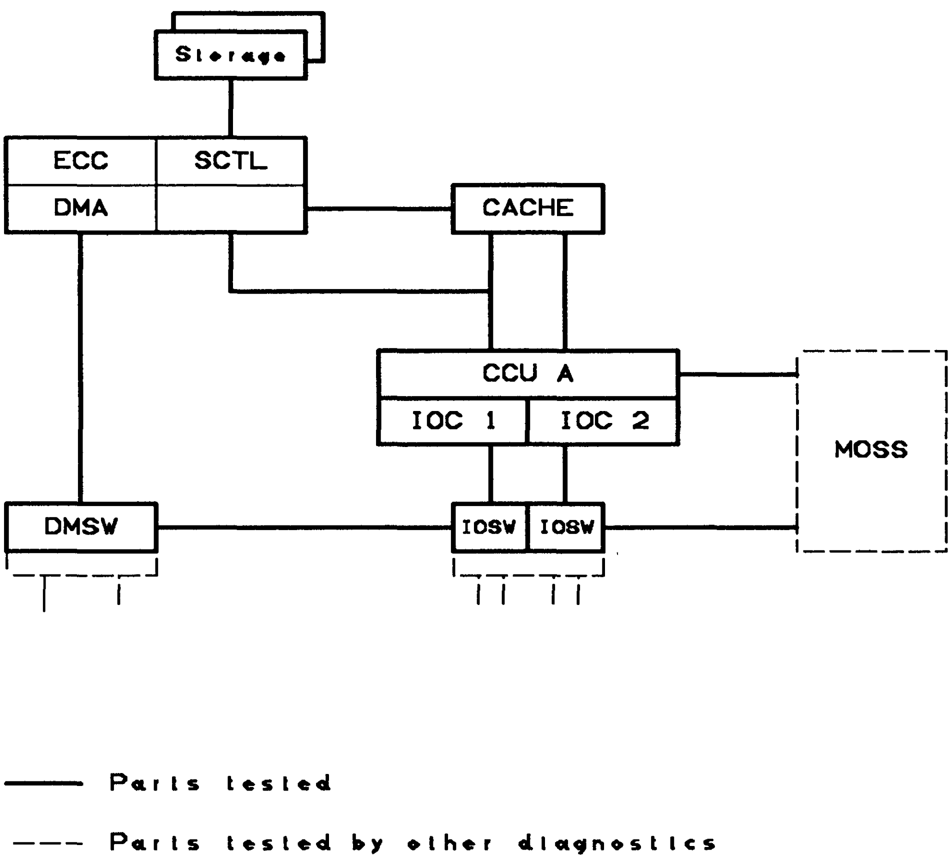


Figure 4-3. CCU Diagnostic Coverage

IOC Diagnostics

The IOC hardware is tested by automatic checkout during IPL. The IFTs for IOC mainly check if the different internal functions are working properly.

Only the adapter bus drivers/receivers are tested in the IOSW/IOSW2 card.

For components tested, see Figure 4-4.

IOC diagnostics include the following IFTs:

IFT I Primary pass for transmission and channel adapters.

IFT J Secondary pass for transmission and channel adapters.

IFT K Transmission adapter attachment to adapter buses.

IFTs I and J have a special isolation process routine to isolate the failing adapter on one adapter bus in case of bus pollution.

This process consists of powering off one adapter by microcode and asking the CE by means of a message to replace or reinstall the CSP, CAL or TRM card of this adapter. Then the diagnostics restart and this process is repeated for each adapter present on this bus. Refer to "Messages for Manual Intervention During IOC Bus Diagnostics" on page 4-33 for message interpretation.

Each power OFF will generate an alarm 9F, ignore these alarms during this test.

These diagnostics can be run in concurrent mode on one CCU for a model 410 or 610.

Running time for the whole group depends on the configuration.

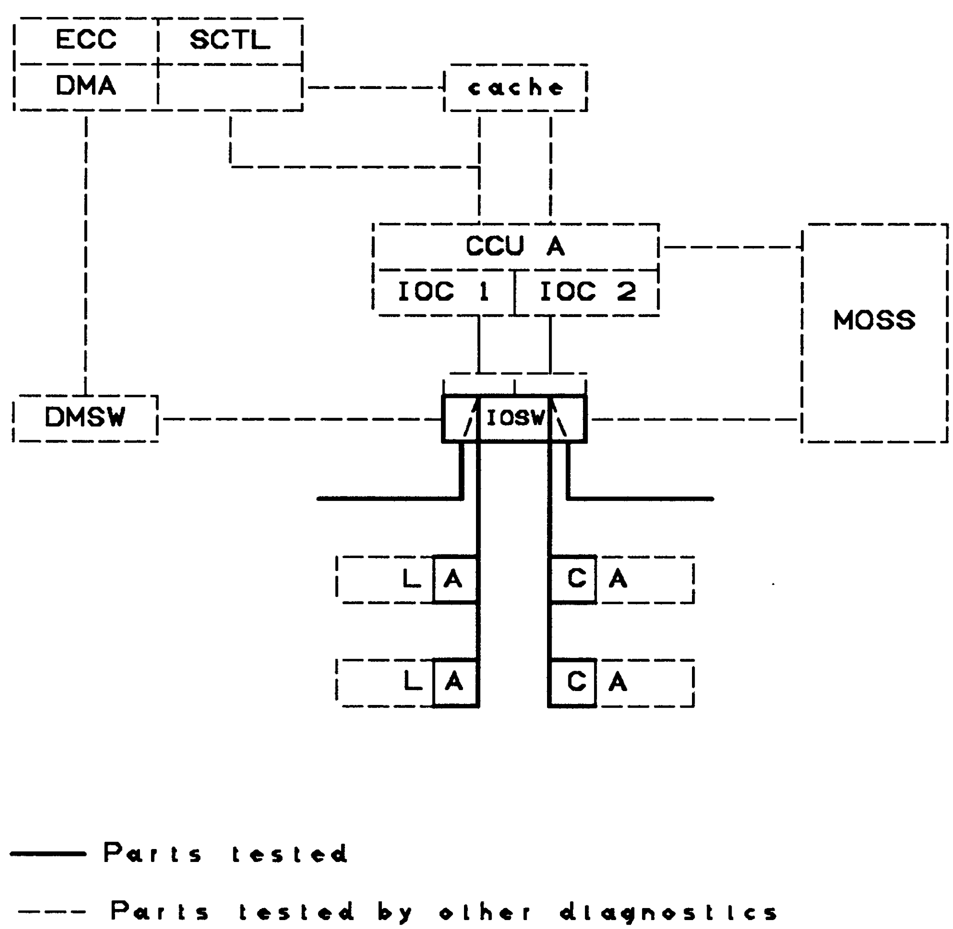


Figure 4-4. IOC Diagnostic Coverage

CA Diagnostics

As the channel adapter hardware is tested during IML checkout by the diagnostics contained in the CA ROS itself, CA diagnostics are mainly designed to check if the different functions with MOSS, CCU, memory, host sequences are working properly.

Autoselect and cycle steal chains, internal wrap and external wrap are also tested.

The channel adapter diagnostics are all included in IFT L.

The following routines are not linked and need a manual intervention:
LG02, LI03, LI04, LJ03, LK02 (channel cables must be removed and terminators installed in the 'OUT' connectors).
LO01 (wrap plugs and terminators installed).

Note: Routine LA must be run before starting the manual routines.

Due to possible interferences with other 3745 components, some routines are not run in concurrent mode but automatically selected and run in offline mode.

Running time for the whole group is about 1 minute per CA.

CA Wrap Test

This test is part of the CA diagnostics. It is a specific manual intervention routine (LO01) which is run on the CA from the 3745 console, with two wrap plugs installed at the tail gate to check if input or output lines of the CA are working properly.

For the running procedure refer to "How to Run the Channel Wrap Test" on page 4-42.

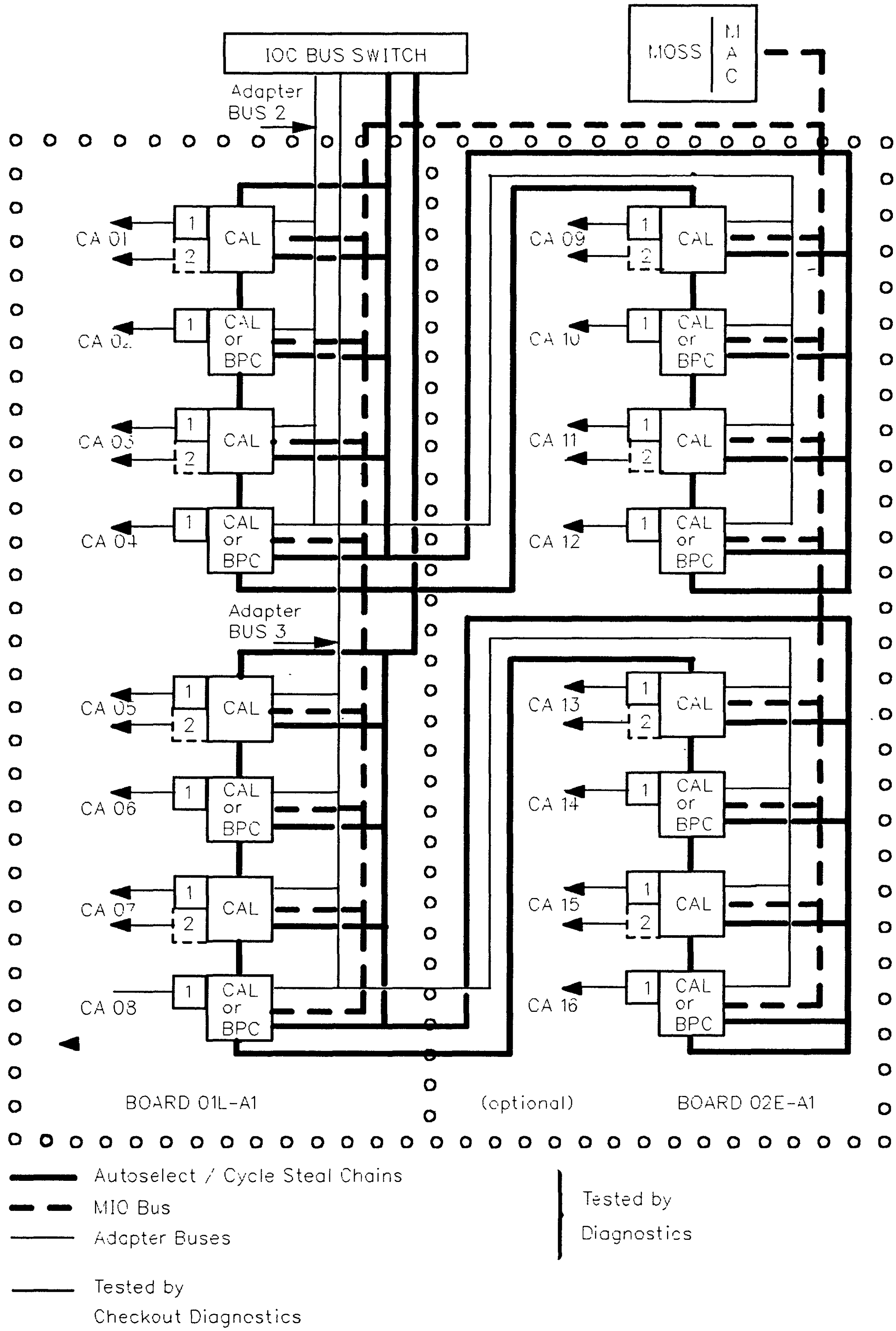


Figure 4-5. CA Diagnostic Coverage

TSS Diagnostics

Two sets of diagnostics are used to test the TSS in the 3745:

- Tests residing in the ROS of the CSP card
- IFTs residing on the disk and run from the MOSS console.

Refer to Figure 4-6 on page 4-13 for the coverage of TSS diagnostics.

CSP ROS diagnostics are run every time the scanner is IMLed. They test the CSP hardware. If an error is detected, a RAC code is sent to MOSS which will build the appropriate reference code. After a successful run, an OK is posted to MOSS.

IFTs are run from the 3745 console. They are used to test the remaining part of the TSS after ROS diagnostics are run.

In concurrent mode, CSP checkout is included in TSS diagnostics.

The following table shows the relation between IFTs and the areas tested.

IFT/RTN	AREA TESTED
PA to PE	FESL/CSP card level
	FESL interconnections
QA	DMUX card level
RA	LIC1-4/ICF card level
RB to RC	LIC1-4/ICF line level
RD	LIC1-4/ICF Japan NTT
RG	LIC5-6 card level
RH	LIC5-6 line level

RC01, RD01 to RD03 and RH59 are manual intervention routines.

IFTs can be run concurrently with the customer's operations. Only one scanner needs to be disabled from NCP/VTAM.

Running time can be up to 15 minutes per adapter, depending of the number of lines connected to that adapter.

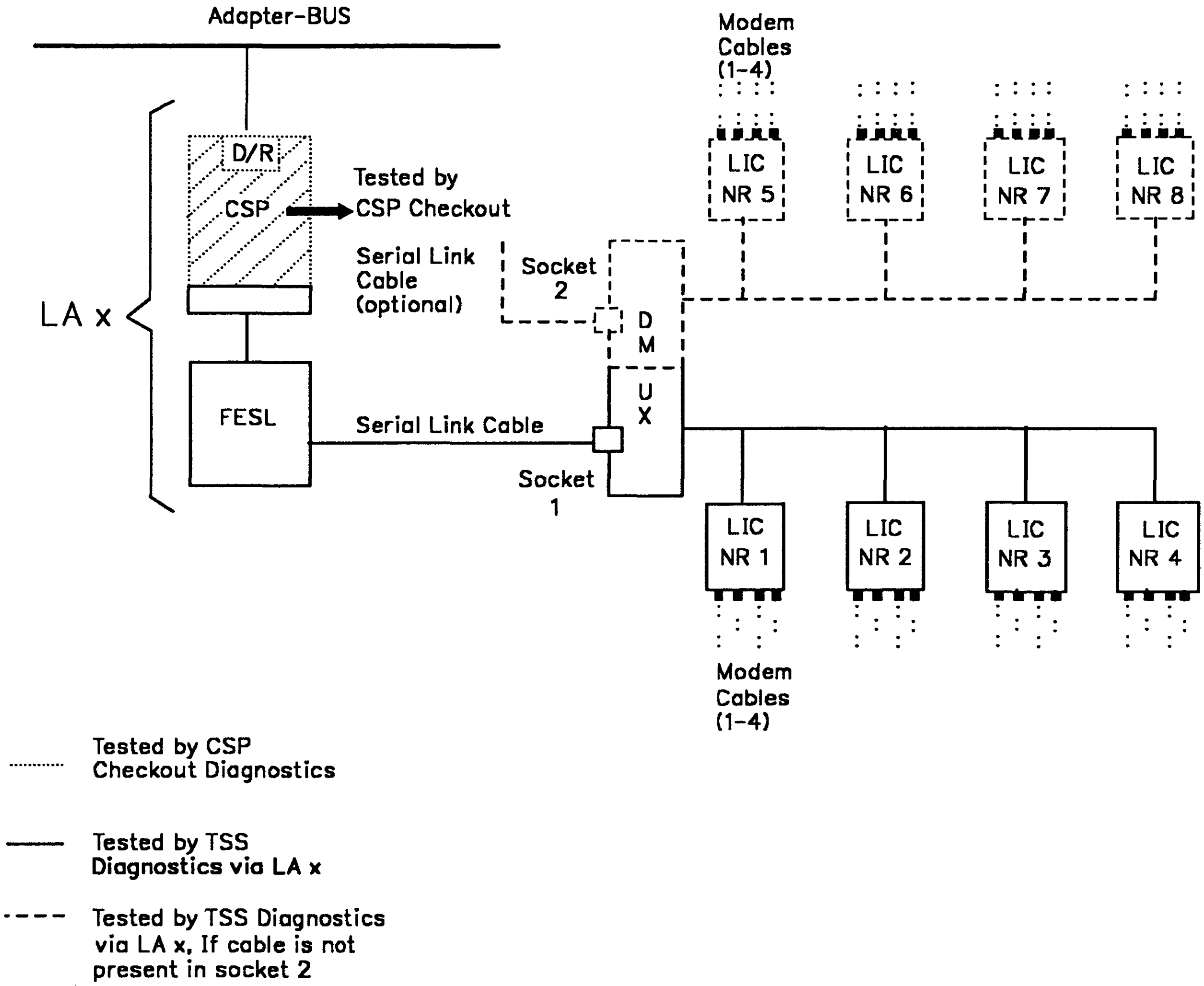


Figure 4-6. TSS Diagnostic Coverage

TRSS diagnostics

IFTs are used to test the TRSS. They are loaded and run using the 3745 console only.

Refer to Figure 4-7 for the coverage of TRSS diagnostics.

The following table shows the relation between IFTs and the areas tested.

IFT/RTN	AREA TESTED
TA to TE	TRM card level
TF to TI	TIC card level

IFTs can be run concurrently with the customer's operations. Only one TRA needs to be disabled from NCP/VTAM.

Running time can be up to 5 minutes per adapter.

Note: The TRA must be disconnected prior to run the diagnostics each time the power supply is turned ON.

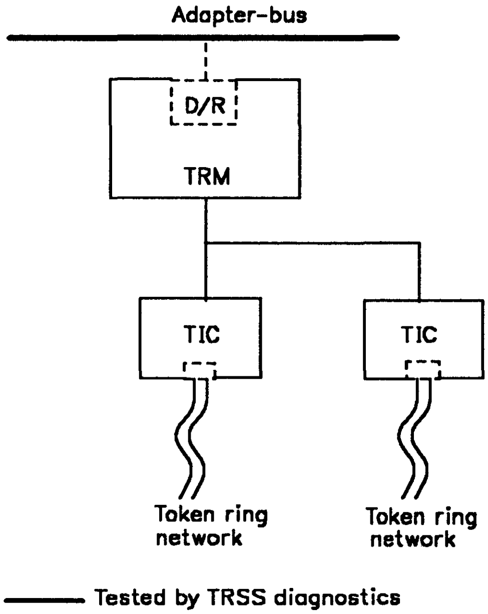


Figure 4-7. TRSS Diagnostic Coverage

HPTSS Diagnostics

Two sets of diagnostics are used to test the HPTSS in the 3745:

- Tests residing in the ROS of the CSP card
- IFTs residing on the disk and run from the 3745 console.

The CSP ROS diagnostics are run every time a scanner is IMLed. They test the CSP hardware. If an error is detected, a RAC code is sent to MOSS which will build the appropriate reference code. After a successful run, an OK is posted to MOSS.

IFTs are run from the 3745 console. They are used to test the FESH card, DMA bus connection from switch to HPTSS, and the line interface from the FESH card up to the tail gate. However, in concurrent mode, the DMA bus is not tested until specifically selected. This is to avoid overloading other adapters residing on the same DMA bus.

Refer to Figure 4-8 for the coverage of HPTSS diagnostics.

The following table shows the relation between IFTs and the areas tested.

IFT/RTN	AREA TESTED
VA	FESH card level and FESH to CSP interconnection.
VB to VD	FESH card state machines.
VE	FESH to CSP cycle steal function.
VF	FESH card SDLC functions.
VG to VH	Complete DMA operation on FESH, DMSW, and SCTL/SCTL2 cards.
VI to VK	FESH to TP lines interface. WRAP PLUG needed.

In concurrent mode, routines VG and VH are run only if explicitly selected.

IFTs can be run concurrently with the customer's operations. Only one scanner needs to be disabled from NCP/VTAM.

Running time can be up to 10 minutes per scanner.

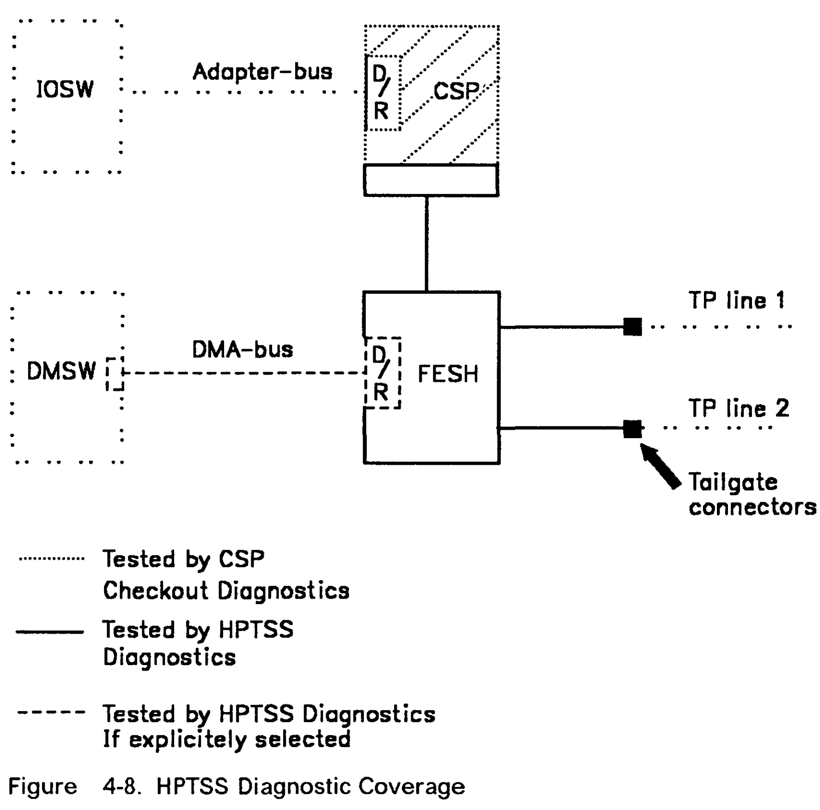


Figure 4-8. HPTSS Diagnostic Coverage

CA Online Test (OLT)

This test causes the OLT responder stored on the disk, to be loaded into the 3745.

It requires that the OLTs be loaded at the host. It is used to respond to requests from the host via the channel interface.

If a failure is detected while running the OLTs, a system message is displayed at the system operator's display.

This test is run only in offline mode.

Information for running the OLTs is covered by the "3745 Channel Adapter Online Tests" D99-3745A.

Note: OLTs are not invoked by any of the MIP's procedures.

Network Power OFF Test

The CCU IFT routine AT05 is a manual routine which tests the correct execution of the network power OFF command.

If the 3745 has only one CCU, running the AT05 routine on this CCU will power OFF the 3745. If the machine has two CCUs, the AT05 routine must be run on both CCUs to cause the power OFF condition.

The 3745 must be fully available before running this routine.

LIC Wrap Test

Two different wrap tests are available for the customer and the CE.

1. The Wrap Test function (WTT) is a problem determination aid available for the customer. It needs the control program (NCP) running and ports on a LIC being 'Sysgenned'. It also needs lines on a LIC being deactivated by the network operator.

   a. The automatic wrap test (option 1) runs at LIC level only and does not need a wrap plug.

      This wrap test, without any manual intervention on the machine aims to confirm if the tested LIC is failing, or checks if the new installed LIC is good.

      The only input is the number of a line on the LIC.

      The result is of the type GO - NOGO with three possibilities:

      - Wrap test completed: Link is OK.
      - Wrap test completed: Link is failing.
      - Unable to perform wrap test on this LIC for ...., please retry. (The reason is given).

      Run time is about 30 seconds.

   b. The Wrap Test At Any Level (option 2) is intended for the customer's use. For more explanations, refer to the "Advanced Operation Guide, Chapter 24".

   Reference for running is given in "How to Run the Wrap Test (WTT) for LIC 1, 3, 4, 5, 6 or HPTSS Port" on page 4-35.

2. The IFT wrap test is run when:

   The RC section (or all TSS or HPTSS IFTs) is called on the selected LA and line when there is a wrap plug or wrap cable installed on the HPTSS port or LIC 1, 3, 4.

   The RH59 routine (or all TSS IFTs) is called on the selected LA and line with a wrap plug installed on LIC 5, 6.

   The RD01 through RD03 routines are reserved for the Nippon Telegraph Telephone (NTT) administration. They check the data wrap. They also check the modem control leads depending on the LIC type (modem-in-wrap).

   Reference for running is given in "How to Run the Wrap Test with IFTs for LIC 1, 3, 4, 5, 6 or HPTSS Port" on page 4-37.

How to Run MOSS Diagnostics

These tests can be run without stopping the customer's application.

Error conditions will result in a control panel code being displayed. Actions for these codes are defined in "Panel Codes" on page 2-14.

or,

Some errors will result in a reference code at IML completion. These types can also be recognized by the panel code displaying '**F0D**'. Refer to "Using Reference Codes" on page 2-12 for action.

Ensure that MOSS is offline or alone.

From the 3745 console

1. Perform a MOSS IML action from the console by entering '**IML**' in menu 1.
2. After approximately 2 minutes the console will be re-initialized with the 'Channel Enable/Disable' screen which indicates that a successful run of MOSS diagnostics and the MOSS IML have been completed.
3. If the console has not been re-initialized, then an error was detected.

From the control panel

1. Set the function to MOSS IML:
   a. Press the 'Service' key until '**0**' or '**1**' is displayed in the service window. (No bypass of MOSS diagnostics.)
   b. Press the 'Validate' key.
   c. Press the 'Function' key until '**1**' is displayed in the function window.
   d. Press the 'Validate' key.
2. If after approximately 2 minutes the control panel displays code '**F0F**', then MOSS diagnostics and a MOSS IML have been successfully completed. The code '**F0E**' can be displayed if the MOSS was previously 'alone', that is, not in 'offline mode'.
3. If any other code is displayed, then an error was detected.

How to Loop MOSS Diagnostics

If an intermittent Moss problem is suspected, the 'loop MOSS diagnostics' facility can be used as follows:

Ensure that MOSS is offline or alone.

1. Set service mode to MAINT1:
   a. Press the 'Service' key until '**1**' is displayed in the service window.
   b. Press the 'Validate' key.
2. Set function to loop on MOSS diagnostics:
   a. Press the 'Function' key until '**A**' is displayed in the function window.
   b. Press the 'Validate' key.
3. The MOSS diagnostics will run continuously unless an error is detected. Usually 5 to 10 minutes of error free operation are sufficient to determine whether the MOSS is working satisfactorily. If an error is detected, a panel code will be permanently displayed. Therefore, go to "Panel Codes" on page 2-14. Gentle vibration of the MOSS cables and cards while the test is running, will locate most loose connection problems.

   If no error is detected:
4. Set service mode to NORMAL:
   a. Press the 'Service' key until '**0**' is displayed in the function window.
   b. Press the 'Validate' key.
5. Set function to MOSS IML:
   a. Press the 'Function' key until '**1**' is displayed in the function window.
   b. Press the 'Validate' key.
6. When the control panel displays '**F0F**' (or '**F0E**' if the MOSS was previously 'alone'), perform a MOSS online. Refer to "How to Put MOSS Online" on page 5-175

How to Run the Panel Test

This test can be run without stopping the customer's application.

It is not a sequential test and can be cancelled at any time, by pressing the 'Exit' key.

Notes:

1. Any inactivity lasting about 60 seconds during the panel test, will result in the test being automatically cancelled and the panel will return to operational mode.
2. During this test the control panel's audible alarm will sound for each action.

'special character': Can be described as when every possible segment of the window is lit.

```
 - -
|\|/|
 - -
|/|\|
 - -
```

1. Set power to local:
   a. Press the 'Power Control' key until '3' is displayed in the power control window.
   b. Press the 'Validate' key.

      If the above action cannot be performed, go to step 11.
2. Set Service mode to MAINT1:
   a. Press the 'Service' key until the number '**1**' is displayed in th service window.
   b. Press the 'Validate' key.

      If the above action cannot be performed go to step 11.
3. Set 'Function' to panel test:
   a. Press the 'Function' key until '**5**' is displayed in the function window.
   b. Press the 'Validate' key.

      If the above action cannot be performed go to step 11.

   Observe the display: All 10 'special character' will be displayed.

   If the pattern is not identical for each of the 10 special characters go to step 11.

   Note: If during the following steps the function window displays '5', the control panel has detected its own failure. Go to step 11.
4. Press the 'Function' key.

   Observe the display: The 'Function' window 'special character' will be displayed. Repetitive action will scroll through the 'Code' window sequentially, and wrap around.

   If this does not occur, go to step 12.
5. Press the 'Service' key.

   Observe the display: The 'Service' window 'special character' will be displayed. Repetitive action will scroll through the 'Power Control' window, and wrap around.

   If this does not occur, go to step 12.
6. Press the 'Power Control' key.

   Observe the display: The 'Console in Use' window 'special character' will be displayed. Repetitive action will scroll through the 'All CA Disabled' 'MOSS Inop' and the 'MOSS Msg' windows sequentially, and wrap around.

   If this does not occur, go to step 12.
7. Press the 'Power ON Reset' key.

   Observe the display: '**8**' will be displayed in the 'Function' window.

   If this does not occur, go to step 12.
8. Press the 'Power OFF' key.

   Observe the display: The display will be completely blank.

   If this does not occur, go to step 12.
9. Press the 'Exit' key.

   Observe the display: The display will present the 'Power Control' and 'Service Mode' indicating that the test is complete, and the panel has returned to operational mode.

   If this does not occur, go to step 12.
10. **The control panel test has completed with no error detected, discard steps 11 and 12**
11. Record that FRU group 4077 on page 2-31 is involved.
12. Record that FRU group 1116 on page 2-30 is involved.

How to Run the Console Link Test

This function tests the customer's console ports with wrap plugs which may be installed at the end of the cable attached to either the local console, the remote console modem, or the RSF link modem. The wrap plugs can also be installed at the connectors for these cables in the 3745. (Not possible with the 3727 console cable)

This test can be run without stopping the customer's application.

Local/Remote or Alternate/RSF Link Tests

1. Ensure that the customer is not using any of the 3745 consoles and also confirm the availability of MOSS.
2. Set the power control to local:
   a. Press the 'Power Control' key until '3' is displayed in the power control window.
   b. Press the 'Validate' key.
3. Set Service mode to MAINT1:
   a. Press the 'Service' key until the number '1' is displayed in the service window.
   b. Press the 'Validate' key.

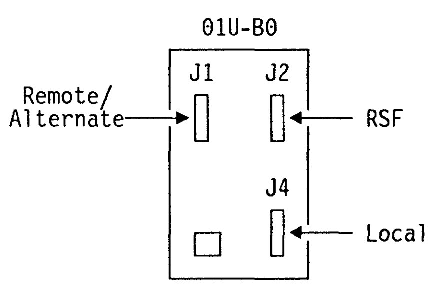


Figure 4-9. Console Outputs

4. We advise you to start the "wrap plugging" from the far end of the DCE interface cable. Refer to Figure 4-10 on page 4-23 for the different cable configurations.
5. Remove the DCE interface cable from the console or modem or console switch. (The DCE interface cable may be connected directly to the DCE, or to an intermediate "adapter". **In this second case remove the the DCE interface cable from the "adapter"**). Connect the appropriate wrap plug at the end of the cable.

   Wrap plug to be used according to the DCE interface cable and to the console:

   a. DCE interface cable between the 3745 and the console/modem **without** intermediate "adapter" - (**A** in Figure 4-10)

      - Use wrap plug P/N 6398697.
   b. DCE interface cable between the 3745 and the console/modem **with** an intermediate "adapter". - (**B** in Figure 4-10)

      - Use the wrap plug P/N 2667737.
   c. DCE interface cable between the 3745 and the console switch (7427) - (**C** in Figure 4-10)

      - Use the wrap plug P/N 2667737.
   d. DCE interface cable between the console swith (7427) and the console/modem - (**D** in Figure 4-10)

      - Use the wrap plug P/N 6398697 for a console 31XX or the wrap plug P/N 2667737 for a console 3727.

   Important: The cable going to the alternate console must be tested on the 'Local' output with the test option '8'.

   OR

   Open the rear cover of the 3745 base frame, remove the appropriate cable (if installed) from the output and connect the wrap plug P/N 6398697. See Figure 4-9.
6. Set function to the link test required: either remote/alternate, RSF or local:
   a. Press the 'Function' key until '**6**','**7**' or '**8**' is displayed in the function window.
      - 6 (remote/alternate)
      - 7 (RSF)
      - 8 (Local).
   b. Press the 'Validate' key.
7. After a partial MOSS IML the following panel codes will be displayed:
   a. LOCAL.
      1B1: Start of test
      1B2: Successful completion of test
   b. REMOTE/ALTERNATE
      1B3: Start of test
      1B4: Successful completion of test
   c. RSF
      1B5: Start of test

1B6: Successful completion of test

If any other panel code is displayed, disconnect the wrap plug, go to "Panel Codes" on page 2-14 and follow the instructions.

8. Disconnect the wrap plug and reconnect the cable.
9. Set service mode to NORMAL:
   a. Press the 'Service' key until '0' is displayed in the function window.
   b. Press the 'Validate' key.
10. Set function to MOSS IML:
    a. Press the 'Function' key until '1' is displayed in the function window.
    b. Press the 'Validate' key.
11. When the control panel displays '**F0F**' or '**F0E**' if the MOS was previously 'alone'), perform a MOSS online. Refer to "How to Put MOSS Online" on page 5-175.
12. The console link test has completed with no error detected.

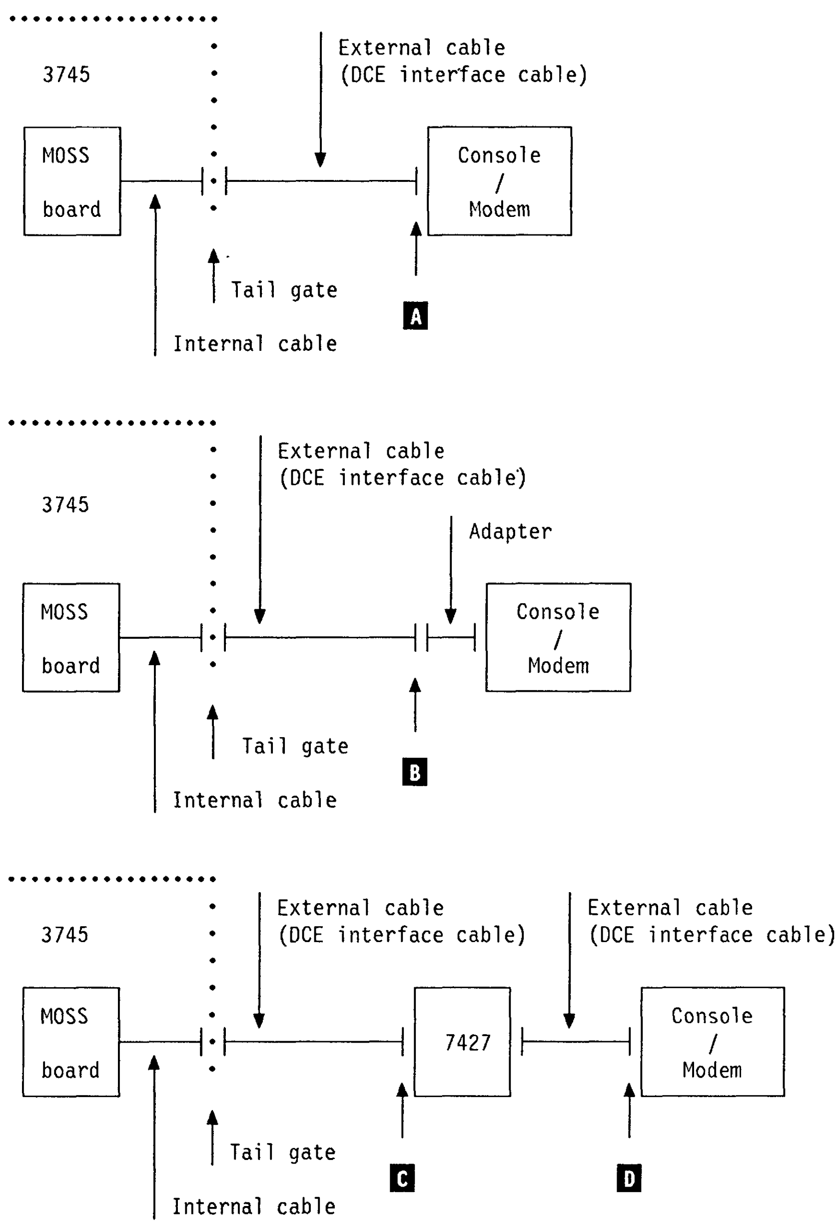


Figure 4-10. Cable Configurations

How to Run the Power Control Bus Test

The Power Control Bus (PCB) test can be run, with the machine being either power OFF or power ON and online.

- Power supplies statuses will not be impacted.
- Power supplies are not polled during the test.
- No cooling detection available.
- Scoping is possible on the wrap card.
- Test result has a code displayed on the control panel.
- Step-by-step action will allow the CE to isolate the faulty FRU.

Power Control Bus Test Procedures

Use the Power Control Wrap Card P/N 65X9848 to run this test.

The power bus test function is available from the control panel.

Start:

1. Set the power control to local.
   a. Press the 'Power Control' key until '**3**' is displayed in the power control window.
   b. Press the 'Validate' key.
2. Set service mode to 'MAINT1'.
   a. Select service '**1**'.
   b. Press the 'Validate' key.
3. Select the power bus test.
   a. Press the 'Function' key until '**C**' is displayed in the function window.
   b. Press the 'Validate' key.
4. For the power terminator's (PTER) location see Figure 5-2 on page 5-6 to Figure 5-7 on page 5-12.
5. Disconnect the power bus cable from the terminator on the bus to be tested. See Figure 4-11.

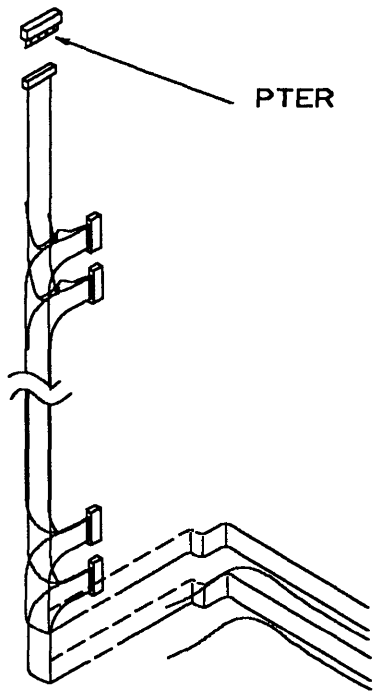


Figure 4-11. Power Terminator (Frame 01 Represented).

6. Fit the wrap card side A to this bus. See Figure 4-12 on page 4-26.
7. Press the 'Function' key until the required character '**D**' through '**H**' (according to the following table) is displayed in the 'Function' window.

Function	Bus Number	
D	Bus 1	Frame 01
E	Bus 2	Frame 02
F	Bus 3	Frame 03
G	Bus 4	Frame 04/05/06 Front
H	Bus 5	Frame 04/05/06 Rear

8. Press the 'Validate' key.
9. On the control panel select service '**A**'.
10. Press the 'Validate' key.

    Now the predetermined patterns are sent on the power control bus.

    The test will loop on these patterns as long as the function or service keys are not pressed, or an error detected.
11. IF code **005** displayed on the control panel, go to "Power MAP 3920: Power Bus Test Failure" on page 3-31.

12. Code 004 displayed on the control panel indicates a successful cycling of the test.
13. Select service '**1**'.
14. Press the 'Validate' key.
15. Reverse the wrap card to side B.
16. Select service '**B**'.
17. Press the 'Validate' key.
18. Code 004 displayed on the control panel indicates a successful cycling of the test.
19. Any other code displayed on the control panel, go to "Power MAP 3920: Power Bus Test Failure" on page 3-31.
20. Remove the power control wrap card and reinstall the removed cable on the terminator.

    Note: Code **005** displayed at this time is a normal consequence of the test without a wrap card installed.
21. Press the 'Exit' key to finish the test.

PCB Wrap Card Description

The wrap card consists of 2 independent wrap circuits (A or B) on the same tool, each circuit having its own connector.

There are 8 output wires for only 5 input wires. The test will be performed in two runs.

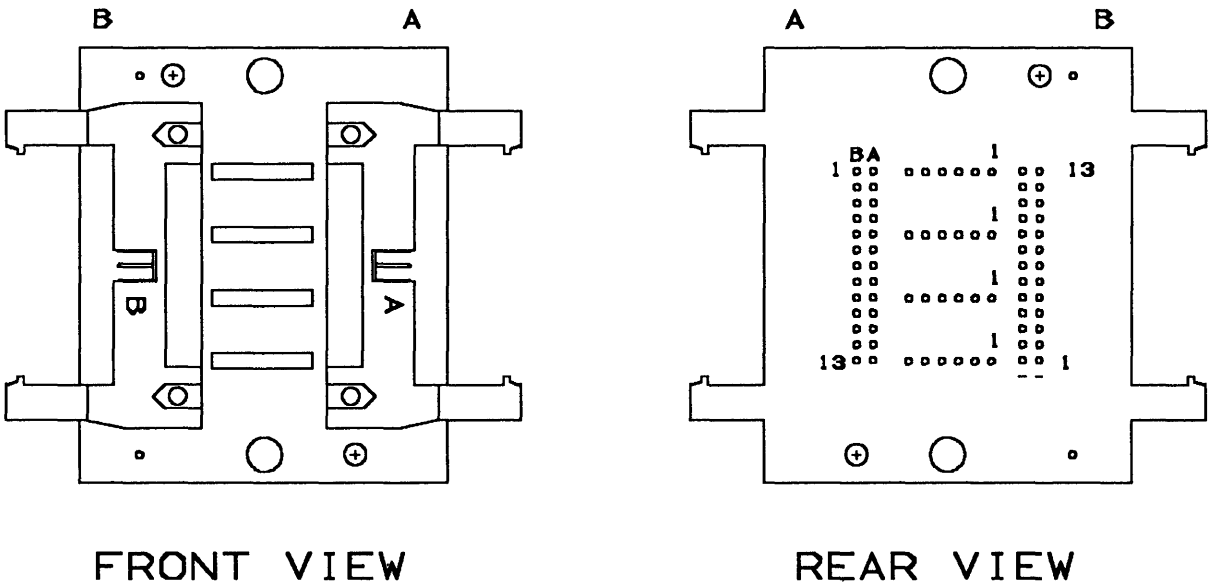


Figure 4-12. Power Control Bus Wrap Card

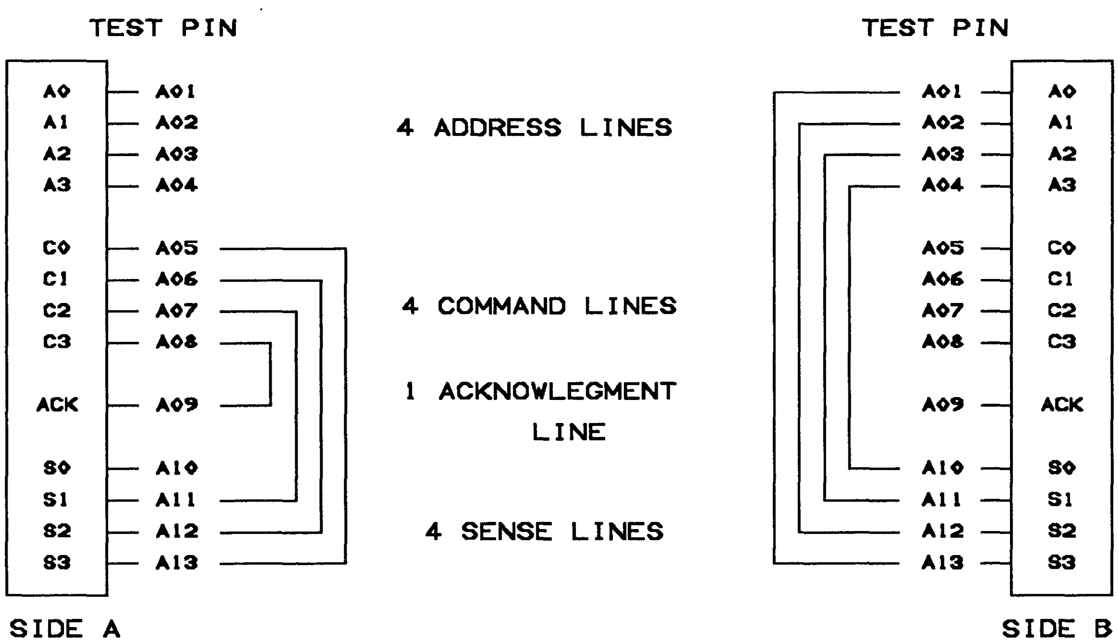


Figure 4-13. Wrap Circuit of the Wrap Card

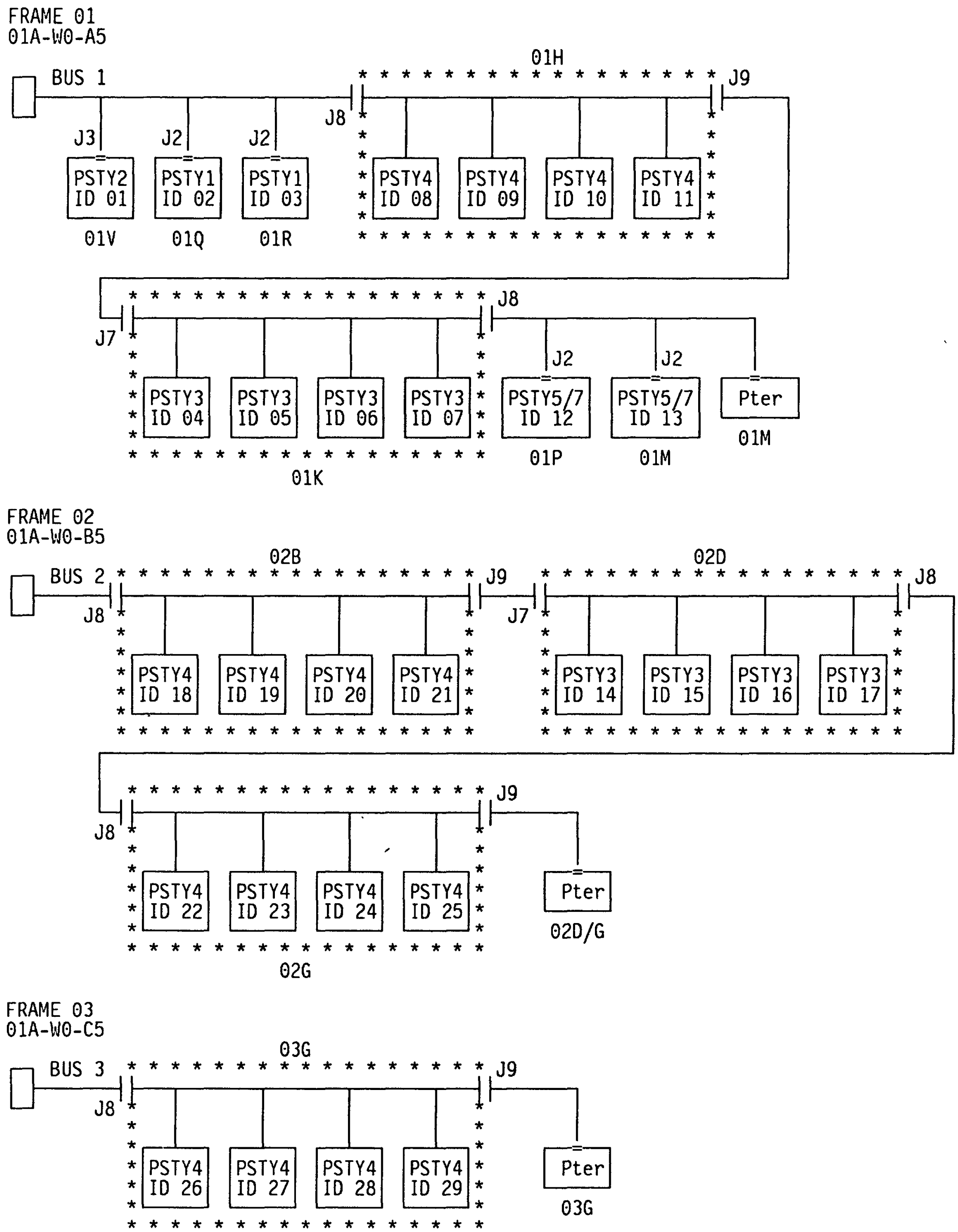


Figure 4-14 (Part 1 of 2). Power Control Bus Layout

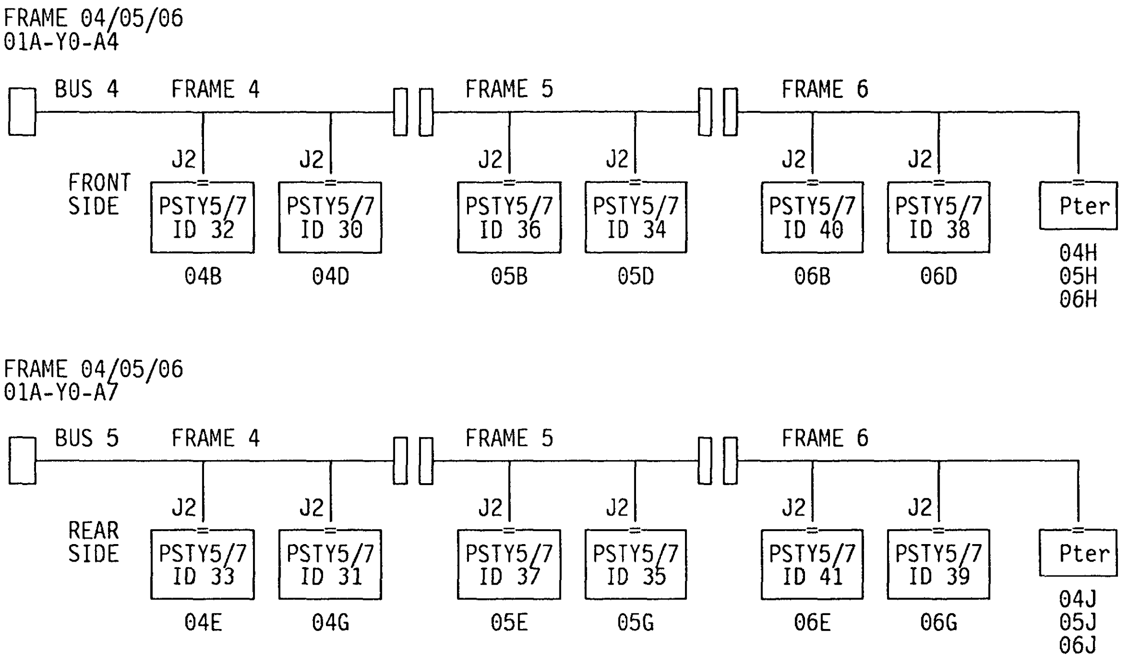


Figure 4-14 (Part 2 of 2). Power Control Bus Layout

Types of Failure Detected

The power bus is made of 13 signal wires, each separated from the other by a ground wire.

- Short circuit on a signal wire.
- Open circuit on a signal wire.
- Driver or receiver forcing a low or high level.
- Board (CA, scanner, MOSS) problems.
- Power supply problems.
- PLC-card problems.

The test sends alternating patterns on the bus and verifies if it receives alternating patterns.

How to Run Internal Function Tests

How to Call Diagnostics

On the 3745 console, from menu 1 hit F5 to get the maintenance function menu (Menu 3). See Figure 4-15.

```
CUSTOMER ID:                           3745-xxx        SERIAL NUMBER:
CCU-A SELECTED PROCESS MOSS-OFFLINE      X71:020415
                                         X72:000085

CCU-B
RUN-REQ
------------------------------------------------------------- 01/12/87 04:29
                                  MENU 3

      MISUSE OF MAINTENANCE FUNCTIONS MAY LEAD TO UNPREDICTABLE RESULTS

BER CORRELATION..: BRC      MODULE DISPLAY...: MDD     TSS SERVICES.....: TSS
CADS SERVICES....: CAS      MOSS STORE DSPLY.: MSD
CONCURRENT DIAGS.: CDG      OFFLINE DIAGS....: ODG
DUMP DISPLAY/DEL.: DDD      TRSS SERVICES....: TRS




                            ENTER OFF TO LOG OFF
===>

F1:END  F2:MENU2   F3:ALARM      F4:MENU1                     F6:RULES
```

Figure 4-15. Maintenance Functions Menu

On this menu two options are available to run diagnostics:

- **CDG** to run diagnostics in **concurrent maintenance mode.**
  Selected diagnostics will run if the adapter is disconnected from the NCP, and only the sections or routines allowed to run in concurrent mode will be called without interfering with the operation of the 3745.

  CDG must be used if at least one CCU + NCP are running.

  Note: If you are in **TWIN-DUAL** mode with one CCU running and the other CCU just powered ON (not IPLed), you can not run the diagnostics on any adapter or IOC connected to the idle CCU.
  In this case, you must IPL this CCU to the end of phase 1 (step-by-step IPL will allow a ready stop at the end of phase 1) then start the concurrent diagnostics.

- **ODG** to run diagnostics in **offline mode** when the 3745 is fully available for maintenance.

  Selected diagnostics will run whatever the status of the adapter.

  All channel interfaces must be disabled.

  ODG must be used if conditions for concurrent maintenance mode are not met (no NCP or CCU running).

Type ODG or CDG after ===> and press SEND.

How to Select Diagnostics

```
CUSTOMER ID:                             3745-xxx        SERIAL NUMBER:
CCU-A SELECTED PROCESS MOSS-OFFLINE        X71:020415
                                           X72:000085

CCU-B
RUN-REQ
------------------------------------------------------------- 03/07/87 00:21
FUNCTION ON SCREEN: CONCURRENT DIAGS
GROUP :ADP# :LINE :
1 ALL           :
2 CCU : A- B:   :
3 IOCB: 1- 4:   :
4 CA  : 1-16:   :
5 TSS : 1-32: 0-31:
6 TRSS: 1- 6: 1- 2:
7 HTSS: 1- 8:   :
8 OLT : 1-16:   :                          DIAGNOSTICS INITIALIZATION
OPT=  Y IF MODIFY :

OPTION REQUIRED   :
                  : ENTER REQUEST ACCORDING TO THE DIAG MENU
                  : DIAG==>       ADP#==>     LINE==>     OPT==>
===>

F1:END  F2:MENU2  F3:ALARM
```

Figure 4-16. How to Select Diagnostics

After entering ODG or CDG on menu 3, the diagnostic menu is displayed. See Figure 4-16.

Four input fields are available in this menu:

- **DIAG==>** Diagnostic group (1-8), IFT, section, or the routine you want to run.

  Example:

  2 (full set of CCU IFTs.)
  K (section K of IOC diags.)
  AC01 (specific routine of CCU diags.)

- **ADP#==>** adapter number
- **LINE==>** Line number for TSS, HPTSS or TRSS (00-31)

  You may obtain the line number from the 'LID' function entering the line address.

- **OPT==>** Y to display the option menu

Diagnostics will be run on the selected adapter if its power is ON.

In concurrent mode, if the 'ALL' option is entered, diagnostics will be run on all adapters, IOC buses and CCUs in CDF which are disconnected from the NCP.

Type your request in the input fields and press SEND.

If OPT===>Y is entered, the option menu is displayed. See Figure 4-17 on page 4-31. If not, the diagnostic is started and the diagnostic result is displayed on this frame.

If an error is detected, an error message is displayed. See Figure 4-18 on page 4-32.

Options Menu

```
CUSTOMER ID:                                3745-xxx       SERIAL NUMBER:
CCU-A SELECTED PROCESS MOSS-OFFLINE           X71:020415
                                              X72:000085

CCU-B
RUN-REQ
------------------------------------------------------------- 03/06/87 00:15
FUNCTION ON SCREEN: CONCURRENT DIAGS
                    :
                    :
                    :
C CANCEL REQUEST    :
G GO                :
M MODIFY OPTIONS:   :
 S/LS/AL/ALS/B/DM   :
 NW/W               : START 09:58:15
 C1/CNNN/C          : REQUEST: CCU  A             DIAGNOSTICS INITIALIZATION
 R1/RNNN            : OPTIONS: S    NW C1    R1     BR
 BR/NBR             :
                    : ENTER REQUEST ACCORDING TO THE DIAG MENU
                    : ==>M R2
===>

F1:END  F2:MENU2  F3:ALARM
```

Figure 4-17. How to Enter an Option

When the OPT field is set to Y in the diagnostic menu, the options menu is displayed. See Figure 4-17.

The default options are automatically displayed.

OPTIONS:	Meaning
S	Stop on first error
LS	Loop on first error with stop
AL	Automatic loop on error
ALS	Automatic loop on error with new error stop
B	Bypass error stop
DM	Display multiple errors
NW	No wait before execution of each routine
W	Wait before execution of each routine
C1/CNNN/C	Cycle request option
R1/RNNN	Repeat routine option
BR/NBR	BER recording option

Enter or modify the option using the 'M' function followed by the option or options needed.

Only one option per line of the menu can be selected. If more than one option is entered, only the last one is accepted.

Press SEND

Restart the same procedure to enter the other options if needed.

Enter '**G**'.

Press SEND.

The diagnostic is started and the diagnostic result is displayed on this frame.

If an error is detected, an error message is displayed. See Figure 4-18 on page 4-32.

Error Menu

```
CUSTOMER ID:                              3745-xxx        SERIAL NUMBER:
CCU-A SELECTED PROCESS MOSS-OFFLINE        X71:020415
                                           X72:000085

CCU-B
RUN-REQ
------------------------------------------------------------ 03/01/87 10:17
FUNCTION ON SCREEN: CONCURRENT DIAGS
                    : ****************              FRU REMOVAL ==> POWER OFF
R RERUN REQUEST     : *RH R3036694   *
A ABORT ROUTINE     : *RAC 906030001 * ERR BIT  C108
C CANCEL REQUEST    : * ERC RB23E01C *                     ERROR COUNT 00001
GO                  : ****************
M MODIFY OPTIONS:   :
 S/LS/AL/ALS/B/DM   :
 NW/W               : START 10:13:46  STOP 10:18:02
 C1/CNNN/C          : REQUEST: TSS  3  0          TSS  DIAG - RUNNING
 R1/RNNN            : OPTIONS: S   NW C1   R1    BR      ROUTINE RB23 TSS 03 L 00
 BR/NBR             :
                    : ENTER REQUEST ACCORDING TO THE DIAG MENU
                    : ==>
===>                ***ERROR FOUND***

F1:END  F2:MENU2  F3:ALARM
```

Figure 4-18. Error Menu

The reference code is in the 8-digit field following 'RH'.

This menu is used by "Diagnostic Result Analysis" on page 4-43, and "Using Reference Codes" on page 2-12 to determine which FRU is involved with the error.

Note: An "unexpected Error" must be considered as a normal error and the reference code is the usable information.

Messages for Manual Intervention During IOC Bus Diagnostics

```
CUSTOMER ID:                                 3745-xxx        SERIAL NUMBER:
CCU-A SELECTED PROCESS MOSS-OFFLINE            X71:020415
                                               X72:000085

CCU-B
RUN-REQ
----------------------------------------------------------- 03/01/87 01:22
FUNCTION ON SCREEN: OFFLINE DIAGS
                  :
A ABORT ROUTINE   :
C CANCEL REQUEST  :
                  :
RX..X REPLY       :
ENTER R           :
FOLLOWED BY X..X  :
(IFT MESSAGE)     : START 14:10:25
THEN PRESS SEND   : REQUEST: DD              CCU DIAG - RUNNING
(REPLY MAY BE A   : OPTIONS: S    NW C1  R1 BR      ROUTINE DD02 CCU A
NULL STRING)      : ISOLATION PROCESS : REPLACE ADPT CA:0500
                  : ENTER REQUEST ACCORDING TO THE DIAG MENU
                  : ==>
===>

F1:END  F2:MENU2  F3:ALARM               F6:QUIT
```

Figure 4-19. Diagnostic Messages Screen

1. When you receive a message asking you to **replace** adapter xx:
   a. Locate the CSP, CAL or TRM card corresponding to the adapter number in the following tables.
   b. Replace it with a new one. (Adapter's PS has automatically been turned OFF)
   c. Reply to the message by typing '**R**'.
   d. Press SEND.
      The power will be turned ON and the routine automatically restarted.

2. When you receive a message asking you to **reinstall** adapter xx:
   a. Reinstall the card previously replaced.
   b. Reply to the message by typing '**R**'.
   c. Press SEND.
      The power will be turned ON and the routine automatically restarted.

This process will be repeated until the test stops with a '*** ERROR FOUND ***' message.

If the reference code is pointing to the last replaced card, the problem is solved. Go to "CE Leaving Procedure" on page 5-172.
If not, replace the FRU(s) given by the reference code using the "FRU Machine Requirements" on page 2-34.

Note: Alarm 9F will be generated at each power OFF, ignore them during this test.

Table 4-1. Channel Adapters			
CA Num	**Location**	**CA Num**	**Location**
01	01L-A1-B2	09	02E-A1-B2
02	01L-A1-E2	10	02E-A1-E2
03	01L-A1-G2	11	02E-A1-G2
04	01E-A1-K2	12	02E-A1-K2
05	01L-A1-N2	13	02E-A1-N2
06	01L-A1-R2	14	02E-A1-R2
07	01E-A1-T2	15	02E-A1-T2
08	01L-A1-W2	16	02E-A1-W2

Table 4-2. Line Adapters							
LA Num	**Location**	**LA Num**	**Location**	**LA Num**	**Location**	**LA Num**	**Location**
01	01G-A1-E2 01G-A1-A2 *	09	02A-A1-E2	17	02F-A1-E2	25	03F-A1-E2
02	01G-A1-G2 01G-A1-D2 *	10	02A-A1-G2	18	02F-A1-G2	26	03F-A1-G2
03	01G-A1-J2 01G-A1-G2 *	11	02A-A1-J2	19	02F-A1-J2	27	03F-A1-J2
04	01G-A1-L2 01G-A1-J2 *	12	02A-A1-L2	20	02F-A1-L2	28	03F-A1-L2
05	01G-A1-N2 01G-A1-L2 *	13	02A-A1-N2	21	02F-A1-N2	29	03F-A1-N2
06	01G-A1-Q2 01G-A1-P2 *	14	02A-A1-Q2	22	02F-A1-Q2	30	03F-A1-Q2
07	01G-A1-S2	15	02A-A1-S2	23	02F-A1-S2	31	03F-A1-S2
08	01G-A1-U2	16	02A-A1-U2	24	02F-A1-U2	32	03F-A1-U2

Note: * Used for the TSST board only.

How to Run the Wrap Test (WTT) for LIC 1, 3, 4, 5, 6 or HPTSS Port

WARNING: MOSS must be online to start this procedure.

- Call Menu 1, type **WTT** and press SEND.
- Follow the instructions given by the following screen.

```
CUSTOMER ID:                                 3745-xxx         SERIAL NUMBER:
CCA-A          PROCESS MOSS-ALONE
RESET     BYP-IOC-CHK STOP-CCU-CHK

CCU-B          PROCESS MOSS-ALONE          X71:0A0800
RUN       BYP-IOC-CHK STOP-CCU-CHK         X72:0BC800
------------------------------------------------------------- 03/01/87 01:22
FUNCTION ON SCREEN: WRAP TEST
              WRAP TEST INITIAL SELECTION

- SELECT ONE OPTION (1,2)  ==> (A)

    1 = AUTOMATIC WRAP TEST ON LIC UNIT

    2 = WRAP TEST AT ANY LEVEL



  THEN PRESS SEND
===>

F1:END  F2:MENU2  F3:ALARM              F6:QUIT
```

(A) Enter 1 or 2 here to select the wrap test option

Option 1: Follow the instructions given by the following screen.

```
CUSTOMER ID:                                 3745-xxx         SERIAL NUMBER:
CCA-A          PROCESS MOSS-ALONE
RESET     BYP-IOC-CHK STOP-CCU-CHK

CCU-B          PROCESS MOSS-ALONE          X71:0A0800
RUN       BYP-IOC-CHK STOP-CCU-CHK         X72:0BC800
------------------------------------------------------------- 03/01/87 01:22
FUNCTION ON SCREEN: WRAP TEST
             AUTOMATIC WRAP TEST ON LIC UNIT

- ENTER A LINE ADDRESS OF THE LIC     (0-1023) ==> (B)



 WARNING: ALL LINES OF THE LIC MUST BE DISABLED/DEACTIVATED




===>

F1:END  F2:MENU2  F3:ALARM      F4:WRAP TEST INITIAL SELECTION
```

(B) Enter the line address here

Option 2: Follow the instructions given by the following screen and select the wrap level '4' (tailgate).

```
CUSTOMER ID:                            3745-xxx        SERIAL NUMBER:
CCA-A          PROCESS MOSS-ALONE
RESET     BYP-IOC-CHK STOP-CCU-CHK

CCU-B          PROCESS MOSS-ALONE          X71:0A0800
RUN       BYP-IOC-CHK STOP-CCU-CHK         X72:0BC800
------------------------------------------------------------ 03/01/87 01:22
FUNCTION ON SCREEN: WRAP TEST
              WRAP TEST INITIAL SELECTION

- ENTER LINE ADDRESS (TSS: 0-895 HPTSS: 1024-1039) ==> (B)

- ENTER WRAP TYPE (1 to 3)  ==>
    1 = DATA                        3 = DISPLAY LIC 5-6 DATA
    2 = CONTROL LEADS

- ENTER WRAP LEVEL (1 to 6) ==> (C)
    1 = LOCAL MODEM                 4 = TAILGATE
    2 = NTT CABLE (TSS ONLY)        5 = REMOTE MODEM  (HPTSS & DATA WRAP ONLY)
    3 = LIC (TSS & DATA WRAP ONLY)  6 = INTERNAL (HPTSS ONLY)

       LINE(S) TO BE TESTED MUST BE DISABLED/DEACTIVATED
===>

F1:END  F2:MENU2  F3:ALARM              F6:QUIT
```

(B) Enter the line address here

(C) Enter '4' here to select the tailgate level

- ***For LIC type 1, 4***

  Install wrap plug P/N 65X8927 on the LIC connector. See Figure 4-20 on page 4-39 and Figure 4-23 on page 4-40.

- ***For LIC type 3***

  Install wrap cable P/N 65X8928 between the 2 sockets. See Figure 4-21 on page 4-39 and Figure 4-23 on page 4-40.

  Notes:

  1. The test must be run a second time with the wrap cable reversed end to end.
  2. If you are working on a Line Adapter with 1 line at 256 kbps speed connected to and at least 1 other line, and if these lines are initialized at the NCP activation, you are not allowed to run the WTT on these lines.

- ***For HPTSS***

  Install wrap plug P/N 58X9349 for V35 or P/N 58X9354 for X21 on the tail gate connector.

- ***For LICs type 5, 6***

  Unplug the line cable at the customer wall frame and install the appropriate wrap plug (see list hereafter) at the end of the cable or unplug the line cable from both ends and install the wrap plug P/N 11F4815 at the LIC connector. (The line cable must be unplugged from the wall frame when necessary for telephone line loading reason.) See Figure 4-22 on page 4-39 and Figure 4-24 on page 4-41.

  LIC5/6 wrap plug P/N according to the Country.

U.S / Canada	66X0807
Japan	6124644
Austria	6162946
France	6162955
Germany	6162950
Belgium	6162950
Luxemburg	6162950
Israel	66X1954
Hong Kong	65X8070
Italy	6162957
Switzerland	66X0748
U.K.	65X8069
Netherlands	6162948

How to Run the Wrap Test with IFTs for LIC 1, 3, 4, 5, 6 or HPTSS Port

1. Install the wrap plug as follows:
   - ***For HPTSS***

     Install wrap plug P/N 58X9349 for V35 or P/N 58X9354 for X21 on the tail gate connector.
   - ***For LICs type 1, 4***

     Install wrap plug P/N 65X8927 on the LIC connector. See Figure 4-20 on page 4-39
   - ***For LIC type 3***

     Install wrap cable P/N 65X8928 between the 2 sockets. See Figure 4-21 on page 4-39 and Figure 4-23 on page 4-40.
   - ***For LICs type 5, 6***

     Unplug the line cable at the customer wall frame and install the appropriate wrap plug (see list hereafter) at the end of the cable or unplug the line cable from both ends and install the wrap plug P/N 11F4815 at the tail gate connector. (The line cable must be unplugged from the wall frame when necessary for telephone line loading reason.) See Figure 4-22 on page 4-39 and Figure 4-24 on page 4-41.

     LIC-5/6 wrap plug P/N according to the Country.

Country	P/N
U.S / Canada	66X0807
Japan	6124644
Austria	6162946
France	6162955
Germany	6162950
Belgium	6162950
Luxemburg	6162950
Israel	66X1954
Hong Kong	65X8070
Italy	6162957
Switzerland	66X0748
U.K.	65X8069
Netherlands	6162948

2. Start the diagnostic as follows:
   - ***For HPTSS***
     - Update the CDF to show that the lines to be tested have wrap plugs installed. Refer to "3745 Service Functions, Chapter 9".
     - Using "How to Run Internal Function Tests" on page 4-29 call the HPTSS diagnostics, and enter '**7**' (HPTSS group) in the DIAG= = > area, the adapter number in the ADP#= = > area.
     - Press SEND.
   - ***For LICs type 1, 3, 4***

     Using "How to Run Internal Function Tests" on page 4-29 call the IFTs and enter the routine number **RC01** in the DIAG= = > area, the adapter number in the ADP#= = > area and the line number in the LINE= = > area.
     (You may obtain the LA number and the line number from the 'LID' function entering the line address. Refer to "Advanced Operation Guide"). See note.
     Press SEND.

     For LIC type 3 reverse the wrap cable end to end and rerun the test.
   - ***For LICs type 5, 6***

     Ensure that no PKD action is in progress, this would lead to an unexpected diagnostic error.

     Using "How to Run Internal Function Tests" on page 4-29 call the IFTs and enter routine number **RH59** in the DIAG= = > area, the adapter number in the ADP#= = > area and the line number in the LINE= = > area.
     (You may obtain the LA number and the line number from the 'LID' function entering the line address. Refer to "Advanced Operation Guide"). See note.
     Press SEND.

Note: MOSS can be alone, online or offline but the scanners must be IMLed and the CCU must be running.
In the case of MOSS alone, IPL until phase 4, then cancel the IPL in order for the LID function to work as required.

Routines RD01 through RD03 for Japan only (LIC 1,3,4 only)

RD01: NTT ON/OFF Driver

This routine sets permanently ON or OFF all the active line drivers of a LIC card to allow measurements by the NTT service personnel.

When the message ***LINE DRIVER STATE: ON=F1, OFF=F2, EXIT=F9*** is displayed, enter:

- RF1 to set drivers at high voltage level
- RF2 to set drivers at low voltage level
- RF9 to exit from the routine

When you enter RF1 or RF2, the following message is displayed:

MODEM INCL X21			
MODEM EXC X21	CHECK DRIVERS ARE	ON	PRESS SEND TO CONTINUE
X21		OFF	
AUTOCALL			

At this step, the NTT personnel may check the driver voltage.
To change the option, press SEND.

RD02: NTT Data Wrap Test

This routine checks the data wrap path (transmit to receive).

The Test/Operate switch on the cable connector or on the DCE must be set as follows:

- LIC type 1: Set the connector TEST/OPERATE switch to TEST
- LIC type 3: Set the DCE Test/Operate switch to T1
- LIC type 4: Set the DCE Test/Operate switch to T1

RD03: Modem-In Wrap Test

This routine check the modem control leads according to the LIC type.

Use the TEST/OPERATE switch or the wrap block as follows:

- LIC type 1 (V24): Set the connector TEST/OPERATE switch to TEST
- LIC type 1 (V25): Plug the wrap block at the cable end
- LIC type 3: Set the DCE Test/Operate switch to T1
- LIC type 4: Set the DCE Test/Operate switch to T1

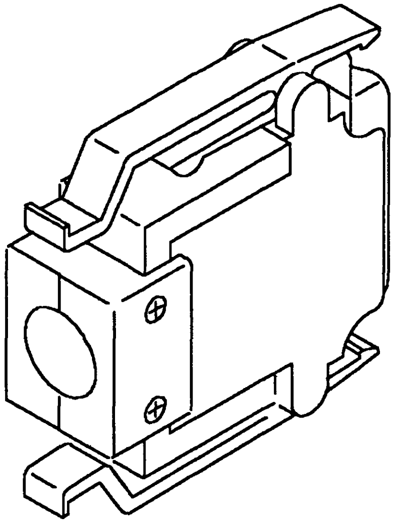


Figure 4-20. LIC Type 1 and 4 Wrap Plug P/N65X8927

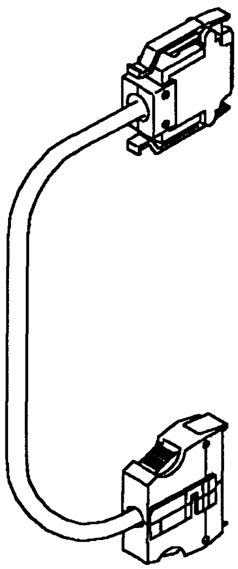


Figure 4-21. LIC Type 3 Wrap Cable P/N65X8928

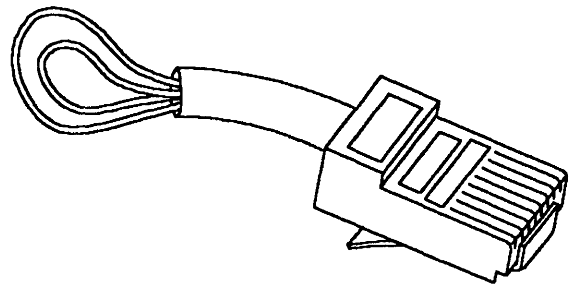
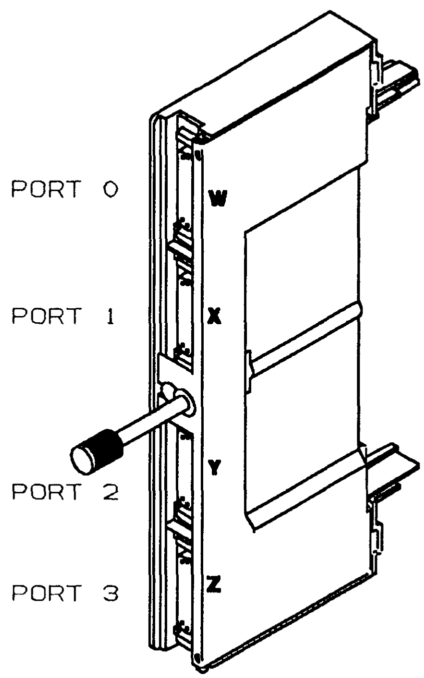
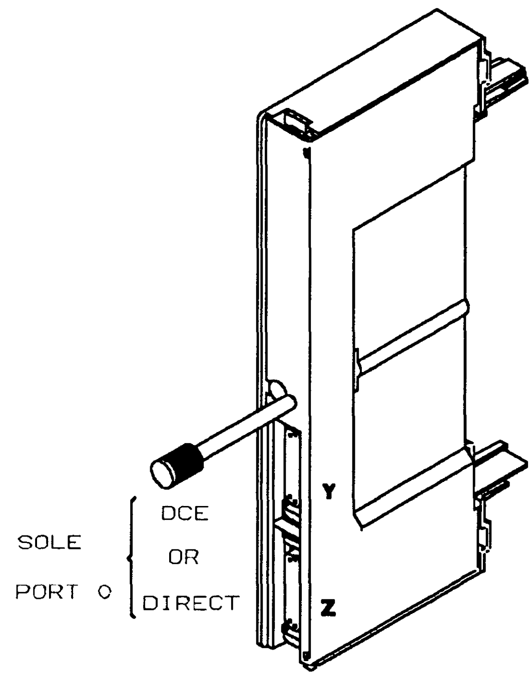


Figure 4-22. LIC Type 5 and 6 Wrap Plug P/N11F4815

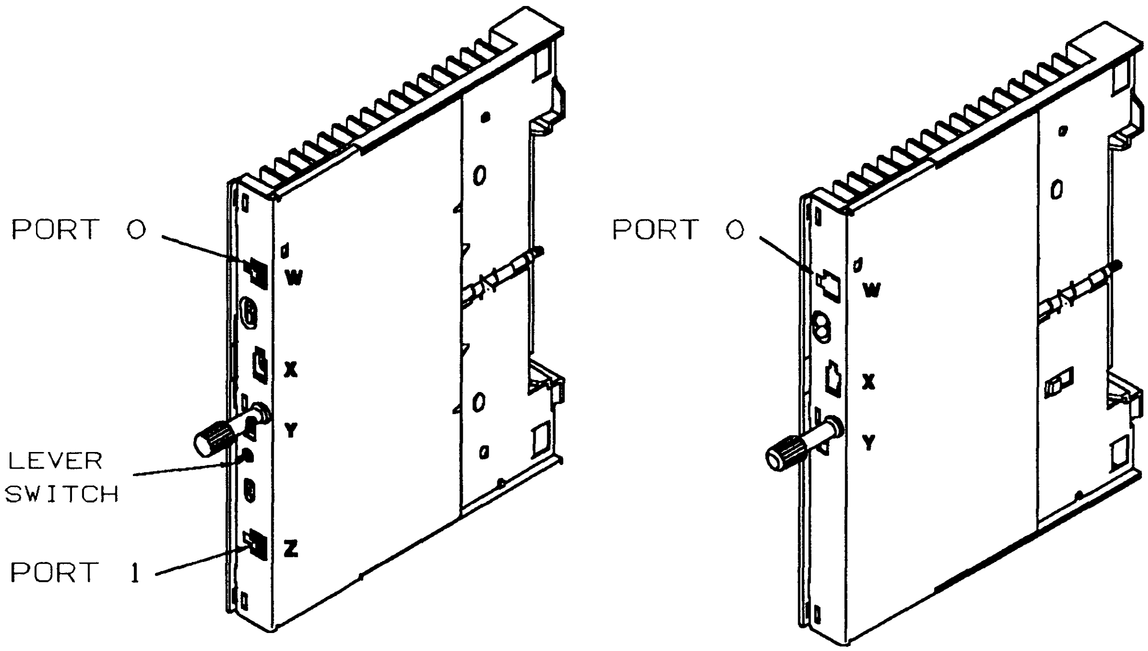


TYPE	KNOB COLOR
LIC1	BROWN
LIC4A	GREEN
LIC4B	GREEN



TYPE	KNOB COLOR
LIC3	BLUE

Figure 4-23. LIC Types 1, 3 and 4



TYPE	KNOB COLOR
LIC5	BLACK

TYPE	KNOB COLOR
LIC6	BLACK

Figure 4-24. LIC Types 5 and 6

How to Run the Channel Wrap Test

1. Ensure that the 'Select Out Bypass' switch is in the 'NORMAL' position.
2. Call the option ODG or CDG from the maintenance function menu.
3. Enter **LO01** in the DIAG= = > area and the channel number in the ADP#= = > area.
4. Press SEND.
5. When you are required by the diagnostic, remove the interface cables then install the wrap plugs and terminators, refer to Figure 5-46 on page 5-46
   In order to allow the customer to use the channel during test time, you have to connect the cables together or to the terminators.
6. You will be asked for the wrap tools P/N you are using.

   Two models of wrap plugs can be used for this test:

   BUS P/N 03F4301 and TAG P/N 03F4300 or
   BUS P/N 26F1755 and TAG P/N 26F1754
7. Messages on the screen will prompt you for the required actions.

   According to the wrap plugs you are using, follow one of the two actions here after :

   - If you have the channel wrap plugs:

     P/N 03F4300 (for Tag)
     and P/N 03F4301 (for Bus)

     install them for interface A in the IN ROW (dark gray) and the CA terminators:

     P/N 2282676 (for Tag)
     and P/N 2282675 (for Bus)

     in the OUT ROW (light gray).
   - If you have the channel wrap plugs :

     P/N 26F1754 (for Tag)
     and P/N 26F1755 (for Bus)

     you have to make two installations, one after the other (when requested by messages on the screen) :

     1st step - Install the wrap plugs for interface A in the IN ROW (dark gray), and the CA terminators:

     P/N 2282676 (for Tag)
     and P/N 2282675 (for Bus)

     in the OUT ROW (light gray).

     2st step - Install the wrap plugs in the OUT ROW (light gray) and leave the IN ROW (dark gray) free. (CA terminators have not to be used).
8. You will be asked to install the wrap plugs on interface connectors B if the TPS feature is installed on this channel. In this case repeat the action as before for interface A.

Action to Take After a Diagnostic Run

Diagnostic Result Analysis

001

This procedure analyzes the results of the diagnostics prior to exchange any FRU and tells you what to do next.

When MOSS diagnostics detect an error, a hex code is set on the control panel. The code can be decoded by using "Panel Codes" on page 2-14.

When ODG/CDG diagnostics detect an error, a reference code is given on the diagnostic screen, see (Figure 4-18 on page 4-32).

This reference code can be decoded to find the action to take using the BRC function in menu 3. If required, see "Using Reference Codes" on page 2-12

Did diagnostics run without a message for manual intervention ?
Yes No

002

Follow the instructions given by the diagnostics. Then, go back to this procedure according to the result.

003

Did the diagnostics detect a failure ?
Yes No

004

- Go to Step 014.

005

Was the failure other than 'unexpected error' ?
Yes No

006

Was a reference code generated by the diagnostics ?
Yes No

007

(Step **007** continues)

007 (continued)

- Run the previous diagnostic for the upper level in the 'run all' diagnostics.
  For exemple, TRSS > IOC Bus > CCU,
  go to "FRU Machine Requirements" on page 2-34.

008

Analyse the reference code. Refer to "Using Reference Codes" on page 2-12

009

You may have started this service call to exchange FRUs called by a reference code or panel code.

Is the first FRU called by diagnostics different from the FRU you were going to exchange ?
Yes No

010

Perform FRU exchange using Chapter 5, "3745 FRU Exchange" on page 5-1.

011

Is there a FRU given by both lists ?
Yes No

012

- If you do not have the first FRU called by the diagnostics, obtain it.

If you have the FRU or when you obtain the FRU, go to "FRU Machine Requirements" on page 2-34.

013

Consider it is the first FRU of the list and exchange it.

014

(Step **014** continues)

014 (continued)

Were HPTSS diagnostics being run for a suspected FESH card ?

Yes No

015

Go to Step 018.

016

- In the 3745 frame 01 at tail gate location 01U, remove cables from the HPTSS lines to be tested. Refer to Figure 5-2 on page 5-6.
- Install wrap plugs in the sockets of 01U for the lines to be tested.
- Update the CDF to show that the lines to be tested have wrap plugs installed. Refer to "3745 Service Functions, Chapter 9".
- Run HPTSS diagnostic routines VI and VK if V.35 wrap plug is installed, or VJ and VK if X.21 wrap plug is installed, or VI, VJ, and VK if both types of wrap plugs are installed. Refer to "How to Run Internal Function Tests" on page 4-29.

Did the diagnostic run free of error ?

Yes No

017

Go to Step 009 on page 4-43.

018

Is the FRU you were processing, the last FRU called for the error ?

Yes No

019

You have an intermittent error or an error not detected by this diagnostic.

Continue using this manual for the next FRU called, go to "FRU Machine Requirements" on page 2-34.

020

Go to "CE Leaving Procedure" on page 5-172.

Chapter 5. 3745 FRU Exchange

Use this chapter once you know what FRU to exchange. You should use all its sections, from front to back, to learn:

- Where the FRU is physically located
- How to exchange FRUs properly
- How to test the machine afterward
- What else to do before returning the machine to the customer.

Exchange Precautions

1. Most of the FRUs can be exchanged in concurrent maintenance. Thus, it is **VERY IMPORTANT** that these procedures be followed when replacing any FRU in the machine.
2. The control panel has voltage present even with the machine 'Power OFF'.
3. Be sure that the involved area of the 3745 is 'power OFF', when requested by the procedure, before replacing any FRUs.
4. **Before starting FRU exchange, make sure the involved area has been disabled by the customer.**
5. The 3745 communication controller contains cards that are sensitive to electrostatic discharge (ESD). Store all cards in their protective packaging when you are not actually exchanging them.
6. Procedures for exchanging FRUs are listed on the next pages, use the list in alphabetical order leading to the correct page.

important. Do not disassemble or attempt to remove FRUs from the 3745 until you have read "Telecommunication Products Safety Handbook" GA33-0126.

VERY IMPORTANT

BEFORE ANY FRU EXCHANGE

BE SURE THAT THE REQUIRED AREA HAS BEEN DISABLED

IF NOT, GO TO START PAGE AND FOLLOW THE APPROPRIATE PROCEDURE

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List of FRUs

CA TAILGATE	Use "Channel Tail Gate and Internal Cables Exchange Procedure" on page 5-119.
CA BOARD	Use "Channel Board Exchange Procedure" on page 5-120.
LA BOARD	Use "Line Adapter Board Exchange Procedure" on page 5-129.
LIC BOARD type 1	Use "LIC Board Type 1 Exchange Procedure" on page 5-139.
LIC BOARD type 2	Use "LIC Board Type 2 Exchange Procedure" on page 5-143.
MOSS BOARD	Use "MOSS Board Exchange Procedure" on page 5-148.
SAC GATE	Use "SAC Gate Assembly Exchange Procedure for Models 210 and 410" on page 5-153.
SAC2 GATE	Use "SAC2 Gate Assembly Exchange Procedure for Models 310 and 610" on page 5-160.
TCM BOARD	Use "TCM Board Exchange Procedure" on page 5-167.
Air Filters	Use "Air Filters Exchange Procedure" on page 5-80.
AMD	Use "Air Moving Device Exchange Procedure for Models 210 and 410" on page 5-84.
AMD2	Use "Air Moving Device Exchange Procedure for Models 310 and 610" on page 5-86.
Battery	Use "Battery Exchange Procedure" on page 5-88.
CADR	Use "CADR/CAL Exchange Procedure" on page 5-51.
CAL	Use "CADR/CAL Exchange Procedure" on page 5-51.
Control Panel	Use "Control Panel Exchange Procedure" on page 5-52.
CSP	Use "CSP Exchange Procedure" on page 5-65.
DFA	Use "DFA Exchange Procedure" on page 5-54.
DMSW	Use "Storage and Controls Exchange Procedure" on page 5-79.
DMUX	Use "DMUX Exchange Procedure" on page 5-68.
DTER	Use "DTER/ITER Exchange Procedure" on page 5-76.
FDD	Use "FDD Exchange Procedure" on page 5-55.
FESH	Use "FESH Exchange Procedure" on page 5-67.
FESL	Use "FESL Exchange Procedure" on page 5-66.
HDD	Use "HDD Exchange Procedure" on page 5-57.
IOSW/IOSW2	Use "Storage and Controls Exchange Procedure" on page 5-79.

ITER	Use "DTER/ITER Exchange Procedure" on page 5-76.
LIC FAN	Use "LIC FAN Exchange Procedure" on page 5-73.
LIC type 1-4	Use "LIC Type 1-4 Exchange Procedure" on page 5-71.
LIC type 5,6	Use "LIC Type 5 and 6 Exchange Procedure" on page 5-72.
MAC/MAC2	Use "MAC/MAC2 Exchange Procedure" on page 5-59.
MCA	Use "MCA/MSC Exchange Procedure" on page 5-61.
MOSS Blower	Use "MOSS Blower Exchange Procedure" on page 5-90.
MPC	Use "MPC Exchange Procedure" on page 5-60.
MSC	Use "MCA/MSC Exchange Procedure" on page 5-61.
PAC	Use "PAC Exchange Procedure" on page 5-62.
PLC	Use "PLC Exchange Procedure" on page 5-63.
PROM	Use "PROM Exchange Procedure" on page 5-64.
PSTY1	Use "PS Type 1 Exchange Procedure for Models 210 and 410" on page 5-103.
PSTY1B	Use "PS Type 1B Exchange Procedure for Models 310 and 610" on page 5-105.
PSTY2	Use "PS Type 2 Exchange Procedure" on page 5-107.
PSTY3	Use "PS Type 3 Exchange Procedure" on page 5-108.
PSTY4	Use "PS Type 4 Exchange Procedure" on page 5-109.
PSTY5	Use "PS Type 5 Exchange Procedure" on page 5-111.
PSTY6	Use "PS Type 6 Exchange Procedure" on page 5-113.
PSTY7	Use "PS Type 7 Exchange Procedure" on page 5-114.
PSTY8	Use "PS Type 8 Exchange Procedure" on page 5-116.
PS FAN	Use "PS Fan Exchange Procedure" on page 5-118.
PTER	Use "PTER Exchange Procedure" on page 5-77.
PUC	Use "Storage and Controls Exchange Procedure" on page 5-79.
SCTL/SCTL2	Use "Storage and Controls Exchange Procedure" on page 5-79.
SMUXA/B	Use "SMUXA/B Exchange Procedure" on page 5-69.
STER	Use "STER Exchange Procedure" on page 5-78.
STO	Use "Storage and Controls Exchange Procedure" on page 5-79.
TCM	Use "TCM Exchange Procedure" on page 5-92.
TIC	Use "TRM/TIC Exchange Procedure" on page 5-74.

TRM — Use "TRM/TIC Exchange Procedure" on page 5-74.

FRU Physical Locations

3745 Frames

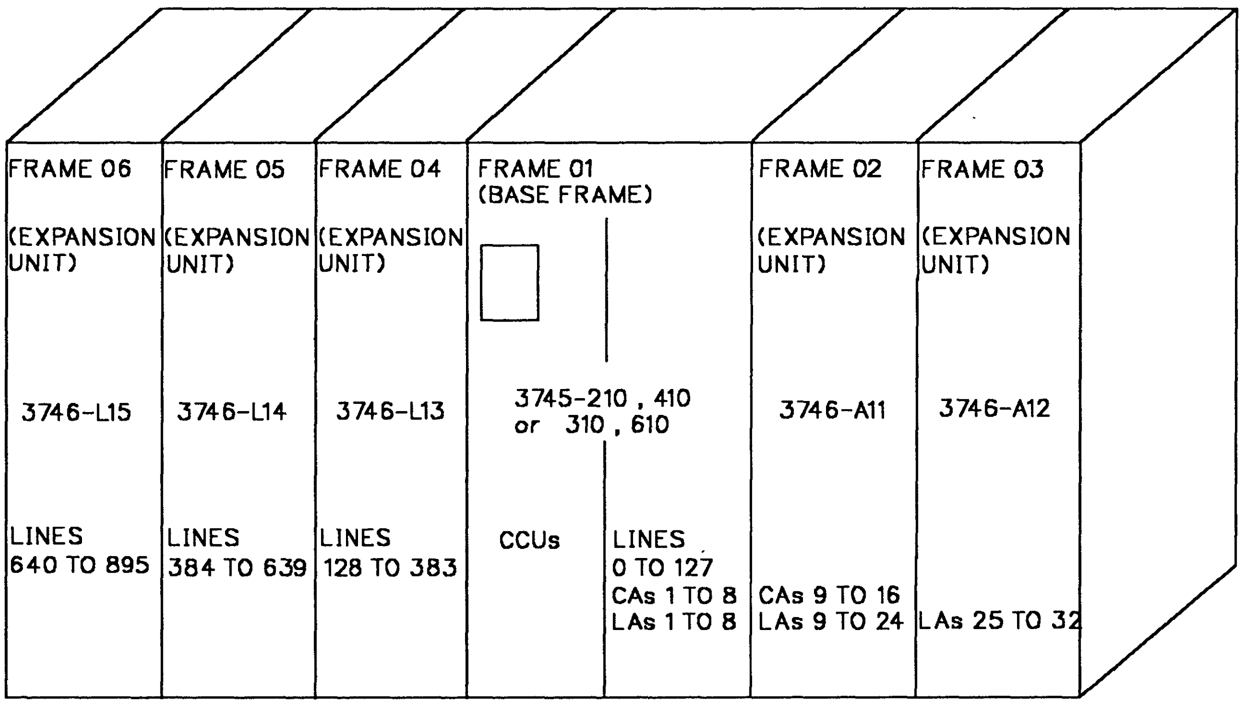
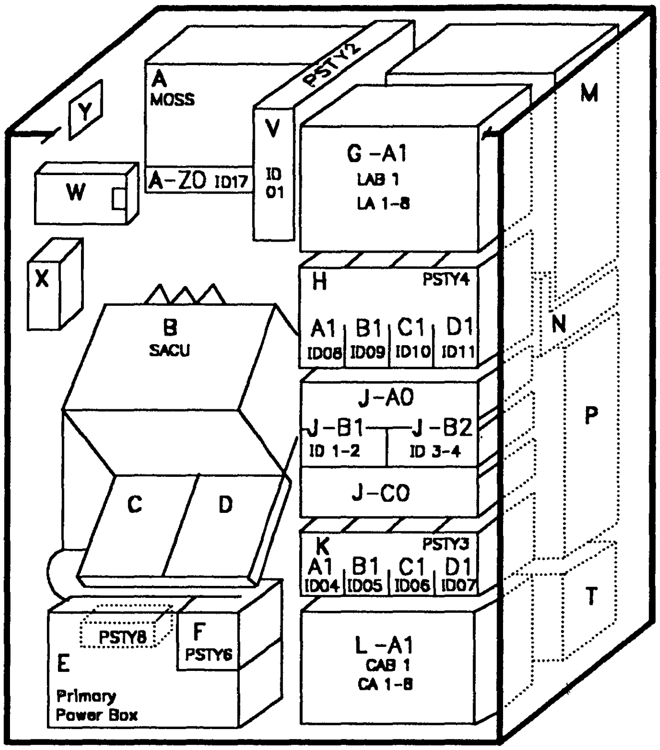


Figure 5-1. 3745 Full Machine Configuration

Frame 01 (Base Frame)

Front View



PTER

Rear View

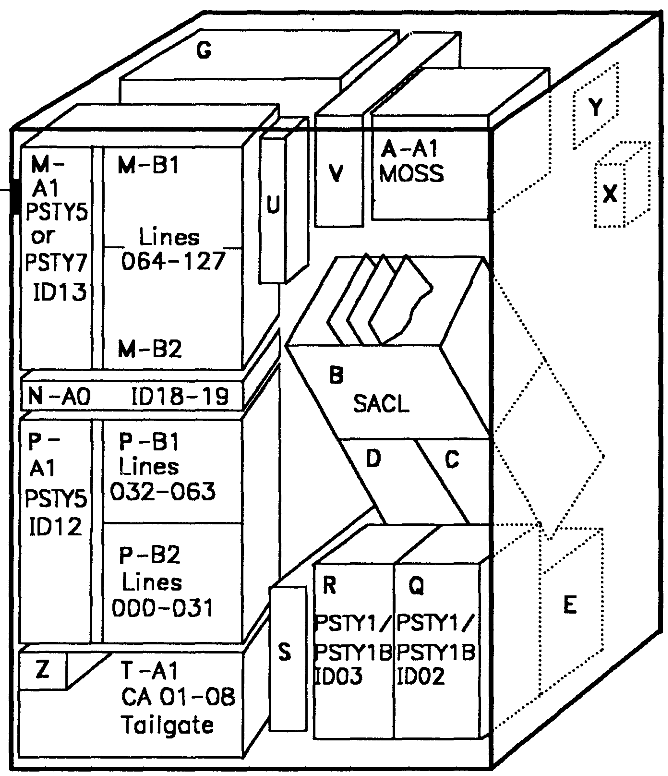


Figure 5-2. 3745-210, 310, 410 or 610

A MOSS
B SAC gate
C AMD/AMD2 for CCU A
D AMD/AMD2 for CCU B
E Primary power box
F Power supply control (type 6)
G Line adapters from 01 to 08
H PS type 4 for line adapters 01 to 08
J Fan, ac and dc distribution
K PS type 3 for channel adapters 01 to 08
L Channel adapters from 01 to 08
M LIC unit (lines from 64 to 127)
N FAN for LICs
P LIC unit (lines from 00 to 63)
Q PS type 1B for CCU A
R PS type 1B for CCU B
S EPO tail gate
T Channels adapters 01 to 08 tail gate
U TRSS or HPTSS tail gate
V PS type 2 for MOSS
W Control panel and FDD
X HDD
Y Remote control
Z Auxiliary power box

Frame 02 (Expansion Unit A11)

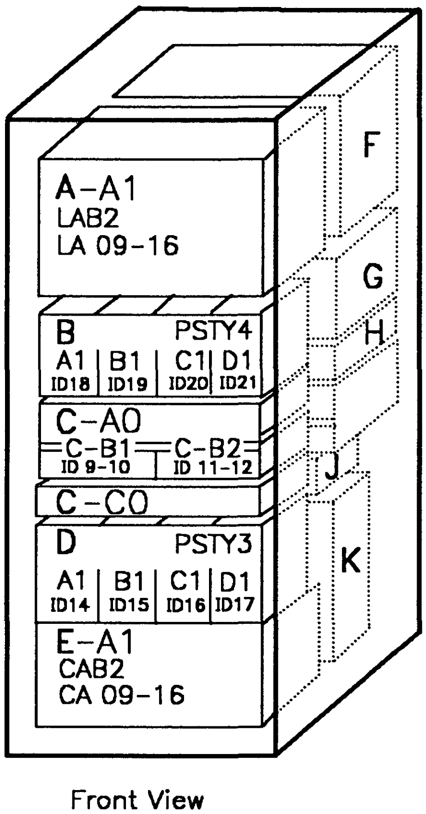


Figure 5-3 (Part 1 of 2). 3746-011

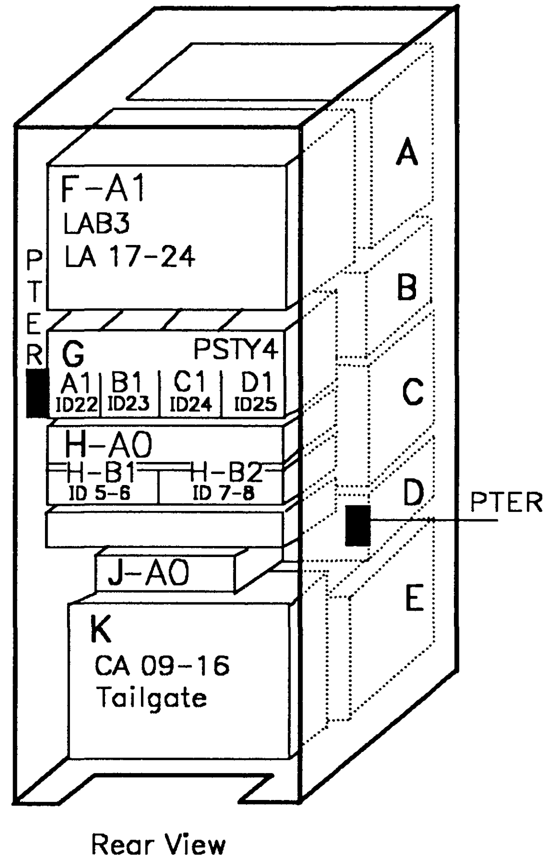


Figure 5-3 (Part 2 of 2). 3746-011

A Line adapters (from 09 to 16)
B PS type 4 for line adapters 09 to 16
C Fan, ac and dc distribution
D PS type 3 for channel adapters 09 to 16
E Channel adapter (from 09 to 16)

F Line adapters (from 17 to 24)
G PS type 4 for line adapters 17 to 24
H Fan, ac and dc distribution
J Auxiliary power box
K Channels adapters 09 to 16 tail gate

Frame 03 (Expansion Unit A12)

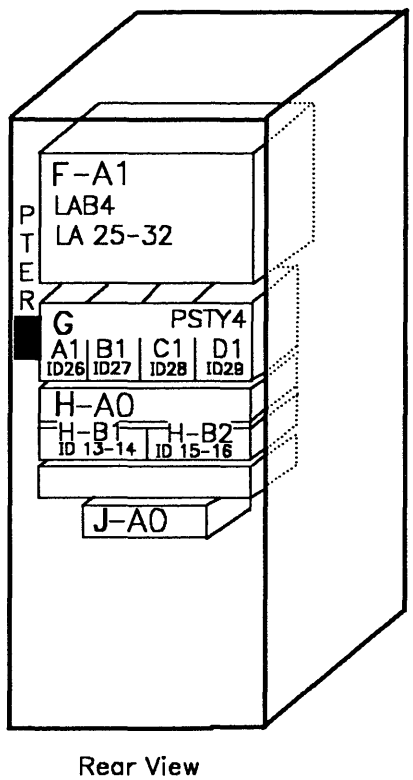


Figure 5-4. 3746-012

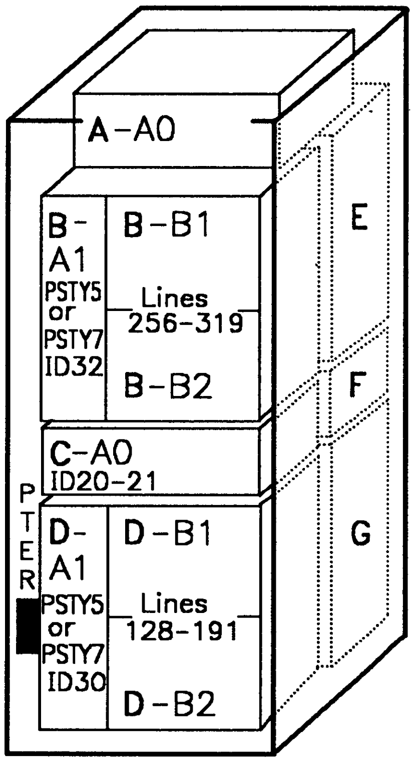
F Line adapters (from 25 to 32)

G PS type 4 for line adapters 25 to 32

H Fan, ac and dc distribution

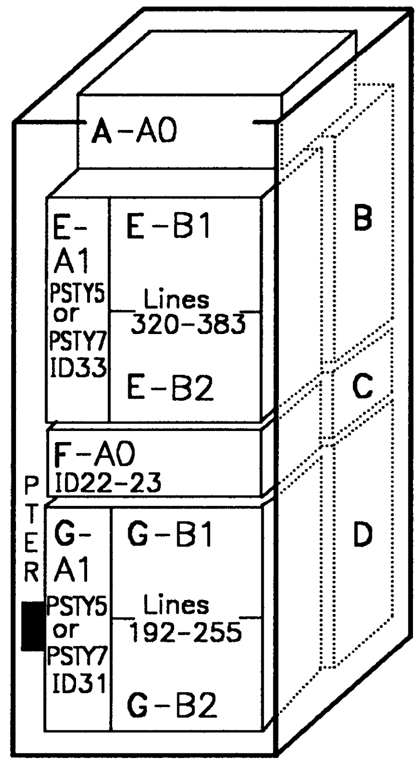
J Auxiliary power box

Frame 04 (Expansion Unit L13)



Front View

Figure 5-5 (Part 1 of 2). 3746-013



Rear View

Figure 5-5 (Part 2 of 2). 3746-013

A ac distribution

B LIC unit (from 256 to 319 lines)

C FAN for LICs

D LIC unit (from 128 to 191 lines)

E LIC unit (from 320 to 383 lines)

F FAN for LICs

G LIC unit (from 192 to 255 lines)

Frame 05 (Expansion Unit L14)

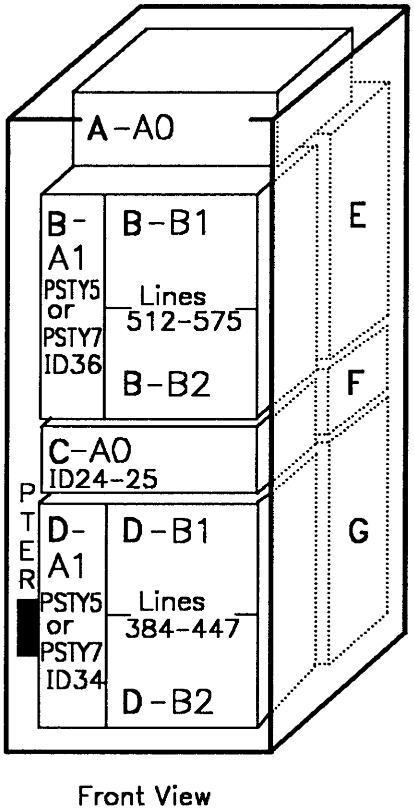


Figure 5-6 (Part 1 of 2). 3746-014

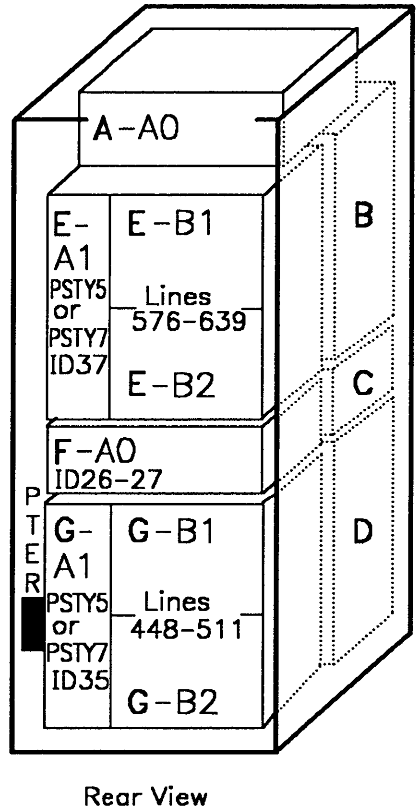
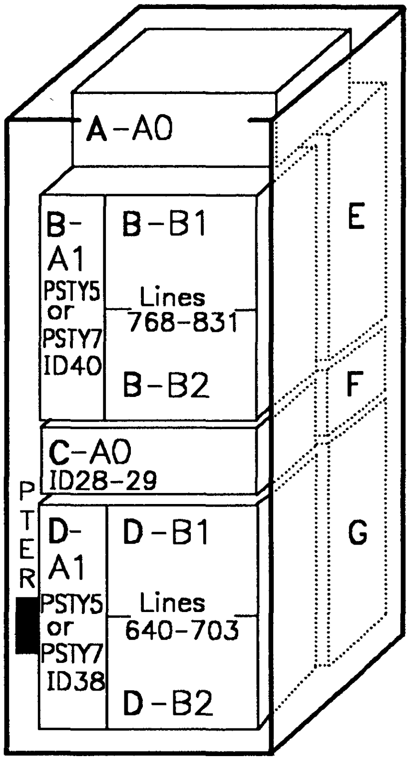


Figure 5-6 (Part 2 of 2). 3746-014

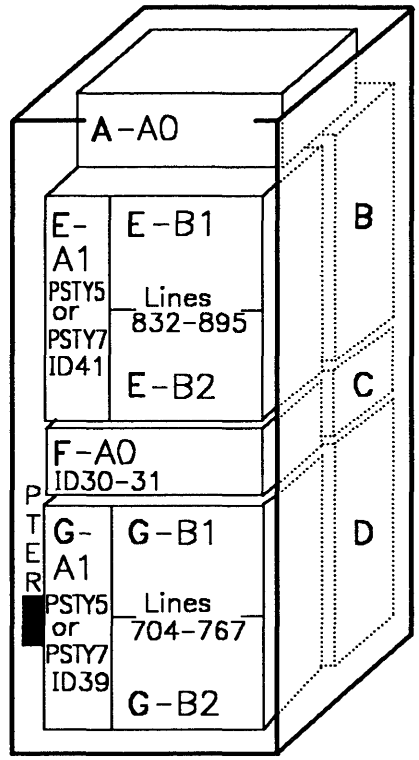
A AC distribution
B LIC unit (from 512 to 575 lines)
C FAN for LICs
D LIC unit (from 384 to 447 lines)
E LIC unit (from 576 to 639 lines)
F FAN for LICs
G LIC unit (from 448 to 511 lines)

Frame 06 (Expansion Unit L15)



Front View

Figure 5-7 (Part 1 of 2). 3746-015



Rear View

Figure 5-7 (Part 2 of 2). 3746-015

A AC distribution

B LIC unit (from 768 to 831 lines)

C FAN for LICs

D LIC unit (from 640 to 703 lines)

E LIC unit (from 832 to 895 lines)

F FAN for LICs

G LIC unit (from 704 to 767 lines)

MOSS Board, Cards and Connectors

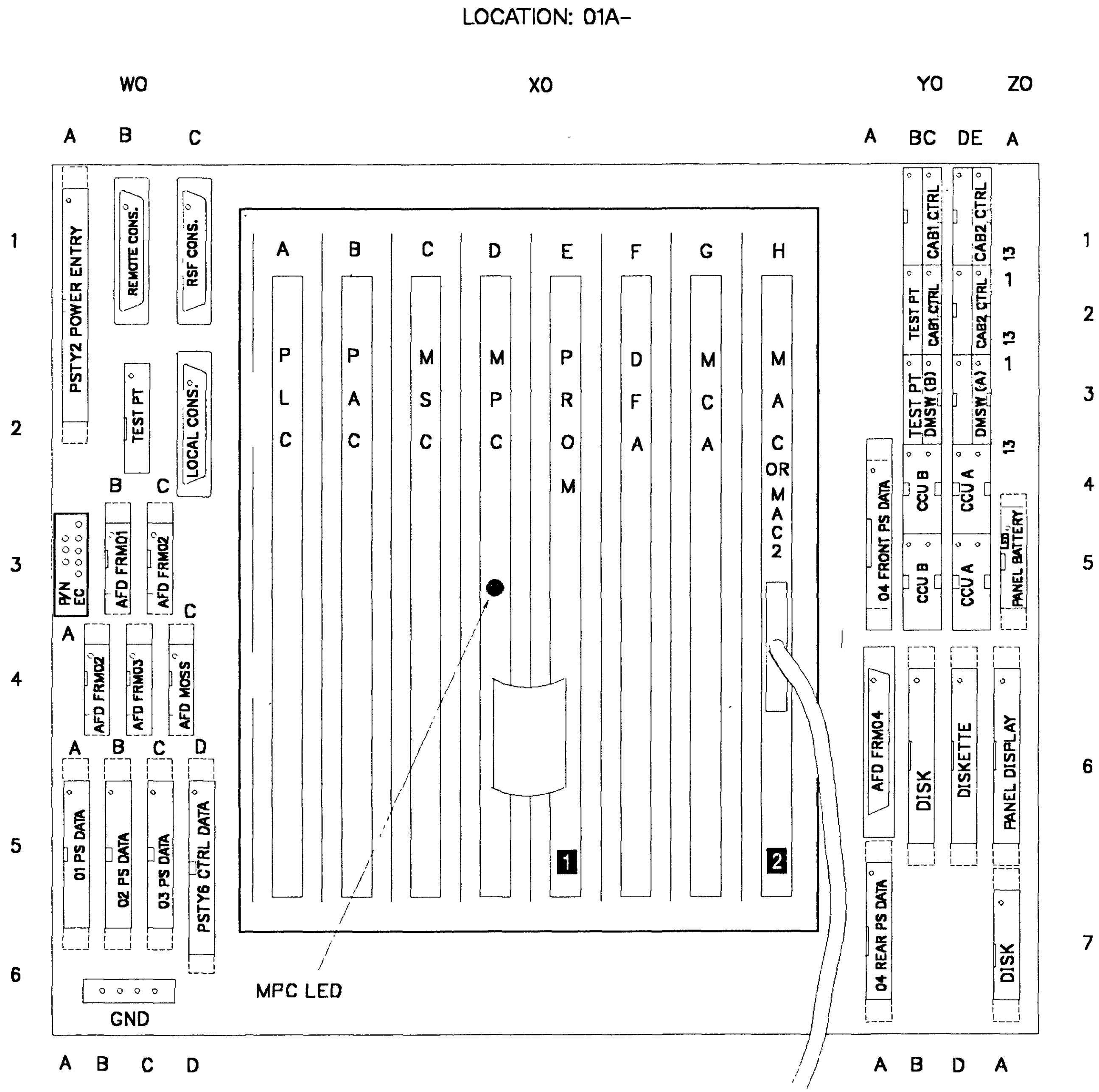
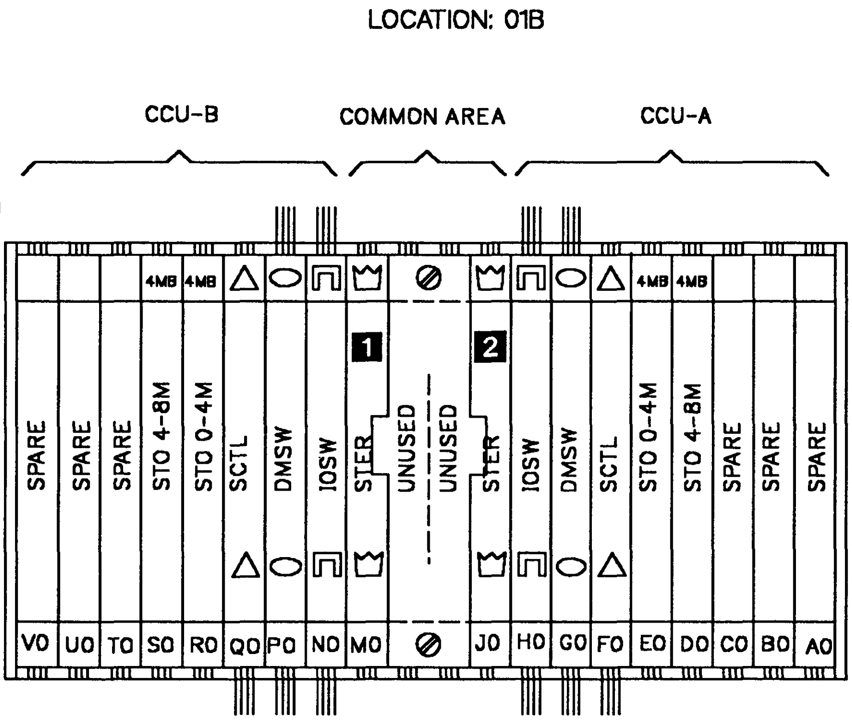


Figure 5-8. 3745 MOSS Board, Cards and Connectors

1 The **PROM** card may not be present on the machine, in this case the interconnecting cable is not present too.

2 MAC card for models 210 and 410 or MAC2 card for models 310 and 610

Storage, Control Boards and Cards for Models 210 and 410



CARD LOCATIONS	
ROW	CARD NAME
AO	
BO	
CO	
DO	STO 4-8M
EO	STO 0-4M
FO	SCTL
GO	DMSW
HO	IOSW
JO	STER
KO	
LO	
MO	STER
NO	IOSW
PO	DMSW
QO	SCTL
RO	STO 0-4M
SO	STO 4-8M
TO	
UO	
VO	

1 STER in MO is for buses 1.2 and 5

2 STER in JO is for buses 3.4 and 6

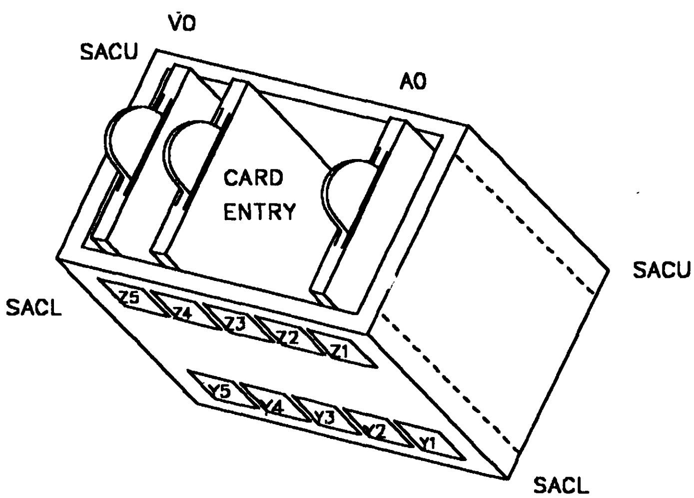
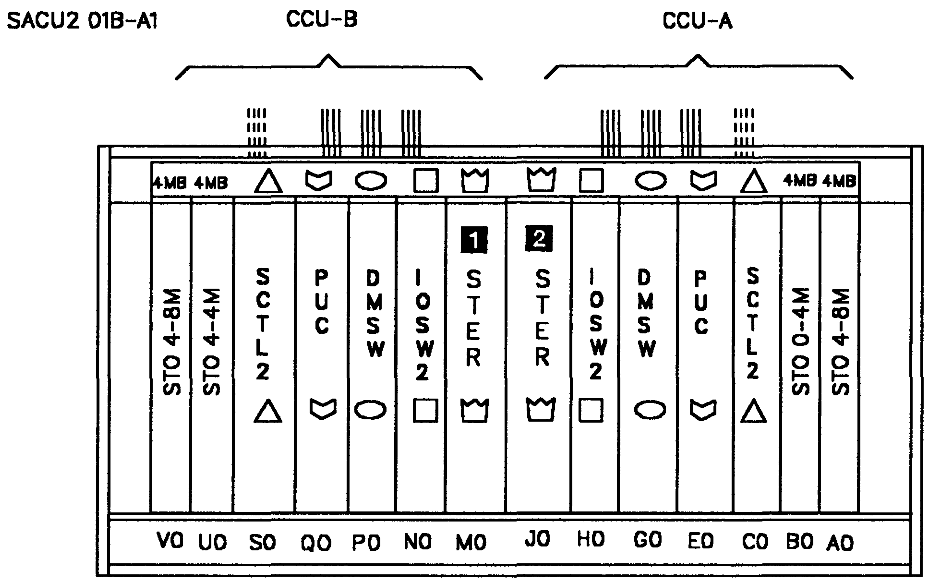


Figure 5-9. 3745 Storage, Control Boards and Cards for Models 210 and 410

Storage, Control Boards and Cards for Models 310 and 610

LOCATION: 01B



CARD LOCATIONS	
FRONT ROW	CARD NAME
AO	STO 4-8M
BO	STO 0-4M
CO	SCTL2
EO	PUC
GO	DMSW
HO	IOSW2
JO	STER
MO	STER
NO	IOSW2
PO	DMSW
QO	PUC
SO	SCTL2
UO	STO 0-4M
VO	STO 4-8M

SACL2 01B-A2

1 STER in MO is for buses 1.2 and 5

2 STER in JO is for buses 3.4 and 6

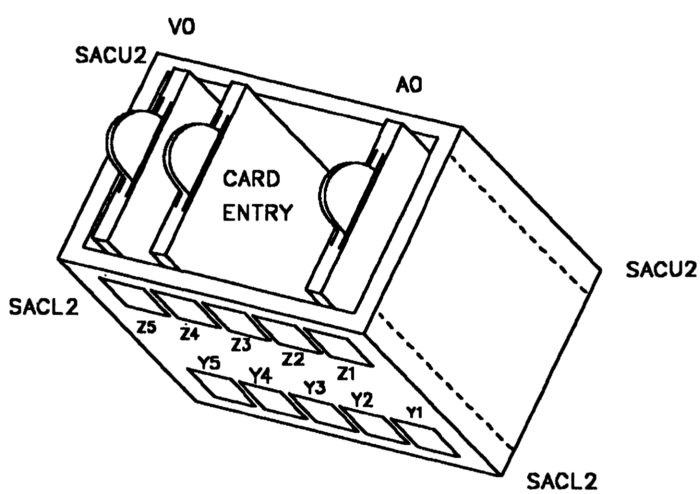


Figure 5-10. 3745 Storage, Control Boards and Cards for Models 310 and 610

SACU Board and Connectors for Models 210 and 410

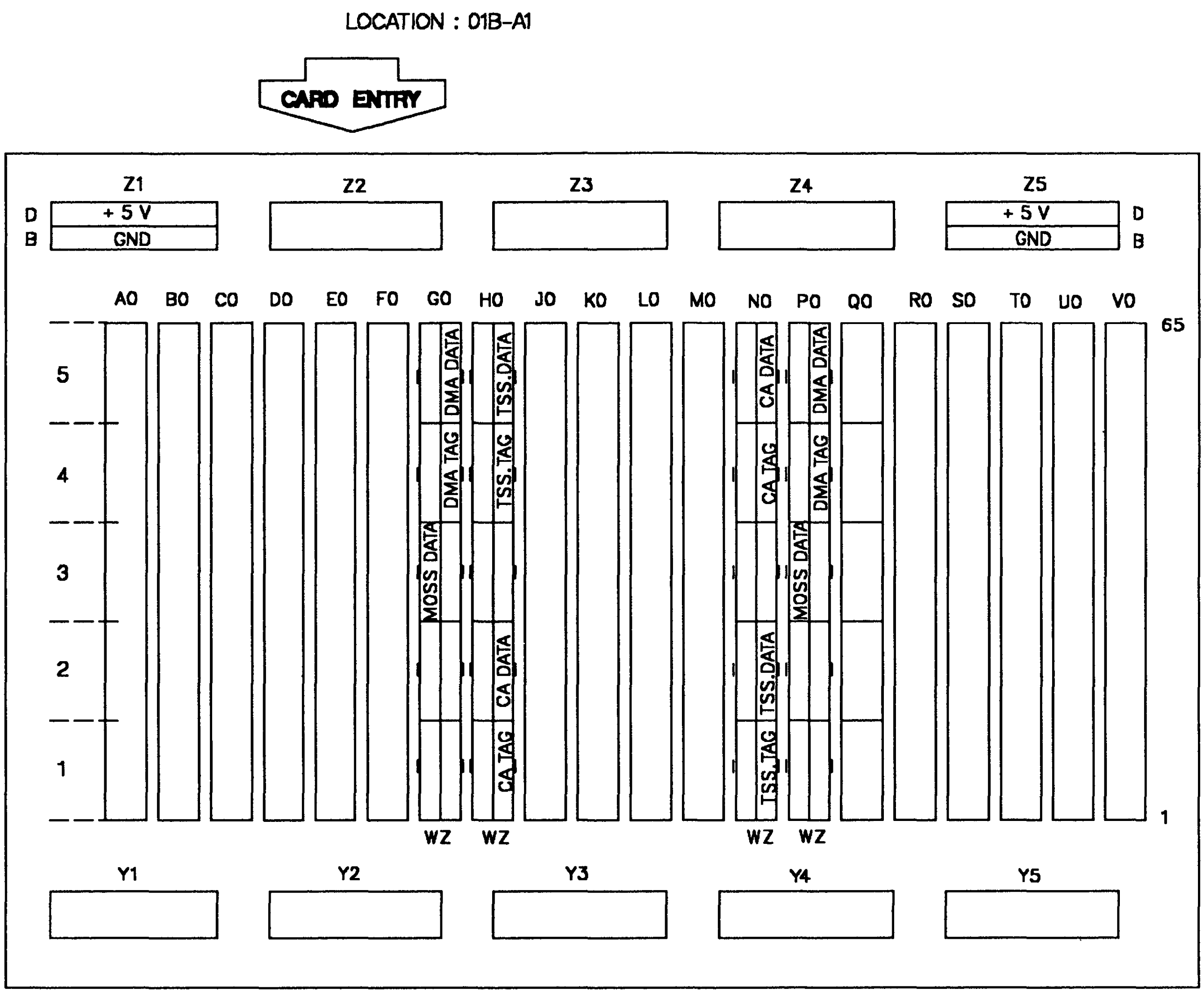


Figure 5-11. 3745 SACU Board and Connectors for Models 210 and 410

SACU2 Board and Connectors for Models 310 and 610

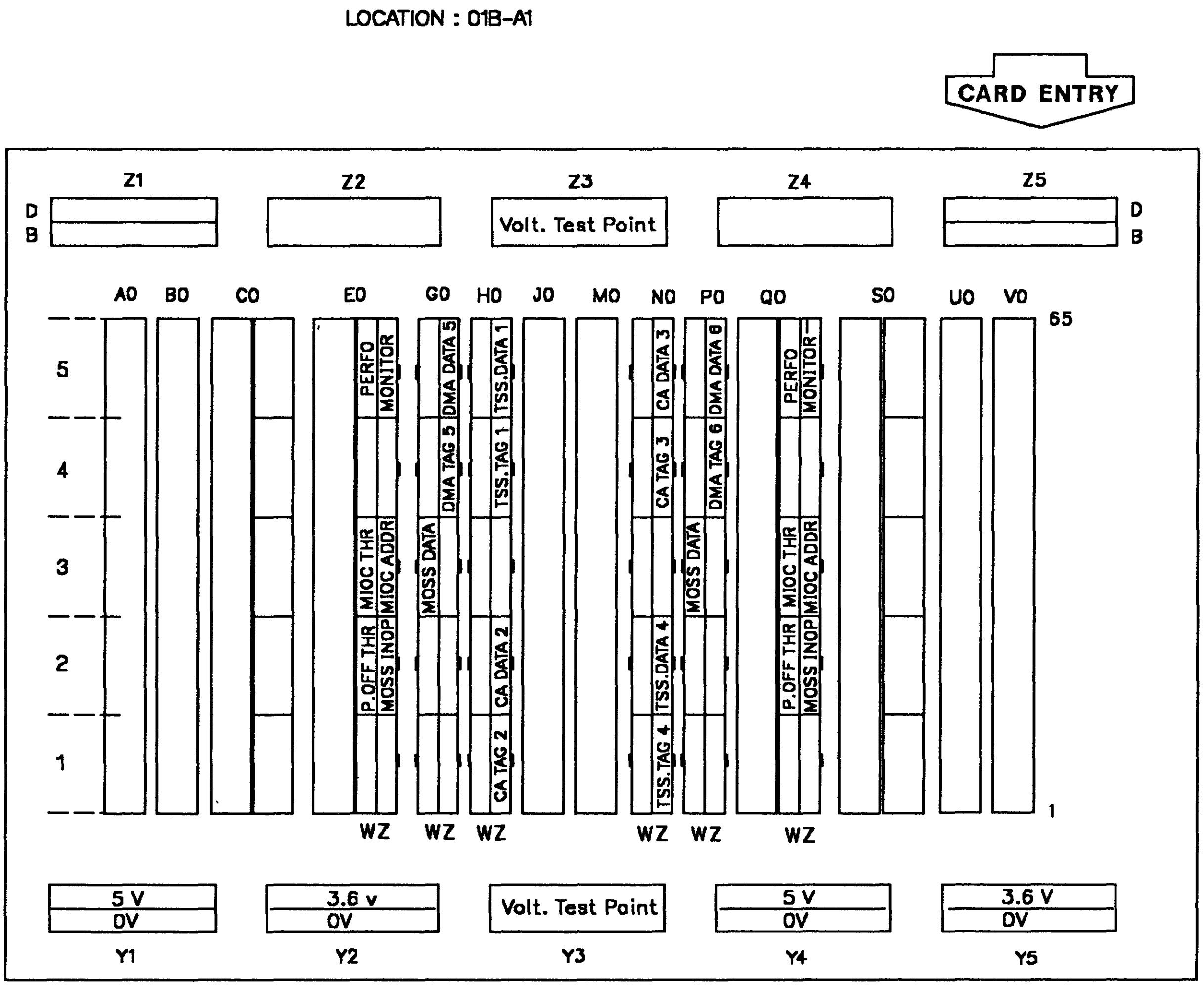
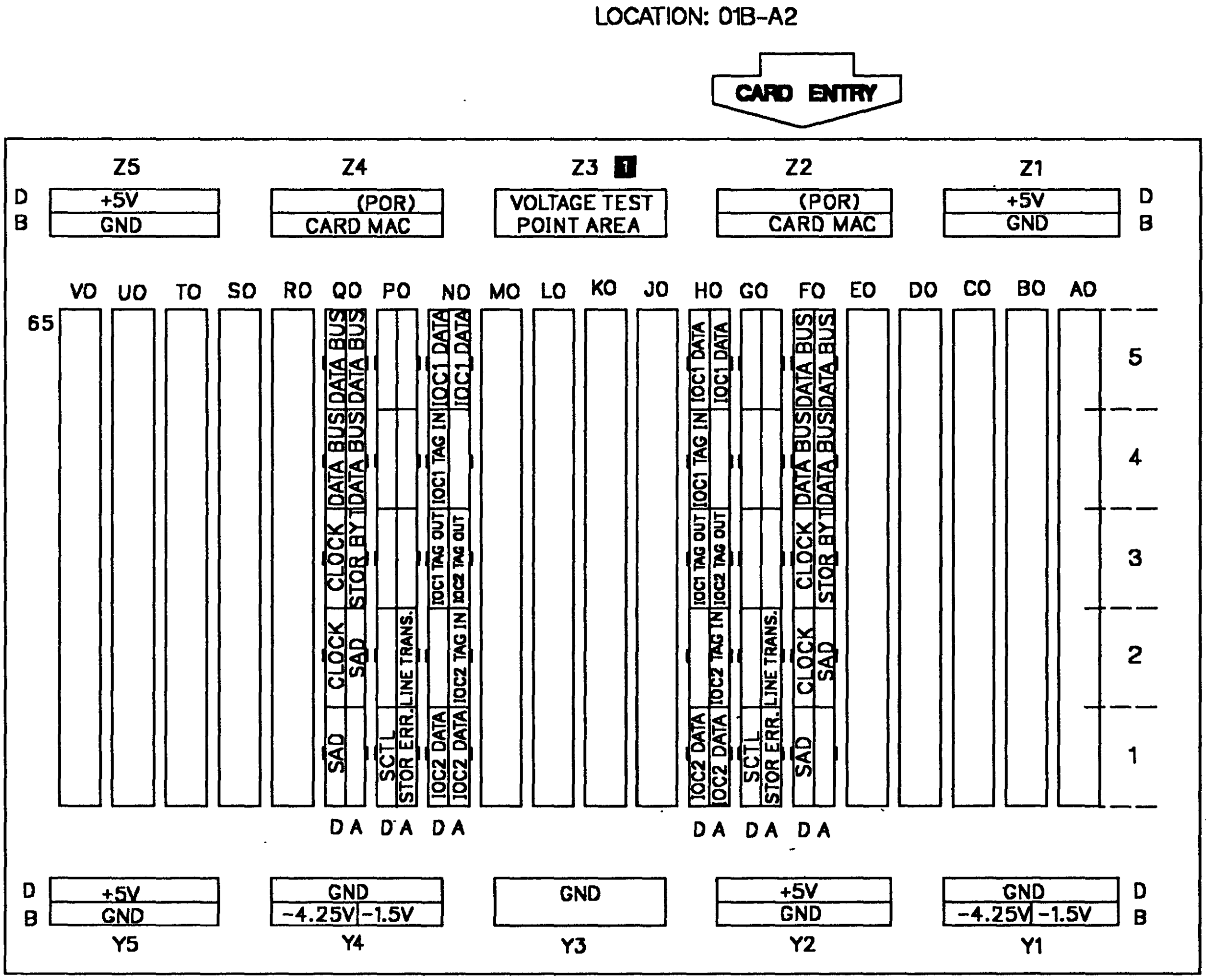


Figure 5-12. 3745 SACU2 Board and Connectors for Models 310 and 610

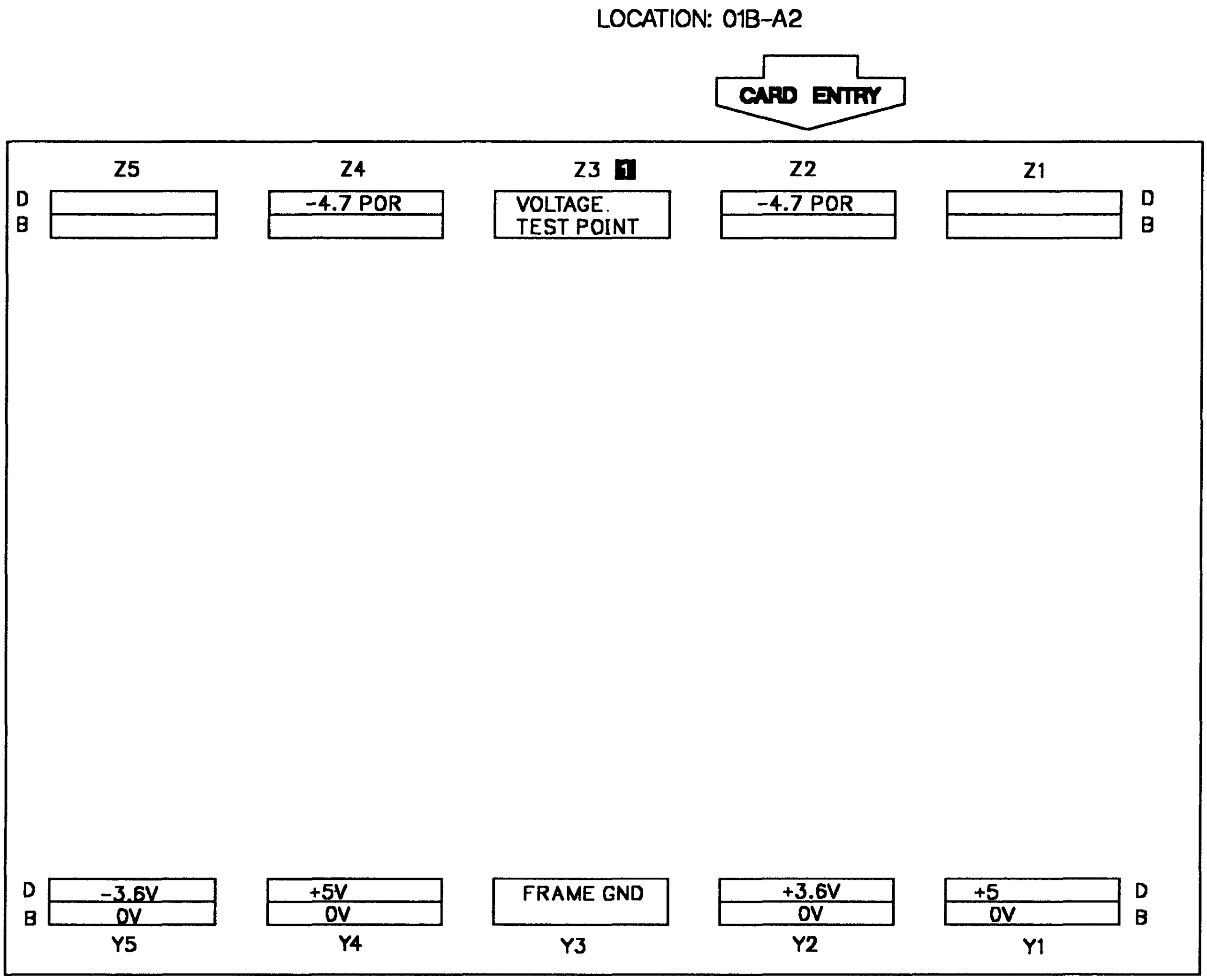
SACL Board and Connectors for Models 210 and 410



1 See Power Supply chapter in the MIR for details.

Figure 5-13. 3745 SACL Board and Connectors for Models 210 and 410

SACL2 Board and Connectors for Models 310 and 610



1 See Power Supply chapter in the MIR for details.

Figure 5-14. 3745 SACL2 Board and Connectors for Models 310 and 610

TCM Board Front

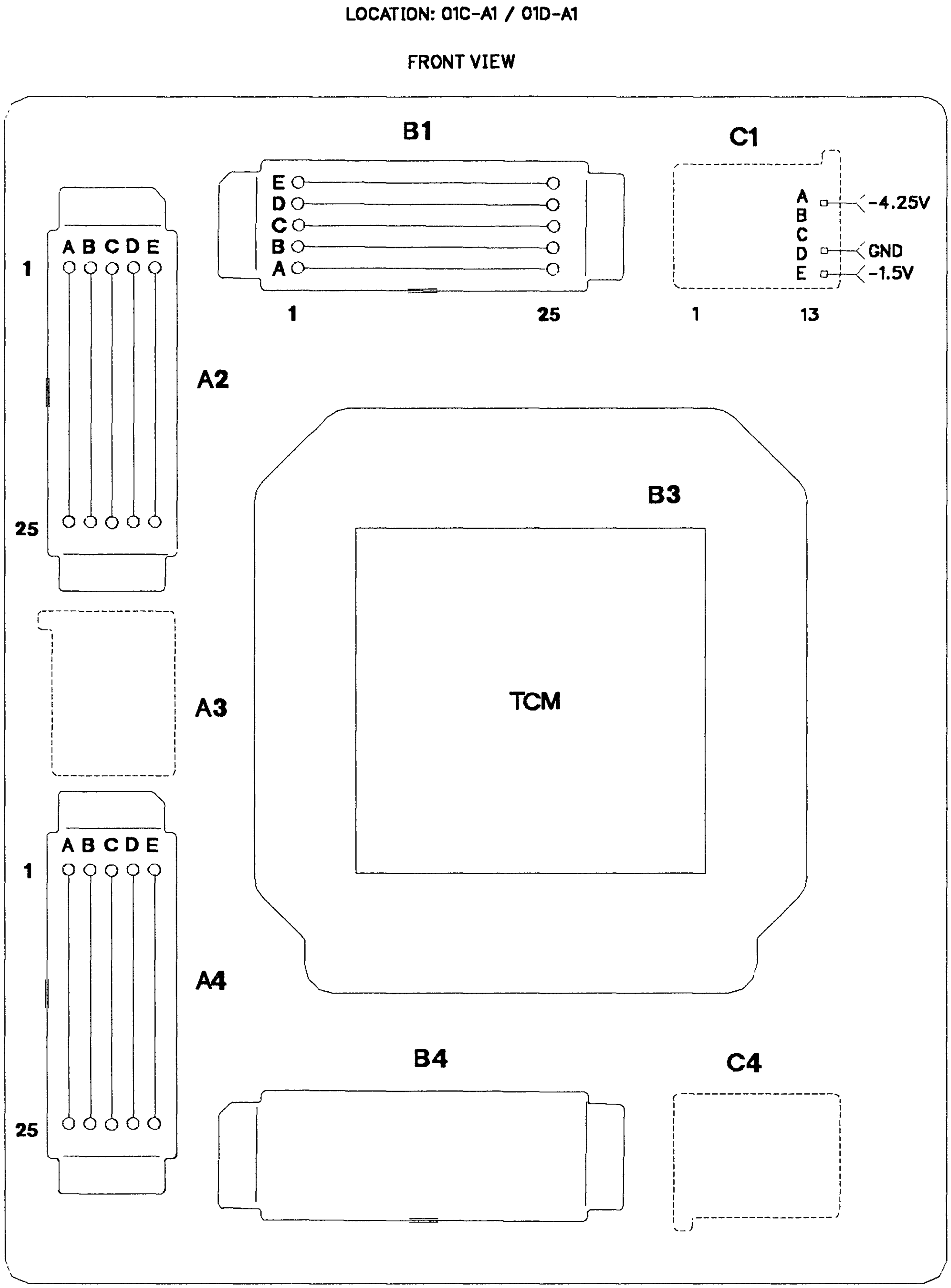


Figure 5-15. 3745 TCM Board and Connectors (Front)

TCM Board Rear

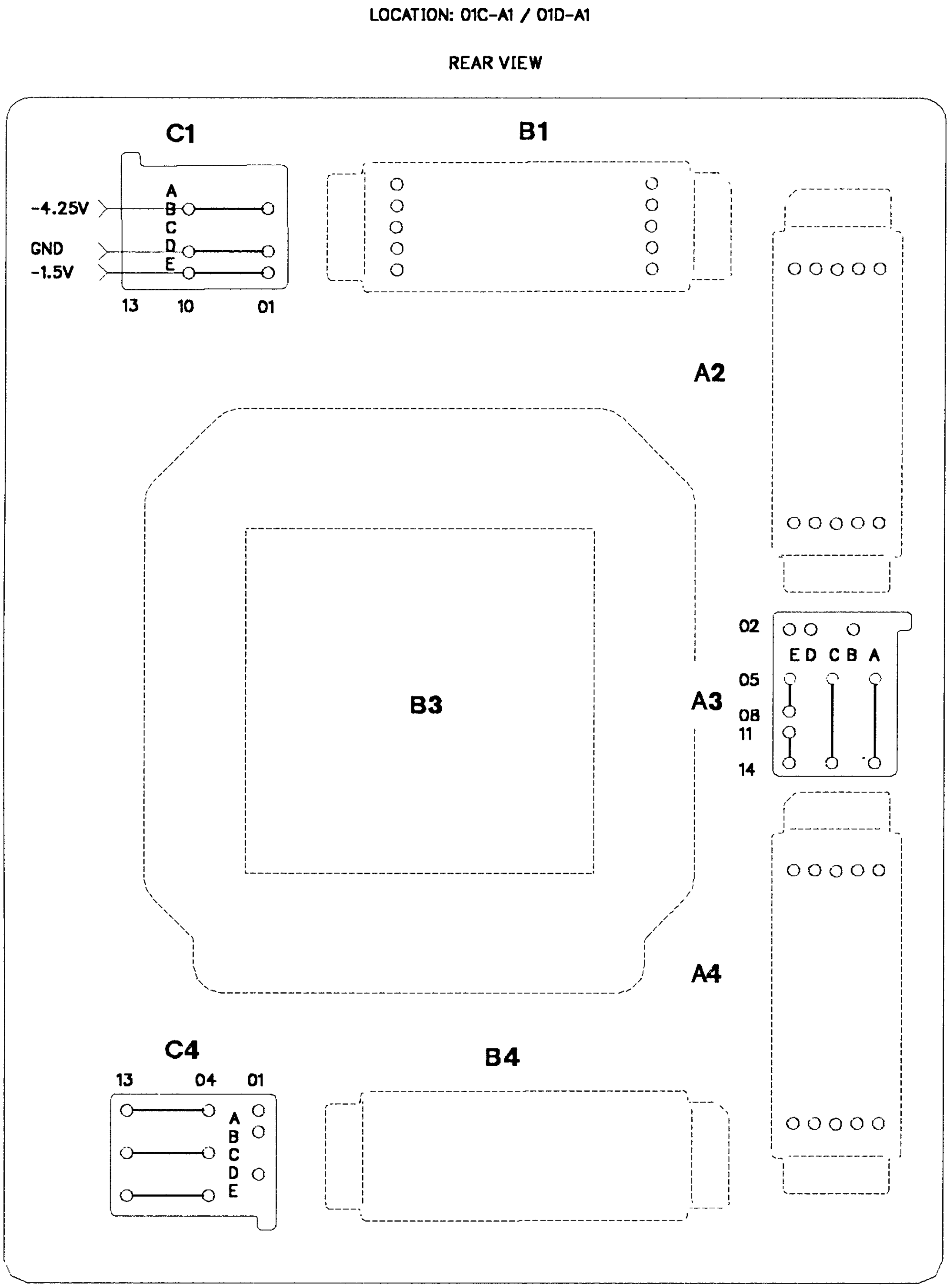
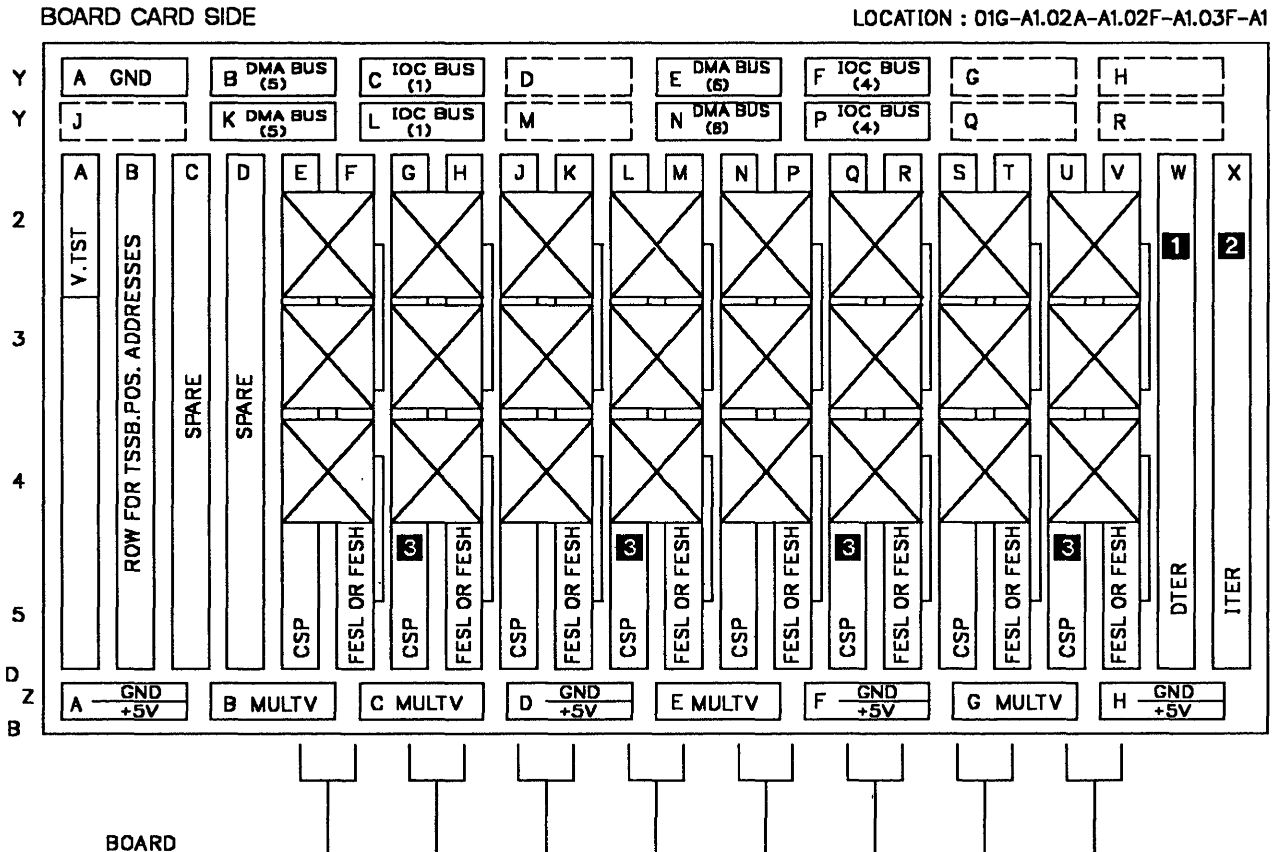


Figure 5-16. 3745 TCM Board and Connectors (Rear)

TSSB Board and Cards



01G-A1	LA01	LA02	LA03	LA04	LA05	LA06	LA07	LA08	
02A-A1	LA09	LA10	LA11	LA12	LA13	LA14	LA15	LA16	
02F-A1	LA17	LA18	LA19	LA20	LA21	LA22	LA23	LA24	
03F-A1	LA25	LA26	LA27	LA28	LA29	LA30	LA31	LA32	

1 Card present when HPTSS installed

2 Either Card or flat cables

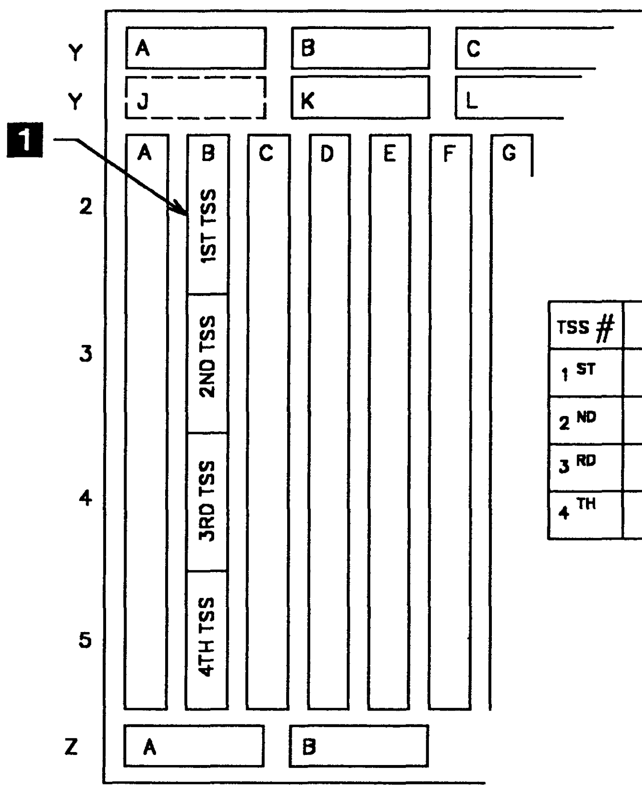
3 Install bypass CARD BPC1 in missing CSP positions to insure the bus continuity between scanners, except for the case when the first adapter of the group is the last adapter of the bus.

Figure 5-17. 3745 TSSB Board and Cards

TSSB Board and Connectors

LOCATIONS : 01G-A1, 02A-A1, 02F-A1, 03F-A1

BOARD CARD SIDE



BOARD ADDRESSING **1**

TSS #	BOARD LOCATION	PLUG ADDR.CARD ON POSITION	PWR SUPP. PLUG JUMPER
1 ST	01G-A1	B2	NO
2 ND	02A-A1	B3	NO
3 RD	02F-A1	B4	YES
4 TH	03F-A1	B5	NO

Figure 5-18. 3745 TSSB Board and Connectors

TSST Board and Cards

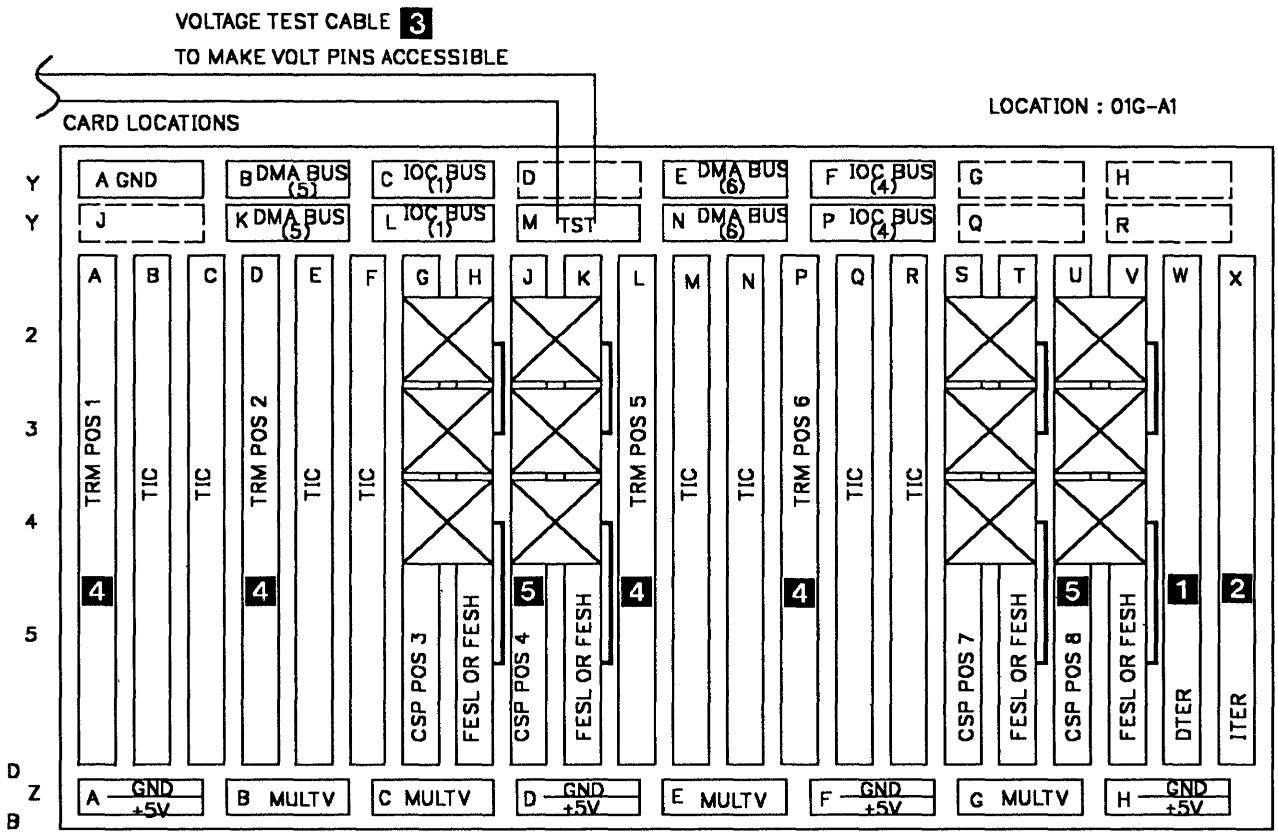


Figure 5-19. 3745 TSST Board Cards and Connectors

1 CARD present when HPTSS installed

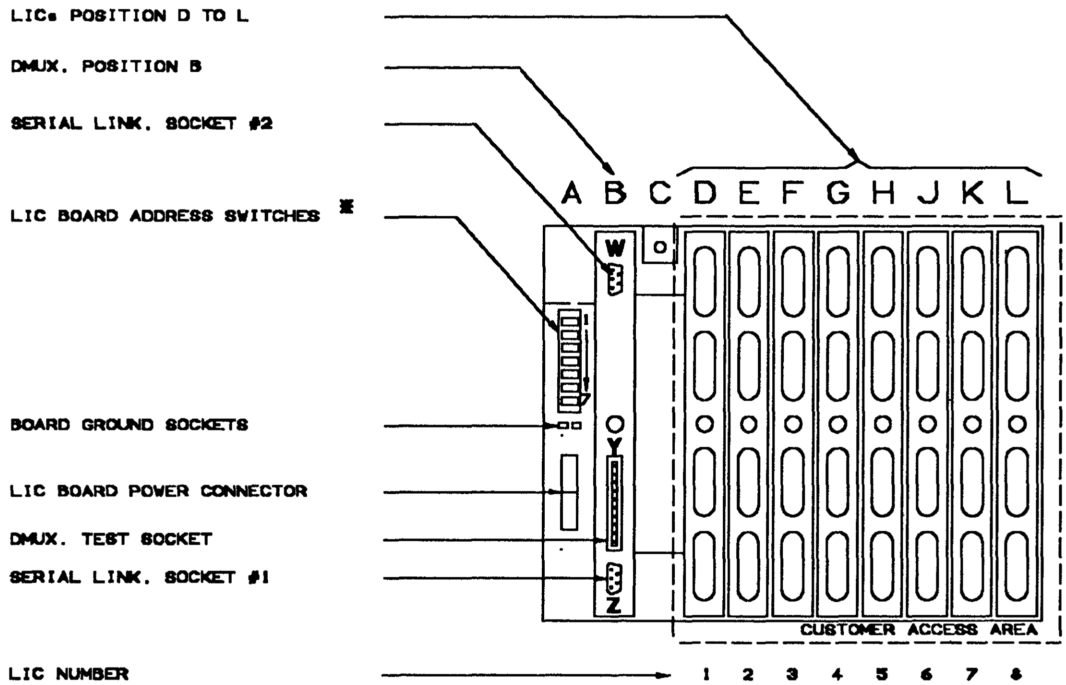
2 either a CARD or flat cable

3 going to voltage test connector located on the left side on board 01G-A1

4 install bypass CARD BPC2 in missing TRM positions to insure the bus continuity between scanners

5 install bypass CARD BPC1 in missing CSP positions to insure the bus continuity between scanners, except if the first adapter of the group is the last adapter of the bus.

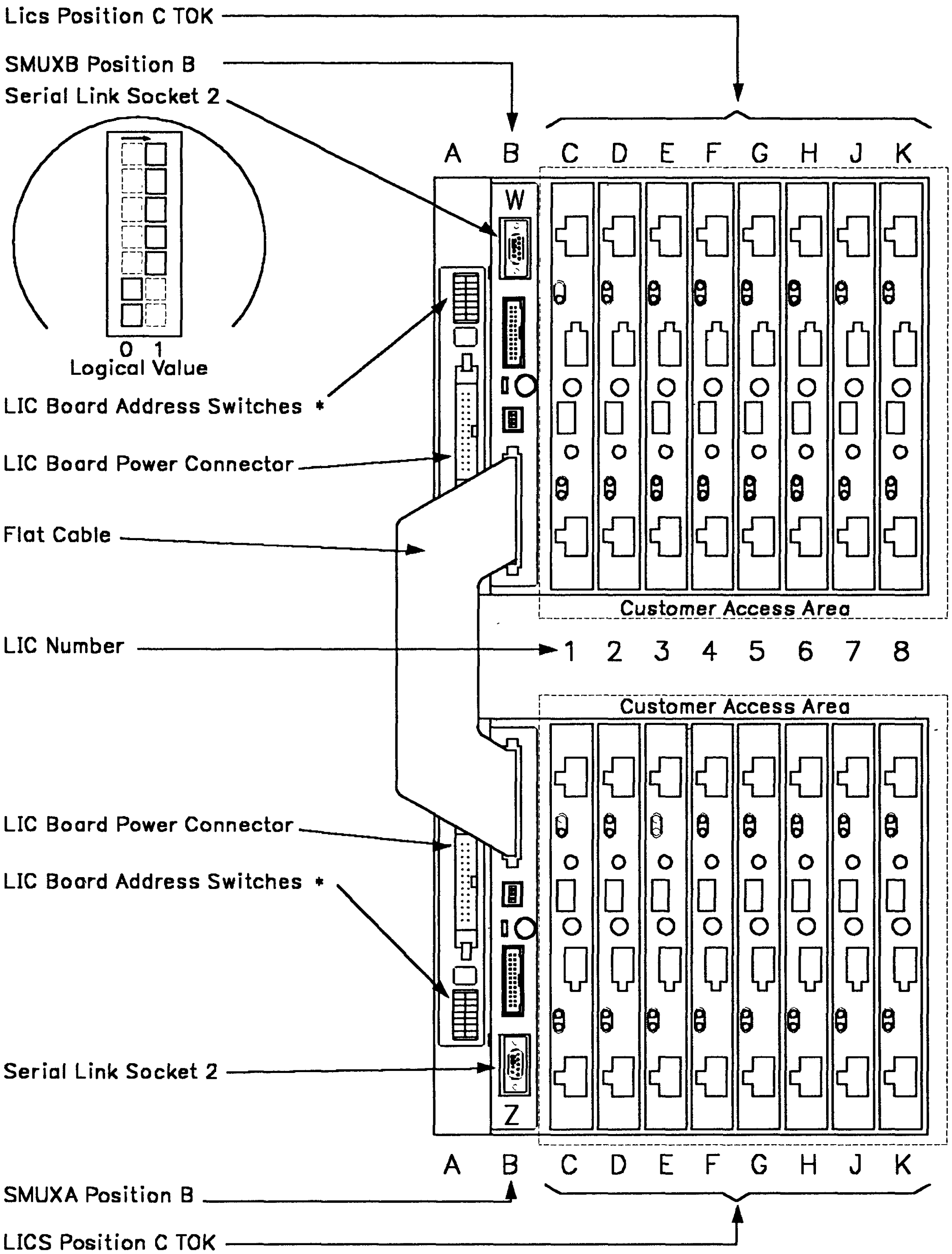
LIC Board Type 1



* See details page 5-140.

Figure 5-20. 3745 LIC Unit Type 1 Board and Connectors

LIC Board type 2



* See details page 5-144.

Figure 5-21. 3745 LIC Unit type 2 Board and Connectors

DMUX Packaging

MUX Number Connector Z	W	DMUX Location
1	2	01P-B2-B1
3	4	01P-B1-B1
5	6	01M-B2-B1
7	8	01M-B1-B1
9	10	04D-B2-B1
11	12	04D-B1-B1
13	14	04G-B2-B1
15	16	04G-B1-B1
17	18	04B-B2-B1
19	20	04B-B1-B1
21	22	04E-B2-B1
23	24	04E-B1-B1
25	26	05D-B2-B1
27	28	05D-B1-B1

MUX Number Connector Z	W	DMUX Location
29	30	05G-B2-B1
31	32	05G-B1-B1
33	34	05B-B2-B1
35	36	05B-B1-B1
37	38	05E-B2-B1
39	40	05E-B1-B1
41	42	06D-B2-B1
43	44	06D-B1-B1
45	46	06G-B2-B1
47	48	06G-B1-B1
49	50	06B-B2-B1
51	52	06B-B1-B1
53	54	06E-B2-B1
55	56	06E-B1-B1

Figure 5-22. 3745 DMUX Packaging

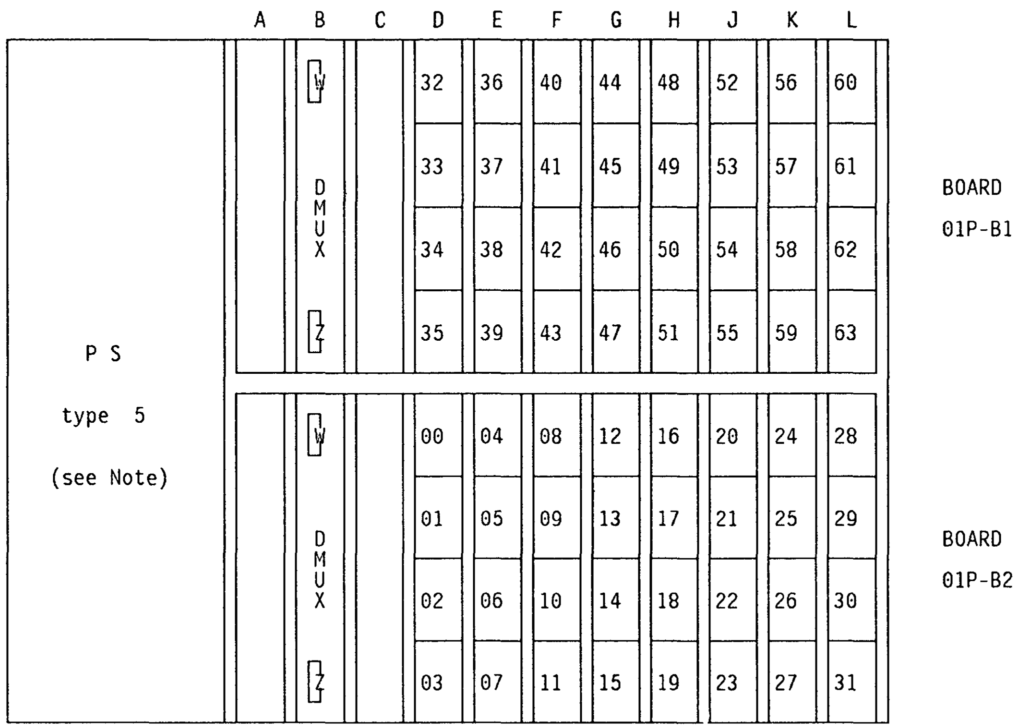
SMUXA/B Packaging

MUX Number Connector Z	W	SMUX Location
NA	NA	01P-B2-B1
NA	NA	01P-B1-B1
5	NA	01M-B2-B1
NA	7	01M-B1-B1
9	NA	04D-B2-B1
NA	11	04D-B1-B1
13	NA	04G-B2-B1
NA	15	04G-B1-B1
17	NA	04B-B2-B1
NA	19	04B-B1-B1
21	NA	04E-B2-B1
NA	23	04E-B1-B1
25	NA	05D-B2-B1
NA	27	05D-B1-B1

MUX Number Connector Z	W	SMUX Location
29	NA	05G-B2-B1
NA	31	05G-B1-B1
33	NA	05B-B2-B1
NA	35	05B-B1-B1
37	NA	05E-B2-B1
NA	39	05E-B1-B1
41	NA	06D-B2-B1
NA	43	06D-B1-B1
45	NA	06G-B2-B1
NA	47	06G-B1-B1
49	NA	06B-B2-B1
NA	51	06B-B1-B1
53	NA	06E-B2-B1
NA	55	06E-B1-B1

Figure 5-23. 3745 SMUXA/B Packaging

LIC Unit Type 1 Packaging for LIC Type 1-4



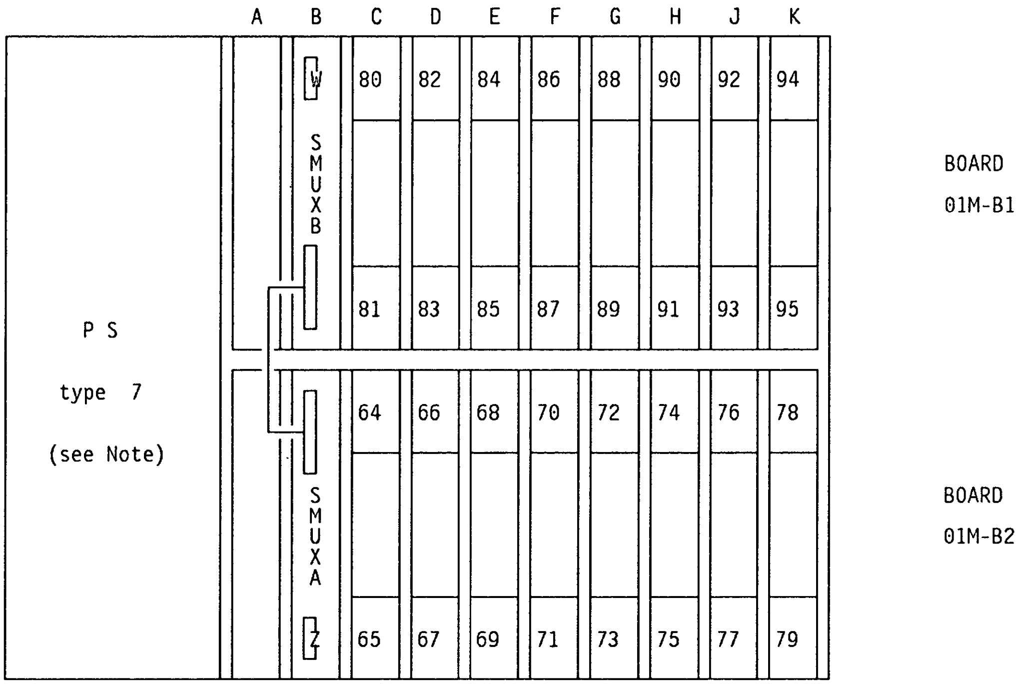
Note: Refer to Vol 4, page YZ075 for PS type 5 addressing switches.

Figure 5-24. LIC Unit Type 1 Packaging (for LIC Type 1-4)

Boards	Lines (LIC 1-4)	Lines (LIC 5-6)
01P-B1/B2	000-063	NA
01M-B1/B2	064-127	064-095
04D-B1/B2	128-191	128-159
04G-B1/B2	192-255	192-223
04B-B1/B2	256-319	256-287
04E-B1/B2	320-383	320-351
05D-B1/B2	384-447	384-415
05G-B1/B2	448-511	448-479
05B-B1/B2	512-575	512-543
05E-B1/B2	576-639	576-607
06D-B1/B2	640-703	640-671
06G-B1/B2	704-767	704-735
06B-B1/B2	768-831	768-799
06E-B1/B2	832-895	832-863

Figure 5-25. Line Numbers and Boards (for LIC Type 1-6)

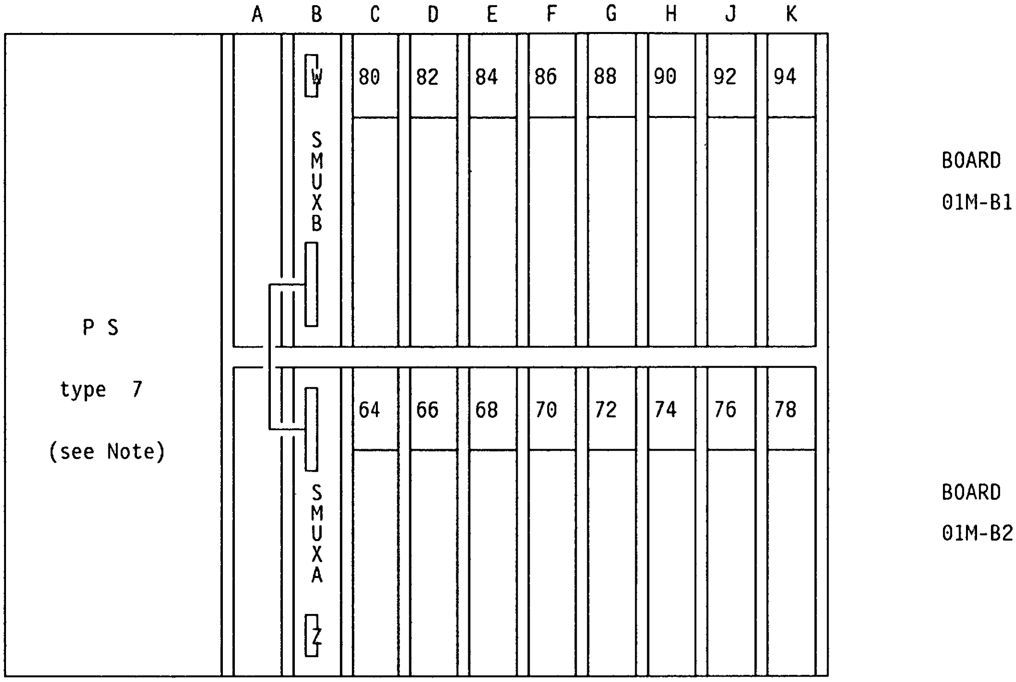
LIC Unit Type 2 Packaging for LIC Type 5



Note: Refer to Vol 4, page YZ077 for PS type 7 addressing switches.
Note: LICs type 5 and 6 can be mixed in this board.

Figure 5-26. LIC Unit Type 2 Packaging (for LIC Type 5)

LIC Unit Type 2 Packaging for LIC Type 6 Low-speed



Note: Refer to Vol 4, page YZ077 for PS type 7 addressing switches.
Note: LICs type 5 and 6 can be mixed in this board.

Figure 5-27. LIC Unit Type 2 Packaging for LIC Type 6 Low-speed

LIC Unit Type 2 Packaging for LIC Type 6 High-speed

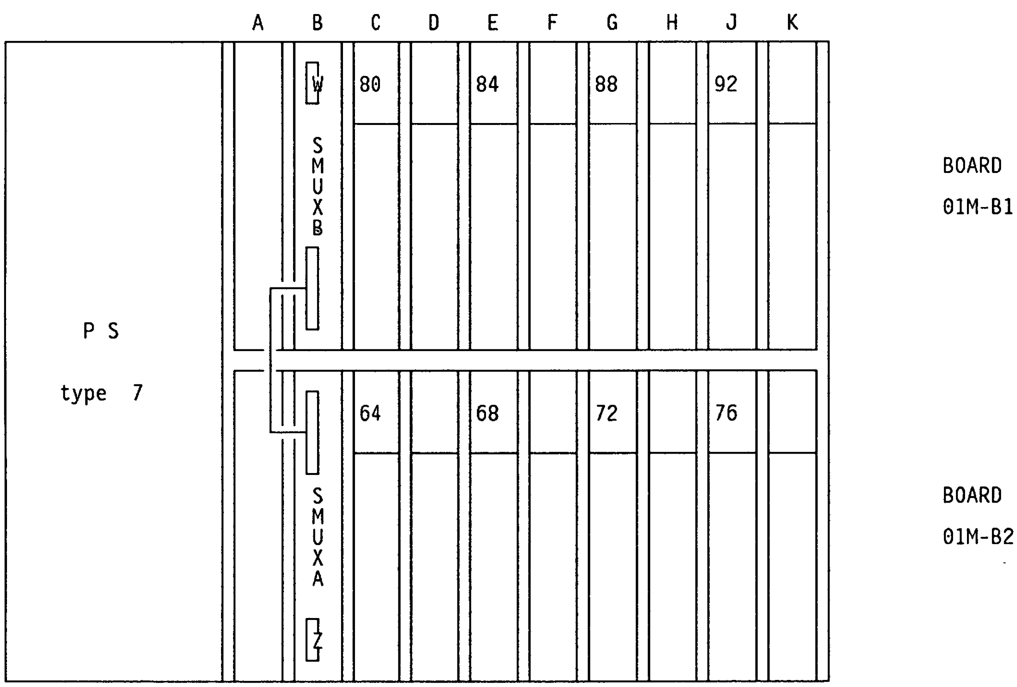


Figure 5-28. LIC Unit Type 2 Packaging for LIC Type 6 High-speed

LIC Unit type 1 Layout Board B2 (for LIC type 1-4)

BOARD	CARD POSITION								
	DMUX	LIC							
	B	D	E	F	G	H	J	K	L
01P-B2	W = 1 Z = 2	000 001 002 003	004 005 006 007	008 009 010 011	012 013 014 015	016 017 018 019	020 021 022 023	024 025 026 027	028 029 030 031
01M-B2	W = 5 Z = 6	064 065 066 067	068 069 070 071	072 073 074 075	076 077 078 079	080 081 082 083	084 085 086 087	088 089 090 091	092 093 094 095
04D-B2	W = 9 Z = 10	128 129 130 131	132 133 134 135	136 137 138 139	140 141 142 143	144 145 146 147	148 149 150 151	152 153 154 155	156 157 158 159
04G-B2	W = 13 Z = 14	192 193 194 195	196 197 198 199	200 201 202 203	204 205 206 207	208 209 210 211	212 213 214 215	216 217 218 219	220 221 222 223
04B-B2	W = 17 Z = 18	256 257 258 259	260 261 262 263	264 265 266 267	268 269 270 271	272 273 274 275	276 277 278 279	280 281 282 283	284 285 286 287
04E-B2	W = 21 Z = 22	320 321 322 323	324 325 326 327	328 329 330 331	332 333 334 335	336 337 338 339	340 341 342 343	344 345 346 347	348 349 350 351
05D-B2	W = 25 Z = 26	384 385 386 387	388 389 390 391	392 393 394 395	396 397 398 399	400 401 402 403	404 405 406 407	408 409 410 411	412 413 414 415
05G-B2	W = 29 Z = 30	448 449 450 451	452 453 454 455	456 457 458 459	460 461 462 463	464 465 466 467	468 469 470 471	472 473 474 475	476 477 478 479
05B-B2	W = 33 Z = 34	512 513 514 515	516 517 518 519	520 521 522 523	524 525 526 527	528 529 530 531	532 533 534 535	536 537 538 539	540 541 542 543
05E-B2	W = 37 Z = 38	576 577 578 579	580 581 582 583	584 585 586 587	588 589 590 591	592 593 594 595	596 597 598 599	600 601 602 603	604 605 606 607
06D-B2	W = 41 Z = 42	640 641 642 643	644 645 646 647	648 649 650 651	652 653 654 655	656 657 658 659	660 661 662 663	664 665 666 667	668 669 670 671
06G-B2	W = 45 Z = 46	704 705 706 707	708 709 710 711	712 713 714 715	716 717 718 719	720 721 722 723	724 725 726 727	728 729 730 731	732 733 734 735
06B-B2	W = 49 Z = 50	768 769 770 771	772 773 774 775	776 777 778 779	780 781 782 783	784 785 786 787	788 789 790 791	792 793 794 795	796 797 798 799
06E-B2	W = 53 Z = 54	832 833 834 835	836 837 838 839	840 841 842 843	844 845 846 847	848 849 850 851	852 853 854 855	856 857 858 859	860 861 862 863

Figure 5-29. LIC Unit Type 1 Layout Board B2 (for LIC Type 1-4)

LIC Unit Type 1 Layout Board B1 (for LIC Type 1-4)

BOARD	CARD POSITION								
	DMUX	LIC							
	B	D	E	F	G	H	J	K	L
01P-B1	W = 3 Z = 4	032 033 034 035	036 037 038 039	040 041 042 043	044 045 046 047	048 049 050 051	052 053 054 055	056 057 058 059	060 061 062 063
01M-B1	W = 7 Z = 8	096 097 098 099	100 101 102 103	104 105 106 107	108 109 110 111	112 113 114 115	116 117 118 119	120 121 122 123	124 125 126 127
04D-B1	W = 11 Z = 12	160 161 162 163	164 165 166 167	168 169 170 171	172 173 174 175	176 177 178 179	180 181 182 183	184 185 186 187	188 189 190 191
04G-B1	W = 15 Z = 16	224 225 226 227	228 229 230 231	232 233 234 235	236 237 238 239	240 241 242 243	244 245 246 247	248 249 250 251	252 253 254 255
04B-B1	W = 19 Z = 20	288 289 290 291	292 293 294 295	296 297 298 299	300 301 302 303	304 305 306 307	308 309 310 311	312 313 314 315	316 317 318 319
04E-B1	W = 23 Z = 24	352 353 354 355	356 357 358 359	360 361 362 363	364 365 366 367	368 369 370 371	372 373 374 375	376 377 378 379	380 381 382 383
05D-B1	W = 27 Z = 28	416 417 418 419	420 421 422 423	424 425 426 427	428 429 430 431	432 433 434 435	436 437 438 439	440 441 442 443	444 445 446 447
05G-B1	W = 31 Z = 32	480 481 482 483	484 485 486 487	488 489 490 491	492 493 494 495	496 497 498 499	500 501 502 503	504 505 506 507	508 509 510 511
05B-B1	W = 35 Z = 36	544 545 546 547	548 549 550 551	552 553 554 555	556 557 558 559	560 561 562 563	564 565 566 567	568 569 570 571	572 573 574 575
05E-B1	W = 39 Z = 40	608 609 610 611	612 613 614 615	616 617 618 619	620 621 622 623	624 625 626 627	628 629 630 631	632 633 634 635	636 637 638 639
06D-B1	W = 43 Z = 44	672 673 674 675	676 677 678 679	680 681 682 683	684 685 686 687	688 689 690 691	692 693 694 695	696 697 698 699	700 701 702 703
06G-B1	W = 47 Z = 48	736 737 738 739	740 741 742 743	744 745 746 747	748 749 750 751	752 753 754 755	756 757 758 759	760 761 762 763	764 765 766 767
06B-B1	W = 51 Z = 52	800 801 802 803	804 805 806 807	808 809 810 811	812 813 814 815	816 817 818 819	820 821 822 823	824 825 826 827	828 829 830 831
06E-B1	W = 55 Z = 56	864 865 866 867	868 869 870 871	872 873 874 875	876 877 878 879	880 881 882 883	884 885 886 887	888 889 890 891	892 893 894 895

Figure 5-30. LIC Unit Type 1 Layout Board B1 (for LIC Type 1-4)

LIC Unit Type 2 Layout Board B2 (for LIC Type 5)

Note:

- LICs 5, LICs 6(low-speed), and LICs 6(high-speed) may be intermixed on a given board.
- A pair of LICs may be made up of a LIC 5 and a LIC 6 (low-speed).

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B2	W = NA Z = 5	064 065	066 067	068 069	070 071	072 073	074 075	076 077	078 079
04D-B2	W = NA Z = 9	128 129	130 131	132 133	134 135	136 137	138 139	140 141	142 143
04G-B2	W = NA Z = 13	192 194	194 196	196 197	198 199	200 201	202 203	204 205	206 207
04B-B2	W = NA Z = 17	256 257	258 259	260 261	262 263	264 265	266 267	268 269	270 271
04E-B2	W = NA Z = 21	320 321	322 323	324 325	326 327	328 329	330 331	332 333	334 335
05D-B2	W = NA Z = 25	384 385	386 387	388 389	390 391	392 393	394 395	396 397	398 399
05G-B2	W = NA Z = 29	448 449	350 351	452 453	454 455	456 457	458 459	460 461	462 463
05B-B2	W = NA Z = 33	512 513	514 515	516 517	518 519	520 521	522 523	524 525	526 527
05E-B2	W = NA Z = 37	576 577	578 579	580 581	582 583	584 585	586 587	588 589	590 591
06D-B2	W = NA Z = 41	640 641	642 643	644 645	646 647	648 649	650 651	652 653	654 655
06G-B2	W = NA Z = 45	704 705	706 707	708 709	710 711	712 713	714 715	716 717	718 719
06B-B2	W = NA Z = 49	768 769	770 771	772 773	774 775	776 777	778 779	780 781	782 783
06E-B2	W = NA Z = 53	832 50833	834 835	836 837	838 839	840 841	842 843	844 845	846 847

Figure 5-31. LIC Unit Type 2 Layout Board B2 (for LIC Type 5)

LIC Unit Type 2 Layout Board B1 (for LIC Type 5)

Note:

- LICs 5, LICs 6(low-speed), and LICs 6(high-speed) may be intermixed on a given board.
- A pair of LICs may be made up of a LIC 5 and a LIC 6 (low-speed).

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B1	W = 7 Z = NA	080 081	082 083	084 085	086 087	088 089	090 091	092 093	094 095
04D-B1	W = 11 Z = NA	144 145	146 147	148 149	150 151	152 153	154 155	156 157	158 159
04G-B1	W = 15 Z = NA	208 209	210 211	212 213	214 215	216 217	218 219	220 221	222 223
04B-B1	W = 19 Z = NA	272 273	274 275	276 277	278 279	280 281	282 283	284 285	286 287
04E-B1	W = 23 Z = NA	336 337	338 339	340 341	342 343	344 345	346 347	348 349	350 351
05D-B1	W = 27 Z = NA	400 401	402 403	404 405	406 407	408 409	410 411	412 413	414 415
05G-B1	W = 31 Z = NA	464 465	366 367	468 469	470 471	472 473	474 475	476 477	478 479
05B-B1	W = 35 Z = NA	528 529	530 531	532 533	534 535	536 537	538 539	540 541	542 543
05E-B1	W = 39 Z = NA	592 593	594 595	596 597	598 599	600 601	602 603	604 605	606 607
06D-B1	W = 43 Z = NA	656 657	658 659	660 661	662 663	664 665	666 667	668 669	670 671
06G-B1	W = 47 Z = NA	720 721	722 723	724 725	726 727	728 729	730 731	732 733	734 735
06B-B1	W = 51 Z = NA	784 785	786 787	788 789	790 791	792 793	794 795	796 797	798 799
06E-B1	W = 55 Z = NA	848 849	850 851	852 853	854 855	856 857	858 859	860 861	862 863

Figure 5-32. LIC Unit Type 2 Layout Board B1 (for LIC Type 5)

LIC Unit Type 2 Layout Board B2 (for LIC Type 6 Low-speed)

Note:

- LICs 5, LICs 6(low-speed), and LICs 6(high-speed) may be intermixed on a given board.
- A pair of LICs may be made up of a LIC 5 and a LIC 6 (low-speed).

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B2	Z=5	064	066	068	070	072	074	076	078
04D-B2	Z=9	128	130	132	134	136	138	140	142
04G-B2	Z=13	192	194	196	198	200	202	204	206
04B-B2	Z=17	256	258	260	262	264	266	268	270
04E-B2	Z=21	320	322	324	326	328	330	332	334
05D-B2	Z=25	384	386	388	390	392	394	396	398
05G-B2	Z=29	448	350	452	454	456	458	460	462
05B-B2	Z=33	512	514	516	518	520	522	524	526
05E-B2	Z=37	576	578	580	582	584	586	588	590
06D-B2	Z=41	640	642	644	646	648	650	652	654
06G-B2	Z=45	704	706	708	710	712	714	716	718
06B-B2	Z=49	768	770	772	774	776	778	780	782
06E-B2	Z=53	832	834	836	838	840	842	844	846

Figure 5-33. LIC Unit Type 2 Layout Board B2 (for LIC Type 6 Low-speed)

LIC Unit Type 2 Layout Board B1 (for LIC Type 6 Low-speed)

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B1	W=7	080	082	084	086	088	090	092	094
04D-B1	W=11	144	146	148	150	152	154	156	158
04G-B1	W=15	208	210	212	214	216	218	220	222
04B-B1	W=19	272	274	276	278	280	282	284	286
04E-B1	W=23	336	338	340	342	344	346	348	350
05D-B1	W=27	400	402	404	406	408	410	412	414
05G-B1	W=31	464	366	468	470	472	474	476	478
05B-B1	W=35	528	510	512	514	516	518	520	522
05E-B1	W=39	592	594	596	598	600	602	604	606
06D-B1	W=43	656	658	660	662	664	666	668	670
06G-B1	W=47	720	722	724	726	728	730	732	734
06B-B1	W=51	784	786	788	790	792	794	796	798
06E-B1	W=55	848	850	852	854	856	858	860	862

Figure 5-34. LIC Unit Type 2 Layout Board B1 (for LIC Type 6 Low-speed)

LIC Unit Type 2 Layout Board B2 (for LIC Type 6 High-speed)

Note:

- Any card plugged in positions C,E,G,J may also be fitted in positions D,F,H,K.
- If there is a LIC 6(high-speed) in one position of a pair, the other position must be left empty.
- LICs 5, LICs 6(low-speed), and LICs 6(high-speed) may be intermixed on a given board.

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B2	Z=5	064		068		072		076	
04D-B2	Z=9	128		132		136		140	
04G-B2	Z=13	192		196		200		204	
04B-B2	Z=17	256		260		264		268	
04E-B2	Z=21	320		324		328		332	
05D-B2	Z=25	384		388		392		396	
05G-B2	Z=29	448		452		456		460	
05B-B2	Z=33	512		516		520		524	
05E-B2	Z=37	576		580		584		588	
06D-B2	Z=41	640		644		648		652	
06G-B2	Z=45	704		708		712		716	
06B-B2	Z=49	768		772		776		780	
06E-B2	Z=53	832		836		840		844	

Figure 5-35. LIC Unit Type 2 Layout Board B2 (for LIC Type 6 High-speed)

LIC Unit Type 2 Layout Board B1 (for LIC Type 6 High-speed)

BOARD	CARD POSITION								
	SMUX	LIC							
	B	C	D	E	F	G	H	J	K
01M-B1	W=7	080		084		088		092	
04D-B1	W=11	144		148		152		156	
04G-B1	W=15	208		212		216		220	
04B-B1	W=19	272		276		280		284	
04E-B1	W=23	336		340		344		348	
05D-B1	W=27	400		404		408		412	
05G-B1	W=31	464		468		472		476	
05B-B1	W=35	528		532		536		540	
05E-B1	W=39	592		596		600		604	
06D-B1	W=43	656		660		664		668	
06G-B1	W=47	720		724		728		732	
06B-B1	W=51	784		788		792		796	
06E-B1	W=55	848		852		856		860	

Figure 5-36. LIC Unit Type 2 Layout Board B1 (for LIC Type 6 High-speed)

MUX Number / LIC Number / LINE Address Tables

Frame 01

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
01M-B1-B1								
01M-B1-C1		N.A	041	041	N.A.	080-081	080	080
01M-B1-D1	for LIC 1-4	025	042	041	096-099	082-083	082	080
01M-B1-E1	Z = 7	026	043	043	100-103	084-085	084	084
01M-B1-F1	W = 8	027	044	043	104-107	086-087	086	084
01M-B1-G1		028	045	045	108-111	088-089	088	088
01M-B1-H1	for LIC 5-6	029	046	045	112-115	090-091	090	088
01M-B1-J1	Z = NA	030	047	047	116-119	092-093	092	092
01M-B1-K1	W = 7	031	048	047	120-123	094-095	094	092
01M-B1-L1		032	N.A	N.A	124-127	N.A.	N.A	N.A
01M-B2-B1								
01M-B2-C1		N.A	033	033	N.A.	064-065	064	064
01M-B2-D1	for LIC 1-4	017	034	033	064-067	066-067	066	064
01M-B2-E1	Z = 5	018	035	035	068-071	068-069	068	068
01M-B2-F1	W = 6	019	036	035	072-075	070-071	070	068
01M-B2-G1		020	037	037	076-079	072-073	072	072
01M-B2-H1	for LIC 5-6	021	038	037	080-083	074-075	074	072
01M-B2-J1	Z = 5	022	039	039	084-087	076-077	076	076
01M-B2-K1	W = NA	023	040	039	088-091	078-079	078	076
01M-B2-L1		024	N.A	N.A	092-095	N.A.	N.A	N.A
01P-B1-B1								
01P-B1-C1		N.A	N.A	N.A	N.A.	N.A	N.A	N.A
01P-B1-D1	for LIC 1-4	009	N.A	N.A	032-035	N.A	N.A	N.A
01P-B1-E1	Z = 3	010	N.A	N.A	036-039	N.A	N.A	N.A
01P-B1-F1	W = 4	011	N.A	N.A	040-043	N.A	N.A	N.A
01P-B1-G1		012	N.A	N.A	044-047	N.A	N.A	N.A
01P-B1-H1	for LIC 5-6	013	N.A	N.A	048-051	N.A	N.A	N.A
01P-B1-J1	Z = NA	014	N.A	N.A	052-055	N.A	N.A	N.A
01P-B1-K1	W = NA	015	N.A	N.A	056-059	N.A	N.A	N.A
01P-B1-L1		016	N.A	N.A	060-063	N.A	N.A	N.A
01P-B2-B1								
01P-B2-C1		N.A	N.A	N.A	N.A.	N.A	N.A	N.A
01P-B2-D1	for LIC 1-4	001	N.A	N.A	000-003	N.A	N.A	N.A
01P-B2-E1	Z = 1	002	N.A	N.A	004-007	N.A	N.A	N.A
01P-B2-F1	W = 2	003	N.A	N.A	008-011	N.A	N.A	N.A
01P-B2-G1		004	N.A	N.A	012-015	N.A	N.A	N.A
01P-B2-H1	for LIC 5-6	005	N.A	N.A	016-019	N.A	N.A	N.A
01P-B2-J1	Z = NA	006	N.A	N.A	020-023	N.A	N.A	N.A
01P-B2-K1	W = NA	007	N.A	N.A	024-027	N.A	N.A	N.A
01P-B2-L1		008	N.A	N.A	028-031	N.A	N.A	N.A

Figure 5-37. LIC Number / Line Address Tables for Frame 01

Frame 04B/D

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
04B-B1-B1								
04B-B1-C1		N.A	137	137	N.A.	272-273	272	272
04B-B1-D1	for LIC 1-4	073	138	137	288-291	274-275	274	272
04B-B1-E1	Z = 19	074	139	139	292-295	276-277	276	276
04B-B1-F1	W = 20	075	140	149	296-299	278-279	278	276
04B-B1-G1		076	141	141	300-303	280-281	280	280
04B-B1-H1	for LIC 5-6	077	142	141	304-307	282-283	282	280
04B-B1-J1	Z = NA	078	143	143	308-311	284-285	284	284
04B-B1-K1	W = 19	079	144	143	312-315	286-287	286	284
04B-B1-L1		080	N.A	N.A	316-319	N.A.	N.A	N.A
04B-B2-B1								
04B-B2-C1		N.A	129	129	N.A.	256-257	256	256
04B-B2-D1	for LIC 1-4	065	130	129	256-259	258-259	258	256
04B-B2-E1	Z = 17	066	131	131	260-263	260-261	260	260
04B-B2-F1	W = 18	067	132	131	264-267	262-263	262	260
04B-B2-G1		068	133	133	268-271	264-265	264	264
04B-B2-H1	for LIC 5-6	069	134	133	272-275	266-267	266	264
04B-B2-J1	Z = 17	070	135	135	276-279	268-269	268	268
04B-B2-K1	W = NA	071	136	135	280-283	270-271	270	268
04B-B2-L1		072	N.A	N.A	284-287	N.A.	N.A	N.A
04D-B1-B1								
04D-B1-C1		N.A	073	073	N.A.	144-145	144	144
04D-B1-D1	for LIC 1-4	041	074	073	160-163	146-147	146	144
04D-B1-E1	Z = 11	042	075	075	164-167	148-149	148	148
04D-B1-F1	W = 12	043	076	075	168-171	150-151	150	148
04D-B1-G1		044	077	077	172-175	152-153	152	152
04D-B1-H1	for LIC 5-6	045	078	077	176-179	154-155	154	152
04D-B1-J1	Z = NA	046	079	079	180-183	156-157	156	156
04D-B1-K1	W = 11	047	080	079	184-187	158-159	158	156
04D-B1-L1		048	N.A	N.A	188-191	N.A.	N.A	N.A
04D-B2-B1								
04D-B2-C1		N.A	065	065	N.A.	128-129	128	128
04D-B2-D1	for LIC 1-4	033	066	065	128-131	130-131	130	128
04D-B2-E1	Z = 9	034	067	067	132-135	132-133	132	132
04D-B2-F1	W = 10	035	068	067	136-139	134-135	134	132
04D-B2-G1		036	069	069	140-143	136-137	136	136
04D-B2-H1	for LIC 5-6	037	070	069	144-147	138-139	138	136
04D-B2-J1	Z = 9	038	071	071	148-151	140-141	140	140
04D-B2-K1	W = NA	039	072	071	152-155	142-143	142	140
04D-B2-L1		040	N.A	N.A	156-159	N.A.	N.A	N.A

Figure 5-38. LIC Number / Line Address for Frame 04B/D

Frame 04E/G

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
04E-B1-B1								
04E-B1-C1		N.A	169	169	N.A.	336-337	336	336
04E-B1-D1	for LIC 1-4	089	170	169	352-355	338-339	338	336
04E-B1-E1	Z = 23	090	171	171	356-359	340-341	340	340
04E-B1-F1	W = 24	091	172	171	360-363	342-343	342	340
04E-B1-G1		092	173	173	364-367	344-345	344	344
04E-B1-H1	for LIC 5-6	093	174	173	368-371	346-347	346	344
04E-B1-J1	Z = NA	094	175	175	372-375	348-349	348	348
04E-B1-K1	W = 23	095	176	175	376-379	350-351	350	348
04E-B1-L1		096	N.A	N.A	380-383	N.A.	N.A	N.A
04E-B2-B1								
04E-B2-C1		N.A	161	161	N.A.	320-321	320	320
04E-B2-D1	for LIC 1-4	081	162	161	320-323	322-323	322	320
04E-B2-E1	Z = 21	082	163	163	324-327	324-325	324	324
04E-B2-F1	W = 22	083	164	163	328-331	326-327	326	324
04E-B2-G1		084	165	165	332-335	328-329	328	328
04E-B2-H1	for LIC 5-6	085	166	165	336-339	330-331	330	328
04E-B2-J1	Z = 21	086	167	167	340-343	332-333	332	332
04E-B2-K1	W = NA	087	168	167	344-347	334-335	334	332
04E-B2-L1		088	N.A	N.A	348-351	N.A.	N.A	N.A
04G-B1-B1								
04G-B1-C1		N.A	105	105	N.A.	208-209	208	208
04G-B1-D1	for LIC 1-4	057	106	105	224-227	210-211	210	208
04G-B1-E1	Z = 15	058	107	107	228-231	212-213	212	212
04G-B1-F1	W = 16	059	108	107	232-235	214-215	214	212
04G-B1-G1		060	109	109	236-239	216-217	216	216
04G-B1-H1	for LIC 5-6	061	110	109	240-243	218-219	218	216
04G-B1-J1	Z = NA	062	111	111	244-247	220-221	220	220
04G-B1-K1	W = 15	063	112	111	248-251	222-223	222	220
04G-B1-L1		064	N.A	N.A	252-255	N.A.	N.A	N.A
04G-B2-B1								
04G-B2-C1		N.A	097	097	N.A.	192-193	192	192
04G-B2-D1	for LIC 1-4	049	098	097	192-195	194-195	194	192
04G-B2-E1	Z = 13	050	099	099	196-199	196-197	196	196
04G-B2-F1	W = 14	051	100	099	200-203	198-199	198	196
04G-B2-G1		052	101	101	204-207	200-201	200	200
04G-B2-H1	for LIC 5-6	053	102	101	208-211	202-203	202	200
04G-B2-J1	Z = 13	054	103	103	212-215	204-205	204	204
04G-B2-K1	W = NA	055	104	103	216-219	206-207	206	204
04G-B2-L1		056	N.A	N.A	220-223	N.A.	N.A	N.A

Figure 5-39. LIC Number / Line Address for Frame 04E/G

Frame 05B/D

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
05B-B1-B1								
05B-B1-C1		N.A	265	265	N.A.	528-529	528	528
05B-B1-D1	for LIC 1-4	137	266	265	544-547	530-531	530	528
05B-B1-E1	Z = 35	138	267	267	548-551	532-533	532	532
05B-B1-F1	W = 36	139	268	267	552-555	534-535	534	532
05B-B1-G1		140	269	269	556-559	536-537	536	536
05B-B1-H1	for LIC 5-6	141	270	269	560-563	538-539	538	536
05B-B1-J1	Z = NA	142	271	271	564-567	540-541	540	540
05B-B1-K1	W = 35	143	272	271	568-571	542-543	542	540
05B-B1-L1		144	N.A	N.A	572-575	N.A.	N.A	N.A
05B-B2-B1								
05B-B2-C1		N.A	257	257	N.A.	512-513	512	512
05B-B2-D1	for LIC 1-4	129	258	257	512-515	514-515	514	512
05B-B2-E1	Z = 33	130	259	259	516-519	516-517	516	516
05B-B2-F1	W = 34	131	260	259	520-523	518-519	518	516
05B-B2-G1		132	261	261	524-527	520-521	520	520
05B-B2-H1	for LIC 5-6	133	262	261	528-531	522-523	522	520
05B-B2-J1	Z = 33	134	263	263	532-535	524-525	524	524
05B-B2-K1	W = NA	135	264	263	536-539	526-427	526	524
05B-B2-L1		136	N.A	N.A	540-543	N.A.	N.A	N.A
05D-B1-B1								
05D-B1-C1		N.A	201	201	N.A.	400-403	400	400
05D-B1-D1	for LIC 1-4	105	202	201	416-419	404-405	402	400
05D-B1-E1	Z = 27	106	203	203	420-423	406-407	404	404
05D-B1-F1	W = 28	107	204	203	424-427	408-409	406	404
05D-B1-G1		108	205	205	428-431	410-411	408	408
05D-B1-H1	for LIC 5-6	109	206	205	432-435	412-413	410	408
05D-B1-J1	Z = NA	110	207	207	436-439	414-415	412	412
05D-B1-K1	W = 27	111	208	207	440-443	416-417	414	412
05D-B1-L1		112	N.A	N.A	444-447	N.A.	N.A	N.A
05D-B2-B1								
05D-B2-C1		N.A	193	193	N.A.	384-385	384	384
05D-B2-D1	for LIC 1-4	097	194	193	384-387	386-387	386	384
05D-B2-E1	Z = 25	098	195	195	388-391	388-389	388	388
05D-B2-F1	W = 26	099	196	195	392-395	390-391	390	388
05D-B2-G1		100	197	197	396-399	392-393	392	392
05D-B2-H1	for LIC 5-6	101	198	197	400-403	394-395	394	392
05D-B2-J1	Z = 25	102	199	199	404-407	396-397	396	396
05D-B2-K1	W = NA	103	200	119	408-411	398-399	398	396
05D-B2-L1		104	N.A	N.A	412-415	N.A.	N.A	N.A

Figure 5-40. LIC Number / Line Address for Frame 05B/D

Frame 05E/G

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
05E-B1-B1								
05E-B1-C1		N.A	297	297	N.A.	592-593	592	592
05E-B1-D1	for LIC 1-4	153	298	297	608-611	594-595	594	592
05E-B1-E1	Z = 39	154	299	299	612-615	596-597	596	596
05E-B1-F1	W = 40	155	300	299	616-619	598-599	598	596
05E-B1-G1		156	301	301	620-623	600-601	600	600
05E-B1-H1	for LIC 5-6	157	302	301	624-627	602-603	602	600
05E-B1-J1	Z = NA	158	303	303	628-631	604-605	604	604
05E-B1-K1	W = 39	159	304	303	632-635	606-607	606	604
05E-B1-L1		160	N.A	N.A	636-639	N.A.	N.A	N.A
05E-B2-B1								
05E-B2-C1		N.A	289	289	N.A.	576-577	576	576
05E-B2-D1	for LIC 1-4	145	290	289	576-579	578-579	578	576
05E-B2-E1	Z = 37	146	291	291	580-583	580-581	580	580
05E-B2-F1	W = 38	147	292	291	584-587	582-583	582	580
05E-B2-G1		148	293	293	588-591	584-585	584	584
05E-B2-H1	for LIC 5-6	149	294	293	592-595	586-587	586	584
05E-B2-J1	Z = 37	150	295	295	596-599	588-589	588	588
05E-B2-K1	W = NA	151	296	295	600-603	590-591	590	588
05E-B2-L1		152	N.A	N.A	604-607	N.A.	N.A	N.A
05G-B1-B1								
05G-B1-C1		N.A	233	233	N.A.	464-465	464	464
05G-B1-D1	for LIC 1-4	121	234	233	480-483	466-467	466	464
05G-B1-E1	Z = 31	122	235	235	484-487	468-469	468	468
05G-B1-F1	W = 32	123	236	235	488-491	470-471	470	468
05G-B1-G1		124	237	237	492-495	472-473	472	472
05G-B1-H1	for LIC 5-6	125	238	237	496-499	474-475	474	472
05G-B1-J1	Z = NA	126	239	239	500-503	476-477	476	476
05G-B1-K1	W = 31	127	240	239	504-507	478-479	478	476
05G-B1-L1		128	N.A	N.A	508-511	N.A.	N.A	N.A
05G-B2-B1								
05G-B2-C1		N.A	225	225	N.A.	448-449	448	448
05G-B2-D1	for LIC 1-4	113	226	225	448-451	450-451	450	448
05G-B2-E1	Z = 29	114	227	227	452-455	452-453	452	452
05G-B2-F1	W = 30	115	228	227	456-459	454-455	454	452
05G-B2-G1		116	229	229	460-463	456-457	456	456
05G-B2-H1	for LIC 5-6	117	230	229	464-467	458-459	458	456
05G-B2-J1	Z = 29	118	231	231	468-471	460-461	460	460
05G-B2-K1	W = NA	119	232	231	472-475	462-463	462	460
05G-B2-L1		120	N.A	N.A	476-479	N.A.	N.A	N.A

Figure 5-41. LIC Number / Line Address for Frame 05E/G

Frame 06B/D

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
06B-B1-B1								
06B-B1-C1		N.A	393	393	N.A.	784-785	784	784
06B-B1-D1	for LIC 1-4	201	394	393	800-803	786-787	786	784
06B-B1-E1	Z = 51	202	395	395	804-807	788-789	788	788
06B-B1-F1	W = 52	203	396	395	808-811	790-791	790	788
06B-B1-G1		204	397	397	812-815	792-793	792	792
06B-B1-H1	for LIC 5-6	205	398	397	816-819	794-795	794	792
06B-B1-J1	Z = NA	206	399	399	820-823	796-797	796	796
06B-B1-K1	W = 51	207	400	399	824-827	798-799	798	796
06B-B1-L1		208	N.A	N.A	828-831	N.A.	N.A	N.A
06B-B2-B1								
06B-B2-C1		N.A	385	385	N.A.	768-769	768	768
06B-B2-D1	for LIC 1-4	193	386	385	768-771	770-771	770	768
06B-B2-E1	Z = 49	194	387	387	772-775	772-773	772	772
06B-B2-F1	W = 50	195	388	387	776-779	774-775	774	772
06B-B2-G1		196	389	389	780-783	776-777	776	776
06B-B2-H1	for LIC 5-6	197	390	389	784-787	778-779	778	776
06B-B2-J1	Z = 49	198	391	391	788-791	780-781	780	780
06B-B2-K1	W = NA	199	392	391	792-795	782-783	782	780
06B-B2-L1		200	N.A	N.A	796-799	N.A.	N.A.	N.A
06D-B1-B1								
06D-B1-C1		N.A	329	329	N.A.	656-657	656	656
06D-B1-D1	for LIC 1-4	169	330	329	672-675	658-659	658	656
06D-B1-E1	Z = 43	170	331	331	676-679	660-661	660	660
06D-B1-F1	W = 44	171	332	331	680-683	662-663	662	660
06D-B1-G1		172	333	333	684-687	664-665	664	664
06D-B1-H1	for LIC 5-6	173	334	333	688-691	666-667	666	664
06D-B1-J1	Z = NA	174	335	335	692-695	668-669	668	668
06D-B1-K1	W = 43	175	336	335	696-699	670-671	670	668
06D-B1-L1		176	N.A	N.A	700-703	N.A.	N.A	N.A
06D-B2-B1								
06D-B2-C1		N.A	321	321	N.A.	640-641	640	640
06D-B2-D1	for LIC 1-4	161	322	321	640-643	642-643	642	640
06D-B2-E1	Z = 41	162	323	323	644-647	644-645	644	644
06D-B2-F1	W = 42	163	324	323	648-651	646-647	646	644
06D-B2-G1		164	325	325	652-655	648-649	648	648
06D-B2-H1	for LIC 5-6	165	326	325	656-659	650-651	650	648
06D-B2-J1	Z = 41	166	327	327	660-663	652-653	652	652
06D-B2-K1	W = NA	167	328	327	664-667	654-655	654	652
06D-B2-L1		168	N.A	N.A	668-671	N.A.	N.A	N.A

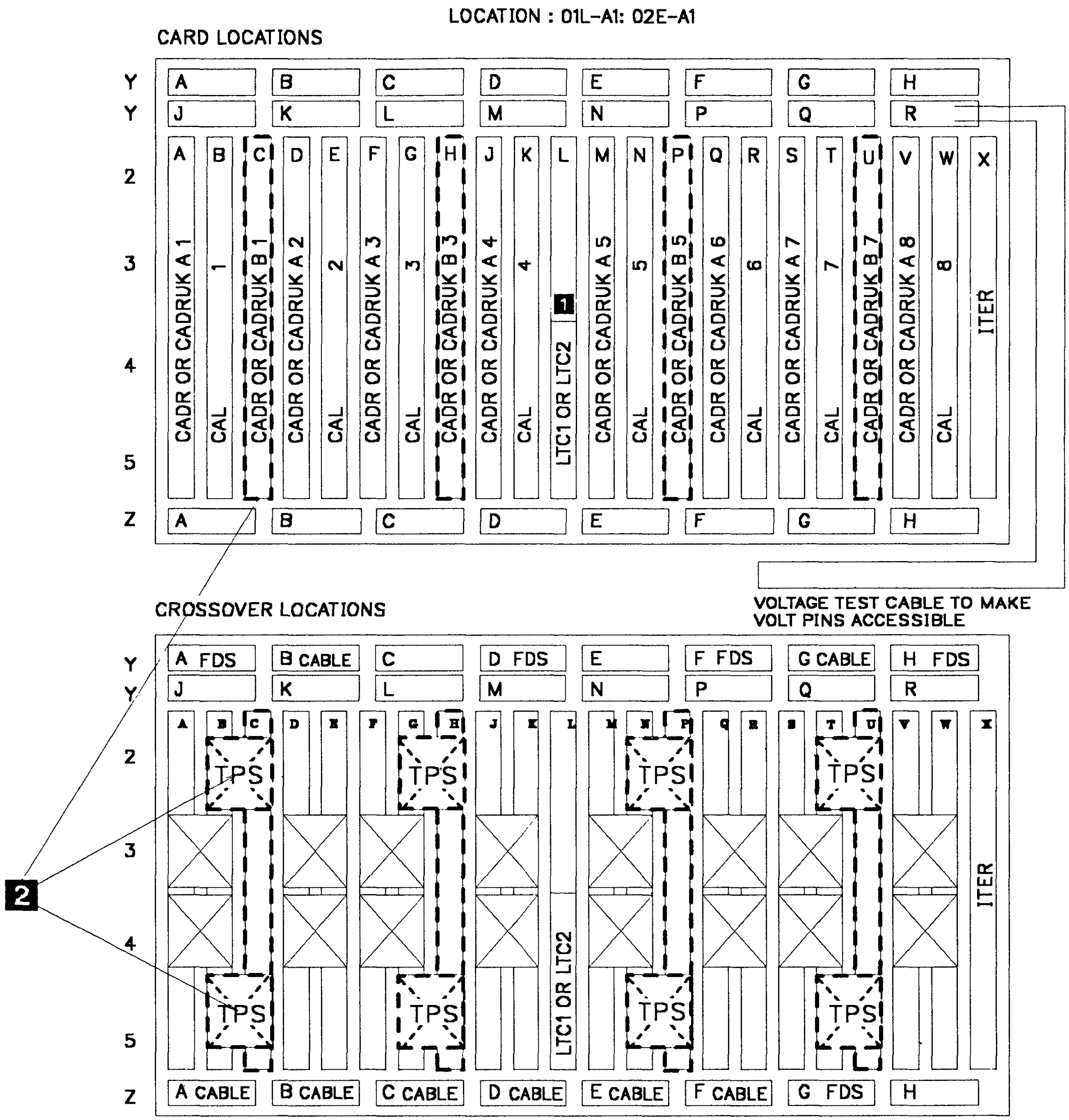
Figure 5-42. LIC Number / Line Address for Frame 06B/D

Frame 06E/G

LOCATION	MUX NUMBER	LIC NUMBER by LIC type			LINE ADDRESS by LIC type			
		1 - 4	5 or 6 LS	6 H	1 - 4	5	6LS	6HS
06E-B1-B1								
06E-B1-C1		N.A	425	425	N.A.	848-849	848	848
06E-B1-D1	for LIC 1-4	217	426	425	864-867	850-851	850	848
06E-B1-E1	Z = 55	218	427	427	868-871	852-853	852	852
06E-B1-F1	W = 56	219	428	427	872-875	854-855	854	852
06E-B1-G1		220	429	429	876-879	856-857	856	856
06E-B1-H1	for LIC 5-6	221	430	429	880-883	858-859	858	856
06E-B1-J1	Z = NA	222	431	431	884-887	860-861	860	860
06E-B1-K1	W = 55	223	432	431	888-891	862-863	862	860
06E-B1-L1		224	N.A	N.A	892-895	N.A.	N.A	N.A
06E-B2-B1								
06E-B2-C1		N.A	417	417	N.A.	832-833	832	832
06E-B2-D1	for LIC 1-4	209	418	417	832-835	834-835	834	832
06E-B2-E1	Z = 53	210	419	419	836-839	836-837	836	836
06E-B2-F1	W = 54	211	420	419	840-843	838-839	838	836
06E-B2-G1		212	421	421	844-847	840-841	840	840
06E-B2-H1	for LIC 5-6	213	422	421	848-851	842-843	842	840
06E-B2-J1	Z = 53	214	423	423	852-855	844-845	844	844
06E-B2-K1	W = NA	215	424	423	856-859	846-847	846	844
06E-B2-L1		216	N.A	N.A	860-863	N.A.	N.A	N.A
06G-B1-B1								
06G-B1-C1		N.A	361	361	N.A.	720-721	720	720
06G-B1-D1	for LIC 1-4	185	362	361	736-739	722-723	722	720
06G-B1-E1	Z = 47	186	363	363	740-743	724-725	724	724
06G-B1-F1	W = 48	187	364	363	744-747	726-727	726	724
06G-B1-G1		188	365	365	748-751	728-729	728	728
06G-B1-H1	for LIC 5-6	189	366	365	752-755	730-731	730	728
06G-B1-J1	Z = NA	190	367	367	756-759	732-733	732	732
06G-B1-K1	W = 47	191	368	367	760-763	734-735	734	732
06G-B1-L1		192	N.A	N.A	764-767	N.A.	N.A	N.A
06G-B2-B1								
06G-B2-C1		N.A	353	353	N.A.	704-705	704	704
06G-B2-D1	for LIC 1-4	177	354	353	704-707	706-707	706	704
06G-B2-E1	Z = 45	178	355	355	708-711	708-709	708	708
06G-B2-F1	W = 46	179	356	355	712-715	710-711	710	708
06G-B2-G1		180	357	357	716-719	712-713	712	712
06G-B2-H1	for LIC 5-6	181	358	357	720-723	714-715	714	712
06G-B2-J1	Z = 45	182	359	359	724-727	716-717	716	716
06G-B2-K1	W = NA	183	360	359	728-731	718-719	718	716
06G-B2-L1		184	N.A	N.A	732-735	N.A.	N.A	N.A

Figure 5-43. LIC Number / Line Address for Frame 06E/G

Channel Board and Cards



1

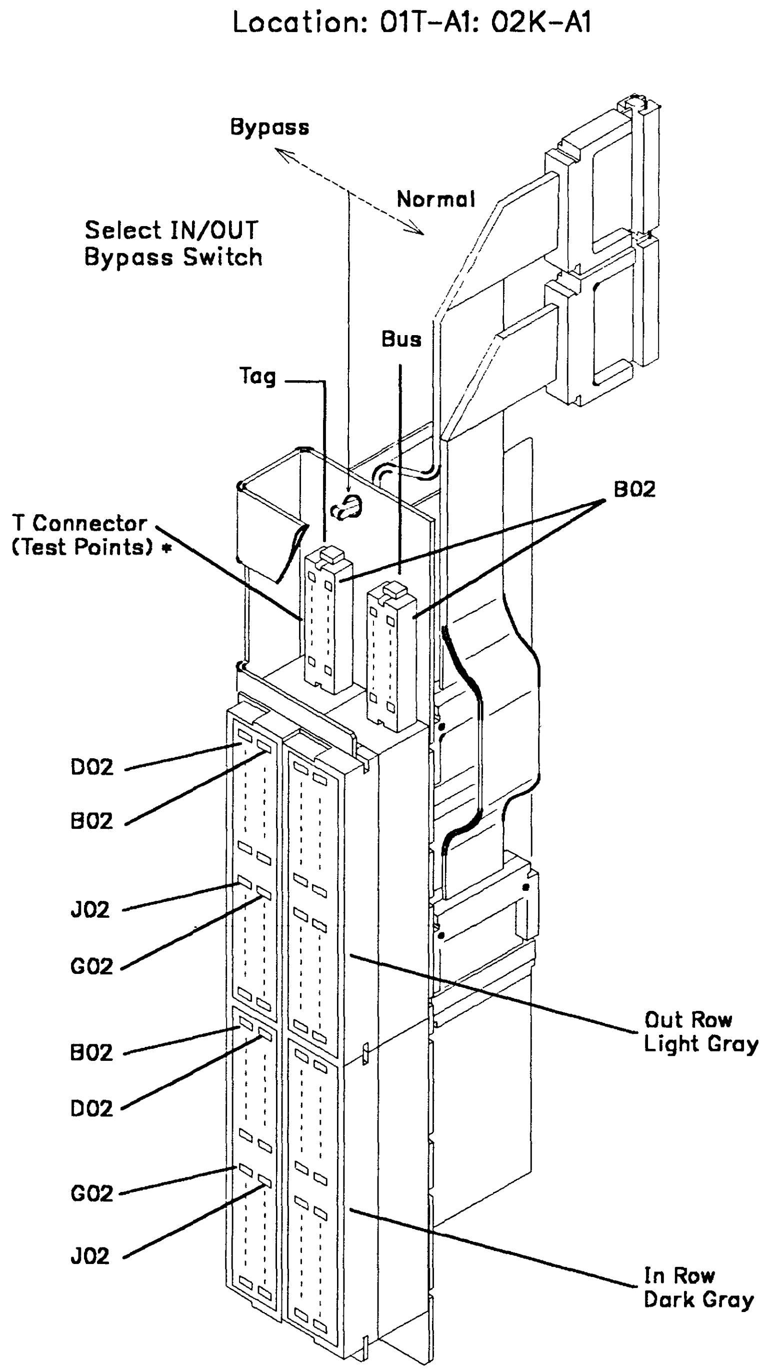
- LTC1 is terminator and gives address for CAB1
- LTC2 is terminator and gives address for CAB2

2

- Cards C,H,P,U and connectors 'TPS' are only present with TPS feature
- When a CA with TPS feature is installed, there is no channel in the associated even position

Figure 5-44. 3745 Channel Board Cards and Connectors

Channel Tail Gate and Internal Cables

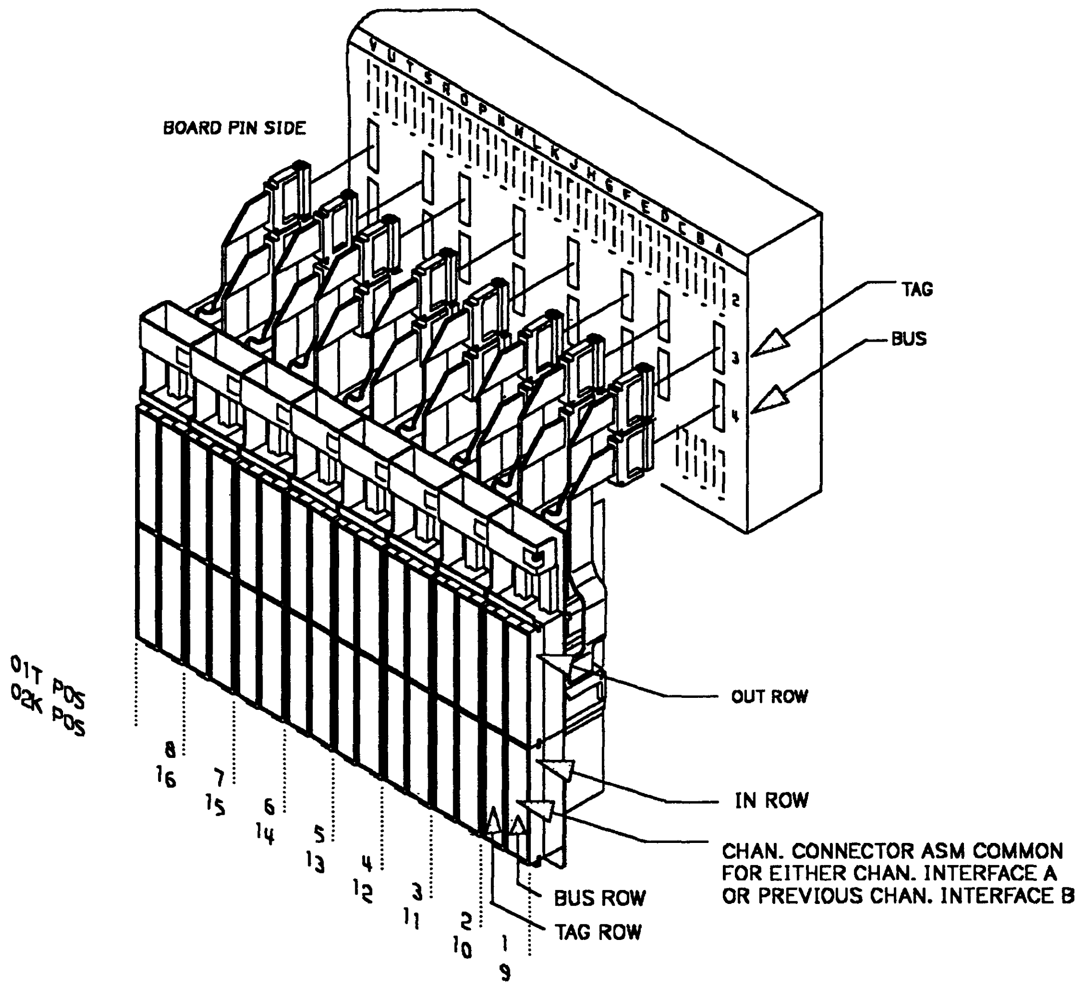


* For details refer to Vol 4; YZ pages.

Figure 5-45. 3745 Channel Tail Gate and Standard Interface Test Points

Channel Tail Gate

LOCATION : 01T-A1 and 02K-A1



CHANNEL INTERFACE A & INTERFACE B (TPS) DISTRIBUTION CHART.		
CA BOARD REAR POS.	TAIL GATE	CA# INTERFACE A INTERFACE B
A3 A4	1	CA1-A
D3 D4	2	CA2-A OR CA1-B
F3 F4	3	CA3-A
J3 J4	4	CA4-A OR CA3-B
M3 M4	5	CA5-A
Q3 Q4	6	CA6-A OR CA5-B
S3 S4	7	CA7-A
V3 V4	8	CA8-A OR CA7-B

CHANNEL INTERFACE A & INTERFACE B (TPS) DISTRIBUTION CHART.		
CA BOARD REAR POS.	TAIL GATE	CA# INTERFACE A INTERFACE B
A3 A4	9	CA9-A
D3 D4	10	CA10-A OR CA9-B
F3 F4	11	CA11-A
J3 J4	12	CA12-A OR CA11-B
M3 M4	13	CA13-A
Q3 Q4	14	CA14-A OR CA13-B
S3 S4	15	CA15-A
V3 V4	16	CA16-A OR CA15-B

Figure 5-46. 3745 Channel Tail Gate

Control Panel

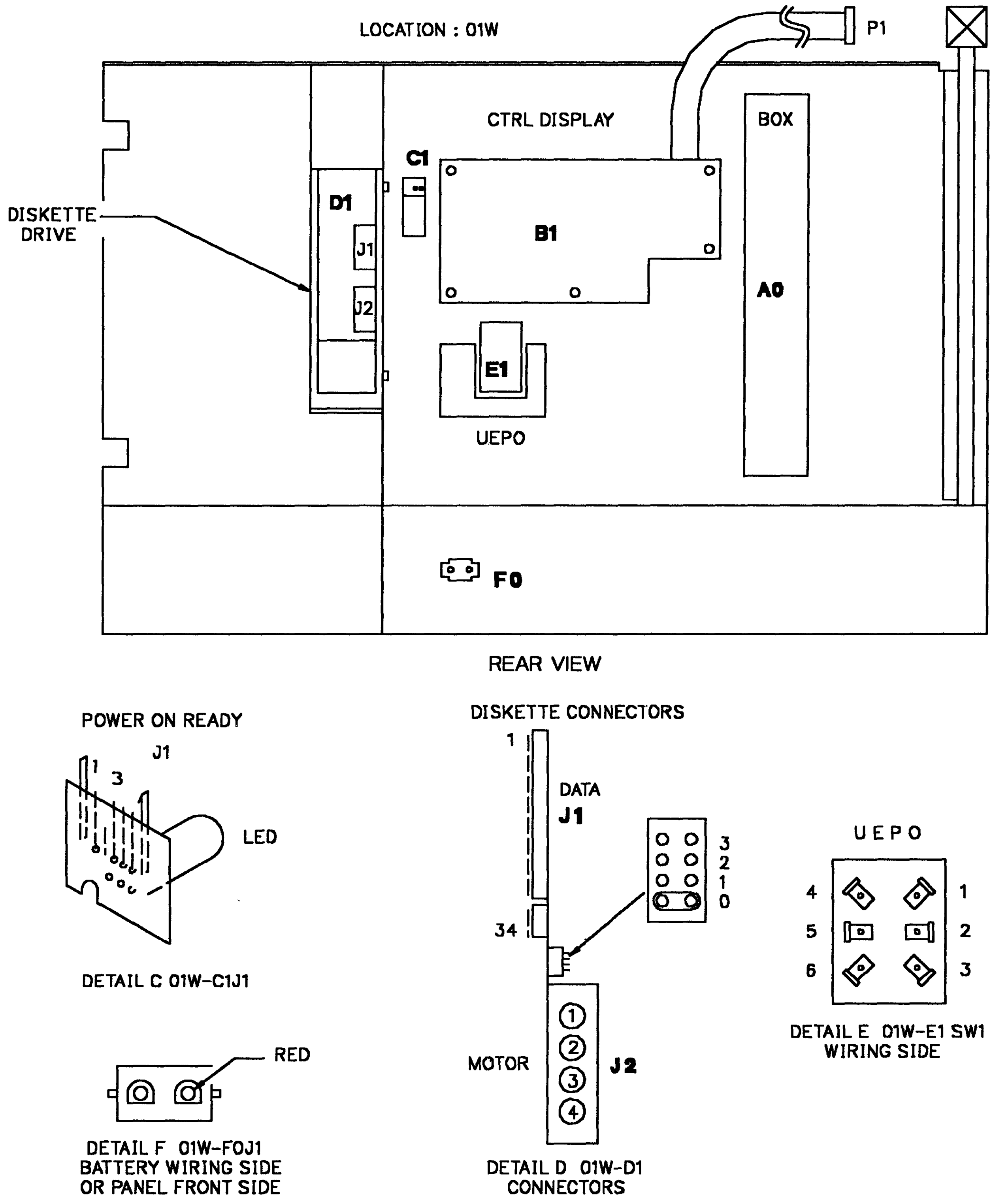


Figure 5-47. 3745 Control Panel

Primary Power Box

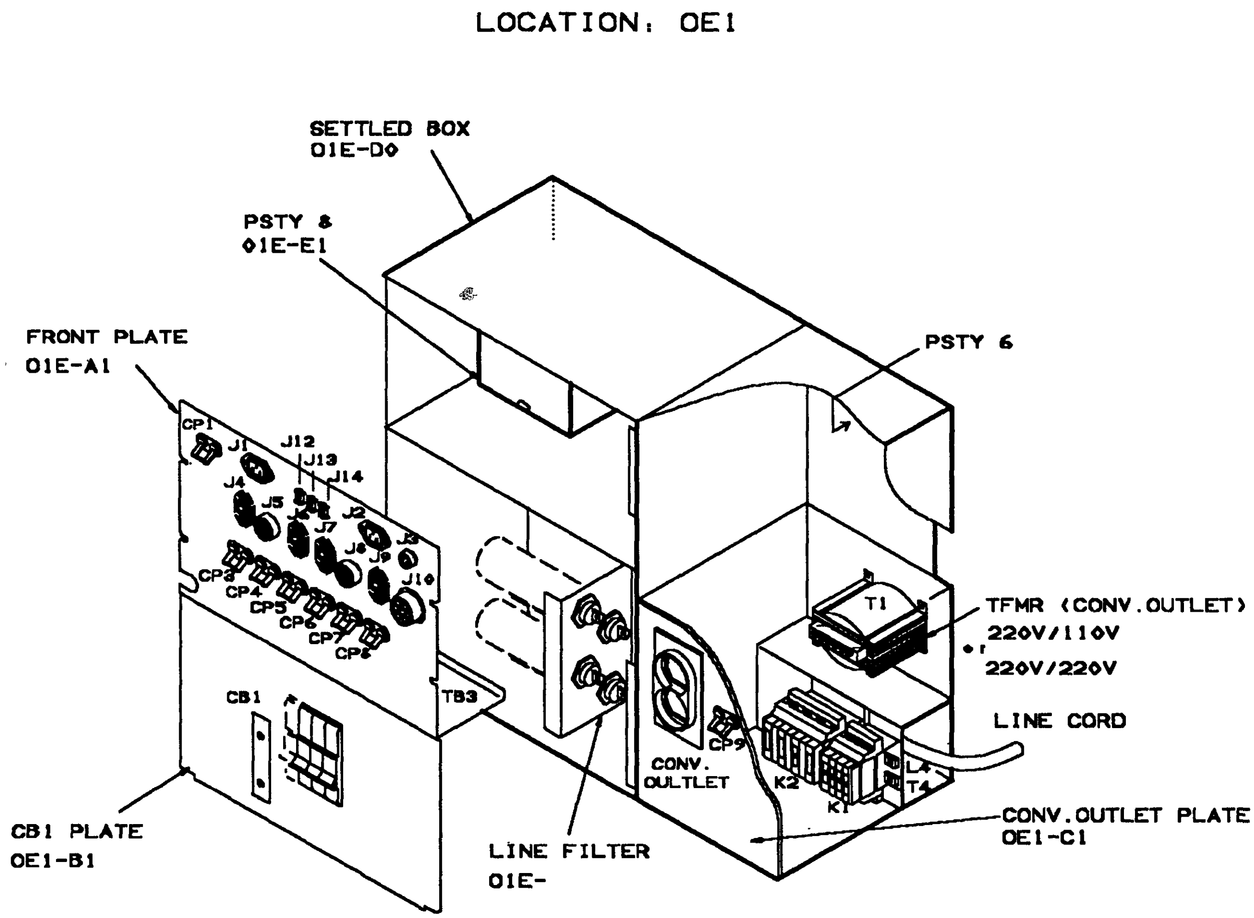


Figure 5-48. 3745 Primary Power Box Components

3745 Power Supply Cross Reference

Table 5-1 (Page 1 of 2). 3745 Power Supply Cross Reference

Frame	Power Supply	Location	Area Supplied
Frame 1	Type 2 ID=01	01V	MOSS
	Type 1 ID=02	01Q	CCU A
	Type 1 ID=03	01R	CCU B
	Type 1/1B ID=02	01Q	CCU A
	Type 1/1B ID=03	01R	CCU B
	Type 3 ID=04	01K-A1	CA 01-02
	Type 3 ID=05	01K-B1	CA 03-04
	Type 3 ID=06	01K-C1	CA 05-06
	Type 3 ID=07	01K-D1	CA 07-08
	Type 4 ID=08	01H-A1	LA 01-02
	Type 4 ID=09	01H-B1	LA 03-04
	Type 4 ID=10	01H-C1	LA 05-06
	Type 4 ID=11	01H-D1	LA 07-08
	Type 5 ID=12	01P-A1	Lines 000-063
	Type 5 or 7 ID=13	01M-A1	Lines 064-127
	Type 6	01F	P S control
	Type 8	01E	Fan control
Frame 2	Type 3 ID=14	02D-A1	CA 09-10
	Type 3 ID=15	02D-B1	CA 11-12
	Type 3 ID=16	02D-C1	CA 13-14
	Type 3 ID=17	02D-D1	CA 15-16
	Type 4 ID=18	02B-A1	LA 09-10
	Type 4 ID=19	02B-B1	LA 11-12
	Type 4 ID=20	02B-C1	LA 13-14
	Type 4 ID=21	02B-D1	LA 15-16
	Type 4 ID=22	02G-A1	LA 17-18
	Type 4 ID=23	02G-B1	LA 19-20
	Type 4 ID=24	02G-C1	LA 21-22
	Type 4 ID=25	02G-D1	LA 23-24
Frame 3	Type 4 ID=26	03G-A1	LA 25-26
	Type 4 ID=27	03G-B1	LA 27-28
	Type 4 ID=28	03G-C1	LA 29-30
	Type 4 ID=29	03G-D1	LA 31-32
Frame 4	Type 5 or 7 ID=30	04D-A1	Lines 128-191
	Type 5 or 7 ID=31	04G-A1	Lines 192-255
	Type 5 or 7 ID=32	04B-A1	Lines 256-319
	Type 5 or 7 ID=33	04E-A1	Lines 320-383

Table 5-1 (Page 2 of 2). 3745 Power Supply Cross Reference			
Frame	**Power Supply**	**Location**	**Area Supplied**
Frame 5	Type 5 or 7 ID=34	05D-A1	Lines 384-447
	Type 5 or 7 ID=35	05G-A1	Lines 448-511
	Type 5 or 7 ID=36	05B-A1	Lines 512-575
	Type 5 or 7 ID=37	05E-A1	Lines 576-639
Frame 6	Type 5 or 7 ID=38	06D-A1	Lines 640-703
	Type 5 or 7 ID=39	06G-A1	Lines 704-767
	Type 5 or 7 ID=40	06B-A1	Lines 768-831
	Type 5 or 7 ID=41	06E-A1	Lines 832-895

FRU Exchange Procedures

CADR/CAL Exchange Procedure

Note: There is a special CADR card for the UK.

For physical FRU locations in Frame 01, refer to Figure 5-2 on page 5-6 and Figure 5-44 on page 5-44.

For physical FRU locations in Frame 02, refer to Figure 5-3 on page 5-8 and Figure 5-44 on page 5-44.

IMPORTANT

Check that the 'POWER CONTROL' display is set to local (3) on the control panel. If yes, go to step 4; if not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the power control window.
2. Press the 'Validate' key.
3. **As described in 'Disabling Procedure' the associated channel adapter must be in disconnect status before powering off the PS.** (Be sure the **two** associated channel adapters are disabled).
   a. Ask the customer to stop activity on the associated channel adapter.
   b. On the 3745 console, call the CID function
   c. Enter **D** on the CHANGE E/D REQ field for the interface A (and B if TPS is installed) for the associated channel adapter you are working on.
   d. Press SEND and wait a few seconds until the **status** change to 'DISABLED'.
   e. Call menu 3 and type '**CAS**' for channel adapter services.
   f. Press SEND.
   g. Type '**4**' for concurrent maintenance commands.
   h. Press SEND and type the channel adapter number in the CA number ===> field.
   i. Press SEND.
4. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area and press 'SEND'.

      You will have the power services menu displayed.
   b. Select the appropriate power services frame and press 'SEND'
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id
   d. For CADR only, referring to Figure 5-45 on page 5-45 and Figure 5-46 on page 5-46, put the 'Select Out Bypass' switch to the 'BYPASS' position for the channel interface you are working on, and the attached channel interface if the TPS feature is installed for this channel.
5. **WARNING: Use the ESD kit and procedures**.
6. Keeping the correct order, remove the top connectors from the card you have to exchange.
7. Exchange the card and re-install the top connectors.
8. For CADR only, put the 'Select Out Bypass' switch (or switches) back to the 'NORMAL' position.
9. In the 3745 console power services frame, key in '**uxx**' where xx is the PS id. This will turn the PS ON.
10. Referring to "How to Run Internal Function Tests" on page 4-29, run the same diagnostics you ran before you exchanged the FRU, then go to "Repair Verification Procedure" on page 5-170.

Control Panel Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6

Note: If the nature of the fault does not allow control panel actions, go to step 3f.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Press the 'Service' key on the control panel until (*1*) is displayed in the service window.
   b. Press the 'Validate' key.
   c. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   d. Press the 'Validate' key.
   e. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (*B*).
   f. Locate the 'Maintenance SW1' on PS type 6. See Figure 5-50 on page 5-53. Lift the lever up and pull it outwards to the 'Test' position. Check that the LED is ON.
   g. Locate the 'Maintenance SW2'' on PS type 6.
   h. Switch it to the 'T1' position.
4. **WARNING: Use the ESD kit and procedures.**
5. Open the front cover and the control panel door.
6. Exchange the FRU as follows:
   a. Remove the cable at position 01A-Z0-A6 (control panel FRU comes complete with interconnecting cable). See Figure 5-8 on page 5-13 for cable location.
   b. Unlatch and swing the control panel gate open.
   c. Release the cable from its securing points.
   d. Remove the 5 screws securing the panel and withdraw the panel complete with cable. **1**

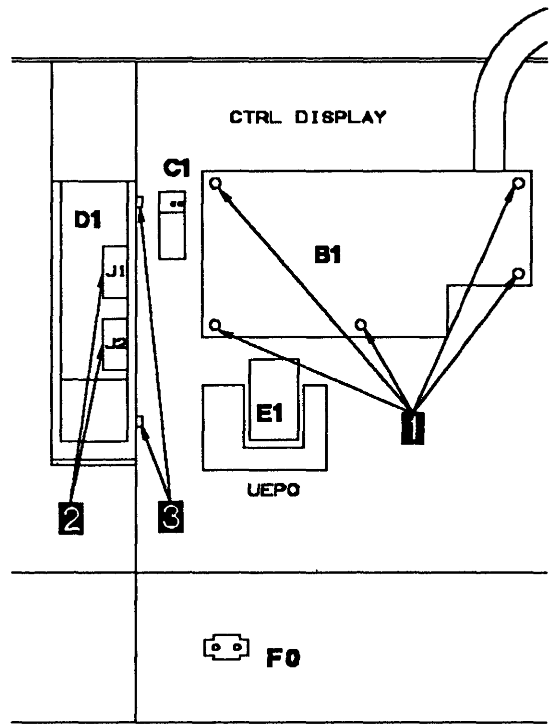


Figure 5-49. Control Panel Removal

   e. To install the control panel, perform this procedure in the reverse order.
7. Re-apply power as follows:
   a. Return the 'Maintenance SW2'' to the 'T2' position.
   b. Is the control panel displaying 'Power Control' and 'Service Mode' information ? If yes, continue with step 8. If not, the initial checkouts have failed.
   c. Switch it to the 'T1' position.
   d. Reseat the PLC card or try another PLC card and return to step 7a.
8. Refer to "How to Run the Panel Test" on page 4-21 and run the diagnostic.
   If the diagnostic runs error free, continue with the next step.
9. Push 'Maintenance SW1' back to the 'NORMAL' position.
10. Press the 'Function' key on the control panel until (*1*) is displayed in the function window.

11. Press the 'Validate' key.

    Note: This action will power the MOSS ON, run MOSS diagnostics, and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14 In the CE leaving procedure you will be instructed to recreate the power configuration, set the time of day clock, and any required scheduled power ON time.

12. Go to "CE Leaving Procedure" on page 5-172.

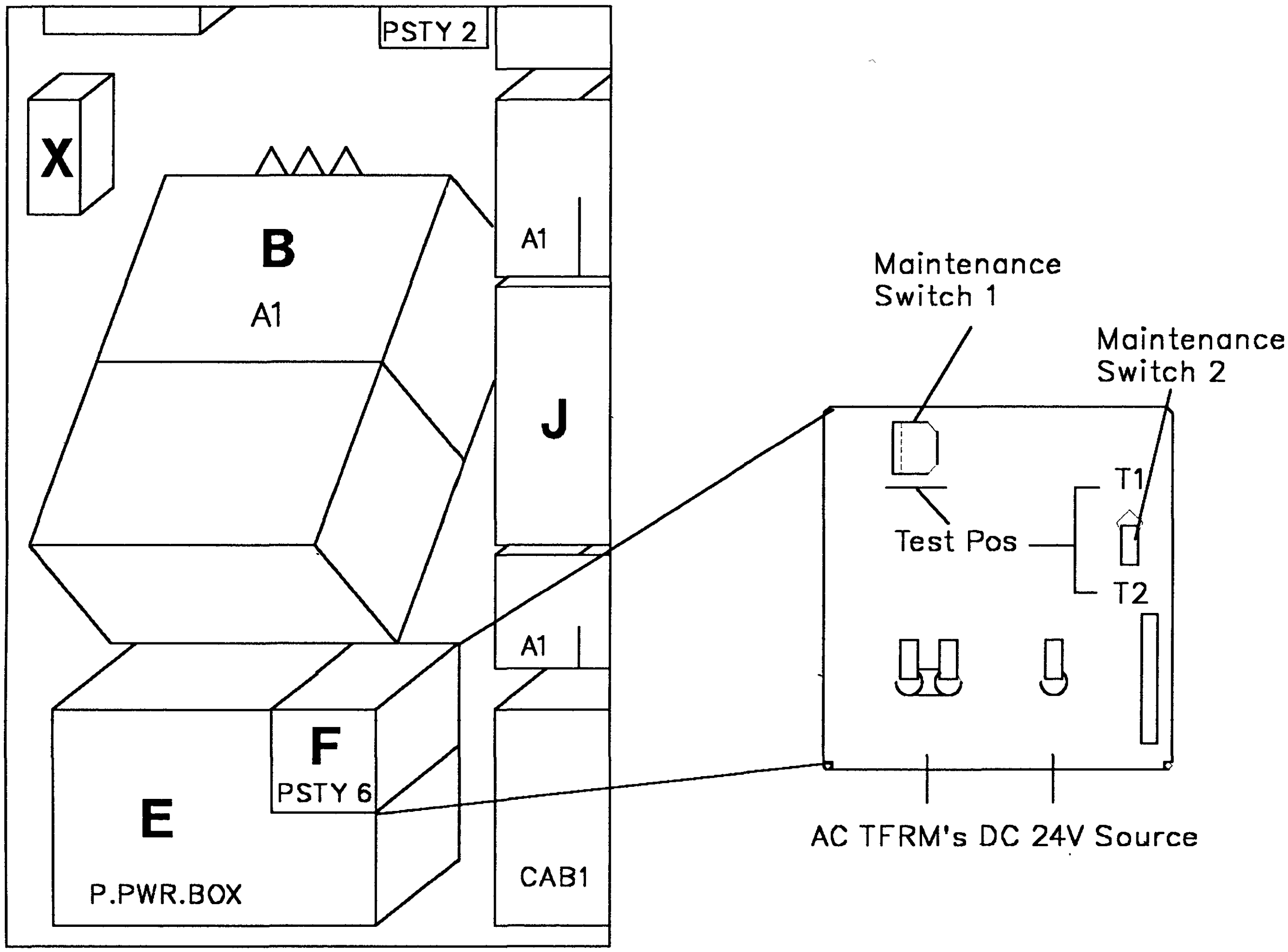


Figure 5-50. PS Type 6 SW1 Actuator

DFA Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not proceed with step 1.

1. Press the 'Power Control' key until (***3***) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (***1***) is displayed in the service window.
4. Press the 'Validate' key.
5. Remove power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (***B***) is displayed.
   b. Press the 'Validate' key.
   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (***B***).).
6. **WARNING: Use the ESD kit and procedures**.
7. Locate the card by referring to Figure 5-8 on page 5-13
8. If present, remove the 'shipping springs' that secure the extractor levers by squeezing them together. Refer to Figure 5-57 on page 5-61.
9. Remove the card.
10. Install the new card.
11. Re-install the 'shipping springs' (if present).

    Note: In the remaining steps, it is assumed that the microcode is at the same level on both the diskette and the hard disk drive.
12. Re-apply power as follows:
    a. Install the primary backup diskette in the FDD.
    b. Press the 'Function' key on the control panel until the 'Load from Diskette' function 9 is displayed.
    c. Press the 'Validate' key.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

    d. If any error is detected, go to "Repair Verification Procedure" on page 5-170.
13. If no error is detected :
    a. Remove the primary backup diskette from the FDD.
    b. Press the 'Service' key until (***0***) is displayed in the service window.
    c. Press the 'Validate' key.
    d. Press the 'Function' key on the control panel until the 'MOSS IML' function (***1***) is displayed.
    e. Press the 'Validate' key.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14.

    f. Go to "Repair Verification Procedure" on page 5-170.

FDD Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (*1*) is displayed in the service window.
4. Press the 'Validate' key.
5. Before exchanging the FDD, check the voltages as follow:.

   Note: The voltages are not permanently applied on the FDD and, to get them available for measurement for approximately 15 minutes, a MOSS IML is required.

   a. Press the 'Function' key on the control panel until the 'MOSS IML' function (*1*) is displayed.

   b. Press the 'Validate' key.

   c. Using Table 5-2 on page 5-56, measure the voltages on the FDD connector (J2). If the voltages are not within tolerance or are missing, check on the voltage test points of the PS type 2, refer to Figure 5-53 on page 5-56. If that is incorrect, exchange the PS type 2.

   Note: If problems are experienced with measuring voltages with the connectors plugged, power the MOSS OFF (function (*B*)), remove connector J2 from the FDD and power the MOSS ON (function 1).
6. Remove power as follows:

   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.

   b. Press the 'Validate' key.

   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, this will display the character (*B*).
7. **WARNING: Use the ESD kit and procedures.**
8. Open the front cover and the control panel door.
9. Replace the FRU as follows:

   a. Unlatch and swing the control panel gate open.

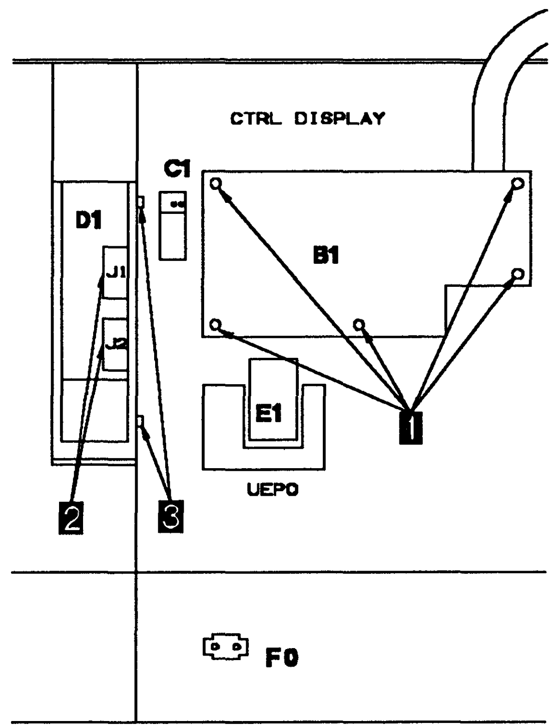


Figure 5-51. FDD Removal

   b. Remove the 2 cables from the drive. **2**

   c. Remove the 4 securing screws from the assembly. **3**

   d. Slide out the FDD assembly.

   e. Check if the new FDD has a jumper, see Figure 5-52 on page 5-56 for **4**. If this is available, ensure that there is a jumper only at position 0.

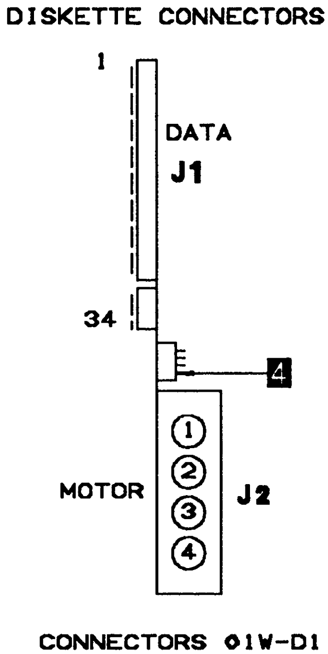


Figure 5-52. FDD Jumpering

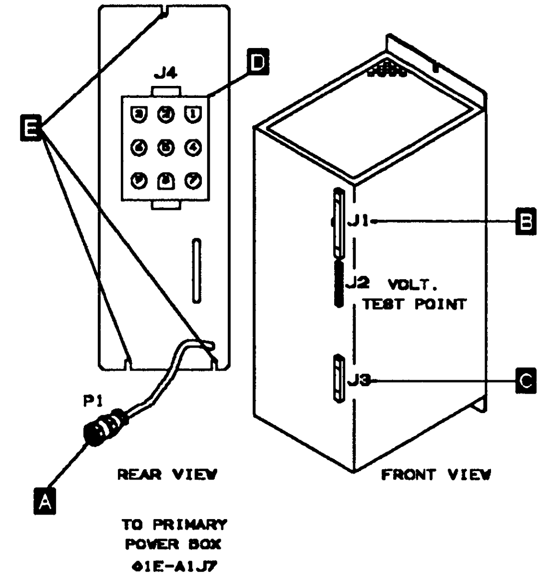


Figure 5-53. PS Type 2

f. To install the new FDD, perform this procedure in the reverse order.

Note: In the remaining steps, it is assumed that the microcode is at the same level on both the diskette and the hard disk drive.

10. Re-apply power as follows:
    a. Install the primary backup diskette in the FDD.
    b. Press the 'Function' key on the control panel until the 'Load from Diskette' function 9 is displayed.
    c. Press the 'Validate' key.

Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

    d. Remove the primary backup diskette from the FDD and go to "Repair Verification Procedure" on page 5-170.

Table 5-2. Voltage Test Points

Connector	Pin	Voltage	Max	Min	Ripple
01W-D1-J2 (FDD)	1	+12v	+12.60v	+11.60v	.12v peak-to-peak
	2	GND			
	3	GND			
	4	+ 5v	+ 5.25v	+ 4.85v	.10v peak-to-peak
PS type 2-J2 Voltage Test Points	2	+12v	+12.60v	+11.60v	.12v peak-to-peak
	5	+ 5v	+ 5.25v	+ 4.85v	.10v peak-to-peak
	10	GND			

HDD Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (*1*) is displayed in the service window.
4. Press the 'Validate' key.
5. Before exchanging the HDD, check the voltages as follows:

   Note: The voltages are not permanently applied to the HDD and, to get them available for measurement for approximately 15 minutes, a MOSS IML is required.

   a. Press the 'Function' key on the control panel until the 'MOSS IML' function (*1*) is displayed.

   b. Press the 'Validate' key.
   Wait until the control panel displays a hexadecimal code greater than 0A0, it takes approximately 1 minute.

   c. Using Table 5-3 on page 5-58 measure the voltages on the HDD connector (J3). If the voltages are not within tolerance or are missing, check on the voltage test points of the PS type 2; refer to Figure 5-53 on page 5-56. If they are incorrect, exchange the PS type 2.

   Note: If problems are experienced with measuring voltages with connectors plugged, power the MOSS OFF (function (*B*)), remove connector P3 from the HDD and power the MOSS ON (function 1).

6. Remove power as follows:

   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.

   b. Press the 'Validate' key.

   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, this will display the character (*B*).

7. **WARNING: Use the ESD kit and procedures.**
8. Open the front cover and the control panel door.
9. Referring to Figure 5-54, replace the FRU as follows:

   a. Remove the 3 cables and the ground wire from the drive. **1**

   b. Remove the 4 securing screws from the assembly. **2**

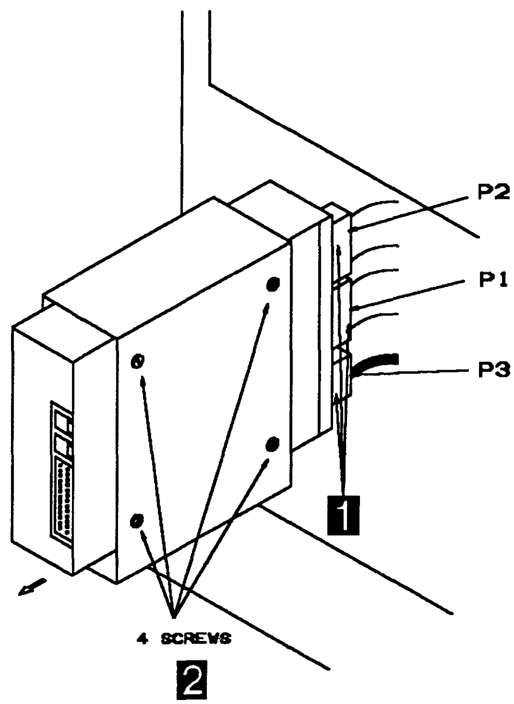


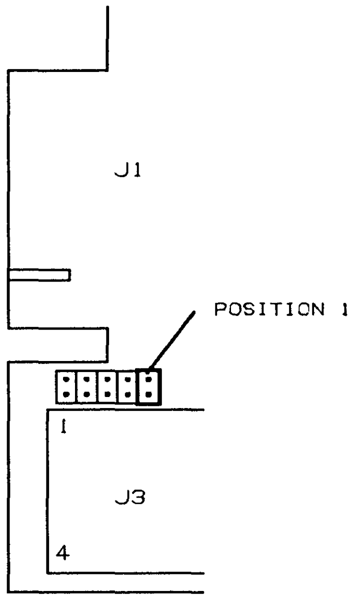
Figure 5-54. HDD Removal

   c. Slide out the HDD assembly.

   d. On the new HDD, remove the rails which are not used in the 3745.

   e. Ensure that there is a jumper in position 1. See Figure 5-55.

   f. To install the new HDD, perform this procedure in reverse order.



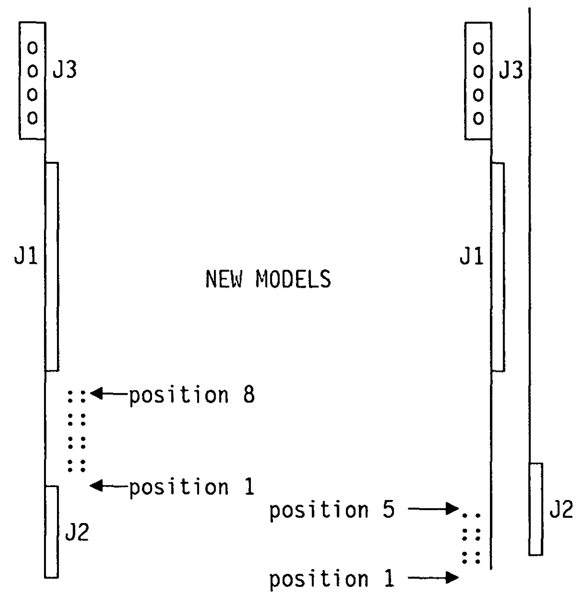


Figure 5-55. HDD Jumpering (Old Model and New Models)

10. Re-apply power as follows:
    a. Install the primary backup diskette in the FDD.
    b. Press the 'Function' key on the control panel until the 'Load from Diskette' function 9 is displayed.
    c. Press the 'Validate' key.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

11. Refer to "3745 Service Functions, Chapter 11" to initialize and restore the HDD. When previous action is completed, a MOSS IML from the HDD will have been executed.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

12. Remove the diskette.
13. Go to "Air Filters Exchange Procedure" on page 5-80 and exchange all the filters.

Table 5-3. Voltage Test Points

Connector	Pin	Voltage	Max	Min	Ripple
01X-A1-P3 (HDD)	1	+12v	+13.00v	+11.00v	.12v peak-to-peak
	2	GND			
	3	GND			
	4	+ 5v	+ 5.25v	+ 4.85v	.10v peak-to-peak
PS type 2-J2 Voltage test points	1	+12v	+13.00v	+11.00v	.12v peak-to-peak
	5	+ 5v	+ 5.25v	+ 4.85v	.10v peak-to-peak
	10	GND			

MAC/MAC2 Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (*1*) is displayed in the service window.
4. Press the 'Validate' key.
5. Remove power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   b. Press the 'Validate' key.
   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (***B***).
6. **WARNING: Use the ESD kit and procedures.**
7. **The following sequence should always be observed.**
   a. Locate the card by referring to Figure 5-8 on page 5-13 and remove the cable attached to the card.
   b. If present, remove the 'shipping springs' that secure the extractor levers by squeezing them together. Refer to Figure 5-56.
   c. Remove the card.
   d. Install the new card.
   e. Re-install the 'shipping springs' (if present).
   f. Install the cable on the card.
8. Re-apply power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS IML' function (*1*) is displayed.
   b. Press the 'Validate' key.

      Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14.
   c. If the MOSS diagnostic was not that which directed you to this FRU, and referring to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, run the same diagnostics you ran before you exchanged the FRU then go to "Repair Verification Procedure" on page 5-170.

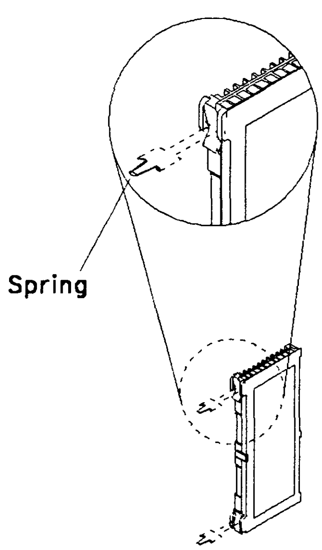


Figure 5-56. Shipping Springs

MPC Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (***3***) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (***1***) is displayed in the service window.
4. Press the 'Validate' key.
5. Remove power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (***B***) is displayed.
   b. Press the 'Validate' key.
   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (***B***).
6. **WARNING: Use the ESD kit and procedures.**
7. Locate the card by referring to Figure 5-8 on page 5-13
   a. If present, remove the interconnecting cable from the 'PROM' card at position 01A-X0-E4-Z.

      Note: The PROM card may not be present on the machine.
   b. Remove the 'shipping springs' (if present) that secure the extractor levers by squeezing them together. Refer to Figure 5-56 on page 5-59.
   c. Remove the MPC card complete with cable (if present).
   d. Install the new card.
   e. Re-install the 'shipping springs'.
   f. Re-plug the interconnecting cable to the 'PROM' card at position 01A-X0-E4-Z (if present).
8. Re-apply power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS IML' function (***1***) is displayed.
   b. Press the 'Validate' key.

      Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14.
9. Go to "Repair Verification Procedure" on page 5-170.

MCA/MSC Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key until (*1*) is displayed in the service window.
4. Press the 'Validate' key.
5. Remove power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   b. Press the 'Validate' key.
   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (*B*).

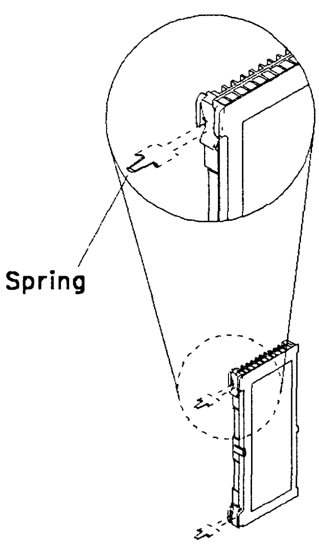


Figure 5-57. Shipping Springs

6. **WARNING: Use the ESD kit and procedures**.
7. Locate the card by referring to Figure 5-8 on page 5-13
8. If present, remove the 'shipping springs' that secure the extractor levers by squeezing them together. Refer to Figure 5-57.
9. Remove the card.
10. Install the new card.
11. Re-install the 'shipping springs' (if present).
12. Re-apply power as follows:
    a. Press the 'Function' key on the control panel until the 'MOSS IML' function (*1*) is displayed.
    b. Press the 'Validate' key.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14.
13. If the MCA has been exchanged, refer to "How to Run the Console Link Test" on page 4-22 to run this diagnostic, then go to "Repair Verification Procedure" on page 5-170.

PAC Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

Note: If the nature of the fault does not allow control panel actions, go to step 3f.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Press the 'Service' key on the control panel until (*1*) is display on the service window.
   b. Press the 'Validate' key.
   c. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   d. Press the 'Validate' key.
   e. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (*B*).
   f. Locate the 'Maintenance SW1' on PS type 6. See Figure 5-50 on page 5-53. Lift the lever up and pull it outwards to the 'Test' position. Check that the LED is ON.
   g. Locate the 'Maintenance SW2'' on PS type 6.
   h. Switch it to the 'T1' position.
4. **WARNING: Use the ESD kit and procedures**.
5. **WARNING: Card damage will result if any other card except PAC is plugged in this position.**
6. Locate the card by referring to Figure 5-8 on page 5-13
   a. If present, remove the 'shipping springs' that secure the extractor levers by squeezing them together. Refer to Figure 5-57 on page 5-61.
   b. Remove the card.
   c. Install the new card.
   d. Re-install the 'shipping springs' (if present).
7. Re-apply power as follows:
   a. Return the 'Maintenance SW2'' to 'T2' position.
   b. Is the control panel displaying 'Power Control' and 'Service Mode' information ? If yes, continue with step 8. If not, the initial checkouts have failed.
   c. Locate the 'Maintenance SW2'' on PS type 6.
   d. Switch it to the 'T1' position
   e. Reseat the PLC card or try another PLC card and return to step 7a.
8. Refer to "How to Run the Panel Test" on page 4-21 and run the diagnostic.
9. Push the 'Maintenance SW1' back to its normal position.
10. Press the 'Function' key on the control panel until (*1*) is displayed in the function window.
11. Press the 'Validate' key.

    Note: This action will power the MOSS ON, run MOSS diagnostics, and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14. In the CE leaving procedure you will be instructed to recreate the power configuration, set the time of day clock, and any required scheduled power ON time.
12. Go to "Repair Verification Procedure" on page 5-170.

PLC Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

Note: If nature of fault does not allow control panel actions, then go to step 3f

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Press the 'Service' key on the control panel until (***1***) is display on the service window.
   b. Press the 'Validate' key.
   c. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (***B***) is displayed.
   d. Press the 'Validate' key.
   e. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (***B***).
   f. Locate the 'Maintenance SW1' on PS type 6. See Figure 5-50 on page 5-53. Lift the lever up and pull it outwards to the 'Test' position. Check that the LED is ON.
   g. Locate the 'Maintenance SW2" on PS type 6.
   h. Switch it to the 'T1' position.
4. **WARNING: Use the ESD kit and procedures**.
5. Locate the card by referring to Figure 5-8 on page 5-13
   a. If present, remove the 'shipping springs' that secure the extractor levers by squeezing them together. Refer to Figure 5-57 on page 5-61.
   b. Remove the card.
   c. Install the new card.
   d. Re-install the 'shipping springs' (if present).
6. Re-apply power as follows:
   - Return the 'Maintenance SW2" to the 'T2' position.
7. Is the control panel displaying 'Power Control' and 'Service Mode' information ?
   If yes, continue with step 11.
   If not, the initial checkouts have failed, and continue with step 8.
8. Locate the 'Maintenance SW2' on PS type 6.
9. Switch it to the 'T1' position.
10. Reseat the PLC card or try another PLC card and return to step 6.
11. Panel code **008** may appear (depending on the FRU level), do not care.
    Refer to "How to Run the Panel Test" on page 4-21 and run diagnostics.
12. Push the 'Maintenance SW1' back to normal position.
13. Press the 'Function' key on the control panel until (***1***) is displayed in the function window.
14. Press the 'Validate' key.

    Note: This action will power the MOSS ON, run MOSS diagnostics, and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14. In the CE leaving procedure you will be instructed to recreate the power configuration, set the time of day clock and any required scheduled power ON time.
15. Go to "Repair Verification Procedure" on page 5-170.

PROM Exchange Procedure

For physical locations, refer to Figure 5-2 on page 5-6 and Figure 5-8 on page 5-13.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Press the 'Service' key on the control panel until (*1*) is displayed on the service window.
4. Press the 'Validate' key.
5. Remove power as follows:
   a. Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   b. Press the 'Validate' key.
   c. Observe the MOSS Inoperative display on the control panel. At completion of power OFF, it will display the character (*B*).
6. **WARNING: Use the ESD kit and procedures.**
7. Refer to Figure 5-8 on page 5-13.
8. Remove the interconnecting cable from the 'PROM' card at position 01A-X0-E4-Z.
9. Exchange the card.
10. Re-plug the interconnecting cable to the 'PROM' card at position 01A-X0-E4-Z.
11. Re-apply power as follows:
    a. Press the 'Function' key on the control panel until the 'MOSS IML' function (*1*) is displayed.
    b. Press the 'Validate' key.

    Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
12. Go to "Repair Verification Procedure" on page 5-170.

CSP Exchange Procedure

For physical FRU locations in Frame 01, refer to Figure 5-2 on page 5-6 and Figure 5-17 on page 5-22, or Figure 5-19 on page 5-24.

For physical FRU locations in Frame 02, refer to Figure 5-3 on page 5-8 and Figure 5-17 on page 5-22.

For physical FRU locations in Frame 03, refer to Figure 5-4 on page 5-9 and Figure 5-17 on page 5-22.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.

Table 5-4. Relation Between the CSP Card Location and the Power Services Screen	
CSP or FESL location	**Power services screen + ID**
01G-A1-YY	Base Frame ID='**1**'
02A-A1-YY 02F-A1-YY	Expansion unit A11 ID='**2**'
03F-A1-YY	Expansion unit A12 ID='**3**'

   b. Refer to Table 5-4 ('x'= Power Services Screen ID) and type '**x**' to select the appropriate power services frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id
4. **WARNING: Use the ESD kit and procedures.**
5. Referring to Figure 5-58 on page 5-66, exchange the CSP card as follows:
   a. Remove the 3 non-polarized top card connectors from positions W, X and Y.
   b. Exchange the CSP card.
   c. Replace the 3 top card connectors.
6. Using the MOSS console, turn the affected power supply ON as follows:

   On the displayed Power Information screen type '**u**' followed by the number of the affected power supply, to turn it ON.
7. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

FESL Exchange Procedure

For physical FRU locations in Frame 01, refer to Figure 5-2 on page 5-6 and Figure 5-17 on page 5-22, or Figure 5-19 on page 5-24.

For physical FRU locations in Frame 02, refer to Figure 5-3 on page 5-8 and Figure 5-17 on page 5-22.

For physical FRU locations in Frame 03, refer to Figure 5-4 on page 5-9 and Figure 5-17 on page 5-22.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Refer to Table 5-4 on page 5-65 ('x'= Power Services Screen ID) and type '**x**'to select the appropriate power services frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id
4. **WARNING: Use the ESD kit and procedures.**
5. Referring to Figure 5-58, exchange the FESL card as follows:
   a. Remove the 3 non-polarized top card connectors from positions W, X and Y.
   b. Withdraw the FESL card until the serial link cable (J1) on component side is accessible. Disconnect the cable and fully remove the card.

      Note: Never remove the other end of the SL cable (DMUX or SMUX side) during this maintenance procedure. DMUX or SMUX can be driven by another line adapter and this would lead to the corresponding lines down.
   c. Exchange the FESL card.
   d. Replace the serial link cable and replug the FESL card.
   e. Replace the 3 top card connectors.
6. Using the 3745 console, turn the affected power supply ON as follows:

   On the displayed power information screen, type '**u**' followed by the ID of the affected power supply to turn it ON.
7. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

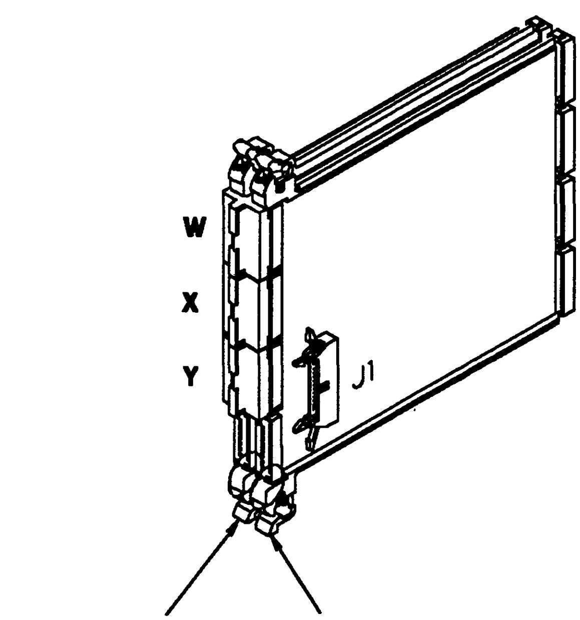


Figure 5-58. CSP and FESL Cards

FESH Exchange Procedure

For physical FRU locations, refer to Figure 5-2 on page 5-6 and Figure 5-17 on page 5-22, or Figure 5-19 on page 5-24.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id
4. **WARNING: Use the ESD kit and procedures.**
5. Referring to Figure 5-59, exchange the FESH card as follows:
   a. Unscrew the plate on the left side of the board and push it up.
   b. Remove the 3 non-polarized top card connectors from positions W, X and Y.
   c. Disconnect the 2 cable ground wires from the board.
   d. Withdraw the FESH card until the 2 line cables (J1, J2) on the component side are accessible. Disconnect the cables (note their position) and remove the card.
   e. Exchange the FESH card (check that the jumper is installed on the new card).
   f. Replace the 2 line cables and replug the FESH card.
   g. Replace the 3 top card connectors.
   h. Reconnect the 2 cable ground wires.
   i. Push the plate on the left side down.

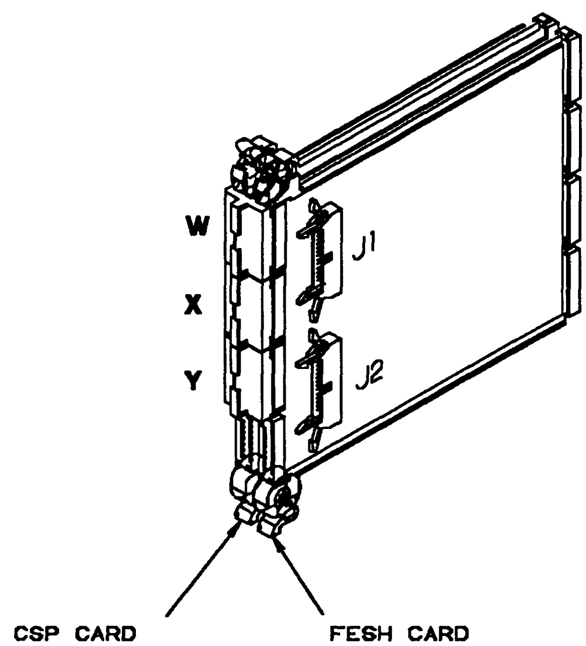


Figure 5-59. FESH Card

6. Using the 3745 console, turn the affected power supply ON as follows:

   On the displayed base frame power information screen type '**u**' followed by the id of the affected power supply to turn it ON.
7. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

DMUX Exchange Procedure

For physical FRU locations, refer to Figure 5-1 on page 5-5 up to Figure 5-7 on page 5-12 ,and Figure 5-22 on page 5-27.

Since the DMUX is 'hot-pluggable', there is no need to power OFF.

Refer to Figure 5-60 and Figure 5-20 on page 5-25.

1. Remove the partial board cover to give access to the DMUX.
2. Remove the serial link cable(s) located on top of the DMUX. Note the position(s).
3. Unfasten the thumb screw holding the DMUX cassette on the board.
4. Exchange the DMUX.
5. Fasten the thumb screw holding the DMUX cassette on the board.
6. Replace the removed serial link cable(s).
7. Replace the partial board cover.
8. Run the same diagnostics you ran before you exchanged the DMUX. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

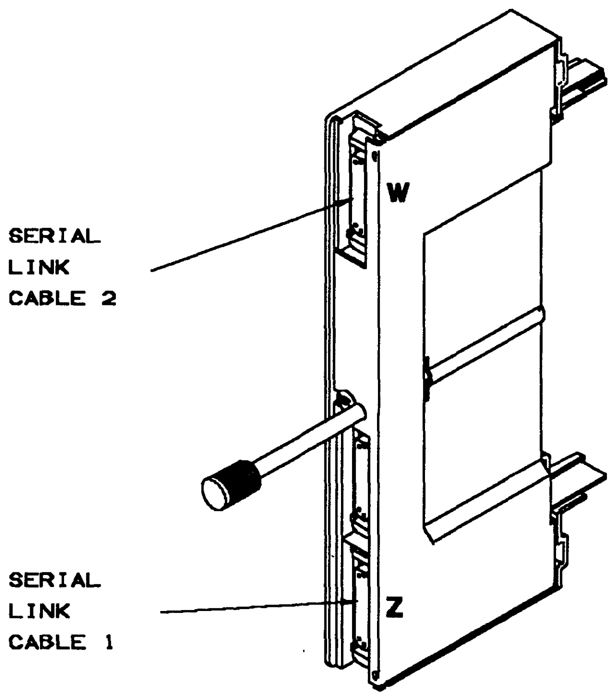


Figure 5-60. DMUX Card

SMUXA/B Exchange Procedure

For physical FRU locations, refer to Figure 5-1 on page 5-5 up to Figure 5-7 on page 5-12 ,and Figure 5-23 on page 5-27.

Since the SMUX is 'hot-pluggable', there is no need to power OFF.

Refer to Figure 5-62 on page 5-70 and Figure 5-20 on page 5-25.

1. Remove the partial board cover to gain access to the SMUX card.
2. Remove the serial link cable(s) located on top or bottom of the SMUX. Note the position(s).
3. Disconnect the flat cable between both SMUX A and B.
4. Unfasten the thumb screw holding the SMUX cassette on the board.
5. Exchange the SMUX.
6. Fasten the thumb screw holding the SMUX cassette on the board.
7. Replace the removed serial link cable(s).
8. Reconnect the flat cable between both SMUX A and B.
9. Set the xmit level switches according to the table below.
10. Replace the partial board cover.
11. Run the same diagnostics you ran before you exchanged the SMUX. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, then go to "Repair Verification Procedure" on page 5-170.

COUNTRY (leased lines)	XMIT LEVEL (in dBm)	SLIDING SWITCHES			
		1	2	3	4
Canada,Greece,US Ireland,other AP/APG countries	0				
	- 1	ON			
	- 2		ON		
	- 3	ON	ON		
	- 4			ON	
	- 5	ON		ON	
Chile,other E.M.E.A countries	- 6		ON	ON	
	- 7	ON	ON	ON	
	- 8				ON
Hong-kong	- 9	ON			ON
Denmark,Finland Iceland,Italy,Sweden	-10		ON		ON
	-11	ON	ON		ON
	-12			ON	ON
Australia,UK	-13	ON		ON	ON
	-14		ON	ON	ON
France,Japan	-15	ON	ON	ON	ON

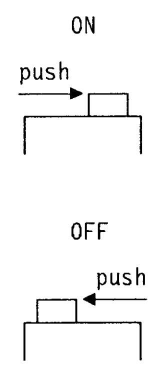


Figure 5-61. SMUX A/B Switches

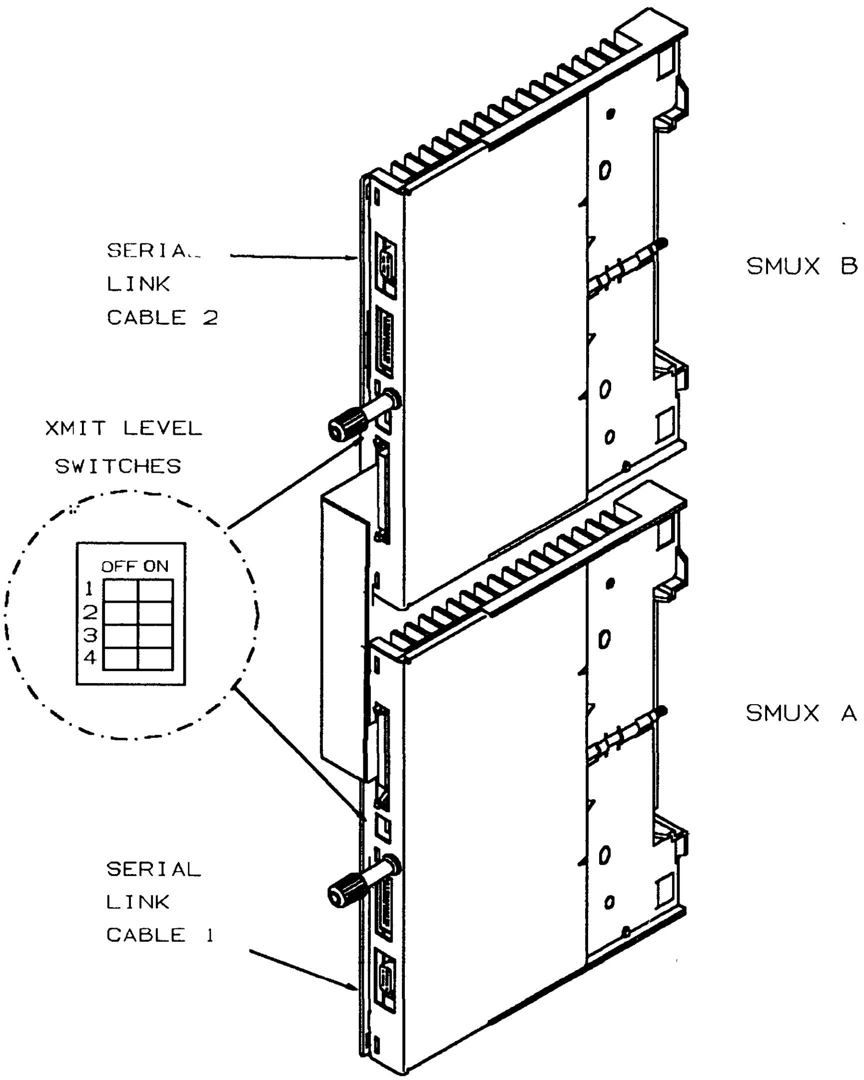


Figure 5-62. SMUX A and SMUX B cards

LIC Type 1-4 Exchange Procedure

For physical FRU locations, refer to Figure 5-1 on page 5-5 up to Figure 5-7 on page 5-12 ,and Figure 5-20 on page 5-25 to 5-29.

Since the LIC is hot-pluggable, there is no need to power OFF.

Refer to Figure 5-63 and Figure 5-20 on page 5-25.

1. Remove the line cable(s) from the LIC. Note their positions.
2. Unfasten the thumb screw holding the LIC cassette on the board.

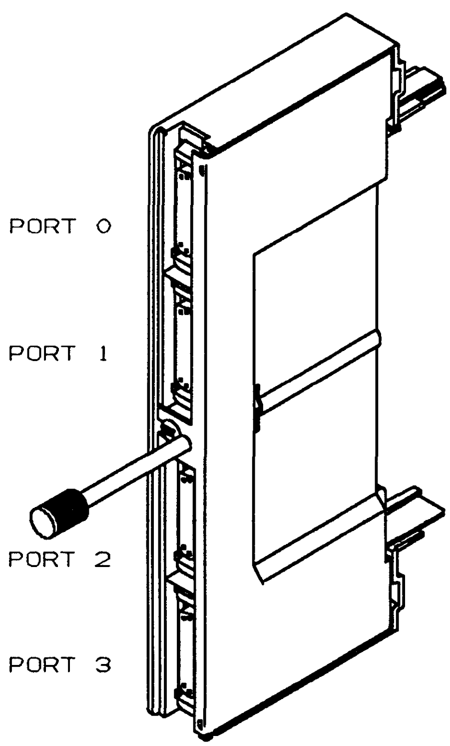


Figure 5-63. LIC Cassette Type 1-4

3. Exchange the LIC.
4. Fasten the thumb screw holding the LIC cassette on the board. Finger strength is enough, do not use pliers.
5. Replace the line cable(s) removed in step 1.
6. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

LIC Type 5 and 6 Exchange Procedure

For physical FRU locations, refer to Figure 5-1 on page 5-5 up to Figure 5-7 on page 5-12 ,and Figure 5-21 on page 5-26 to 5-33.

Since the LIC is hot-pluggable, there is no need to power OFF.

Refer to Figure 5-64 and Figure 5-21 on page 5-26.

1. Unplug the line cable(s) at the customer wall frame (to keep the PTT lines loaded).
2. Remove the line cable(s) from the LIC. Note their positions.
3. Unfasten the thumb screw holding the LIC cassette on the board.
4. Exchange the LIC.
5. Fasten the thumb screw holding the LIC cassette on the board. Finger strength is enough, do not use pliers.
6. If you are exchanging a LIC type 6, locate the speed switch on the right side of the LIC cassette (see Figure 5-64) and set it as it was on the replaced card.
7. Ask the customer to select the correct configuration parameters by using the PKD.
8. Replace the line cable(s) removed in step 1.
9. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

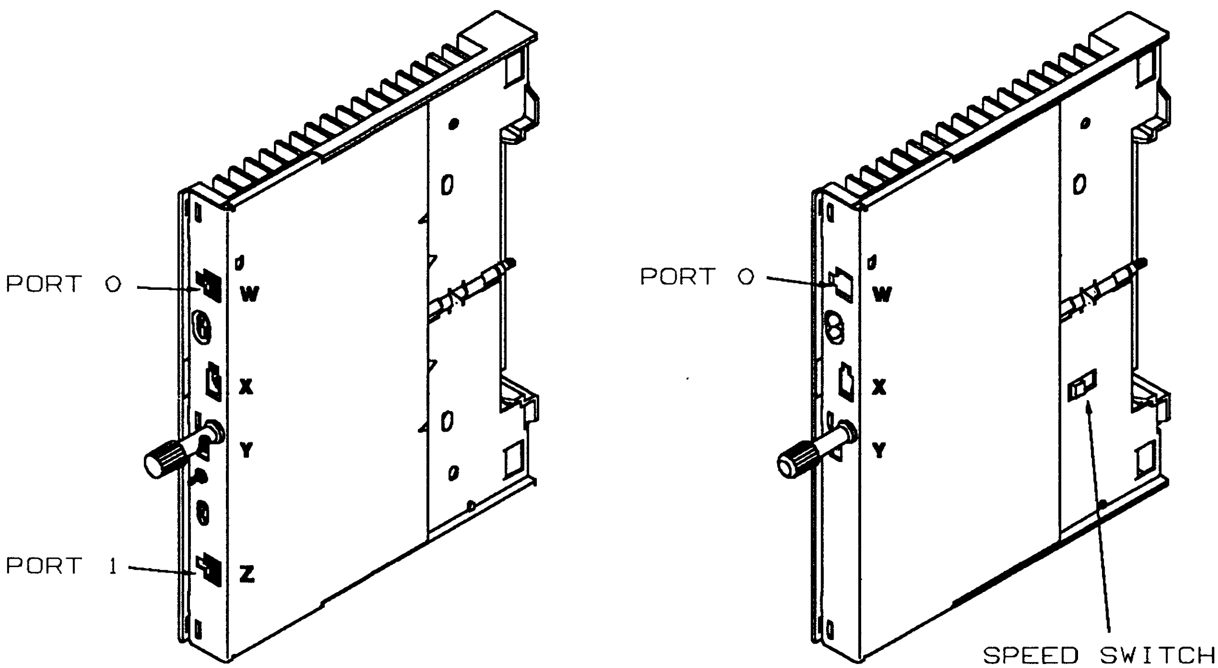


Figure 5-64. LIC Cassette Type 5 and 6

BE SURE TO HAVE NEW FAN READY FOR QUICK EXCHANGE SO 3745 DOESN'T GO DOWN IF REPLACING FAN WHILE 3745 IS IN USE, MAKE SURE N

LIC FAN Exchange Procedure

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

WARNING: Power may be present when nothing is displayed on the control panel.

Locations

For LIC fan location 01N :
refer to Figure 5-2 on page 5-6.

For LIC fan locations 04C/04F :
refer to Figure 5-5 on page 5-10.

For LIC fan locations 05C/05F :
refer to Figure 5-6 on page 5-11.

For LIC fan locations 06C/06F :
refer to Figure 5-7 on page 5-12.

If the LICs cooled by the LIC fan assembly are type 1,3 or 4 only (powered by PS type 5), go to step 2

If there are LICs type 5 or 6 (powered by PS type 7), continue with the next step.

1. **WARNING: Do not forget that the assembly contains 2 fans. You have 2 minutes to replace the assembly. If you exceed 2 minutes the associated power supplies type 7 will automatically be powered OFF.**

   For this reason:

   - Read the following procedure before starting to exchange the assembly.
   - Have the assembly to be installed unpacked and close to the location of the failing unit.

2. Be sure that the fan blades are running free. Do this by pushing the blades with a thin screwdriver or similar tool.
3. Referring to Figure 5-65:
   a. Unscrew the two screws C
   b. Disconnect the power plug A
   c. Disconnect the AFD plug B
   d. Slide the assembly out of the machine.
   e. Fit the new assembly into the machine.
   f. Reconnect the AFD plug B
   g. Reconnect the power plug A
   h. Secure the two screws C
   i. Go to "CE Leaving Procedure" on page 5-172.

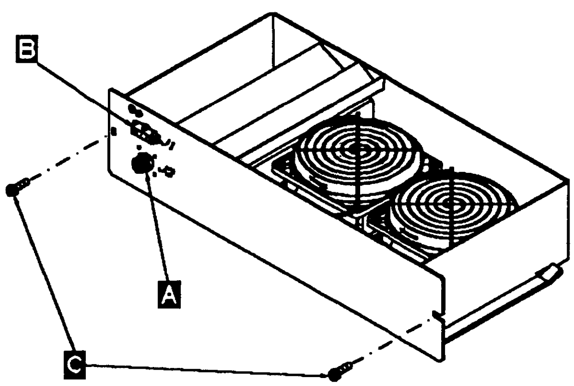


Figure 5-65. Fan Assembly

TRM/TIC Exchange Procedure

For physical FRU locations, refer to Figure 5-2 on page 5-6 and Figure 5-19 on page 5-24.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id
4. **WARNING: Use the ESD kit and procedures.**
5. If the card you are exchanging is the TIC, do the following, otherwise go to step 6.

   Refer to Figure 5-66 on page 5-75 and Figure 5-67 on page 5-75.
   a. Unplug the TIC card and withdraw it until the token-ring cable on the component side is accessible.
   b. Disconnect the token-ring cable.
   c. Fully remove the TIC card.
   d. If the card is a TIC type 1 card, ensure that Jumper A is present and all switches in switch block B are set to ON.
   e. Replug the TIC card in reverse order.
6. If you were sent to exchange the TRM, exchange it now. Refer to Figure 5-66 on page 5-75.
7. Using the 3745 console, power the affected power supply ON as follows:

   On the displayed base frame power services screen type '**u**' followed by the ID of the affected power supply, to power it ON.
8. Although the TRA has been disconnected before exchanging the FRU, you must disconnect again this adapter after power ON and prior to run the diagnostics. Proceed as follows:
   a. From menu 3 select 'TRSS Services' by entering '**TRS**' into the selection area.
   b. From the 'TRSS Services' screen choose 'select' by entering '**1**' in the selection area.
   c. In the input area enter the number of the suspected adapter.
   d. Enter '**2**' in the selection area to choose 'Connect/Disc'.
   e. On the 'Connect/Disc' screen enter '**DS**' to disconnect the TRA.
9. Run the same diagnostics you ran before you exchanged the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

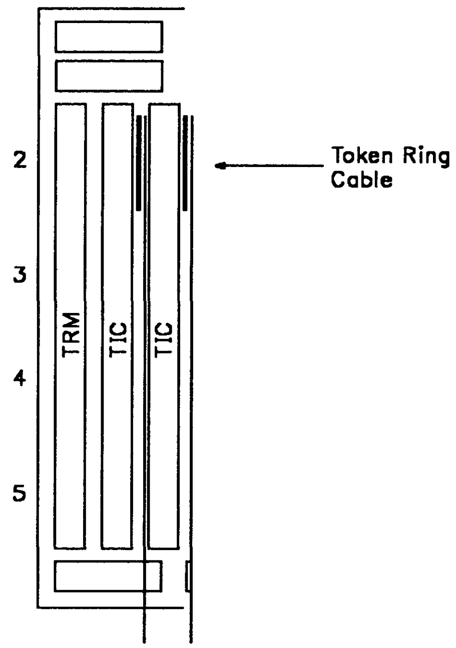


Figure 5-66. TIC and TRM

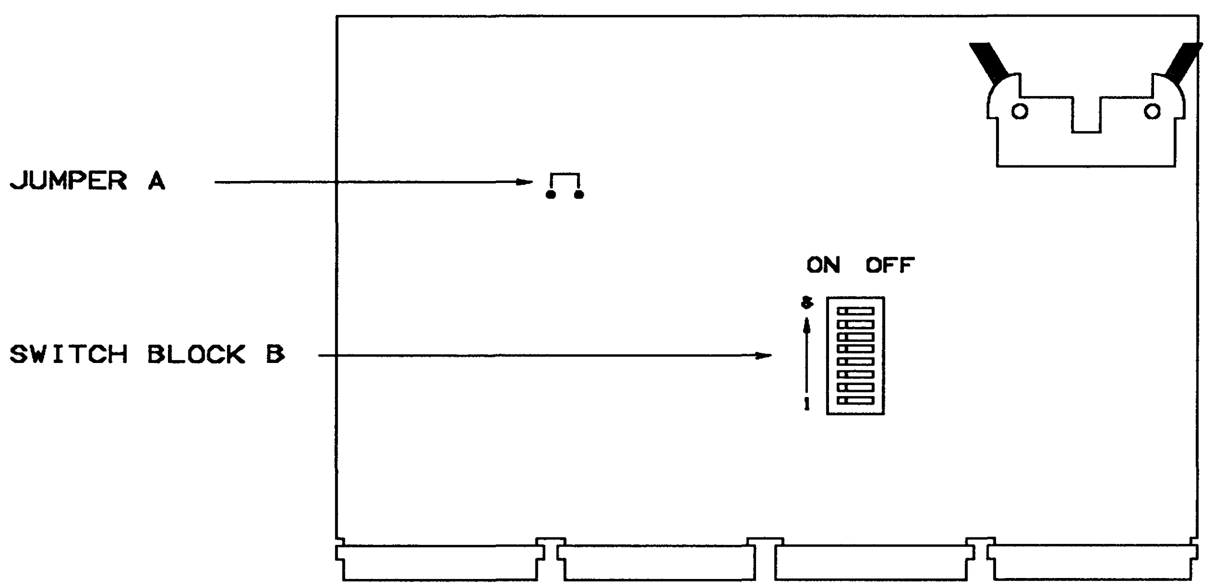


Figure 5-67. Location of Jumper A and Switch Block B on the TIC Card

DTER/ITER Exchange Procedure

For physical FRU locations in frame 01, refer to Figure 5-2 on page 5-6.

For physical FRU locations in frame 02, refer to Figure 5-3 on page 5-8.

For physical FRU locations in frame 03, refer to Figure 5-4 on page 5-9.

WARNING: As each of those cards is common to both CCUs, the whole machine must be available to exchange one of them.

Since DTER and ITER are hot-pluggable, there is no need to turn any power OFF.

1. Remove the board cover.
2. Exchange the card.
3. Replace the board cover.
4. Run the same diagnostics you ran before exchanging the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

PTER Exchange Procedure

Refer to the table below for location.

FR01	01M
FR02	02D
	02G
FR03	03G
FR04	04J
	04H
FR05	05J
	05H
FR06	06J
	06H

Figure 5-68. PTER Locations

The 6 power buses on which the power terminator are mounted are located at each frame on the raceway, refer to Figure 5-2 on page 5-8 to figure 5-7 on page 5-12.

Figure 5-68 shows PTER for frame 01.

PTERs are always fitted at the uppermost part of the bus.

The power terminators are hot-pluggable, there is no need to power OFF.

1. Locate the terminator you wish to exchange, as per the above table.

   Prior to exchanging the power terminator card, perform the following action:
2. Set the Power Control to 'local' as follows:
   - Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
   - Press the 'Validate' key.

   The procedure is the same as that of the power bus test.
3. Set the service mode to 'MAINT 1' as follows:
4. Select service (*1*).
5. Press the 'Validate' key.
6. Select Function (**C**).
7. Press the 'Validate' key.
8. Select the bus on which the failing PTER is fitted (D to H), from power bus test.
9. Press the 'Validate' key.
10. Locate and remove the power bus terminator card.
11. Fit the new power bus terminator card.
12. Press the 'Exit' key.
13. Press the 'Validate' key.
14. Now you have to check that the new terminator card is good, go to "How to Run the Power Control Bus Test" on page 4-24.

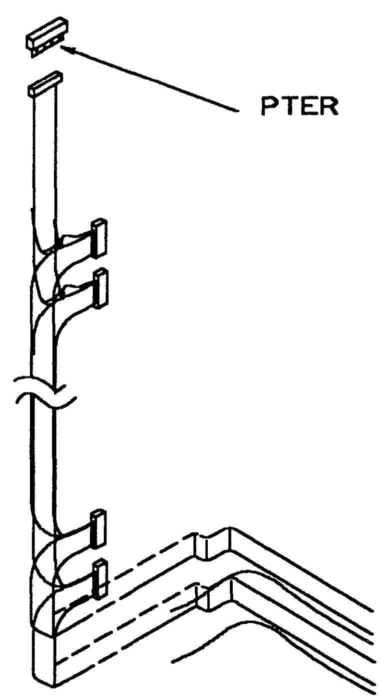


Figure 5-69. Power Terminator (Frame 01 Represented)

STER Exchange Procedure

For physical FRU locations, refer to Figure 5-2 on page 5-6 and Figure 5-9 on page 5-14 for models 210 or 410, or Figure 5-10 on page 5-15 for models 310 or 610.

WARNING: Do not remove more than one card at a time, since the air flow would not be powerful enough to cool the other cards properly.

Since STER is hot pluggable, there is no need to turn the power OFF.

1. Remove the board cover by loosening the screws.
2. Remove the card as follows:
   a. Using both hands, release levers A and B simultaneously by moving them upwards and outwards to their fullest extent, refer to Figure 5-70.
   b. Press catches C and D in gently, draw the card assembly out of the board (catches can be released after initial withdrawal).
3. Replace the card as follows:
   a. ***Open the card handle by pressing in catches C and D gently and pulling the handle.***
   b. Ensure that the levers A and B are still open to their fullest extent.
   c. ***Insert the card into the slot and allow it to seat under its own weight ensuring that it has reached the end of the slot.***

      Take care to place the card so that the card label is towards the corresponding board label.
   d. Press catches C and D in and push the handle until it locks in the closed position (catches can be released after initial motion).
   e. Using both hands, release levers A and B simultaneously by moving them down-wards and inwards.

   Note: In order to improve contact, maneuver the card seating levers 3 times.
4. Replace the cover above the common area.
5. Replace the board cover.
6. Run the same diagnostics you ran before exchanging the FRU. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 then go to "Repair Verification Procedure" on page 5-170.

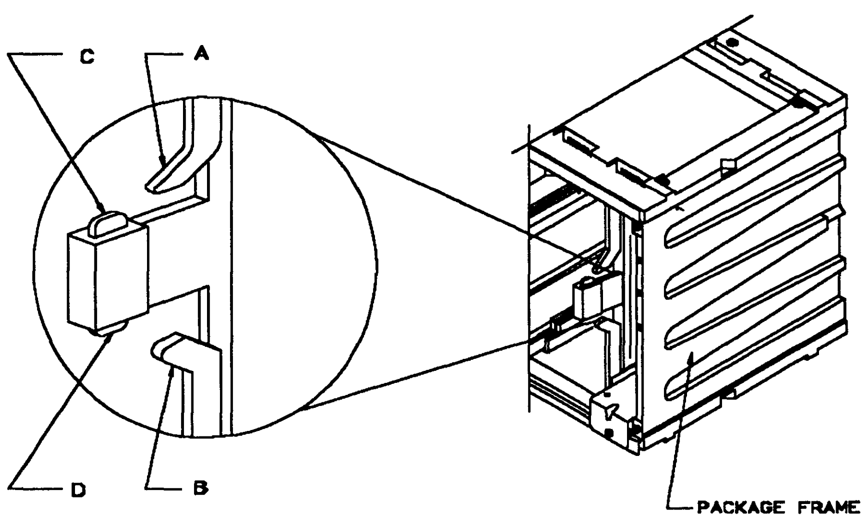


Figure 5-70. Card Clamp Mechanism

Storage and Controls Exchange Procedure

For physical FRU locations, refer to Figure 5-2 on page 5-6 and Figure 5-9 on page 5-14 for models 210 or 410, or Figure 5-10 on page 5-15 for models 310 or 610.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.

   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx= affected power supply id

   WARNING: Do not remove more than one card at a time, since the air flow would not be powerful enough to cool the other cards properly.
4. **WARNING: Use the ESD kit and procedures.**
5. Remove the board cover by loosening the screws.
6. Remove the card as follows:
   a. Using both hands, release levers A and B simultaneously by moving them upwards and outwards to their fullest extent, refer to Figure 5-70 on page 5-78.
   b. Press catches C and D in gently, draw the card assembly out of the board (catches can be released after initial withdrawal).
7. Replace the card as follows:
   a. ***Open the card handle by pressing catches C and D in gently and pulling the handle.***
   b. Ensure that the levers A and B are still open to their fullest extent.
   c. ***Insert the card into the slot and allow it to seat under its own weight ensuring that it has reached the end of the slot.***

      Take care to place the card so that the card label is towards the corresponding board label.

   d. Press catches C and D in and push the handle until it locks in the closed position (catches can be released after initial motion).
   e. Using both hands, release levers A and B simultaneously by moving them downwards and inwards.

   Note: In order to improve contact, maneuver the card seating levers 3 times.
8. Replace the board cover.
9. Turn the power supply ON by using the power menus as follows:
   a. Type '**POS**' on any displayed screen selection area. You will have power services menu displayed.
   b. Type '**1**' to call the base frame power services.
   c. Type '**u02**' or '**u03**' depending of the power id you want to turn ON.
10. Run the CCU diagnostics for any of the replaced cards, and

    Run IOC diagnostics for IOSW card or HPTSS diagnostics for DMSW card. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1), and follow 'How to Run Internal Function Tests' then go to "Repair Verification Procedure" on page 5-170.

Air Filters Exchange Procedure

It is the CE's responsibility to exchange the air filters of the 3745.

(**Note** : We advise you to take advantage of this intervention to check the battery voltage and to exchange it if necessary.)

Gate Filters

No special procedure is needed to exchange the filters located at the bottom of the following gates:

Frame 01
Frame 02
Frame 03

1. Open the front cover of the frame.
2. Open the internal black cover.
3. Exchange the filter, follow the arrow direction.
4. Close the covers.

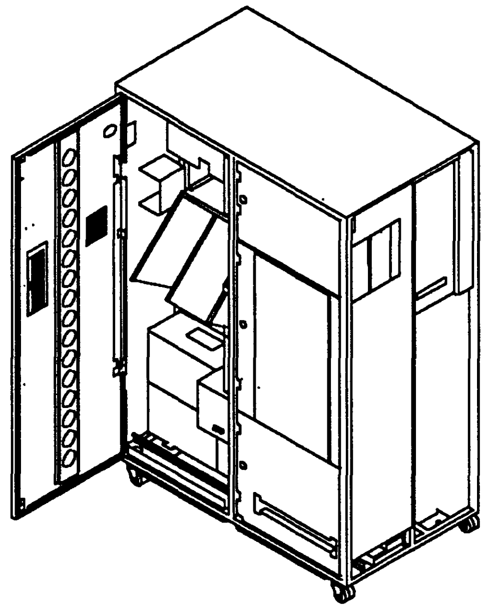


Figure 5-71. Frame 01 Internal Access

Air Moving Device Filters for Models 210 or 410

The 3745 will automatically send an alert to the operator console when the filters have to be changed.

Perform the following steps to remove the air filter unit:

1. Referring to Figure 5-71:
   - Open the left front cover of frame 01.
   - Remove the internal black cover, by unscrewing the 4 screws.
2. Referring to Figure 5-72:
   - Locate the air filters for CCU A and CCU B **A**
3. Referring to Figure 5-73 on page 5-81:
   - Unlock the air filter retaining screw **A**
   - Remove the air filter **B**
   - Put the new air filter in and tighten the screw.
4. Close the covers.

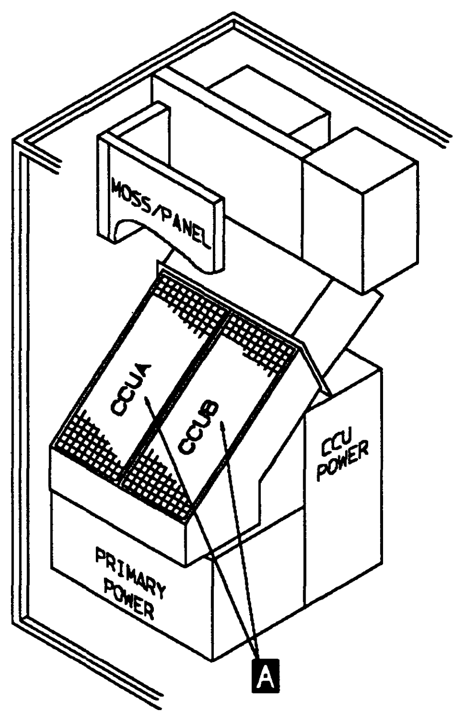


Figure 5-72. AMD Filter Location

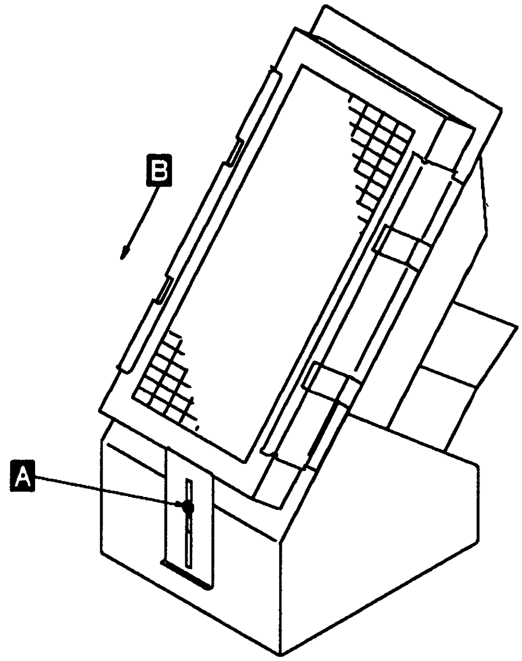


Figure 5-73. Filter Removal

Reporting: Now you have to update the air filters exchange record as follows:

- Using the 3745 console type '**POS**' on any displayed screen selection area.
- You now have the power services menu displayed.

  If you have a MOSS console function in process, hit the 'F1' key to terminate it.

Referring to Figure 5-76 on page 5-83 and Figure 5-77 on page 5-83:

- Select option **A**.
- Select option **F** to acknowledge the change.
- Confirm the change (**Y/N**).

  A successful command message will appears.

  If you have exchanged the air filters after a HDD replacement, Go to "Repair Verification Procedure" on page 5-170.

  If not: Go to "CE Leaving Procedure" on page 5-172.

Air Moving Device Filter for Models 310 and 610

(**Note** : We advise you to take advantage of this intervention to check the battery voltage and to exchange it if necessary.)

The 3745 will automatically send an alert to the operator console when the filter has to be changed.

1. Open the left front door of frame 01 (base frame).
2. Locate the front air moving device filter, refer to Figure 5-74.
3. Loosen the screw which maintains the bracket **1** then push the bracket down. You can now remove the air filter by sliding it down.
4. Insert the new air filter. Take care, the arrow on the side of the filter must be **downward**.
5. Slide the bracket up then tighten the screw.
6. Close the front door.

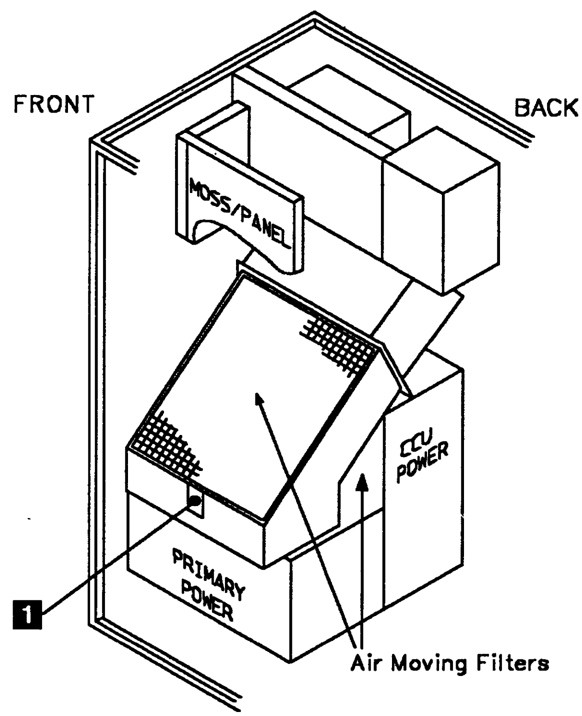


Figure 5-74. Air Filter locations

7. Open the back doors of the frame 01 (Base frame).
8. Locate the back air moving device filter **2**. Refer to Figure 5-74 on page 5-81 and Figure 5-75.
9. Loosen the screw wich maintains the bracket **3**, then remove it. You have to draw gently aside the FDS cables then you can remove the air filter.
10. Insert the new air filter. Take care, the arrow on the side of the filter must be **upward**.
11. Reinstall the bracket, then tighten the screw.
12. Cose the back doors.

Reporting: Now you have to update the air filters exchange record as follows:

- Using the 3745 console type '**POS**' on any displayed screen selection area.
- You now have the power services menu displayed.

  If you have a MOSS console function in process, hit the 'F1' key to terminate it.

Referring to Figure 5-76 on page 5-83 and Figure 5-77 on page 5-83:

- Select option **A**.
- Select option **F** to acknowledge the change.
- Confirm the change **(Y/N)**.

  A successful command message will appear.

  If you have exchanged the air filters after an HDD replacement, go to "Repair Verification Procedure" on page 5-170.

  If not: go to "CE Leaving Procedure" on page 5-172.

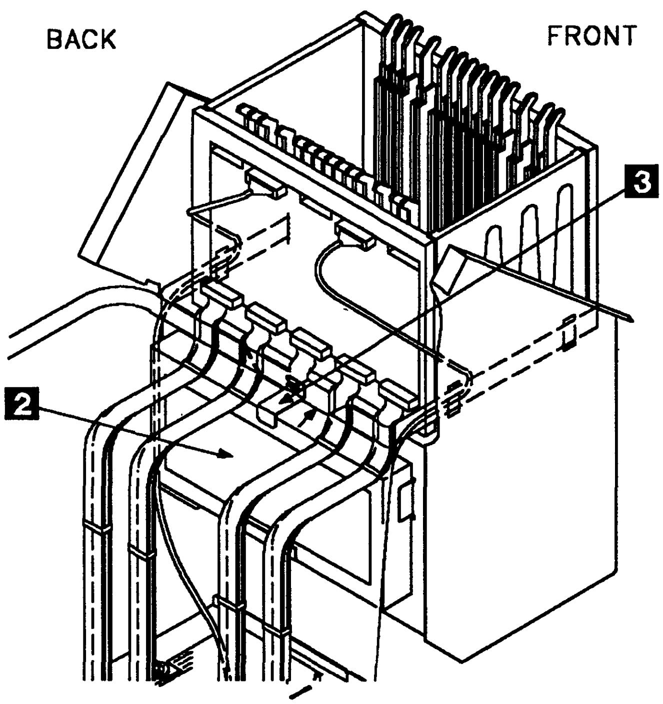


Figure 5-75. Back Air Filter location

```
CUSTOMER ID:                             3745-xxx         SERIAL NUMBER:
CCA-A         PROCESS MOSS-ALONE
RESET    BYP-IOC-CHK STOP-CCU-CHK

CCU-B         PROCESS MOSS-ALONE            X71:0A0800
RUN      BYP-IOC-CHK STOP-CCU-CHK           X72:0BC800
------------------------------------------------------------- 03/01/87 01:2
FUNCTION ON SCREEN: POWER SERVICES

- SELECT ONE OPTION (1 TO 6,C,A OR D), THEN PRESS ENTER  ==>

   1 = DISPLAY 3745                         4 = DISPLAY 3746 L13
   2 = DISPLAY 3746 A11                     5 = DISPLAY 3746 L14
   3 = DISPLAY 3746 A12                     6 = DISPLAY 3746 L15

          C = RE-CREATE POWER CONFIGURATION TABLE
          A = AIR FILTERS/BATTERY CHANGE ACKNOWLEDGE
          D = DISPLAY AIR FLOW DETECTORS STATUSES



===>

F1:END  F2:MENU2  F3:ALARM              F6:QUIT
```

Figure 5-76. Power Services Screen

```
CUSTOMER ID:                             3745-xxx         SERIAL NUMBER:
CCA-A         PROCESS MOSS-ALONE
RESET    BYP-IOC-CHK STOP-CCU-CHK

CCU-B         PROCESS MOSS-ALONE            X71:0A0800
RUN      BYP-IOC-CHK STOP-CCU-CHK           X72:0BC800
------------------------------------------------------------- 03/01/87 01:2
FUNCTION ON SCREEN: POWER SERVICES

                  AIR FILTERS/BATTERY CHANGE ACKNOWLEDGE

- SELECT ONE OPTION (F,B), THEN PRESS ENTER  ==>

F = ACKNOWLEDGE AIR FILTERS CHANGE

B = ACKNOWLEDGE BATTERY CHANGE

CONFIRM BATTERY CHANGE (Y/N) ==>



===>

F1:END  F2:MENU2  F3:ALARM              F6:QUIT
```

Figure 5-77. Acknowledge Screen

Air Moving Device Exchange Procedure for Models 210 and 410

The following procedures concern the removal and installation of the air moving device (AMD).

This procedure is valid for both CCUs.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**'

      CCU A xx=02
      CCU B xx=03.

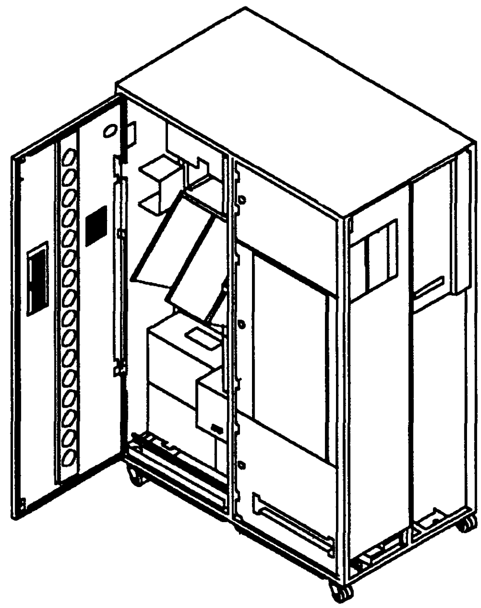


Figure 5-78. Frame 01 Internal Access

Air Moving Device Removal

1. Referring to Figure 5-78:
   - Open the left front cover of frame 01.
   - Remove the upper internal black covers by unscrewing the 4 screws.
2. Referring to Figure 5-79:
   - Locate the failing AMD given by either the reference code or the FRU list **A**
   - Unplug the power cord **B** of the CCU air moving device.

     WARNING: Take care not to switch the nearby CPs OFF.

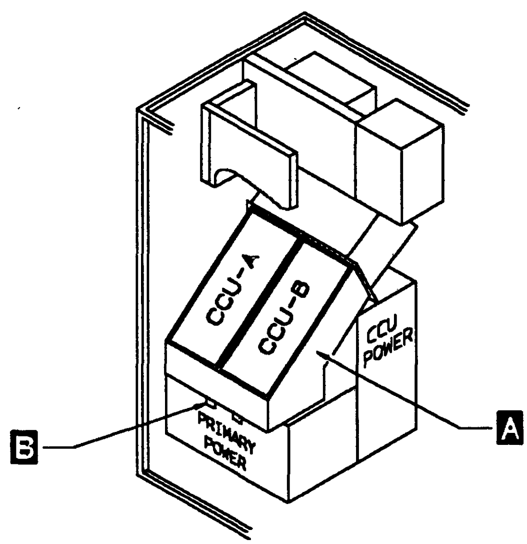


Figure 5-79. Air Moving Devices Location

3. Referring to Figure 5-80:
   - Remove the 4 mounting screws A of the air moving device unit.
   - To remove the air moving device, swing out the bottom of the unit and lift out B

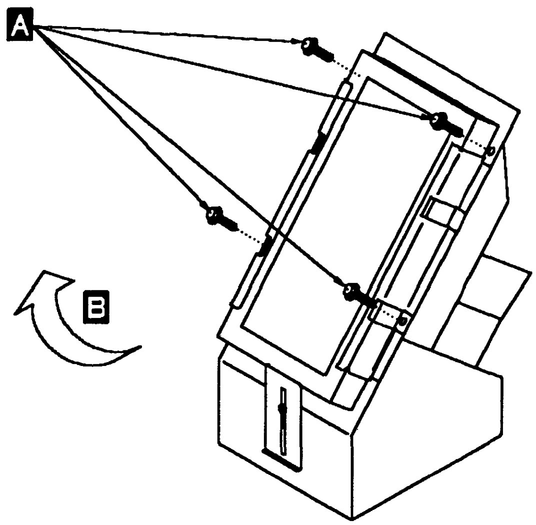


Figure 5-80. Air Moving Devices Removal

Air Moving Device Installation

Note: Inspect the air filter, do not hesitate to exchange it if dirty, also update the exchange record, refer to "Air Filters Exchange Procedure" on page 5-80.

To replace the air moving device assembly, perform the removal procedure in the reverse order.

Then:

1. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

     You now have the power services menu displayed.

   - Select option **1**.
   - Type '**uxx**' to turn the power supply ON.
     CCU A xx=02
     CCU B xx=03.
2. Go to "Repair Verification Procedure" on page 5-170.

Air Moving Device Exchange Procedure for Models 310 and 610

The following procedure concerns the removal and the installation of the air moving device (AMD).

This procedure is valid for both CCUs.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follow:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**'
      CCU A xx=02
      CCU B xx=03

Air Moving Device Removal

1. Open the left front door of frame 01 (base frame).
2. Locate the air moving devices, refer to Figure 5-81.

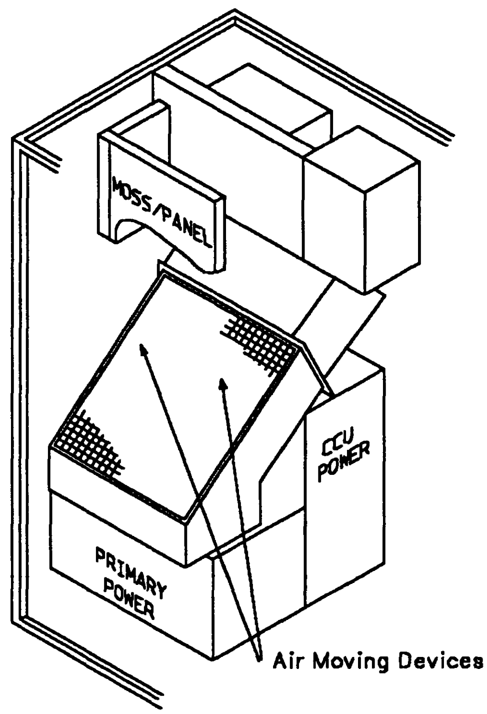


Figure 5-81. Air Moving Devices Location

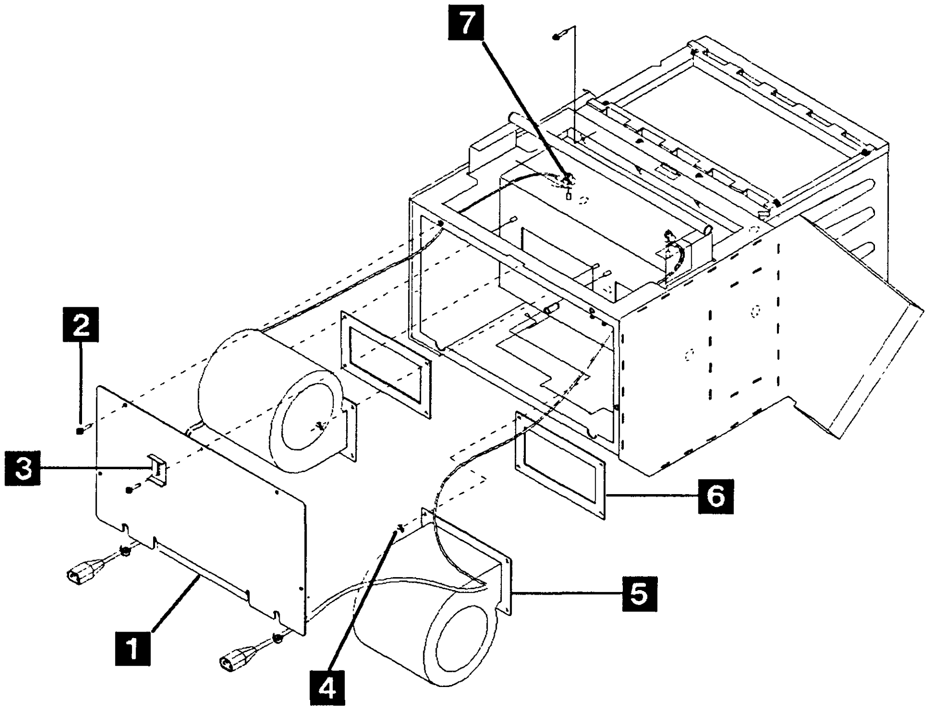


Figure 5-82. Air Moving Devices Removal

3. Refer to Figure 5-82. Remove the screw which maintains the bracket **3**. You can now remove the upper filter by sliding it down.
4. Remove the four screws **2** which maintain the plate **1**. Remove the plate.
5. Locate the failing air moving device given by either the reference code or the FRU list. The air moving device for CCU A is the left one.
6. Disconnect the power plug related to the failing air moving device.
7. Disconnect the ground wire related to the failing air moving device **7**.
8. Remove the four nuts **4** which maintain the failing air moving device unit. Remove this unit.
9. Remove the related pad **6**.

Air Moving Device Installation

Note: Inspect the air filter, do not hesitate to exchange it if dirty, also update the exchange record, refer to "Air Moving Device Filter for Models 310 and 610" on page 5-81.

To replace the air moving device unit, perform the removal procedure in the reverse order.(If you do not achieve to reinstall the four nuts which maintain the air moving device, note that it is admitted that three nuts may be considered sufficient).

Then:

1. Using the 3745 console, turn the affected power supply ON as follow:
   a. Type **POS** on any displayed screen selection area.

      You now have the services menu displayed.
   b. Select option **1**.
   c. Type '**uxx**' to turn the power supply ON.
      CCU A xx=02
      CCU B xx=03
2. Go to "Repair Verification Procedure" on page 5-170.

Battery Exchange Procedure

It is the CE's responsibility to exchange the battery.

The 3745 will automatically send an alert to the operator console when there is a need to exchange the battery.

Perform the following steps to remove the battery:

1. Referring to Figure 5-83:
   - Open the left front cover of frame 01.
   - Locate the battery at the bottom of the control panel **A**

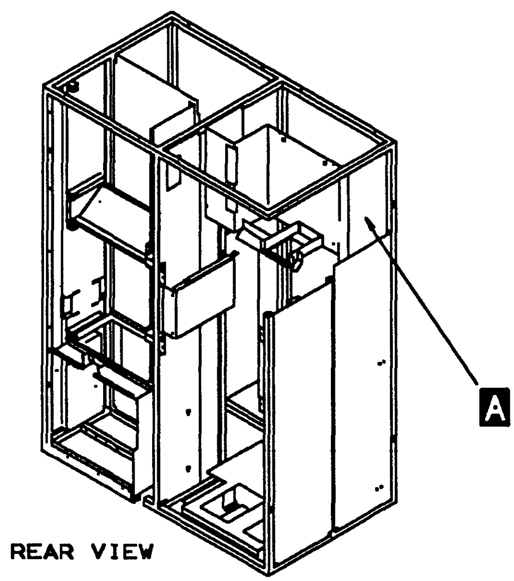


Figure 5-83. Battery Location

2. Referring to Figure 5-84:
   - Unclip the battery **A**
   - Unplug the battery plug **B**
   - Replace the new battery and reconnect the plug.

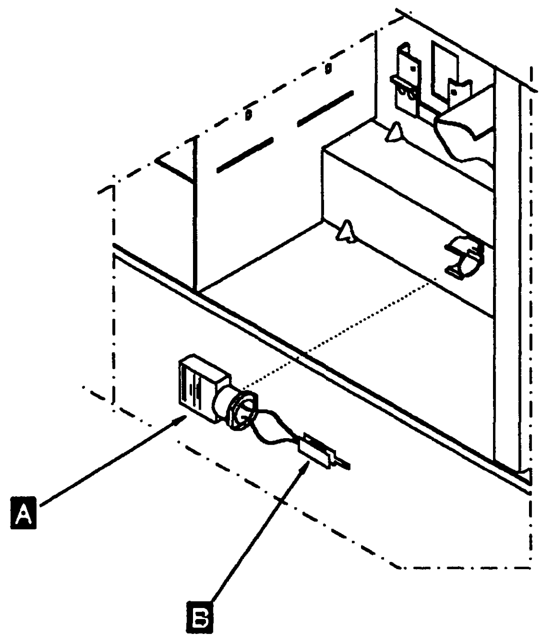


Figure 5-84. Battery Removal

3. Close the covers.
4. Battery disposal must be performed according to the instructions on the battery case.

Reporting

Now you have to update the battery exchange record as follows:

- Using the 3745 console, type '**POS**' on any displayed screen selection area.
- You now have the power services menu displayed. If you have a MOSS console function in process, hit the 'F1' key to terminate it.

Referring to Figure 5-85 on page 5-89 and Figure 5-86 on page 5-89:

- Select option **A** = air filter/battery.
- Select option **B** = acknowledge battery.
- Confirm the exchange (**Y/N**).

A successful command message will appears.

Go to "CE Leaving Procedure" on page 5-172.

```
CUSTOMER ID:                           3745-xxx        SERIAL NUMBER:
CCA-A          PROCESS MOSS-ALONE
RESET     BYP-IOC-CHK STOP-CCU-CHK

CCU-B          PROCESS MOSS-ALONE         X71:0A0800
RUN       BYP-IOC-CHK STOP-CCU-CHK        X72:0BC800
------------------------------------------------------------- 03/01/87 01:2
FUNCTION ON SCREEN: POWER SERVICES

- SELECT ONE OPTION (1 TO 6,C,A OR D), THEN PRESS ENTER  ==>

   1 = DISPLAY 3745                           4 = DISPLAY 3746 L13
   2 = DISPLAY 3746 A11                       5 = DISPLAY 3746 L14
   3 = DISPLAY 3746 A12                       6 = DISPLAY 3746 L15

          C = RE-CREATE POWER CONFIGURATION TABLE
          A = AIR FILTERS/BATTERY CHANGE ACKNOWLEDGE
          D = DISPLAY AIR FLOW DETECTORS STATUSES



===>

F1:END  F2:MENU2  F3:ALARM             F6:QUIT
```

Figure 5-85. Power Services Screen

```
CUSTOMER ID:                           3745-xxx        SERIAL NUMBER:
CCA-A          PROCESS MOSS-ALONE
RESET     BYP-IOC-CHK STOP-CCU-CHK

CCU-B          PROCESS MOSS-ALONE         X71:0A0800
RUN       BYP-IOC-CHK STOP-CCU-CHK        X72:0BC800
------------------------------------------------------------- 03/01/87 01:2
FUNCTION ON SCREEN: POWER SERVICES

                  AIR FILTERS/BATTERY CHANGE ACKNOWLEDGE

- SELECT ONE OPTION (F,B), THEN PRESS ENTER  ==>

F = ACKNOWLEDGE AIR FILTERS CHANGE

B = ACKNOWLEDGE BATTERY CHANGE

CONFIRM BATTERY CHANGE (Y/N) ==>


===>

F1:END  F2:MENU2  F3:ALARM             F6:QUIT
```

Figure 5-86. Acknowledge Screen

MOSS Blower Exchange Procedure

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the "Validate" key.
3. Press the 'Service' key until (*1*) is displayed.
4. Press the "Validate" key.
5. Remove power as follows:
   - Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   - Press the 'Validate' key.
   - Observe the MOSS inoperative display on the control panel. At completion of power OFF, it will display the character (*B*).

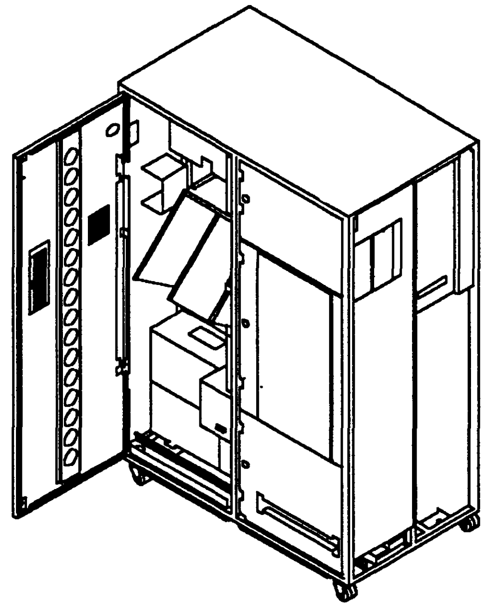


Figure 5-87. Frame 01 Internal Access

MOSS Blower Assembly Removal

1. Referring to Figure 5-87:
   - Open the left front cover of frame 01.
   - Remove the upper internal black covers by unscrewing the 4 screws.
   - Locate the blower below the MOSS board at 01A-Z0.
2. Referring to Figure 5-88:
   - Unplug the connector **A** from the front.
   - Go to the rear side of the 3745 and open the right cover of frame 01.
   - Unplug the connector **B** 01A-W0C4.
   - Unlock the 2 retaining screws **C**
   - Slide the assembly out of the machine **D**

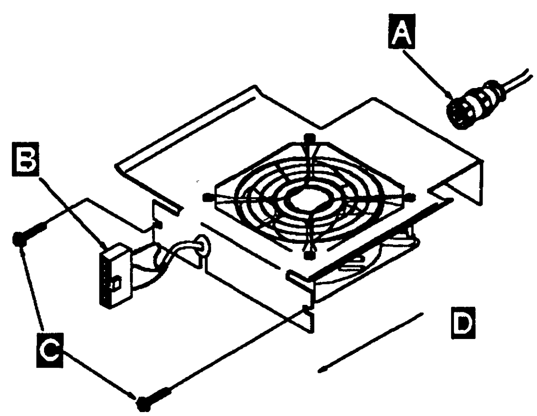


Figure 5-88. Blower Assembly Removal

MOSS Blower Assembly Installation

To replace the MOSS blower assembly, perform this procedure in the reverse order. Then:

1. Turn the MOSS ON, proceed as follows:
   - Using the 'Function' key scroll till the value is (*1*), MOSS IML.
   - Press the 'Validate' key.

   Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
2. Go to "Repair Verification Procedure" on page 5-170.

TCM Exchange Procedure

The following procedures concern the removal and installation of FRUs that pertain to the Thermal Conduction Modules (TCM), and TCM cables.

This procedure is valid for both CCUs.

WARNING: Always be aware that the TCM is susceptible to mechanical shock damage. Carefully observe handling instructions and keep the TCM in its shipping container whenever it is not in the machine.

Tools Required and Preliminary Procedures

Tools Required

The following tools are required to service the TCM area of the CCU.

- TCM tool kit P/N 69x7667

This tool kit contains the following tools:

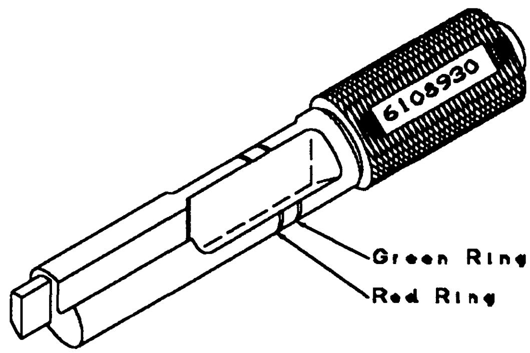
- Tool case TCM P/N 69x7668
- Label TCM kit, (inside the case) P/N 69x7669
- Clip-on TCM cover (COTC) P/N 7331541*
- TCM handle P/N 7331537*
- TCM actuation tool P/N 5665908
- TCM cam gauge P/N 6108930
- Module pin aligner (2) P/N 2360424
- Module Pin Template P/N 4447370
- Hex drive torque tool (red) P/N 2360092
- Hex drive torque tool (blue) P/N 4134750
- 1/4 ratchet P/N 1808111

- ESD kit P/N 6428316
- Signal cable unlatch tool P/N 2360349

* Also shipped in container with each new TCM

TCM Cam Gauge P/N 6108930

The TCM Cam Gauge is provided to check that the TCM is cammed into position correctly after the TCM is installed, using the TCM actuating tool.



TCM Actuation Tool P/N 5665909

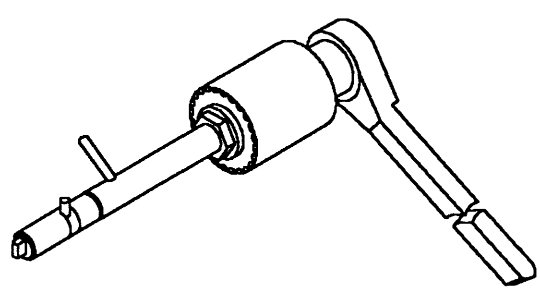
This tool is used to bring the TCM to a cammed position (installation) or to an uncammed position (removal).

The depth indicator ring gives an indication if the tool is properly inserted.

If the tool is fully inserted the ring is no longer visible.

The detent pin must be set to the R position for removal and to the I position to install the TCM.

The indicator pin, points to the 3 o'clock position if the TCM is in the cammed position and to the 7 o'clock position if the TCM is in the uncammed position.



Module Pin Aligner P/N 2360424

Pins may become bent on a module so that it cannot be installed properly without causing severe damage to the system.

To ensure against this potential damage, the pin alignment of a module must be checked before installation.

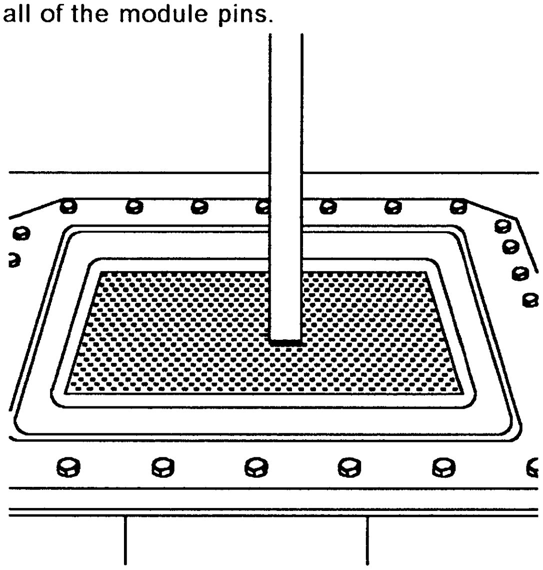
A visual inspection must be made by sighting down the row of pins.

Any pins out of alignment should be checked using the multiple end of the tool to ensure alignment.

The module pin aligner tool should be used only if PINS ARE BENT.

One end of the tool is for straightening a single pin, while the other end is used to verify that a bent pin is straightened correctly, in relation to the surrounding pins.

After bent pins have been straightened, use the Module Pin Template to verify the alignment of all of the module pins.



Module Pin Template P/N 4447370

This tool is provided to check the alignment of the TCM connector pins.

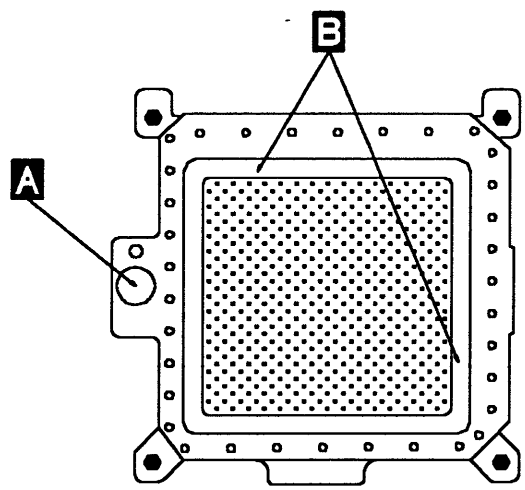
Take the template in both hands with the part number visible.

Align the template so that the large hole in the template coincides with the cam hole in the TCM **A**

Carefully align the gauge with the guide pins on the TCM base plate.

A slight downward pressure on each end of the pin gauge **B** should cause the template to fit easily.

If it does not fit properly use the module pin aligner to straighten the bent pin(s).



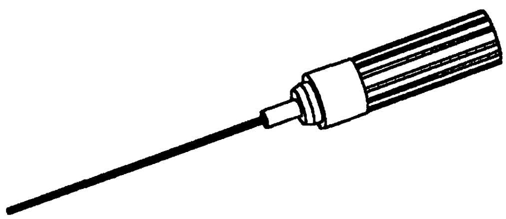
Torque Tool P/N 2360092

This tool is used to operate the screws that hold the TCM module, heat-sink, and module guide.

It is a hand-operated tool with a preset torque setting when turned in a clockwise direction.

Torque control is needed to prevent damage to the screw threads and inserts. When removing screws always ensure that the tip is fully seated in the socket head screw.

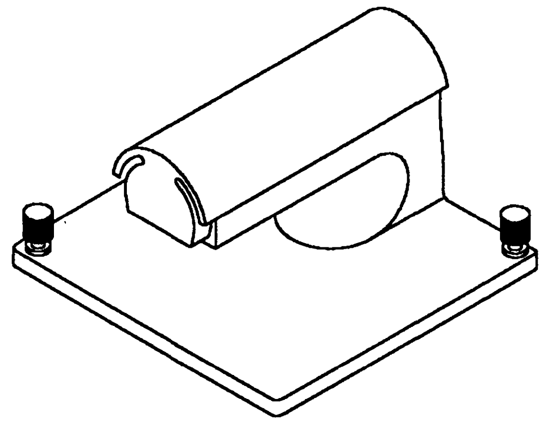
The tool has a positive drive in the counterclockwise direction.



TCM Handle P/N 7331537

This handle is part of the shipping container.

When removing a TCM module, this handle must be mounted right after the heat-sink is removed.



Clip-on TCM Cover (COTC) P/N 7331541

This cover is normally used when the module is returned to the manufacturing plant.

It should also be used if the module is removed for any other reason, to keep the pins from being bent.

Handling ESD-Sensitive TCM FRUs

The 3745 CCUs use parts that are known to be sensitive to electrostatic discharge (ESD).

To prevent damage to ESD-sensitive parts, observe the following procedures.

Perform these procedures in addition to all the usual precautions, such as powering OFF the unit before removing TCMs.

- Keep the ESD-sensitive part in its original shipping container until the part is ready to be installed in the machine.
- Make as few body movements as possible to prevent an increase of static electricity in clothing, carpet, and furniture fabric.
- Before touching the ESD-sensitive part, connect the ESD kit, P/N 6428316 as follows:

  Place the wristband around your wrist and attach the wristband to the snap-on clip at the end of the ESD cable

  Attach the alligator clip on the other end of the ESD cable to a ground strap on the machine frame.
- Hold the ESD-sensitive part by the edge or the connector shroud (cover); **Do not touch the pins**. If a pluggable module is being removed, use the correct module.
- Do not place the ESD-sensitive part on the machine cover or on a metal table; if the ESD-sensitive part must be put down for any reason, first place it in its special protective container.

  Machine covers and metal tables are electrical grounds.

  They increase the risk of damage because they provide a discharge path from the human body through the ESD-sensitive part.

  Large metal objects can provide discharge paths without being grounded.
- Prevent ESD-sensitive parts from being accidentally touched by other customer engineers (CEs) or customers.

  Re-install the cover on the machine while the machine is not being serviced, and do not place unprotected ESD-sensitive parts on a table.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet or case.
- Be especially careful in working with ESD-sensitives parts when cold weather heating is used; low humidity increases static electricity.

Removal and Replacement Procedure

Connect the ESD kit:

- Place the wristband around your wrist and attach the wristband to the snap-on clip at the end of the ESD cable.
- Attach the alligator clip on the other end of the ESD cable to a ground strap on the machine frame, for example grounding strap close to the frame lock.
- Attach the center connector of the ESD cable to the conductive mat.

TCM Removal

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.

   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**'

      CCU A xx=02

      CCU B xx=03.
4. Referring to Figure 5-89:
   - Open the left front cover of frame 01.
   - Remove the internal black cover by unscrewing the 4 screws.

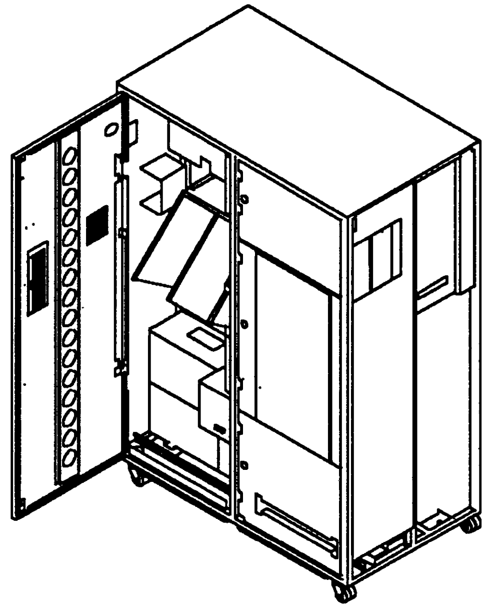


Figure 5-89. Frame 01 Internal Access

5. Referring to Figure 5-90:
   - Locate the failing CCU unit given by either the reference code or the FRU list **A**
   - Unplug the power cord of the CCU Air Moving Device **B**

     J1 for CCU A,
     J2 for CCU B.

     WARNING: Take care not to switch the nearby CPs OFF.

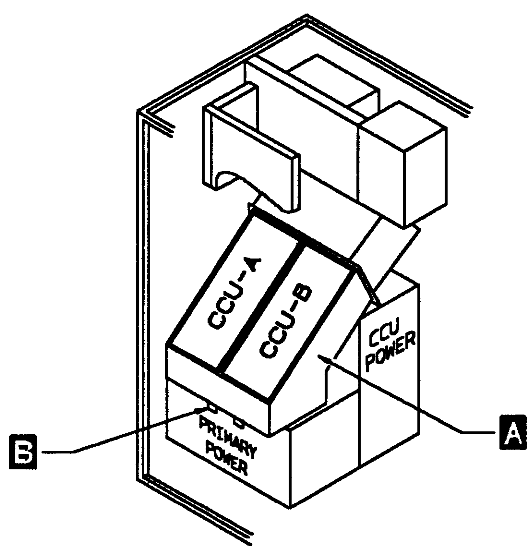


Figure 5-90. AMD Location

6. Referring to Figure 5-91 on page 5-97:
   - Remove the 4 mounting screws **A**
   - To remove the Air Moving Device, swing up the bottom of the unit and lift out **B**

     Move the AMD to a safe place for a later reuse.

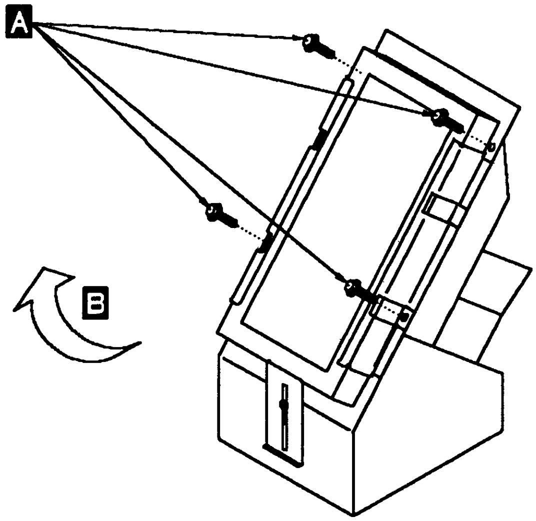


Figure 5-91. Air Moving Device Removal

7. Referring to Figure 5-92:
   - Use the torque tool P/N2360092 to loosen the 9 screws which hold the TCM heat sink **A**
   - **Carefully remove the heat-sink B**

     With care place it in a safe area, resting it with the TCM face uppermost, for a later reuse.

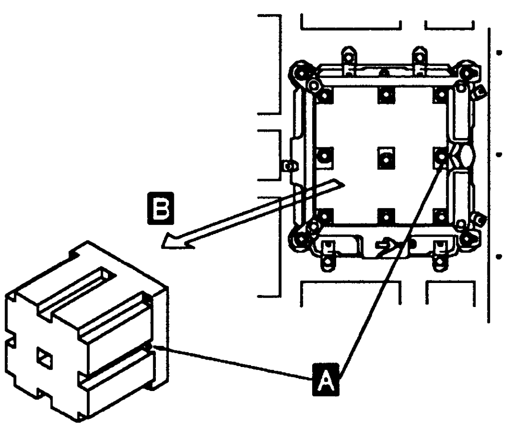


Figure 5-92. Heat Sink Removal

8. Referring to Figure 5-93:
   - Attach the TCM handle to the surface of the TCM **A**
   - Tighten the two thumbscrews securely **B**

     Note: The handle is part of the TCM shipping container. You may have to remove the handle from the new TCM.

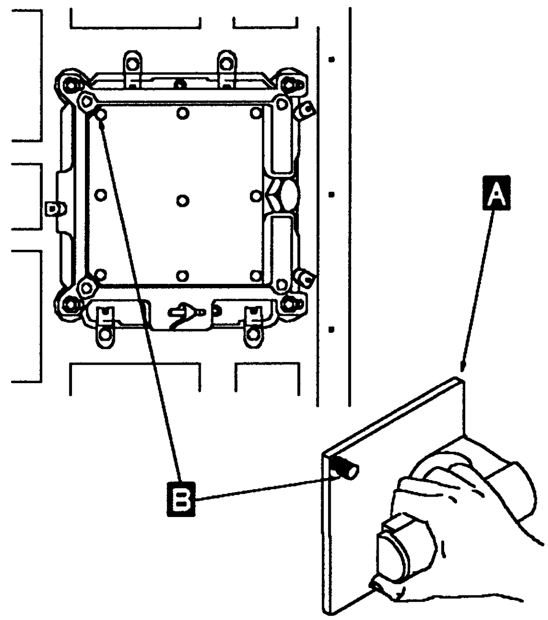


Figure 5-93. TCM Handle Attachment

9. Referring to Figure 5-94 on page 5-98:
   - Use the torque tool P/N 2360092 to loosen the four TCM retaining screws completely **A**

     Note: The TCM retaining screws are captive screws; therefore, be certain that they are unscrewed completely and are free of the tapped holes in the board stiffener.

     These screws must be loosened completely to allow the cam guard to slide to the left side.

     This permits the TCM actuation tool to be inserted to release the TCM.

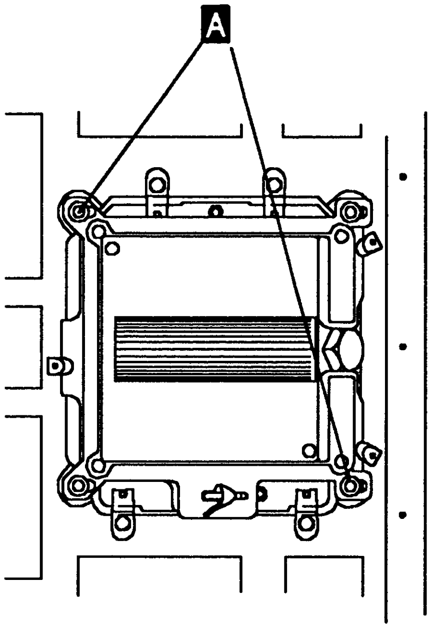


Figure 5-94. TCM Retaining Screws

10. Use the TCM actuation tool P/N5665909 to remove the TCM.

    Perform the following steps:

    - Before using the TCM actuation tool, be certain that the detent pin in the tool is in the ***Removal position*** **R** as shown Figure 5-95.

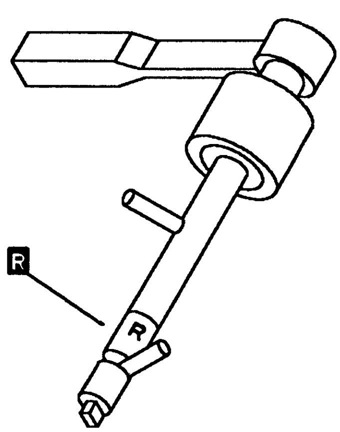


Figure 5-95. Actuation Tool, TCM Removal

- Set the lever on the ratchet handle to drive in a counterclockwise direction.
- On the TCM, slide the cam guard to its left side limit.

  Insert the tip of the TCM actuation tool into the module with its indicator pin pointing to the cammed (9 o'clock) position as shown in Figure 5-96.

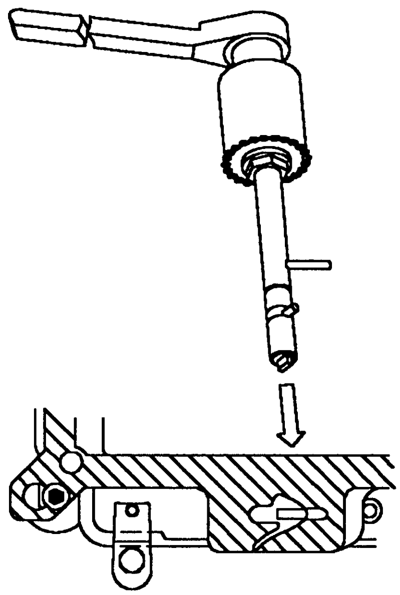


Figure 5-96. Actuation Tool Usage

- Be certain that the TCM actuation tool is fully inserted until the red ring is no longer visible.

  WARNING: When turning the TCM actuation tool, avoid exerting any side force on the tool.

  If the TCM actuation tool is not fully inserted, turning the actuation tool may damage the cam guard.

- Place both hands on the actuation tool and turn the actuation tool slowly counterclockwise from the cammed position to the uncammed position.

  Continue to turn the actuation tool counterclockwise until the slip clutch is activated. This assures that the TCM is uncammed completely as shown Figure 5-97 on page 5-99.

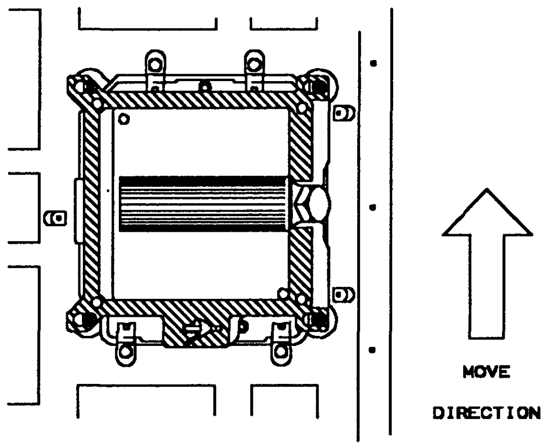


Figure 5-97. TCM Uncammed Position

Remove the TCM actuation tool.

WARNING: Be sure to keep one hand firmly on the TCM handle to hold it in position until after the next operation is completed.

11. Referring to Figure 5-98:
    - Grasp and unlatch the three spring clip retainers A starting with the one on the left, then the two on the right.

      Unlatch them by grasping each clip, lift and rotate the clip approximately 180 degrees see detail A
    - Hold the TCM handle firmly and carefully remove the TCM from the machine B

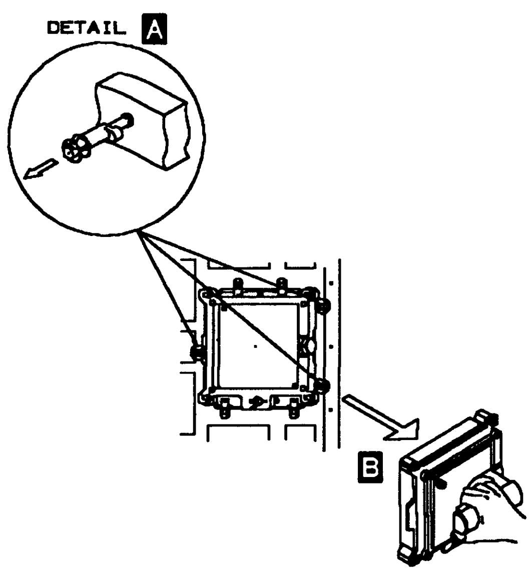


Figure 5-98. TCM Removal

12. Install the clip-on TCM cover (COTC) on the pin side of the TCM, as shown Figure 5-99.

    Ensure that the P/N labels are visible through the holes.
13. Using the ESD mat, place the TCM in a safe place until you can put it in the shipping container, as shown Figure 5-100.

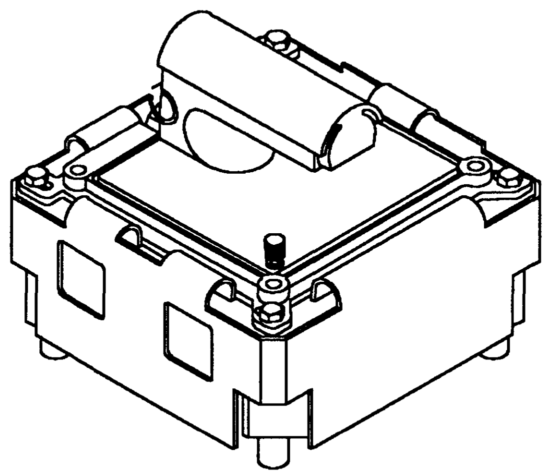


Figure 5-99. TCM Protection

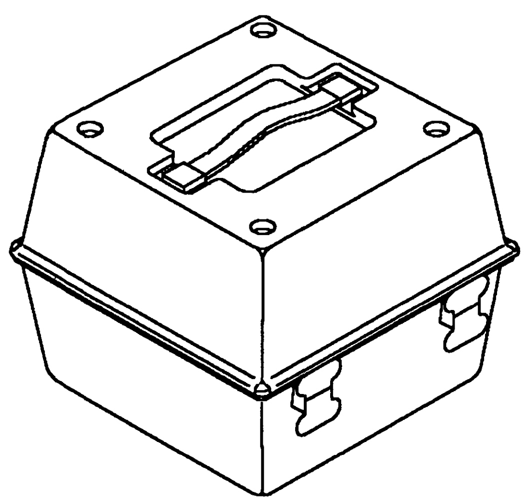


Figure 5-100. TCM Container

TCM Installation

WARNING: When handling a TCM, be extremely careful not to drop, bump, or jar the assembly.

1. Inspect the TCM board connectors for dirt, dust or lint as shown in Figure 5-101.

   Use extreme care, if you have to remove foreign debris so that the connectors are not bent.
   If any deformed or damaged connectors are detected, ***DO NOT INSTALL THE TCM*** and call your next level of support.

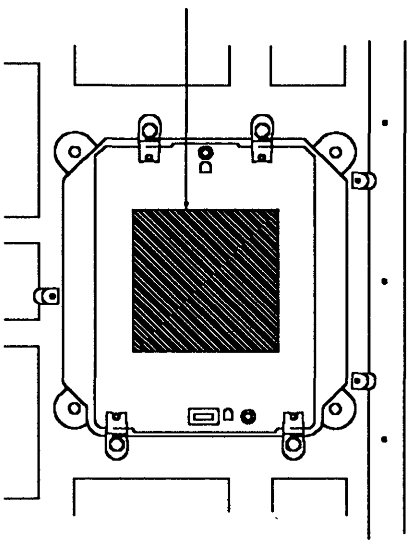


Figure 5-101. TCM Board

2. Grasp the TCM handle and take out the TCM from the shipping container.

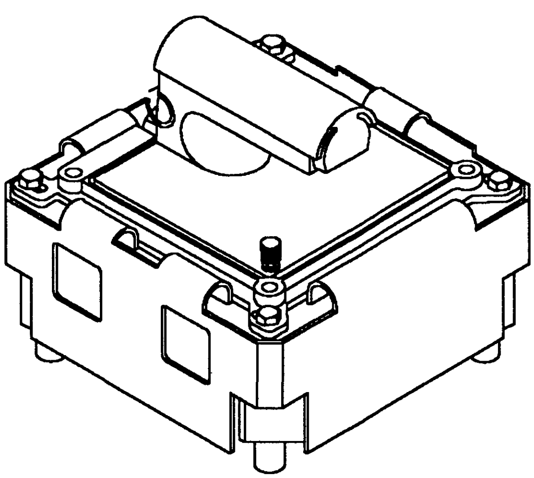


Figure 5-102. TCM Assembly

3. Referring to Figure 5-103:

   - Remove the clip-on cover from the TCM. Squeeze at arrows to remove clip-on cover **A**
   - Inspect the TCM for dirt, debris and bent pins **B**
   - Use the module pin template to ensure alignment, refer to "Module Pin Template P/N 4447370" on page 5-93.

     If any pin is damaged ***DO NOT INSTALL THE TCM***.

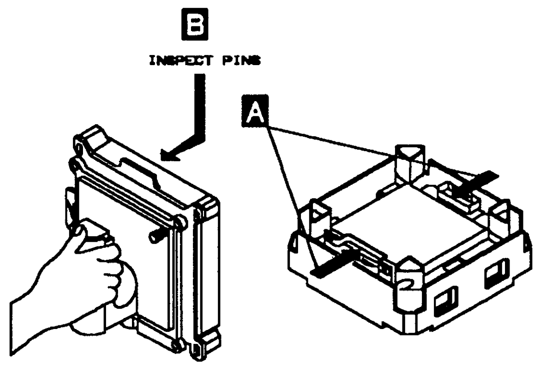


Figure 5-103. TCM Inspection

4. Hold the TCM by the handle, position the cam at the bottom, and carefully insert it into the board as shown in Figure 5-104.

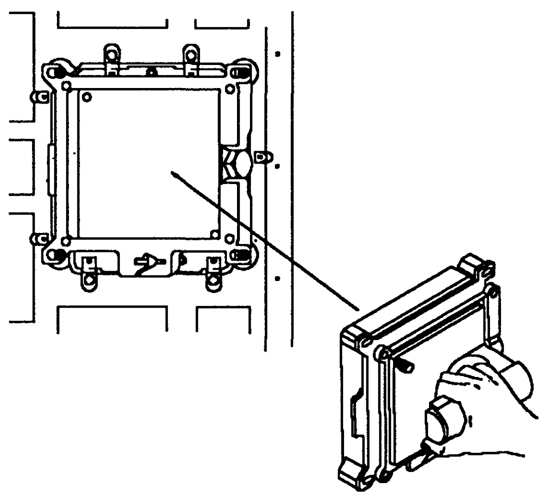


Figure 5-104. TCM Installation

WARNING: Be sure to keep one hand firmly on the module to hold it in position until the next operation is completed.

5. Grasp and latch each of the three spring clip retainers by lifting and rotating the clip approximately 180 degrees.
6. Then, perform the following steps:

- Before using the TCM actuation tool be certain that the detent pin is in the ***Installation position*** **I** as shown in Figure 5-105 on page 5-101.

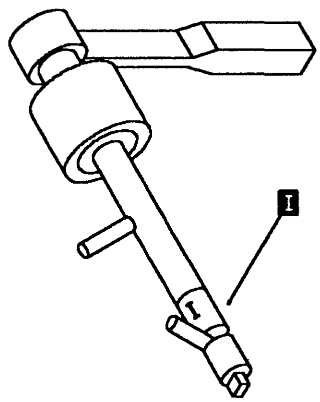


Figure 5-105. Actuation Tool Installation

- Set the lever on the ratchet handle to drive the tool in a clockwise direction.
- Move the cam guard to its left side to insert the TCM actuation tool, see Figure 5-106.

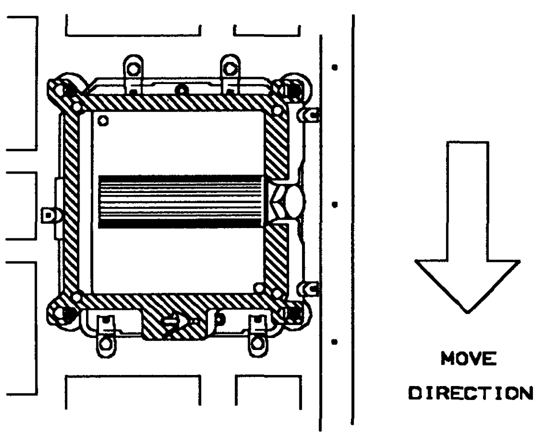


Figure 5-106. TCM Cammed Position

- Insert the tip of the TCM actuation tool into the module with the indicator pin pointing to the uncammed (9 o'clock) position.

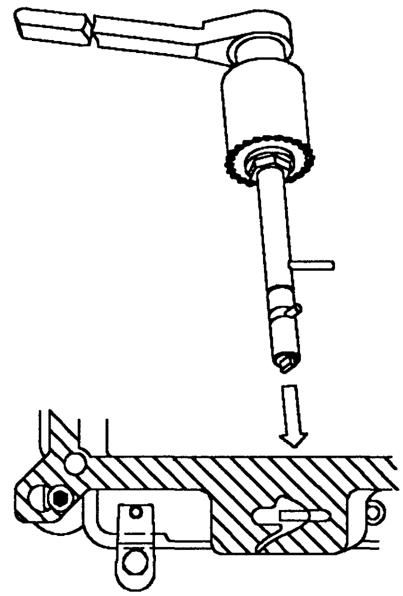


Figure 5-107. Actuation Tool Usage

- Turn the actuation tool clockwise until the slip clutch is activated.
- Remove the TCM actuation tool.
- Use the TCM cam gauge P/N6108930 to check that the TCM is cammed into position correctly.

  Insert and turn the gauge, the red ring should disappear, only the green ring should remain.
- Referring to Figure 5-108 on page 5-102:
  - Move the cam guard to its rightmost limit and use the torque tool to tighten the four (4) TCM retaining screws completely **A**
  - Remove the TCM handle by loosening the two thumbscrews **B**

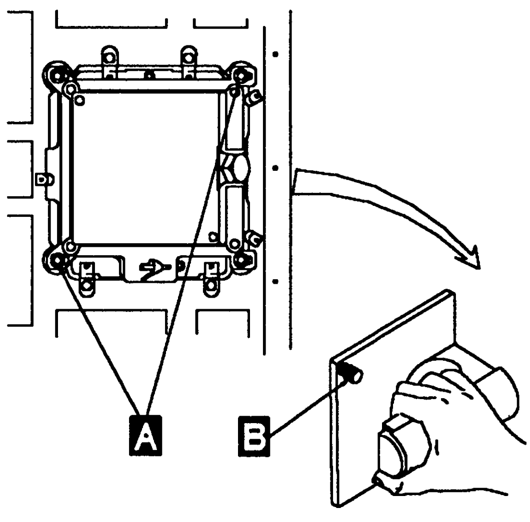


Figure 5-108. TCM Handle Removal

7. Referring to Figure 5-109:
   - **Carefully** install the heat sink **A** previously removed with the two beveled corners **B** to the left.
   - Use the torque tool to tighten the nine (9) screws **C** which hold the heat sink
8. Disconnect the ESD kit.

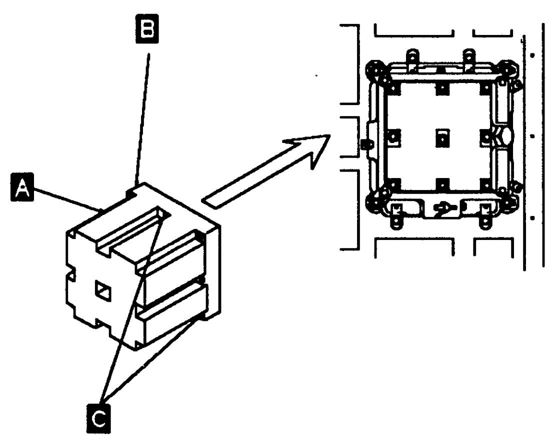


Figure 5-109. Heat Sink Installation

9. Referring to Figure 5-110:
   - Install the Air Moving Device unit and tighten the 4 mounting screws **A**
   - Inspect the filter **B** do not hesitate to exchange it if dirty (refer to "Air Filters Exchange Procedure" on page 5-80, if you have exchanged it).

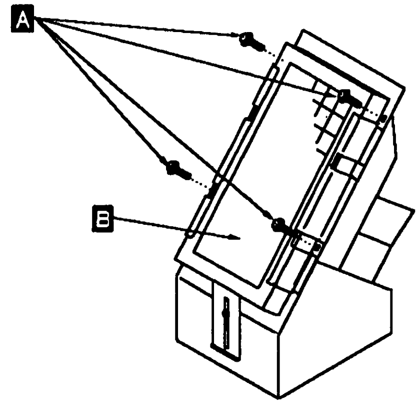


Figure 5-110. AMD Installation

   - Plug the power cord of the Air Moving Device.
10. If previously removed, replace the internal black cover and reconnect the ground strap.
11. Close the internal black cover.
12. Close the front left cover of frame 01.
13. Using the 3745 console, power ON the affected power supply as follows:
    - Type '**POS**' on any displayed screen selection area.

      You have the power services menu displayed.
    - Select option **1**.
    - Type '**uxx**' to turn the power supply ON.

      CCU A xx=02

      CCU B xx=03.
14. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, and run diagnostics for the associated area then go to "Repair Verification Procedure" on page 5-170.

PS Type 1 Exchange Procedure for Models 210 and 410

For physical FRU location, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01Q or 01R.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**'

      CCU A xx=02

      CCU B xx=03.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Before exchanging the PS type 1, visually check that there are no opened wires at connector J1 .

Power Supply Assembly Removal Procedure

1. Switch OFF the corresponding CP in the primary box:

   CCU A PS type 1 id=02 CP3

   CCU B PS type 1 id=03 CP8.

Refer to Figure 5-111:

2. Disconnect the connector from P1 **B**

   J4 for CCU A
   J9 for CCU B
3. Take note of SW1's position **A** :
4. Disconnect the connector from J1 **C**
5. Disconnect the connector from J2 **D**
6. Disconnect laminar buses from TB-1 to TB-9 **E** (mark each laminar for easier replacement).

   IMPORTANT This power supply weighs 19 kilos.
7. Remove the three mounting screws **F** and slide the power supply assembly out of the machine using, the handle **G**

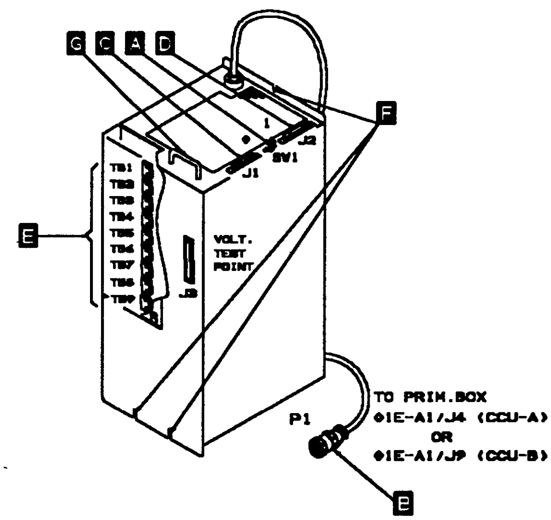


Figure 5-111. PS Type 1

Power Supply Assembly Installation

1. To replace the power supply assembly, perform the removal procedure in the reverse order.

   Note: Be sure that SW1 is in the same position as noted in step 2 of the power supply removal.
   If not, refer to "Volume 4, page YZ071" for the proper setting.
2. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

     You now have the power services menu displayed.
   - Select frame 01.
   - Type '**uxx**' to turn the power supply ON:

     CCU A xx=02

     CCU B xx=03.

3. Run CCU diagnostics, refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, and follow 'How to Run Internal Function Tests'. then go to "Repair Verification Procedure" on page 5-170.

PS Type 1B Exchange Procedure for Models 310 and 610

For physical FRU location, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01Q or 01R.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**1**' to select the base frame power services.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type 'dxx'

      CCU A xx=02

      CCU B xx=03.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Before exchanging the PS type 1B, visually check that there are no opened wires at connector J1 .

Power Supply Assembly Removal Procedure

1. Switch OFF the corresponding CP in the primary box:

   CCU A PS type 1B id=02 CP3

   CCU B PS type 1B id=03 CP8.

Refer to Figure 5-112:

2. Disconnect the P1 connector in the Primary Power Box.

   01E-A1J4 for CCU A
   01E-A1J9 for CCU B
3. Take note of SW1's position.
4. Disconnect the connector from J1.
5. Disconnect the connector from J2.
6. Disconnect laminar buses from TB-1 to TB-4. (mark each laminar for easier replacement).
7. Remove the three mounting screws **1** and slide the power supply assembly out of the machine.

PSTY1B	P.P.B
01Q	01E-A1/J4
01R	01E-A1/J9

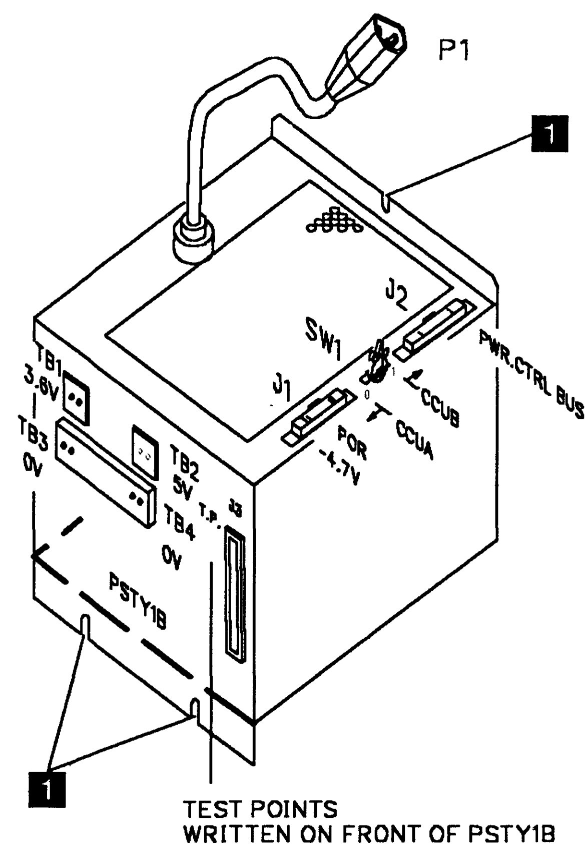


Figure 5-112. PS Type 1B

Power Supply Assembly Installation

1. To replace the power supply assembly, perform the removal procedure in the reverse order.

   Note: Be sure that SW1 is in the same position as noted in step 2 of the power supply removal.
   If not, refer to "Volume 4, page YZ071" for the proper setting.

2. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

     You now have the power services menu displayed.
   - Select frame 01.
   - Type '**uxx**' to turn the power supply ON:

     CCU A xx=02

     CCU B xx=03.
3. Run CCU diagnostics, refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, and follow 'How to Run Internal Function Tests'. then go to "Repair Verification Procedure" on page 5-170.

PS Type 2 Exchange Procedure

For physical FRU location, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01V.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.

   Note: Normally, a failure on the MOSS power supply (PS type 2) will automatically turn the power supply OFF. If the MOSS is still available, continue the procedure in sequence. If not, check at the voltage test point (J2) on the power supply that no voltage is distributed; see YZ370 for voltage pin assignment. Then continue with paragraph 'Power Supply Assembly Removal Procedure' for that power supply.
3. Remove power as follows:
   - Press the 'Service' key on the control panel until (*1*) is displayed on the service window.
   - Press the 'Validate' key.
   - Press the 'Function' key on the control panel until the 'MOSS Power OFF' function (*B*) is displayed.
   - Press the 'Validate' key.
   - Observe the MOSS inoperative display on the control panel. At completion of power OFF, this will display the character (*B*).

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

1. Switch CP6 OFF in the primary box.

Referring to Figure 5-113:

2. Disconnect the P1 connector in the primary power box (01E-A1J7) **A**
3. Free the ac cable from primary to power supply, from the raceway(s).
4. Disconnect the connector from J1 **B**
5. Disconnect the connector from J3 **C**
6. Disconnect the connector from J4 **D**
7. Remove the three mounting screws and slide the power supply assembly out of the machine **E**

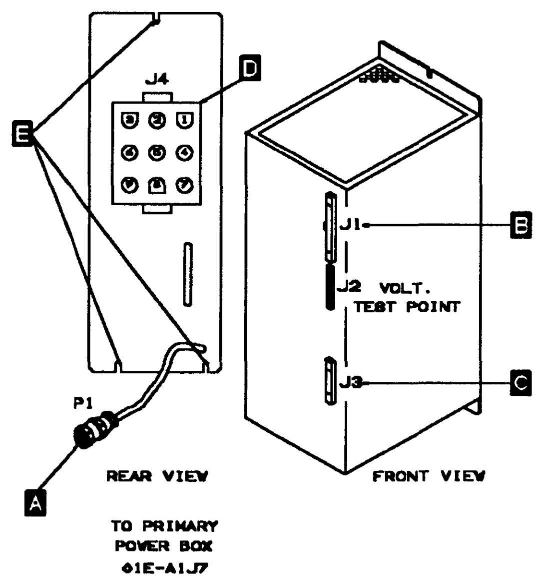


Figure 5-113. PS Type 2

Power Supply Assembly Installation

1. To replace the power supply assembly perform the removal procedure in the reverse order.

   When only the MOSS is powered OFF proceed as follows:
   - Using the 'Function' key scroll till the value is (*1*), MOSS IML.
   - Press the 'Validate' key.
   - Initiates a MOSS power ON.

   Note: This action will also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
2. Go to "Repair Verification Procedure" on page 5-170.

PS Type 3 Exchange Procedure

For PS type 3 locations in frame 01, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01K.

For PS type 3 locations in frame 02, refer to Figure 5-3 on page 5-8.

This type of power supply is located at 02D.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**x**' to select the appropriate service frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx=affected power supply id.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

Referring to Figure 5-114:

1. Switch the CP OFF on the power supply **A**
2. Disconnect the ac power plug P1 **B**
3. Unscrew the 2 tab screws until they are free **C**
4. Unlock the retaining screw **D**
5. Slide the power supply assembly out of the machine, using the handle **E**

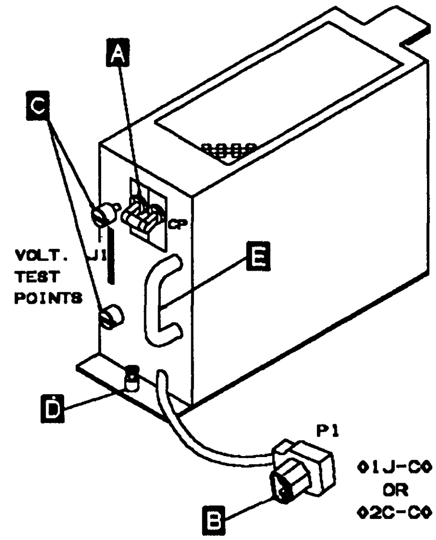


Figure 5-114. PS Type 3

Power Supply Assembly Installation

1. To replace the power supply assembly, perform the removal procedure in the reverse order.
2. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

     You now have the power services menu displayed.
   - Type '**uxx**' to turn the power supply ON.
3. Run diagnostics for the associated area, refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1 and then go to "Repair Verification Procedure" on page 5-170.

PS Type 4 Exchange Procedure

For PS type 4 locations in frame 01, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01H.

For PS type 4 locations in frame 02, refer to Figure 5-3 on page 5-8.

This type of power supply is located at 02B,02G.

For PS type 4 locations in frame 03, refer to Figure 5-4 on page 5-9.

This type of power supply is located at 03G.

IMPORTANT

Check that the 'Power Control' display is set to local (3) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Type '**x**' to select the appropriate service frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx=affected power supply id.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

Referring to Figure 5-115:

1. Switch the CP OFF on the power supply **A**

IMPORTANT

Do not switch OFF more than one CP of PS type 4s in the same power supply board (01H, 02B, 02G, or 03G) at the same time. If you switch OFF two or more CPs at the same time, the remaining supply in that board may go to "NOREPLY" status.

2. Disconnect the ac power plug P1 **B**
3. Unscrew the 2 tab screws until they are free **C**
4. Unlock the retaining screw **D** and slide the power supply assembly out of the machine, using the handle **E**

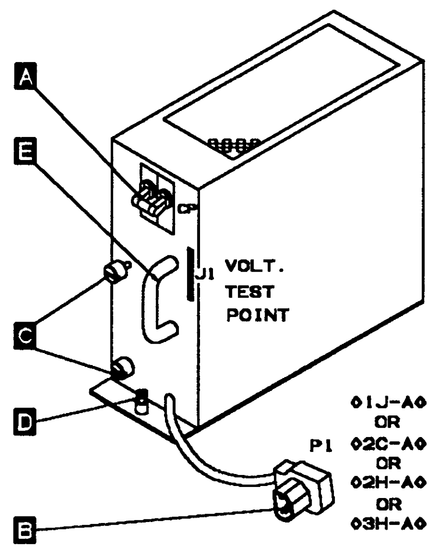


Figure 5-115. PS Type 4

Power Supply Assembly Installation

1. To replace the power supply assembly, perform the removal procedure in the reverse order.
2. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

     You now have the power services menu displayed.
   - Type '**uxx**' to turn the power supply ON.
   - If it is successful, continue with step 3.

- If any other status, go to step 4.

3. Using the 3745 console, proceed as follows:
   a. If the power is supplying TSSs or HPTSSs, IML the two line adapters as follows:
      - From menu 3 select TSS services by entering '**TSS**' into the selection area.
      - From the TSS services screen, choose 'Select/Release' by entering '**1**' into the selection area.
      - In the input area enter an 'S' followed by the suspected adapter number.
      - Enter '**2**' in the selection area to choose Dump/IML.
      - On the Dump/IML screen, enter 'I' to IML the line adapter.
      - Enter '**1**' in the selection area to choose 'Select/Release'.
      - Enter '**REL**' in the input area to release the disabled line adapter.
      - Repeat the preceding steps for the associated adapter.
   b. If this power is supplying TRSSs, you must disconnect again the adapters after power ON and prior to running the diagnostics. Proceed as follows:
      - From menu 3 select 'TRSS Services' by entering '**TRS**' into the selection area.
      - From the 'TRSS Services' screen choose 'select' by entering '**1**' in the selection area.
      - In the input area enter the number of the suspected adapter.
      - Enter '**2**' in the selection area to choose 'Connect/Disc'.
      - On the 'Connect/Disc' screen enter '**DS**' to disconnect the TRA.
      - Repeat the preceding steps for the associated adapter.
4. Run diagnostics for the associated area , refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, then go to "Repair Verification Procedure" on page 5-170.

PS Type 5 Exchange Procedure

For PS type 5 locations 01M-A1, 01P-A1:
refer to Figure 5-2 on page 5-6.

For PS type 5 locations 04B-A1, 04D-A1, 04E-A1, 04G-A1:
refer to Figure 5-5 on page 5-10.

For PS type 5 locations 05B-A1, 05D-A1, 05G-A1, 05E-A1:
refer to Figure 5-6 on page 5-11.

For PS type 5 locations 06B-A1, 06D-A1, 06G-A1, 06E-A1:
refer to Figure 5-7 on page 5-12.

IMPORTANT

Check that the 'Power Control' display is set to local (*3*) on the control panel. If yes, go to step 3.

If not, proceed with step 1.

1. Press the 'Power Control' key until (*3*) is displayed in the Power Control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Select the appropriate service frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx=affected power supply id.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

In order to access the power supply you have to remove the partial board cover.

Referring to Figure 5-116:

1. Switch the CP OFF on the power supply **A**
2. Trace the AC power cord **B** of the PS type 5 back to the AC distribution (01Z or 04A or 05A) and unplug the P1 connector, (see table bellow).
3. Disconnect the J3 connector **C**
4. Disconnect the J2 connector **D**
5. Disconnect the J4 connector **E**
6. Take note of the addressing switches positions **F**
7. Unscrew the two mounting screws **G** and slide the power supply assembly out of the machine, using the handle **H**

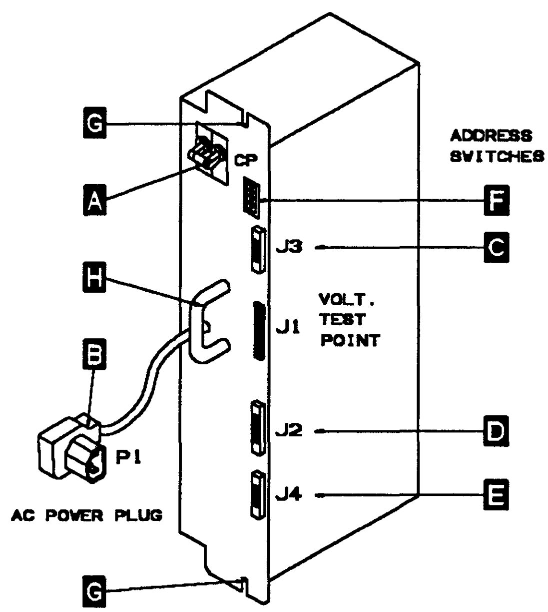


Figure 5-116. PS Type 5

	FRAME 04				FRAME 05				FRAME 06			
PS ID	30	31	32	33	34	35	36	37	38	39	40	41
POWER PLUG	J5	J9	J6	J10	J5	J9	J6	J10	J5	J9	J6	J10

Power Supply Assembly Installation

To replace the power supply assembly, perform the removal procedure in the reverse order.

Note: Be sure that the addressing switches are in the same positions as noted in step 6 of the power supply removal.

If not, refer to "Volume 4, page YZ075, Addressing" for the proper setting.

1. Using the 3745 console, turn the affected power supply ON as follows:
   - Type '**POS**' on any displayed screen selection area.

   You now have the power services menu displayed.

   - Type '**uxx**' to turn the power supply ON.
   - If it is successful, continue with step 2.
   - If any other status, go to "Repair Verification Procedure" on page 5-170.
2. Run diagnostics for the associated area (refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1),then go to "Repair Verification Procedure" on page 5-170.

PS Type 6 Exchange Procedure

For physical FRU location, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01F.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

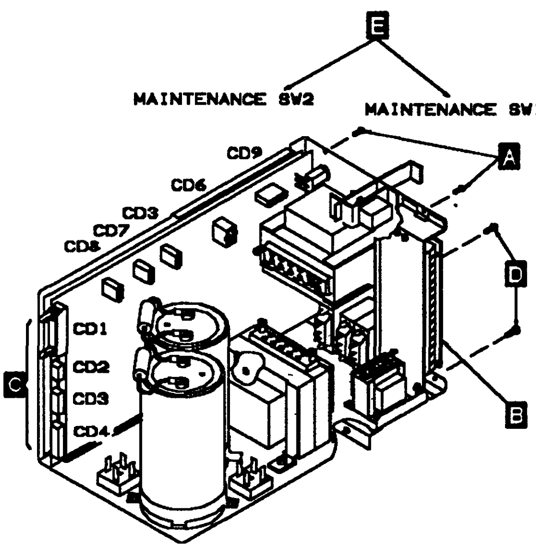


Figure 5-117. PS Type 6

1. **Switch CB1 OFF** located at frame 01, 01E-B1.

Referring to Figure 5-117:

You have to remove the cover by unscrewing the 2 screws **A** to access and perform the following steps:

2. Disconnect the TB1 wires **B** positions 1, 6, 10, 14, refer to YZ576.
3. Go to the rear and disconnect the CD1 CD2 CD4 CD5 connectors **C**
4. Unscrew the 2 mounting screws **D**
5. Disconnect the ground strap.
6. Remove the power supply assembly out of the machine.

   Note: Switches 1 and 2 **E**:

   Maintenance Sw1 normally OFF when the machine is operating., Closing the external cover actuates Sw1 to the normal position. Maintenance Sw2 is used for card unplugging.

Power Supply Assembly Installation

1. To replace the power supply assembly, perform the removal procedure in the reverse order.

   Note: Check with YZ576 for voltage input.

2. Switch CB1 ON, located at frame 01, 01E-B1.
3. Re-apply the power as follows by means of the control panel :
   a. Press the Power Control key until (*3*) appears in the power control window (Power Control in local).
   b. Press the 'Validate' key.
   c. Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).
   d. Press the 'Validate' key.
   e. Press the 'Service' key until (*1*) appears in the service window (service in MAINT.1).
   f. Press the 'Validate' key.
   g. Press 'power ON Reset' key.

   Note: The former actions will power the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

4. Go to "Repair Verification Procedure" on page 5-170.

PS Type 7 Exchange Procedure

For PS Type 7 locations 01M-A1:
refer to Figure 5-2 on page 5-6.

For PS Type 7 locations 04B-A1, 04D-A1, 04E-A1, 04G-A1:
refer to Figure 5-5 on page 5-10.

For PS Type 7 locations 05B-A1, 05D-A1, 05E-A1, 05G-A1:
refer to Figure 5-6 on page 5-11.

For PS Type 7 locations 06B-A1, 06D-A1, 06E-A1, 06G-A1:
refer to Figure 5-7 on page 5-12.

IMPORTANT
Check that the 'Power Control' display is set to local (3) on the control panel.
If yes, go to step 3.
If not, proceed with step 1.

1. Press the 'Power Control' key until (**3**) is displayed in the power control window.
2. Press the 'Validate' key.
3. Remove power as follows:
   a. Type '**POS**' on any displayed screen selection area.

      You will have the power services menu displayed.
   b. Select the appropriate service frame.
   c. On the displayed information screen, check the status of the affected power supply.

      If it is up, type '**dxx**' where xx=affected power supply id.

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

In order to access the power supply you have to remove the partial board cover.

Referring to Figure 5-118:

1. Switch the CP OFF on the power supply **A**
2. Trace the AC power cord **B** of the PS type 7 back to the AC distribution (01Z or 04A or 05A or 06A) and unplug the P1 connector, (see table below).
3. For easier access to power connectors, remove both SMUXs as follows:
   a. Remove the cables located on the top of the SMUXs
   b. Unfasten the thumb screw holding the SMUX cassettes
   c. Remove the SMUXs
4. Disconnect the P2 connector **D**
5. Disconnect the J3 connector **C**
6. Disconnect the J4 connector **E**
7. Take note of the addressing switches positions **F**
8. Unscrew the four mounting screws **G** and slide the power supply assembly out of the machine, using the handle **H**

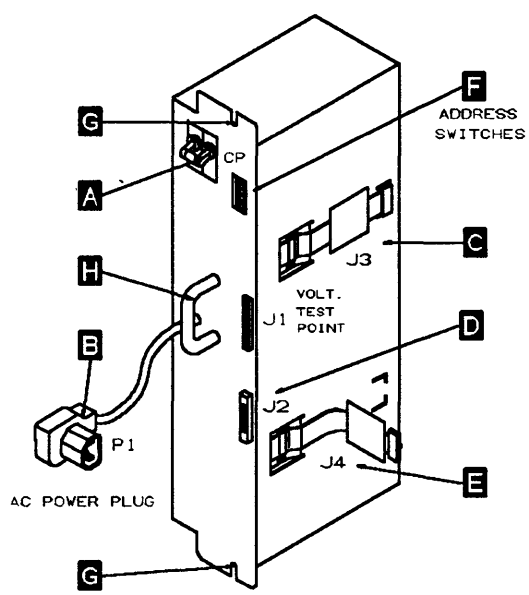


Figure 5-118. PS Type 7

	FRAME 04				FRAME 05				FRAME 06			
PS ID	30	31	32	33	34	35	36	37	38	39	40	41
POWER PLUG	J5	J9	J6	J10	J5	J9	J6	J10	J5	J9	J6	J10

Power Supply Assembly Installation

To replace the power supply assembly, perform the removal procedure in the reverse order.

Note: Be sure that the addressing switches are in the same position as noted in step 7 of the power supply removal. ,

If not, refer to the ″Volume 4, page YZ077″ for the proper setting.

1. Using the 3745 console, turn the affected power supply ON as follows:
   - Type ′**POS**′ on any displayed screen selection area.

     You now have the power services menu displayed.
   - Type ′**uxx**′ to turn the power supply ON.
   - If it is successful, continue with step 2.
   - If any other status, go to "Repair Verification Procedure" on page 5-170.
2. Run diagnostics for the associated area , refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, then go to "Repair Verification Procedure" on page 5-170.

PS Type 8 Exchange Procedure

For physical FRU location, refer to Figure 5-2 on page 5-6.

This type of power supply is located at 01E.

VERY IMPORTANT

Before starting maintenance:

1. **Imperatively ask** the customer to remove ac power from the 3745.
2. **Confirm** that ac power is no longer present.
3. Find TB1 in PS type 6, located at 01F.
4. **Check** for power not present at PS type 6 TB1-6, 10, 14, **A** with a CE meter, using ground as reference, see Figure 5-119.

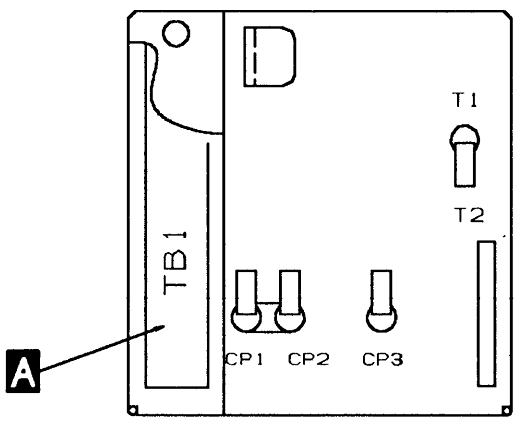


Figure 5-119. Phases

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

Power Supply Assembly Removal Procedure

1. Referring to Figure 5-120:
   - Open the left front cover of frame 01.
   - Open the lower and upper internal black covers.
   - Remove the front plate 01E-A1 to access the PS type 8, refer to Figure 5-48 on page 5-48.
   - Disconnect connectors J1 to J10 and remove the cover.

Note: Do not damage the AMD cables when removing the cover.

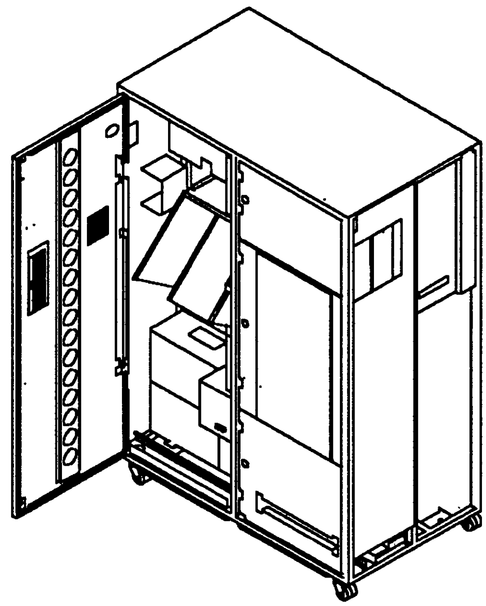


Figure 5-120. Frame 01 Internal Access

2. **Switch CB1 OFF,** location 01E-B1.
3. Referring to Figure 5-121:
   - Disconnect the P11 connector **A**
   - Unscrew the 2 mounting screws **B**
   - Remove the power supply assembly from the machine.

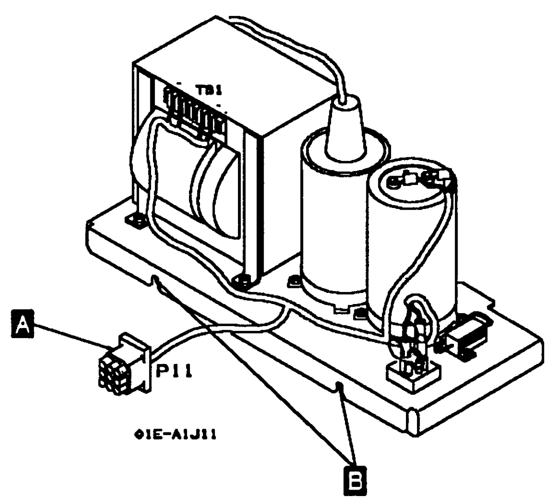


Figure 5-121. PS Type 8

Power Supply Assembly Installation

To replace the power supply assembly, perform the removal procedure in the reverse order.

1. Ask the customer to enable the ac power to the 3745.
2. Switch CB1 ON, located at frame 01, 01E-B1.
3. Re-apply the power as follows by means of the control panel :
   - Press the 'Power Control' key until (**3**) appears in the Power Control window (Power Control in local).
   - Press the 'Validate' key.
   - Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).
   - Press the 'Validate' key.
   - Press the 'Service' key until (*1*) appears in the service window (service in MAINT.1).
   - Press the 'Validate' key.
   - Press the 'power ON Reset' key.

   Note: The former actions will turn the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0**F or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
4. Go to "Repair Verification Procedure" on page 5-170.

PS Fan Exchange Procedure

Prior to starting the exchange, read the 'Telecommunication Products Safety Handbook', GA33-0126.

WARNING: Power may be present when nothing is displayed on the control panel.

Locations

For PS fan locations 01J-B1 ,01J-B2:
refer to Figure 5-2 on page 5-6.

For PS fan locations 02C-B1, 02C-B2, 02H-B1, 02H-B2:
refer to Figure 5-3 on page 5-8.

For PS fan locations 03H-B1, 03H-B2:
refer to Figure 5-4 on page 5-9.

WARNING: Do not forget that the assembly contains 2 fans. You have 2 minutes to replace the assembly. If you exceed 2 minutes the associated power supplies will automatically be powered OFF.

For this reason:

- Read the following procedure before starting to exchange the assembly.
- Have the assembly to be installed unpacked and close to the location of the failing unit.
- Be sure that the fan blades are running free. Do this by pushing the blades with a thin screwdriver or similar tool.

Referring to Figure 5-122:

1. Unlock the T-Knobs **A**
2. Disconnect the power plug **B**
3. Disconnect the AFD plug **C**
4. Slide the assembly out of the machine.
5. Fit the new assembly into the machine.
6. Reconnect the AFD plug **C**
7. Reconnect the power plug **B**
8. Lock the T-Knobs **A**
9. Using the 3745 console POS function, verify that all power supplies are in the 'UP' status, refer to "3745 Service Functions, Chapter 12".
10. Go to "CE Leaving Procedure" on page 5-172.

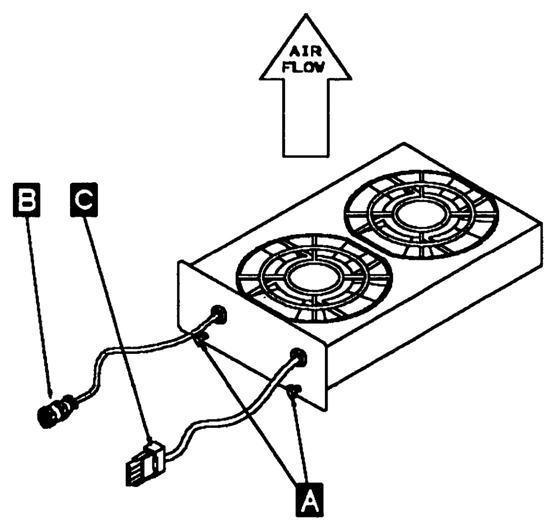


Figure 5-122. Fan Assembly

Channel Tail Gate and Internal Cables Exchange Procedure

1. **Advise the customer that the 3745 is to be turned OFF and the channel removed from the host configuration. (Channel will be opened).**
2. **Check that the 'Power Control' display is set to local (3) on the control panel.** If yes, go to step 5; if not, proceed with step 3.
3. Press the 'Power Control' key until (**3**) is displayed in the Power Control window.
4. Press the 'Validate' key.
5. Remove power as follows:
6. Press 'Power OFF' on the control panel.
7. Switch the CB1 OFF. Refer to Figure 5-124 on page 5-120 for the location of CB1.
8. Using Figure 5-125 on page 5-121 or Figure 5-126 on page 5-121 locate Tail Gate 01T-A1 containing the channels 1 to 8, or Tail Gate 02K-A1 containing the channels 9 to 16.

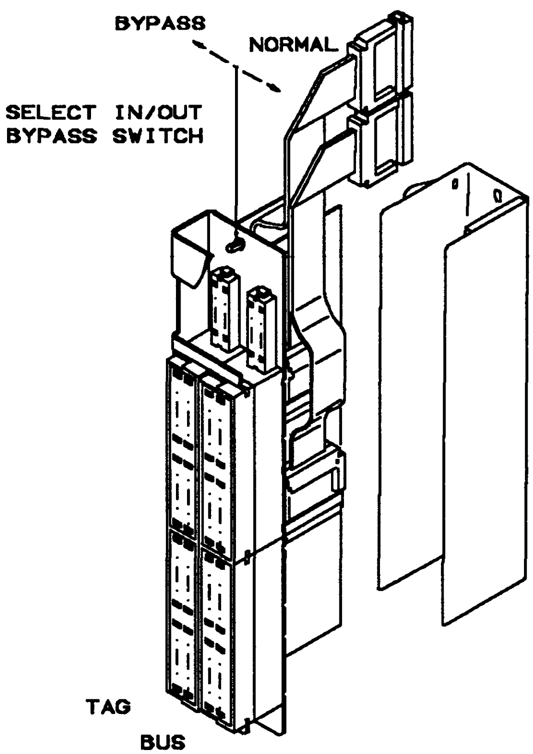


Figure 5-123. Tail Gate Connector

9. Remove the tail gate front cover.
10. Disconnect the interface cables or terminators from the tail gate for the involved channel interface.
11. Remove the cover above the tail gate connectors. (6 screws)
12. Remove the two screws retaining the tail gate connector and the screw holding the flat cable retainer on the board.
13. Remove the retainer and unplug the flat cable connectors.
14. Remove the assembly.
15. For re-installation proceed in reverse order.

    Warning: Take care of the springs located at the left side of the assembly.
16. Power the 3745 ON and referring to "How to Run the Channel Wrap Test" on page 4-42, run diagnostics on the involved channel interface then go to "Repair Verification Procedure" on page 5-170

Channel Board Exchange Procedure

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**
2. Press 'Power OFF' on the control panel.
3. Switch CB1 OFF. Refer to Figure 5-124 for the location of CB1.
4. Locate using Figure 5-125 on page 5-121 channel board 01L-A1 containing channels 1 to 8, or using Figure 5-126 on page 5-121 the channel board 02E-A1 containing channels 9 to 16.
5. For the channel board you are working on, locate the related tail gate using Figure 5-125 on page 5-121 or Figure 5-126 on page 5-121.
6. At the tail gate, switch all the channel select in/out bypass switches to the 'BYPASS' position. Refer to Figure 5-127 on page 5-122.
7. From the rear of the channel adapter board, note the locations and remove the flat cables coming from the tail gate (2 per channel).
8. Open the channel adapter board cover and remove it by lifting it upwards.

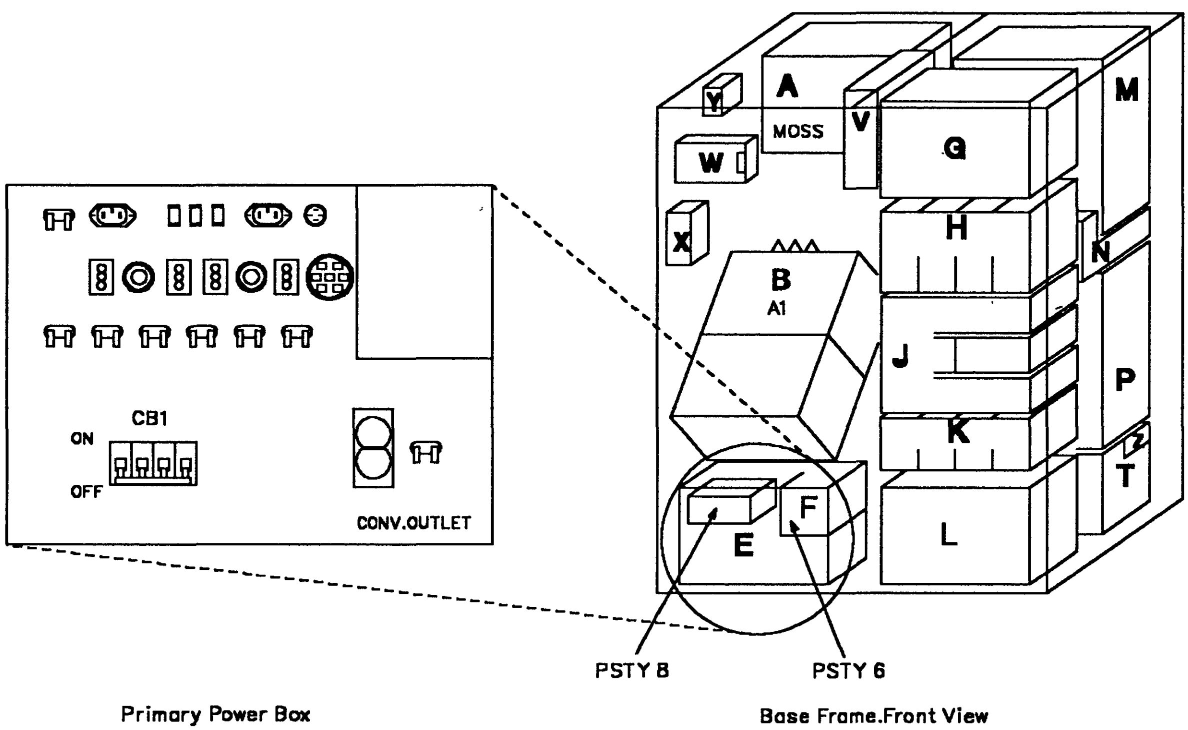


Figure 5-124. Primary Power Box in Frame 01

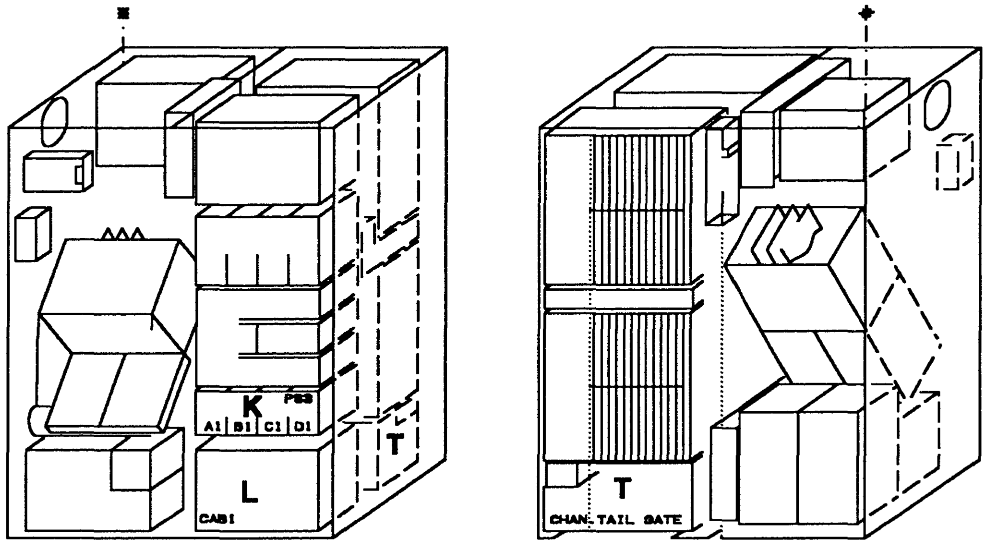


Figure 5-125. Channel Board, Tail Gate and Channel Power in Basic Frame 01

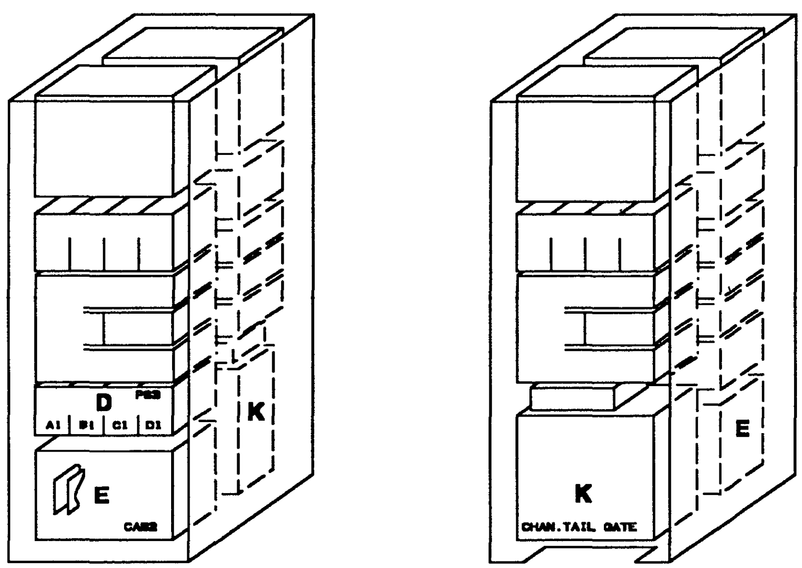


Figure 5-126. Channel Board, Tail Gate and Channel Power in Frame 02

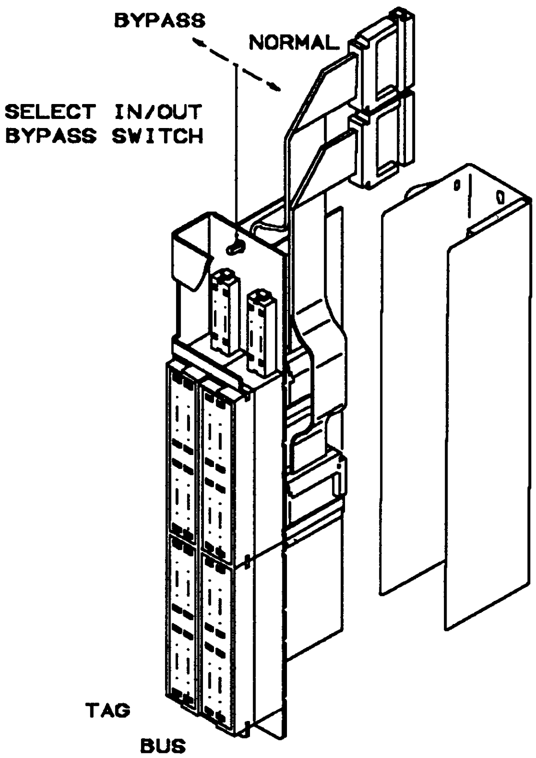


Figure 5-127. Tail Gate

9. The power supplies for channel board 01L-A1 are located at 01K. Refer to Figure 5-125 on page 5-121.
   The power supplies for channel board 02E-A1 are located at 02D. Refer to Figure 5-126 on page 5-121.
   Using Figure 5-128, remove the power supply(ies) as follows:

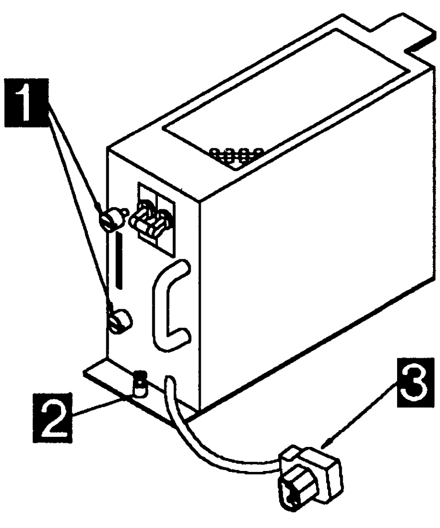


Figure 5-128. Channel Board Power Supply

   a. On each power supply, unscrew the 2 tab screws **1** until they are free and the green band is visible.
   b. Unlock the retaining screw **2**.
   c. Disconnect connector **3** and slide the assembly out of the machine.
10. Note the locations and remove the top card connectors.
11. **WARNING: Use the ESD kit and procedures.** Check if all the cards are labelled according to their positions, if not, label them. Then remove the cards and store them in a safe place.
12. When exchanging channel board 01L-A1 proceed as directed in step 13. When exchanging channel board 02E-A1 proceed as directed in step 14.
13. For board 01L-A1
    a. In positions:

       01L-A1X2
       01L-A1X3
       01L-A1X4
       01L-A1X5,

       you may find flat cables instead of a terminator card, if so disconnect these cables and remove them from the raceway in the channel board enclosure.
    b. Locate cables at:

       01A-Y0C1
       01A-Y0C2

       01B-A1HZ1
       01B-A1HZ2
       01B-A1NZ4
       01B-A1NZ5.

       Check that the cables are labelled according to their positions, if not, label them.
       Disconnect the cables.
    c. Feed the cables through the frame back to the 01L-A1 board enclosure.
    d. Remove power connectors 01K-J7 and 01K-J8, refer to Figure 5-129 on page 5-124.
    e. At machine frame 01 ground bus remove the FDS ground cable coming from the channel board assembly.
    f. Continue with step 16 on page 5-124.
14. For board 02E-A1
    a. Locate cables at:

       01A-Y0E1
       01A-Y0E2

01L-A1X2
01L-A1X3
01L-A1X4
01L-A1X5.

Check that the cables are labelled according to their positions, if not, label them.
Disconnect the cables.

b. Remove the cables from the raceway and feed the cables through the frame back to the 02E-A1 board enclosure.

c. Remove power connectors 02D-J7 and 02D-J8. refer to Figure 5-129 on page 5-124.

d. At machine frame ground area to the right of the 01L-A1 board, remove the FDS ground cable coming from the channel board assembly.

15. Continue with step 16 on page 5-124.

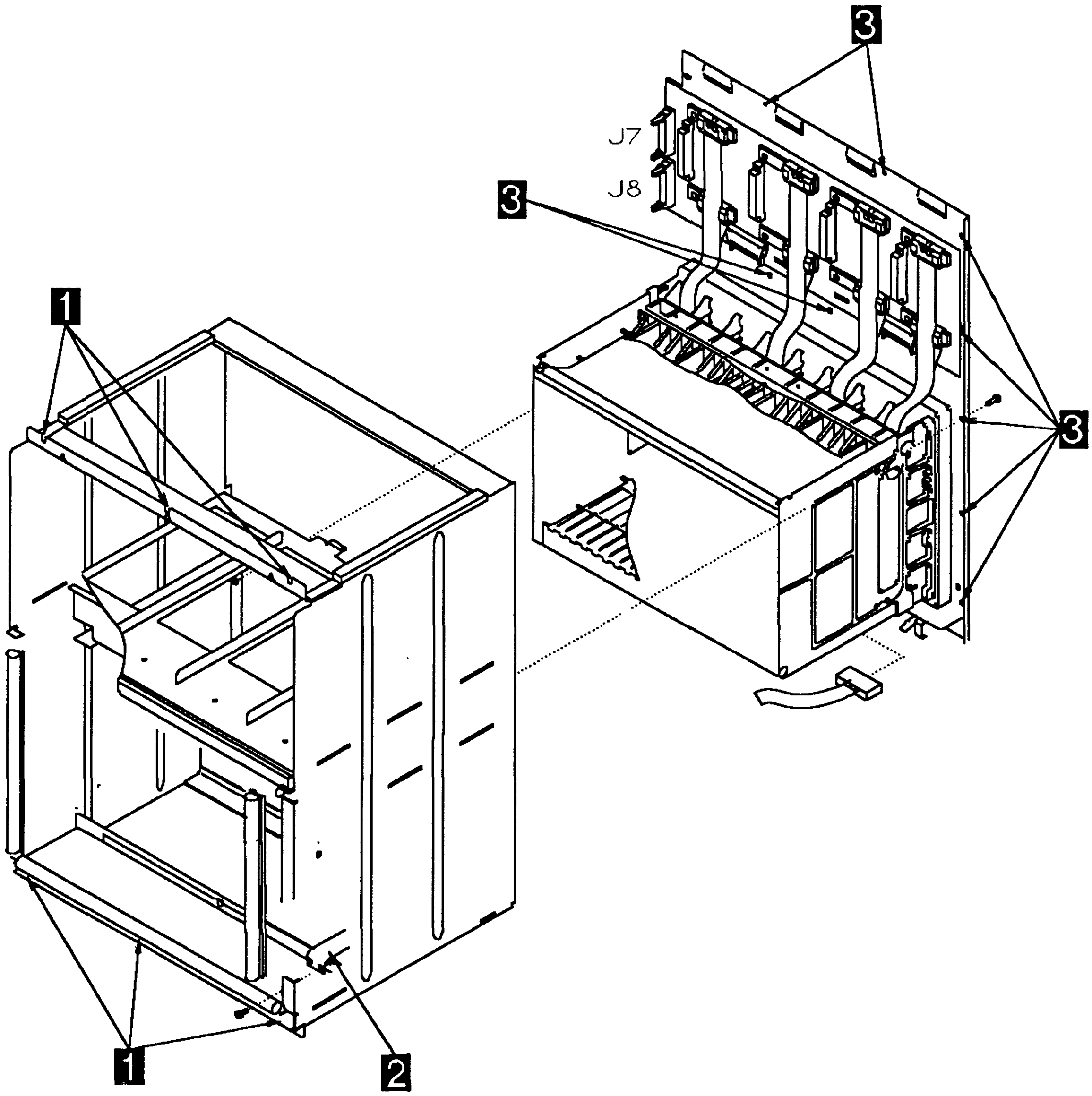


Figure 5-129. Channel Board and Power Enclosure

16. Refer to Figure 5-129.
    Remove the 6 screws 1 which maintain the enclosure on the frame. Then slide the enclosure out of the machine taking care not to damage the power board and connectors on the left side.

17. Remove the 2 screws 3 securing the FDS cable.

18. Refer to Figure 5-129. Remove the 11 screws 3 holding the enclosure back plate assembly. Remove the back plate assembly and place in an area for further work.

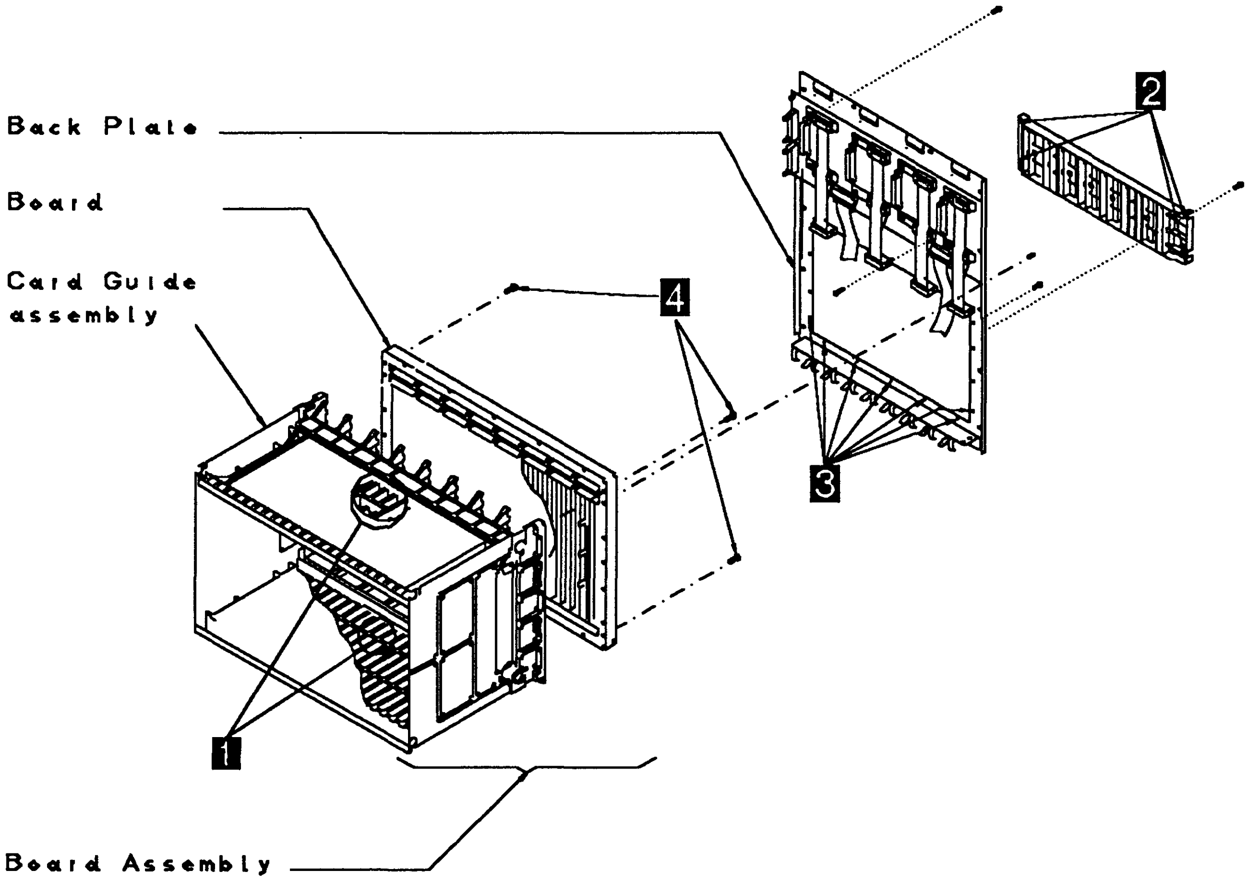


Figure 5-130. Board Assembly

19. Refer to Figure 5-130. At the front of the board, loosen the brackets **1** which maintain the flat cables at the top and bottom of the board (rows 'Y' and 'Z'). Remove those cables from the board.
    a. Refer to Figure 5-130.
    b. At the back of the channel board, remove the 4 screws **2** which hold the cable retainer to the board assembly.
    c. Remove the 10 screws **3** which maintain the board assembly on the frame. You can now remove the board assembly.
    d. Remove the 4 screws **4** which hold the board to the card guide assembly and remove the board.

Installation Procedure

1. Attach the card guide assembly to the new board using the 4 screws **4**.
   Refer to Figure 5-130 on page 5-125.
2. Install the 10 screws **3** which hold the board assembly to the back panel.
3. Refer to Figure 5-130 on page 5-125.
   Ensure that there are no bent pins on the board.
   At the back of the channel board, re-install the 4 screws **2** which hold the cable retainer to the board assembly taking care that the retainer is located correctly.
4. At the front of the board, re-install the cables at the top and bottom of the board (rows 'Y' and 'Z'). Re-install and tighten the cable retainers **1** for these cables and re-install the cables in the raceway.
5. Refer to Figure 5-129 on page 5-124.
   Re-install the 11 screws **2** holding the enclosure back plate assembly to the enclosure.
6. Refer to Figure 5-129 on page 5-124.
   Slide the enclosure into the machine taking care not to damage the power board and connectors on the left side. Re-install the 6 screws **1** which maintain the enclosure to the frame.
7. When exchanging channel board 01L-A1, proceed as directed in step 9. When exchanging channel board 02E-A1, proceed as directed in step 8.
8. For board 02E-A1
   a. Feed the cables through the frame back to their correct locations.

      01A-Y0E1
      01A-Y0E2

      01L-A1X2
      01L-A1X3
      01L-A1X4
      01L-A1X5

      Replug the cables.
   b. Replug power connectors 02D-J7 and 02D-J8.
   c. At machine frame ground area to the right of 01L-A1 board, connect the ground FDS cable coming from the 02E-A1 board assembly.
   d. Continue with step 10.
9. For board 01L-A1
   a. Feed the cables through the frame back to their correct locations.

      01A-Y0C1
      01A-Y0C2

      01B-A1HZ1
      01B-A1HZ2
      01B-A1NZ4
      01B-A1NZ5

      Connect the cables.
   b. Re-install power connectors 01K-J7 and 01K-J8.
   c. At machine frame 01 ground bus, re-install the ground FDS cable coming from the channel board assembly.
   d. In the positions

      01L-A1X2
      01L-A1X3
      01L-A1X4
      01L-A1X5

      if you removed flat cables, re-install those cables.
10. **WARNING: Use the ESD kit and procedures.**
    Re-install the cards.
11. Re-install the top card connectors.
12. The power supplies for channel board 01L-A1 are located at 01K.
    The power supplies for channel board 02E-A1 are located at 02D.
    Using the Figure 5-128 on page 5-122, re-install the power supply(ies) as follows:
    a. On each power supply, slide the assembly into the machine.
    b. Tighten the 2 tab screws **1**
    c. Lock the retaining screw **2**
    d. Re-install connector **3**
13. At the rear of the channel adapter board, re-install the flat cables coming from the tail gate (2 per channel).
14. Re-install the channel adapter board cover.
15. Close the internal covers.
16. Switch the CB1 ON.
17. Close the frame doors.
18. power the machine ON using the control panel as follows:
    a. Press the Power Control key until (*3*) appears in the Power Control window (Power Control in local).
    b. Press the 'Validate' key.
    c. Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).

d. Press the 'Validate' key.

e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).

f. Press the 'Validate' key.

g. Press the 'power ON' Reset key.

Note: The former actions will turn the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

19. Run the diagnostics related to the channel boards you changed.

20. At the tail gate, switch all the channel select in/out bypass switches to the 'NORMAL' position. Refer to Figure 5-127 on page 5-122.
Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1.

21. Go to "Repair Verification Procedure" on page 5-170.

Notes:

Line Adapter Board Exchange Procedure

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**

2. Press 'Power OFF' on the control panel.

3. Switch CB1 OFF. Refer to Figure 5-131 for the location of the CB1.

4. Locate the Line Adapter Boards at:

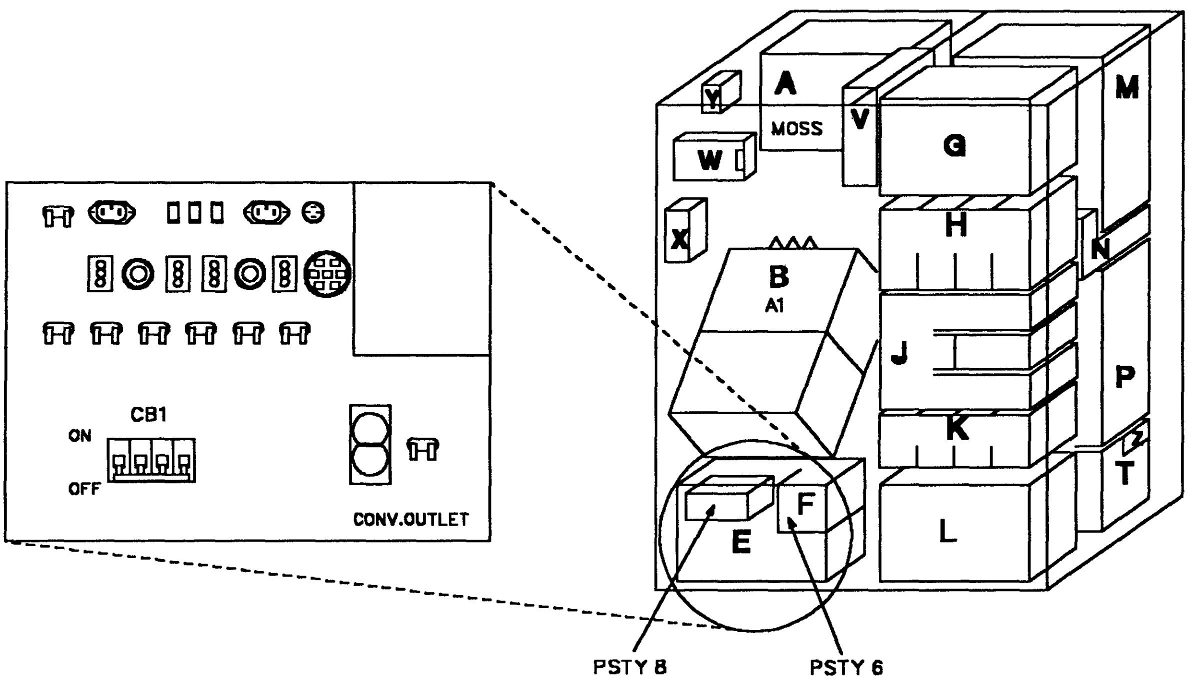
   01G-A1 = LAB1 (TSSB or TSST)
   02A-A1 = LAB2 (TSSB)
   02F-A1 = LAB3 (TSSB)
   03F-A1 = LAB4 (TSSB)

   For the location of the boards and associated power supplies refer to Figure 5-132 on page 5-130 for line adapters 01 to 08 (LAB1);

   Figure 5-133 on page 5-130 for line adapters 09 to 15 (LAB2) and line adapters 15 to 24 (LAB3);

   Figure 5-134 on page 5-131 for line adapters 25 to 32 (LAB4).

   To identify the board type of LAB1, refer to "Line Adapter Board Type" on page 1-29.



Primary Power Box

Base Frame.Front View

Figure 5-131. Primary Power Box in Frame 01

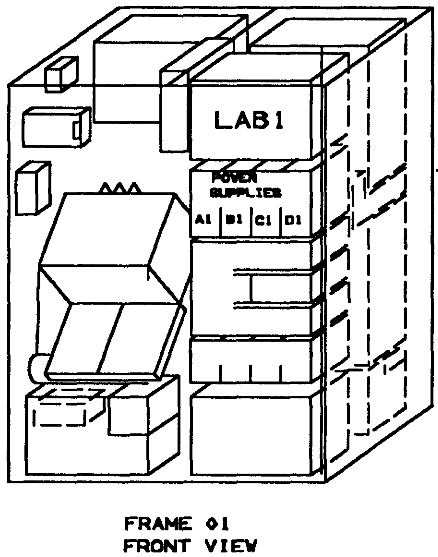


Figure 5-132. LAB1 and the Associated Power Supplies

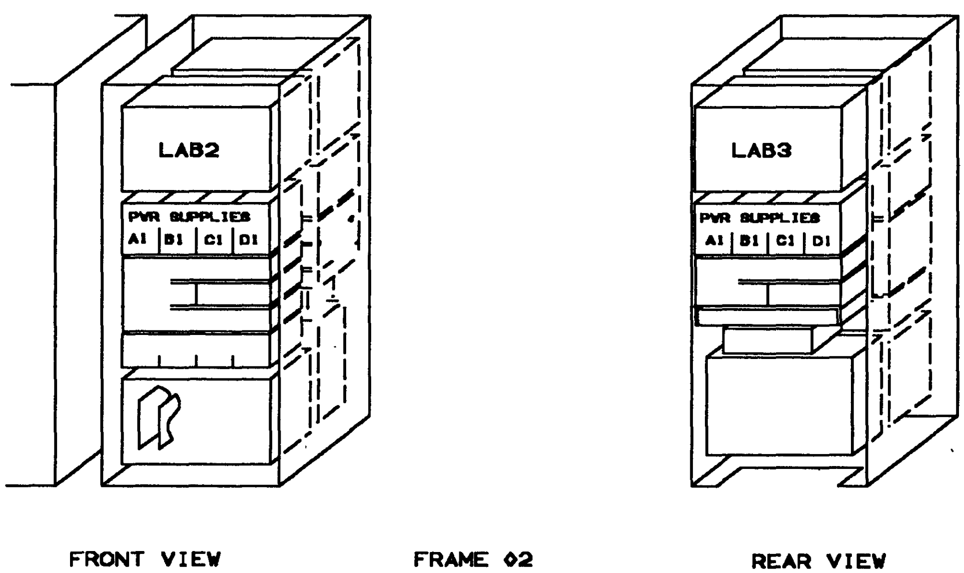


Figure 5-133. LAB2, LAB3 and the Associated Power Supplies

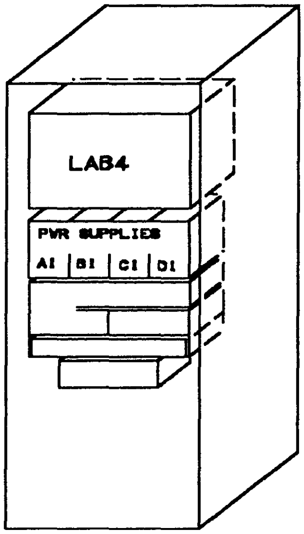


Figure 5-134. LAB4 and Associated Power Supplies

5. Using Figure 5-135, remove the power supply(ies) (Up to 4 power supplies can be installed) as follows:
   a. Unscrew the 2 tab screws **1** until they are free and the green band is visible.
   b. Unlock the retaining screw **2**
   c. Disconnect the connector **3** and slide the power supply assembly out of the machine.
   d. Repeat the previous steps for each of the power supplies in the rack.

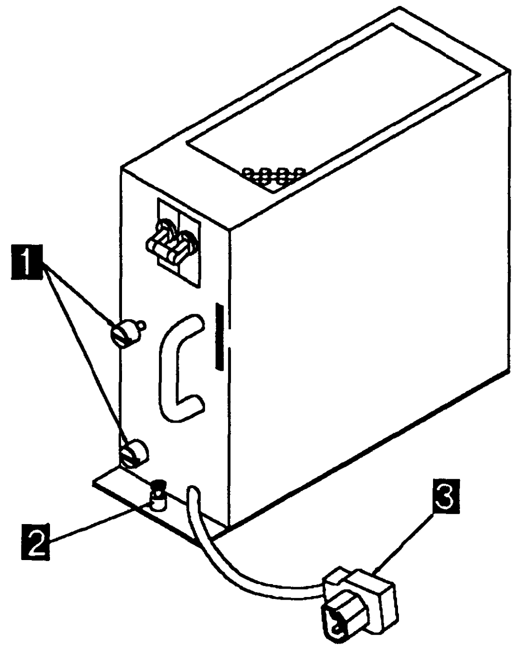
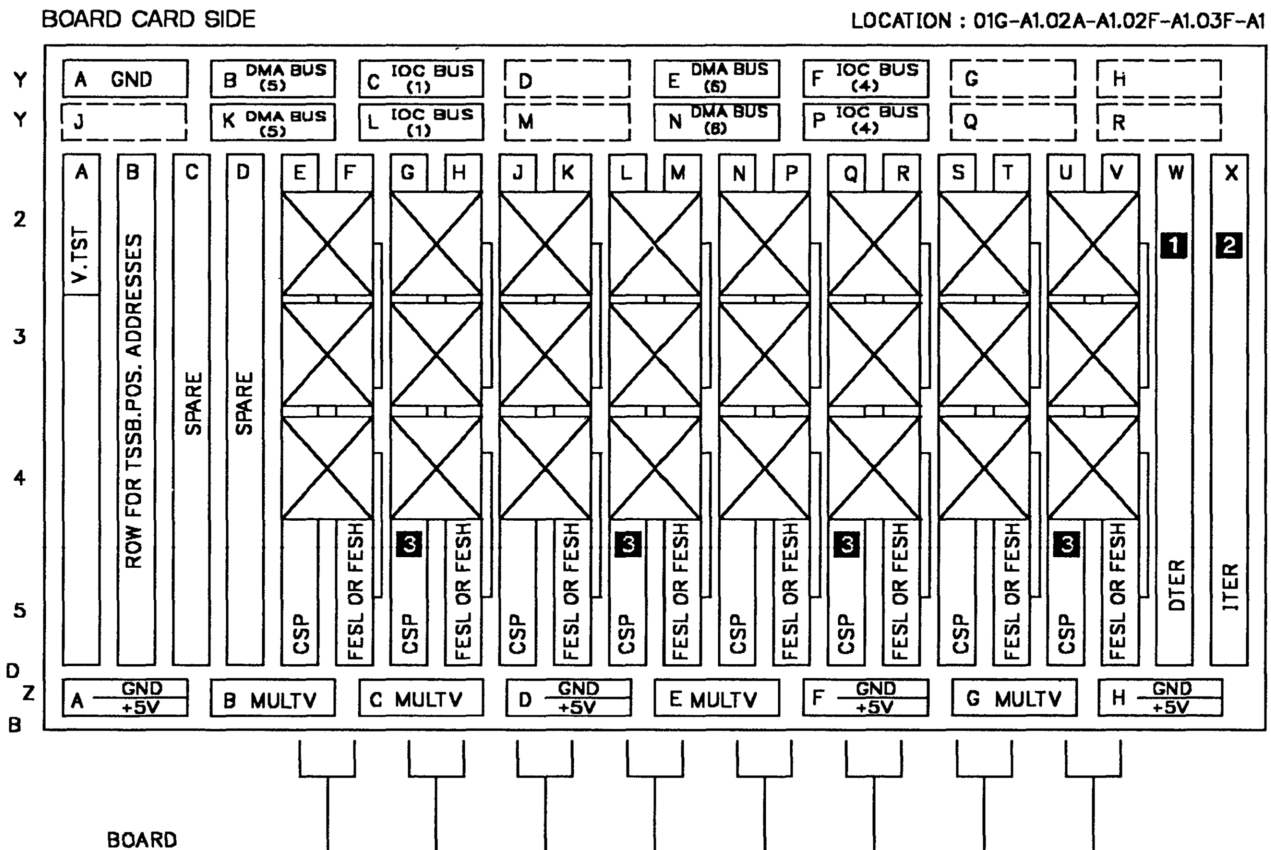


Figure 5-135. Line Adapter Power Supply

6. **WARNING: Use the ESD kit and procedures.**

   Refer to Figure 5-136 if dealing with a TSSB Board or to Figure 5-137 on page 5-133 if dealing with a TSST Board.

   a. Note the locations and remove the top card connectors.
   b. Note the locations and remove the serial link cables from the FESL card(s) if any.
   c. Note the locations and remove the token-ring cables from the TRM card(s) if any.
   d. Note the locations and remove the line cables from the FESH card(s) if any.
   e. Check if the cards are labelled according to their positions, if not, label them. Then, remove the cards and store them in a safe place.
   f. If flat cables are present in positions X2, X3, X4, X5, disconnect and remove them from the raceway in the line adapter board enclosure.
   g. Remove the grounding screws of the serial link, token-ring and line cables. Feed these cables out of the enclosure.



BOARD									
01G-A1	LA01	LA02	LA03	LA04	LA05	LA06	LA07	LA08	
02A-A1	LA09	LA10	LA11	LA12	LA13	LA14	LA15	LA16	
02F-A1	LA17	LA18	LA19	LA20	LA21	LA22	LA23	LA24	
03F-A1	LA25	LA26	LA27	LA28	LA29	LA30	LA31	LA32	

1 Card present when HPTSS installed

2 Either Card or flat cables

3 Install bypass CARD BPC1 in missing CSP positions to insure the bus continuity between scanners, except for the case when the first adapter of the group is the last adapter of the bus.

Figure 5-136. Line Adapter Board, Cards and Crossovers (TSSB)

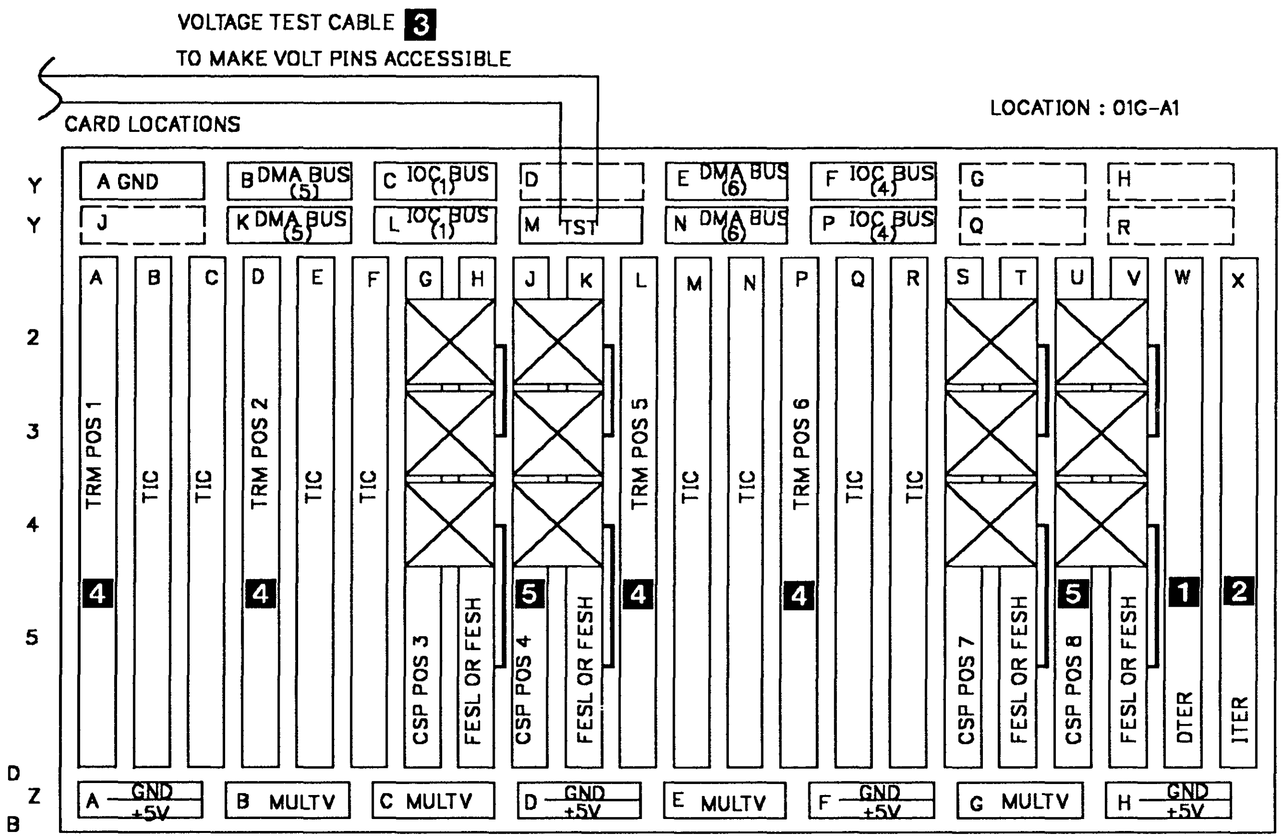


Figure 5-137. Line Adapter Board, Cards and Crossovers (TSST)

1 CARD present when HPTSS installed

2 either a CARD or flat cable

3 going to voltage test connector located on the left side on board 01G-A1

4 install bypass CARD BPC2 in missing TRM positions to insure the bus continuity between scanners

5 install bypass CARD BPC1 in missing CSP positions to insure the bus continuity between scanners, except for the case when the first adapter of the group is the last adapter of the bus.

7. If you are exchanging a LAB1 board, go to step 8.

   If you are exchanging a LAB2 board, go to step 9 on page 5-134.

   If you are exchanging a LAB3 board, go to step 10 on page 5-134.

   If you are exchanging a LAB4 board, go to step 11 on page 5-134.

8. For a LAB1 board:

   a. Refer to Figure 5-11 on page 5-16 and locate cables at:

      01B-A1-GZ4
      01B-A1-GZ5
      01B-A1-HZ4
      01B-A1-HZ5
      01B-A1-NZ1
      01B-A1-NZ2
      01B-A1-PZ4
      01B-A1-PZ5

   b. Check that the cables are labelled according to their positions. If not, label them, then disconnect the cables from the SACU board.

   c. Free these cables from the raceway and feed them through the frame back to LAB1 board enclosure.

   d. Refer to Figure 5-139 on page 5-136 and remove the power connectors 01H-J8 and 01H-J9.
   e. Disconnect the FDS ground cable from the LAB1 board.
   f. Continue with step 12.

9. For a LAB2 board:
   a. Refer to Figure 5-136 on page 5-132 and locate cables at:

      01G-A1-X2
      01G-A1-X3
      01G-A1-X4
      01G-A1-X5
   b. Check that the cables are labelled according to their positions. If not, label them, then disconnect the cables.
   c. Free these cables from the raceway and feed them through the frame back to LAB2 board enclosure.
   d. Refer to Figure 5-139 on page 5-136 and remove the power connectors 02B-J8 and 02B-J9.
   e. Disconnect the FDS ground cable from the LAB2 board.
   f. Continue with step 12.

10. For a LAB3 board:
   a. Refer to Figure 5-136 on page 5-132 and locate cables at:

      02A-A1-X2
      02A-A1-X3
      02A-A1-X4
      02A-A1-X5.
   b. Check that the cables are labelled according to their positions. If not, label them, then disconnect the cables.
   c. Free these cables from the raceway and feed them through the frame back to LAB3 board enclosure.
   d. Refer to Figure 5-139 on page 5-136 and remove the power connectors 02G-J8 and 02G-J9.
   e. Disconnect the FDS ground cable from the LAB3 board.
   f. Continue with step 12.

11. For a LAB4 board:
   a. Refer to Figure 5-136 on page 5-132 and locate cables at:

      02F-A1-X2
      02F-A1-X3
      02F-A1-X4
      02F-A1-X5.
   b. Check that the cables are labelled according to their positions. If not, label them, then disconnect the cables.
   c. Free these cables from the raceway and feed them through the frame back to LAB4 board enclosure.
   d. Refer to Figure 5-139 on page 5-136 and remove the power connectors 03G-J8 and 03G-J9.
   e. Disconnect the FDS ground cable from the LAB4 board.

12. Refer to Figure 5-138 on page 5-135 and Figure 5-139 on page 5-136, and do the following:
   a. Remove the 6 screws **1** which maintain the enclosure on the frame. Then slide the enclosure out of the machine taking care not to damage the power board and connectors on the left side. Place the enclosure on safe working area front side up.
   b. Unscrew the 2 screws **2** securing the FDS cable.
   c. Loosen the spring-loaded cable retainers which hold the cables on rows Y and Z by completely loosening the 2 screws **6**. Then remove these cables.

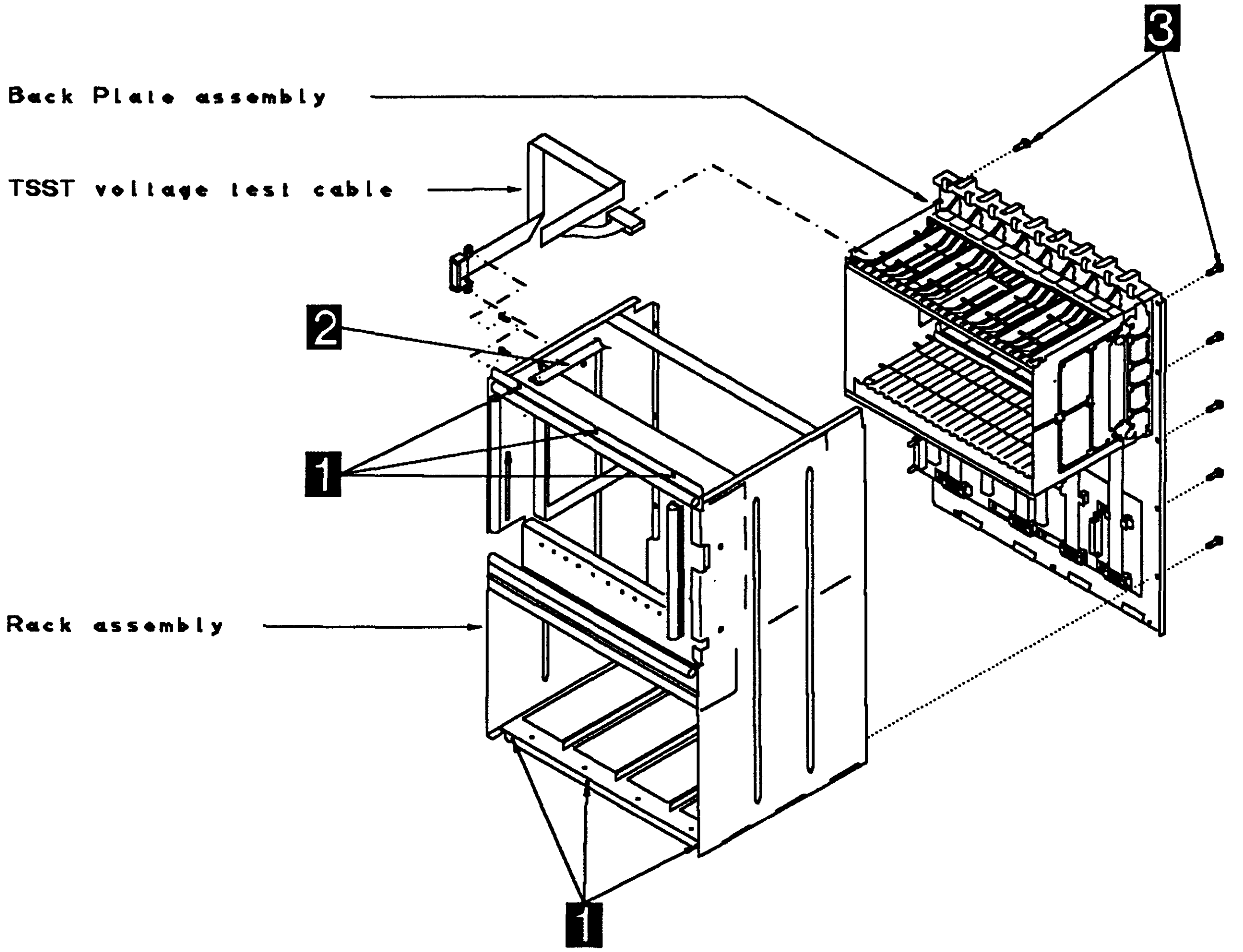


Figure 5-138. Enclosure for the Line Adapter Board

d. If you are exchanging a TSST Board, remove the 2 screws holding the TSST voltage test cable on the left side of the rack assembly.

e. Working from the rear side of the enclosure, remove the 11 screws **3** holding the back plate assembly and rack assembly together. Then, remove back the plate assembly and place it in an area for further work.

f. Remove the 10 screws **4**, which maintain the board assembly on the back plate. Remove the board assembly.

g. Remove the 4 screws **5** which hold the board to the card guide assembly. You can now remove the line adapter board.

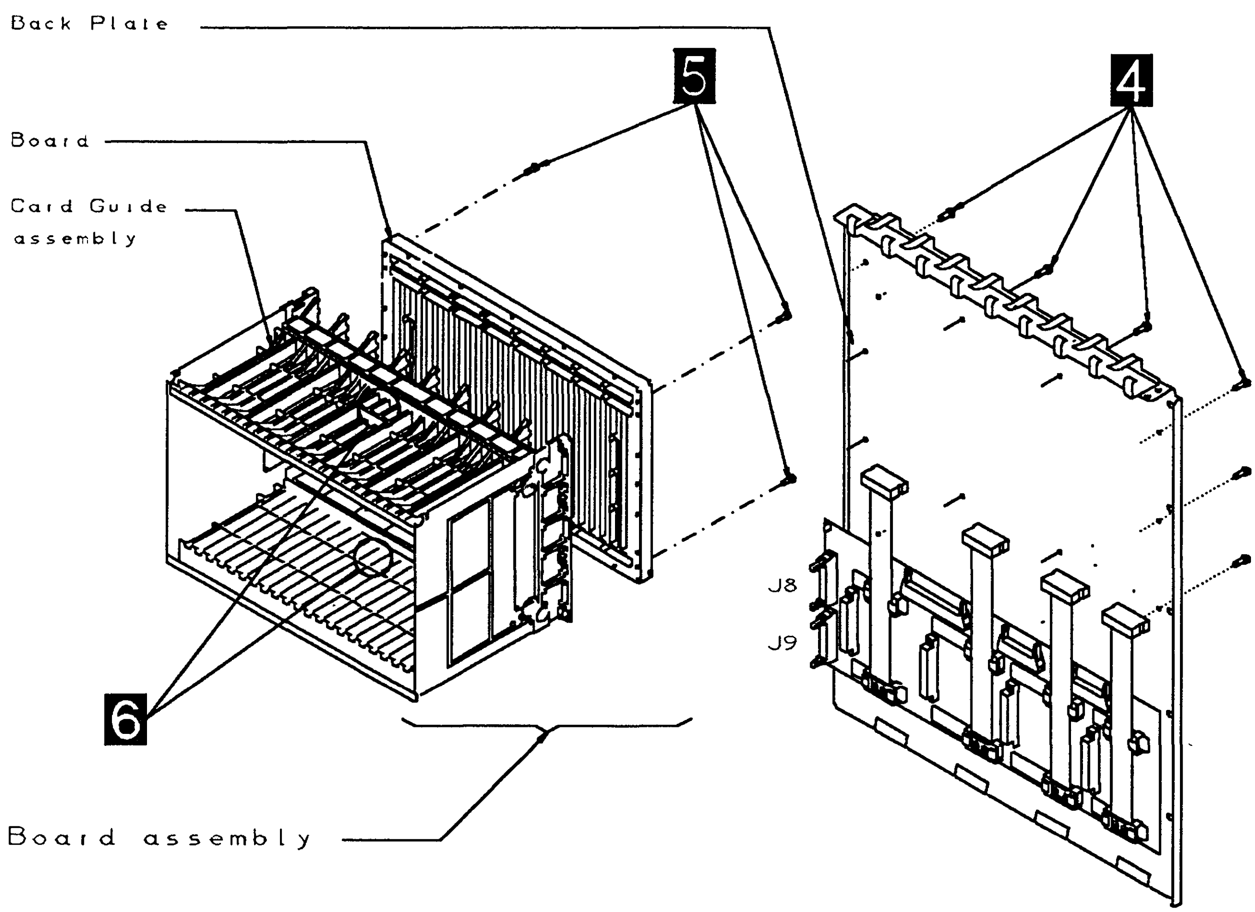


Figure 5-139. Back Plate Assembly

Installation Procedure

1. Refer to Figure 5-138 on page 5-135 and Figure 5-139 on page 5-136 and do the following:
   a. Fasten the new line adapter board on the card guide assembly by means of 4 screws **5**
   b. Fasten the board assembly on the back plate assembly with 10 screws **4**
   c. Fasten the back plate assembly on the rack assembly with 11 screws **3**
   d. Reconnect the flat cables at the top and at the bottom of the board (row 'Y' and 'Z') and tighten the brackets which maintain them with 2 screws **6**
   e. If you have exchanged a TSST Board, re-install the 2 screws holding the TSST voltage test cable on the left side of the rack assembly.
   f. Slide the enclosure into the machine, then fasten it on the frame with 6 screws **1**
2. Secure the cables with the cable clamps on the enclosure raceway.
3. **WARNING: Use the ESD kit and procedures.**

   Refer to Figure 5-136 on page 5-132 (for a TSSB), or to Figure 5-137 on page 5-133 (for a TSST) and do the following:
   a. Re-install all the cards and the top card connectors.
   b. Route the present serial link, token-ring and line cables back to the enclosure and fasten their grounding screws. Reconnect them to the FESL, TIC and FESH cards according to their labels.
   c. If no card is present on X2, re-install the flat cables on X2, X3, X4, X5. Secure them on the raceway with cable clamps.
4. Refer to Figure 5-135 on page 5-131, re-install the removed power supplies as follows:
   a. Slide the PS type 4 assembly into the machine.
   b. Connect the P1 connector **1**
   c. Lock the retaining screw **2**
   d. Tighten the 2 tab screws **3**
5. If you have exchanged a LAB1 board, go to step 6 .

   If you have exchanged a LAB2 board, go to step 7.

   If you have exchanged a LAB3 board, go to step 8.

   If you have exchanged a LAB4 board, go to step 9 on page 5-138.
6. For the LAB1 board:
   a. Feed the cables through the frame back to the SACU board and re-install them in their correct locations:

      01B-A1-GZ4
      01B-A1-GZ5
      01B-A1-HZ4
      01B-A1-HZ5
      01B-A1-NZ1
      01B-A1-NZ2
      01B-A1-PZ4
      01B-A1-PZ5.
   b. Re-install the power connectors 01H-J8 and 01H-J9.
   c. At machine frame 01 ground bus, reconnect the FDS cable coming from the LAB1 board.
   d. Continue with step 11 on page 5-138.
7. For the LAB2 board:
   a. Feed the cables through the frames back to the LAB1 board enclosure. Reconnect the cables to their correct locations:

      01G-A1-X2
      01G-A1-X3
      01G-A1-X4
      01G-A1-X5.
   b. Re-install the power connectors 02B-J8 and 02B-J9.
   c. At machine frame 02 ground bus, re-install the FDS cable coming from the LAB2 board.
   d. Continue with step 11 on page 5-138.
8. For the LAB3 board:
   a. Feed the cables through the frame back to the LAB2 board enclosure. Reconnect the cables to their correct locations:

      02A-A1-X2
      02A-A1-X3
      02A-A1-X4
      02A-A1-X5.
   b. Reconnect the power connectors 02G-J8 and 02G-J9.
   c. At machine frame ground bus, reconnect the FDS cable coming from the LAB3 board.
   d. Continue with step 11 on page 5-138.

9. For the LAB4 board:
   a. Feed the cables through the frames back to the LAB3 board enclosure. Reconnect the cables to their correct locations:

      02F-A1-X2
      02F-A1-X3
      02F-A1-X4
      02F-A1-X5.
   b. Reconnect power connectors 03G-J8 and 03G-J9.
   c. At machine frame 03 ground bus, reconnect the FDS cable coming from the LAB4 board.
10. Close the internal covers.
11. Switch the CB1 ON.
12. Close the frame doors.
13. Turn the machine ON using the control panel as follows:
    a. Press the 'Power Control' key until (***3***) appears in the Power Control window (Power Control in local).
    b. Press the 'Validate' key.
    c. Press the 'Function' key until (***1***) appears in the function window (function in MOSS IML).
    d. Press the 'Validate' key.
    e. Press the 'Service' key until (***1***) appears in the service window (service in MAINTENANCE 1).
    f. Press the 'Validate' key.
    g. Press the 'power ON Reset' key.

       Note: The former actions will power the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
14. Run the TSS diagnostics.
    Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1.
15. Go to "Repair Verification Procedure" on page 5-170.

LIC Board Type 1 Exchange Procedure

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**

2. Press power OFF on the control panel.

3. Switch CB1 OFF. Refer to Figure 5-140.

4. Locate the board to exchange. Refer to Figures 5-1 to 5-6.

Refer to Figure 5-141 on page 5-140 and do the following:

5. Verify that the LIC cables are labelled according to their positions. If not, label them. Then, remove the LIC cables from the LICs.

6. Remove the cover to allow access to the DMUX.

7. Verify the serial link cable(s) on the DMUX are labeled according to their positions. If not, label them. Then remove the serial link cable(s).

8. Note the types and locations of the LICs. The LIC type is indicated by the color of the thumb screw.

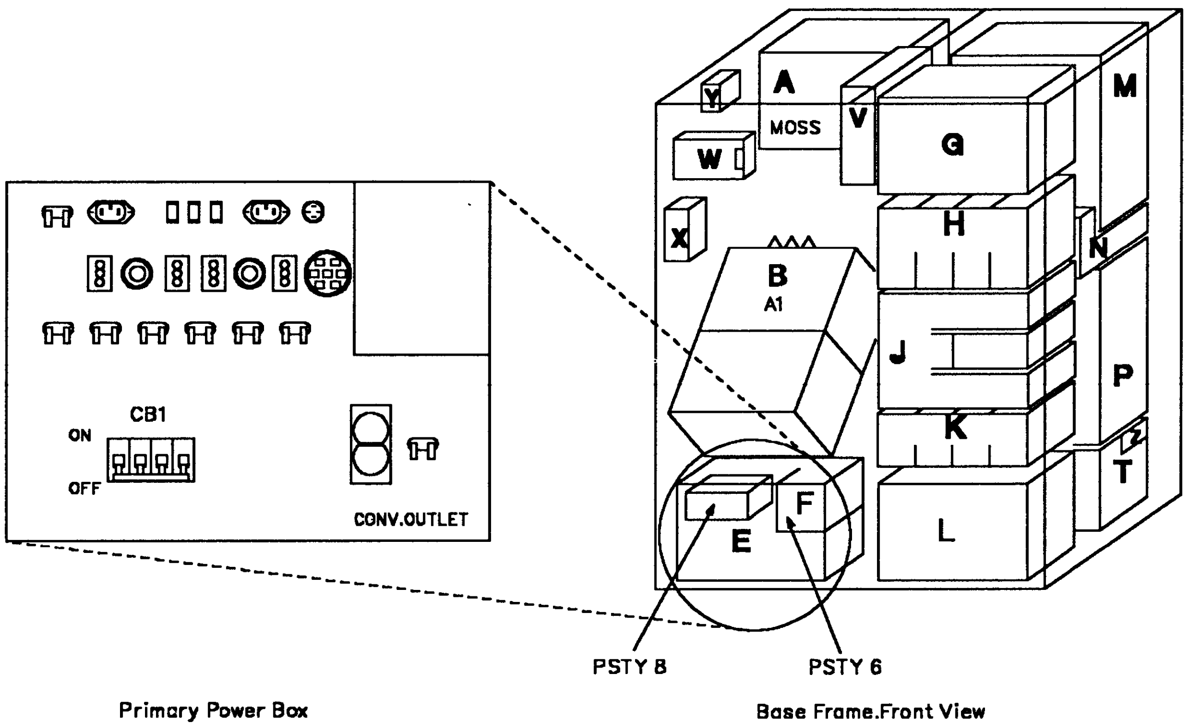


Figure 5-140. Primary Power Box

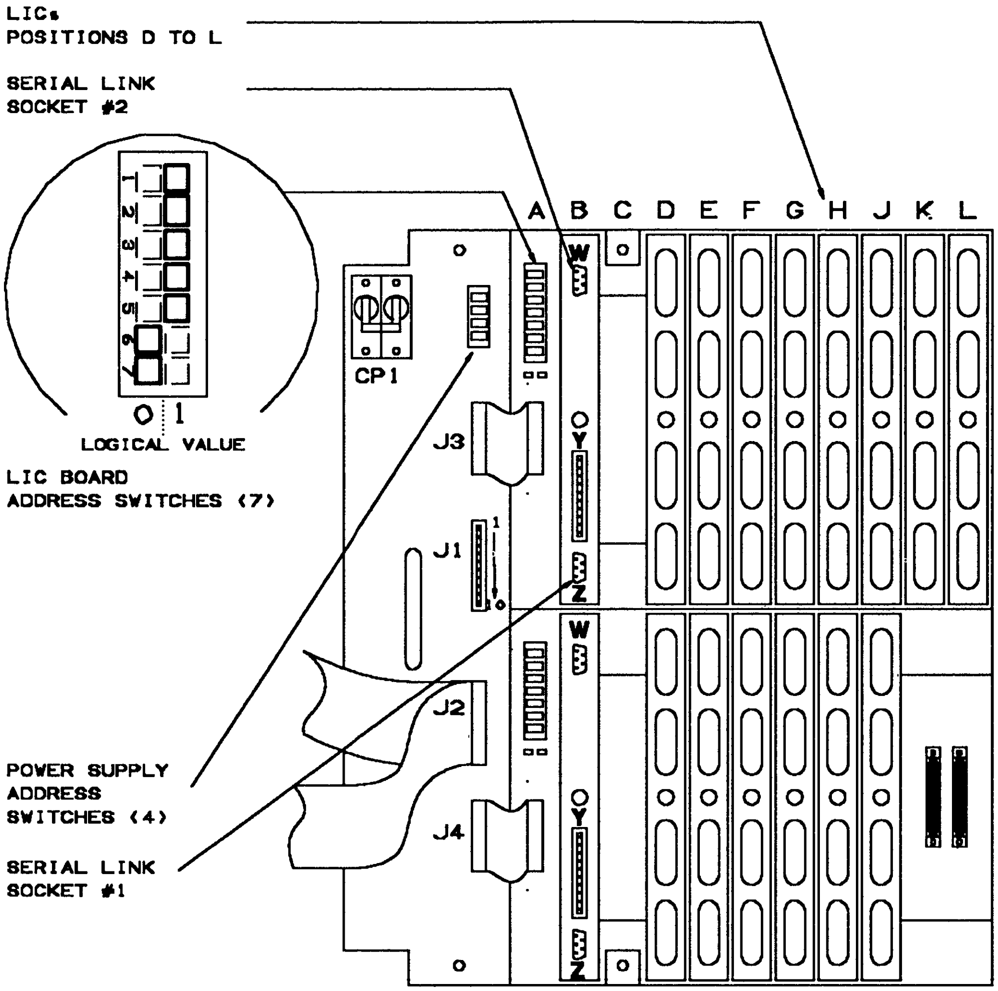


Figure 5-141. LIC Board Type 1 Assembly

LIC Board Type 1 Location	Address Switches 7 to 1	LIC Board Type 1 Location	Address Switches 7 to 1
01M-B1	0000011	05D-B1	0010001
01M-B2	0000010	05D-B2	0010000
01P-B1	0000001	05E-B1	0010111
01P-B2	0000000	05E-B2	0010110
04B-B1	0001101	05G-B1	0010011
04B-B2	0001100	05G-B2	0010010
04D-B1	0001001	06B-B1	0011101
04D-B2	0001000	06B-B2	0011100
04E-B1	0001111	06D-B1	0011001
04E-B2	0001110	06D-B2	0011000
04G-B1	0001011	06E-B1	0011111
04G-B2	0001010	06E-B2	0011110
05B-B1	0010101	06G-B1	0011011
05B-B2	0010100	06G-B2	0011010

FRU Type	Thumb Screw Colors
LIC Type 1	Brown
LIC Type 3	Blue
LIC Type 4A	Green
LIC Type 4B	Green
DMUX	White

9. **WARNING: Use the ESD kit and procedures.** Remove the LICs and the DMUX by unfastening the thumb screws holding them to the board.
10. Note the board address for later use.

Refer to Figure 5-142 and Figure 5-143 and do the following:

11. Disconnect the flat power cable **1** from the LIC Board.

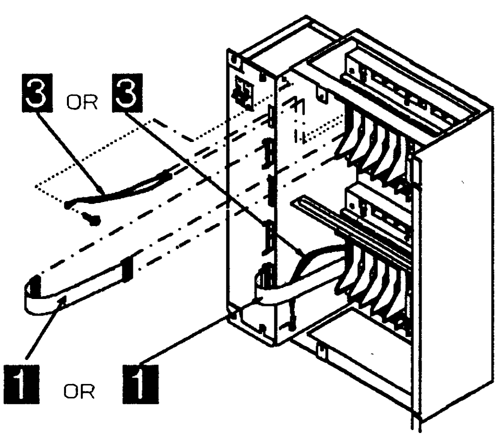


Figure 5-142. LIC Board Type 1 Enclosure Assembly

12. If present, disconnect the ground strap from the LIC board **3**.
13. Remove the 4 screws **2** holding the board assembly to the frame.
14. Remove the LIC Board assembly.

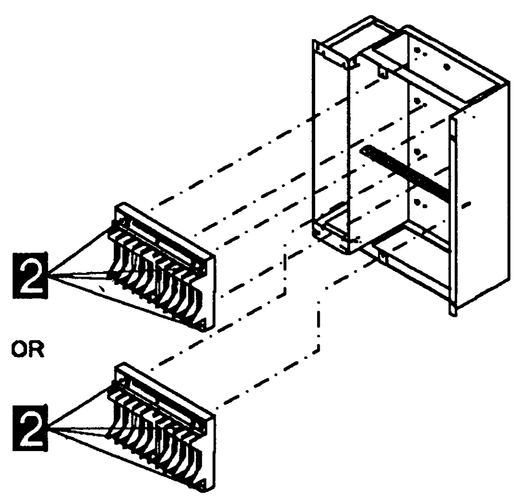


Figure 5-143. LIC Board Type 1 Assemblies

Installation Procedure

1. Refer to Figure 5-141 on page 5-140 and set the board address the same way you noted it during board removal.

2. Refer to Figure 5-143 on page 5-141.
   If present, check if there is a place on the new board to install the ground strap and reconnect it;
   If not, remove the ground strap from the frame.
   Mount the new board in place and secure it with the four screws **2**

3. Refer to Figure 5-142 on page 5-141.
   Reconnect the flat power cable **1**

4. **WARNING: Use the ESD kit and procedures.**

   Install the LICs and the DMUX in their proper positions and fasten the thumb screws holding them on the board. Finger strength is enough, do not use tools.

5. Install the LIC cables on the LICs.

6. Note from the serial link cable label(s) the connection information (which line adapter they were connected to). Record this information for later use.

7. Install the serial link cable(s) on the DMUX.

8. Re-install the DMUX cover.

9. Record the Part Number of the new board on the label stuck above the LIC enclosure.

10. Switch the CB1 ON, refer to Figure 5-140 on page 5-139.

11. Turn the machine ON, using the control panel as follows:

    a. Press the 'Power Control' key until (**3**) appears in the Power Control mode window (Power Control in local).

    b. Press the 'Validate' key.

    c. Press the 'Function' key until (*1*) appears in the function window (function MOSS IML).

    d. Press the 'Validate' key.

    e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).

    f. Press the 'Validate' key.

    g. Press the 'power ON' Reset key.

    Note: The former actions will power the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14

12. Run the TSS diagnostics for the Line Adapters you recorded in step 6 in this procedure. Refer to "How to Run Internal Function Tests" on page 4-29.

13. Go to "Repair Verification Procedure" on page 5-170.

LIC Board Type 2 Exchange Procedure

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**
2. Press power OFF on the control panel.
3. Switch CB1 OFF. Refer to Figure 5-144
4. Locate the board to exchange. Refer to Figures 5-1 to 5-6.

Refer to Figure 5-145 on page 5-144 and do the following:

5. Verify that the LIC cables are labeled according to their positions. If not, label them. Then remove the LIC cables from the LICs.
6. Remove the cover to allow access to the SMUX.
7. Verify that the serial link cable on the SMUXA or SMUXB is labeled according to its position. If not, label them. Then remove the serial link cable.
8. Remove the flat cable between SMUXA and SMUXB.
9. Note the types and locations of the LICs.

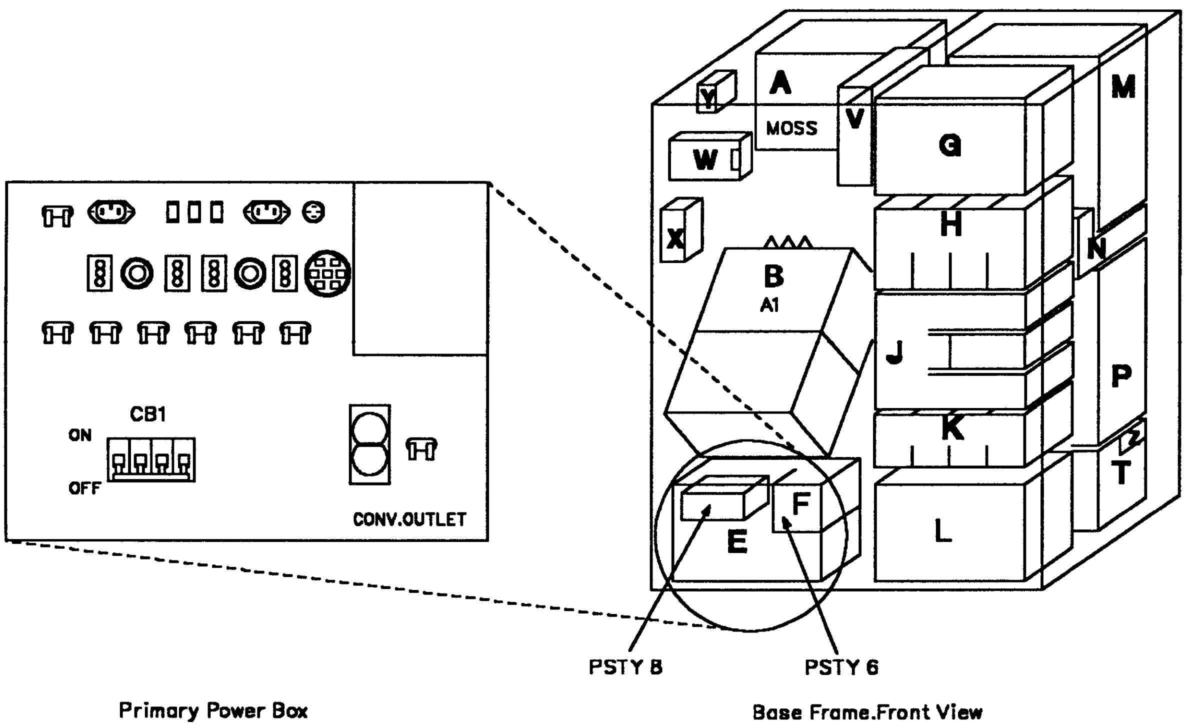


Figure 5-144. Primary Power Box

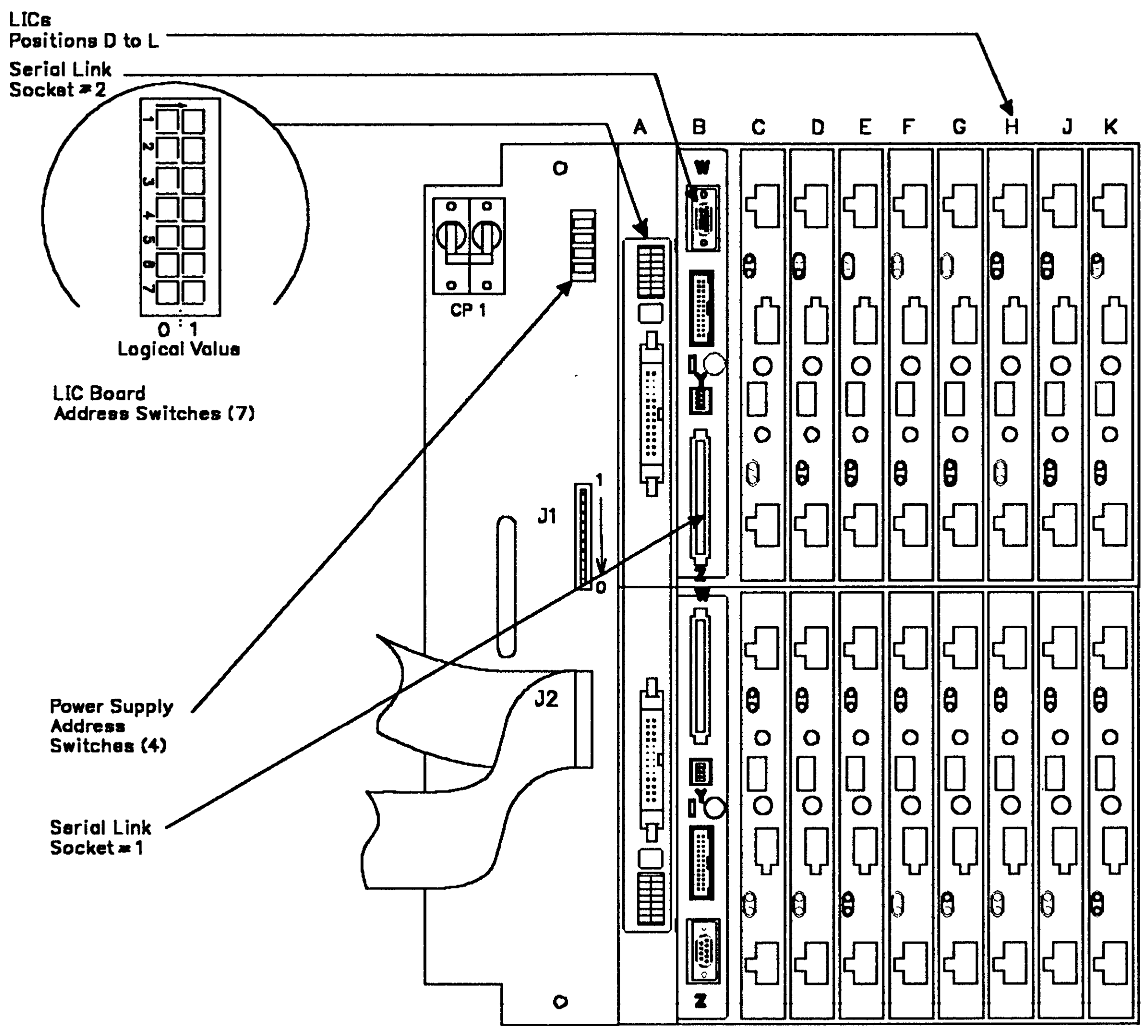


Figure 5-145. LIC Board Type 2 Assembly

LIC Board Type 2 Location	Address Switches 7 to 1	LIC Board Type 2 Location	Address Switches 7 to 1
01M-B1	0000011	05D-B1	0010001
01M-B2	0000010	05D-B2	0010000
01P-B1	N.A.	05E-B1	0010111
01P-B2	N.A.	05E-B2	0010110
04B-B1	0001101	05G-B1	0010011
04B-B2	0001100	05G-B2	0010010
04D-B1	0001001	06B-B1	0011101
04D-B2	0001000	06B-B2	0011100
04E-B1	0001111	06D-B1	0011001
04E-B2	0001110	06D-B2	0011000
04G-B1	0001011	06E-B1	0011111
04G-B2	0001010	06E-B2	0011110
05B-B1	0010101	06G-B1	0011011
05B-B2	0010100	06G-B2	0011010

FRU Type	Thumb Screw Colors
LIC Type 1	Brown
LIC Type 3	Blue
LIC Type 4A	Green
LIC Type 4B	Green
LIC Type 5	Black
LIC Type 6	Black
DMUX	White
SDMUXA	Black
SDMUXB	Black

10. **WARNING: Use the ESD kit and procedures.**

    Remove the LICs and the SMUXA or SMUXB by unfastening the thumb screws holding them on the board.

11. Note the board address for later use.

Refer to Figure 5-146 and Figure 5-147 and do the following:

12. Disconnect the flat power cable **1** from the LIC board.

13. Remove the 4 screws **2** holding the board assembly on the frame.

14. Remove the LIC board assembly.

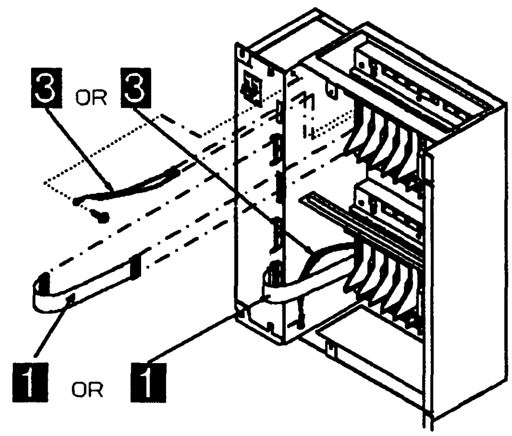


Figure 5-146. LIC Board Type 2 Enclosure Assembly

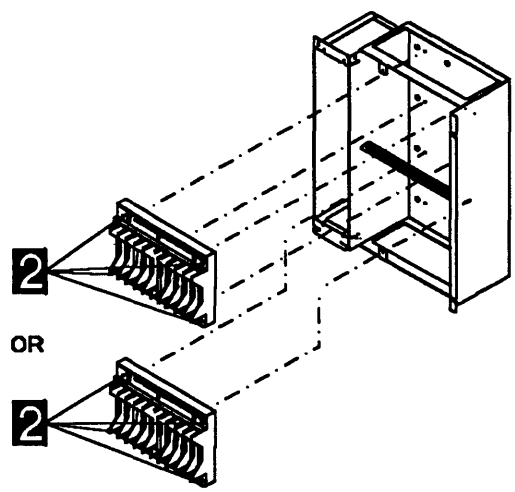


Figure 5-147. LIC Board Type 2 Assemblies

Installation Procedure

1. Refer to Figure 5-145 on page 5-144 and set the board address to the same one you noted during board removal.
2. Refer to Figure 5-147 on page 5-146. Mount the new board in place and secure it with the four screws **2**
3. Refer to Figure 5-146 on page 5-146. Reconnect the flat power cable **1**
4. **WARNING: Use the ESD kit and procedures.**

   Install the LICs and the SMUXA or SMUXB in their proper positions and fasten the thumb screws holding them on the board. Finger strength is enough, do not use tools.
5. Install the LIC cables on the LICs.
6. Note from the serial link cable label the connection information (which line adapter they are connected to). Record this information for later use.
7. Install the serial link cable on the SMUXA or SMUXB.
8. Install the flat cable between SMUXA and SMUXB.
9. Re-install the SMUX cover.
10. Record the part number of the new board on the label stuck above the LIC enclosure.
11. Switch CB1 ON, refer to Figure 5-144 on page 5-143
12. Power the machine ON using the control panel as follows:
    a. Press the 'power control' key until (*3*) appears in the Power Control mode window (Power Control in local).
    b. Press the 'Validate' key.
    c. Press the 'Function' key until (*1*) appears in the function window (function MOSS IML).
    d. Press the 'Validate' key.
    e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).
    f. Press the 'Validate' key.
    g. Press the 'power ON' Reset key.

    Note: The former actions will power the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
13. Run the TSS diagnostics for the Line Adapters you recorded on step 6 in this procedure. Refer to "How to Run Internal Function Tests" on page 4-29.
14. Go to "Repair Verification Procedure" on page 5-170.

MOSS Board Exchange Procedure

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**
2. Press 'Power OFF' on the control panel.
3. Switch CB1 OFF. Refer to Figure 5-149.
4. Refer to Figure 5-148 to locate the MOSS board.
5. Refer to Figure 5-150 on page 5-149.
   a. Disconnect the flat cable **2** from PROM card 01A-X0E1. **The disconnection can be done only from the PROM card.**
   b. Disconnect the cable **1** from MAC/MAC2 card 01A-X0H1.

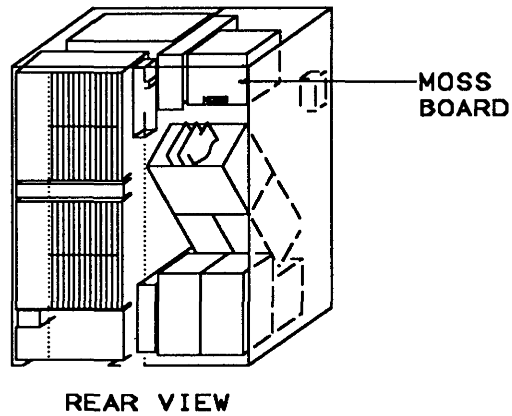


Figure 5-148. Base Frame - Rear View

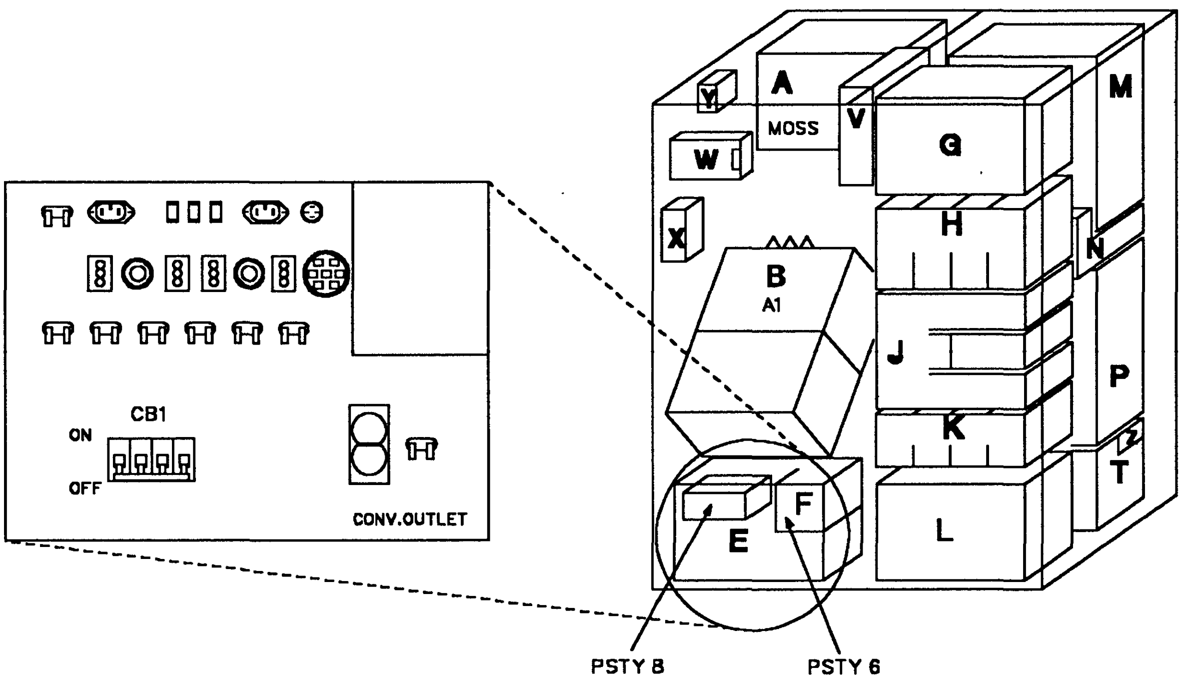


Figure 5-149. Primary Power Box in Frame 01

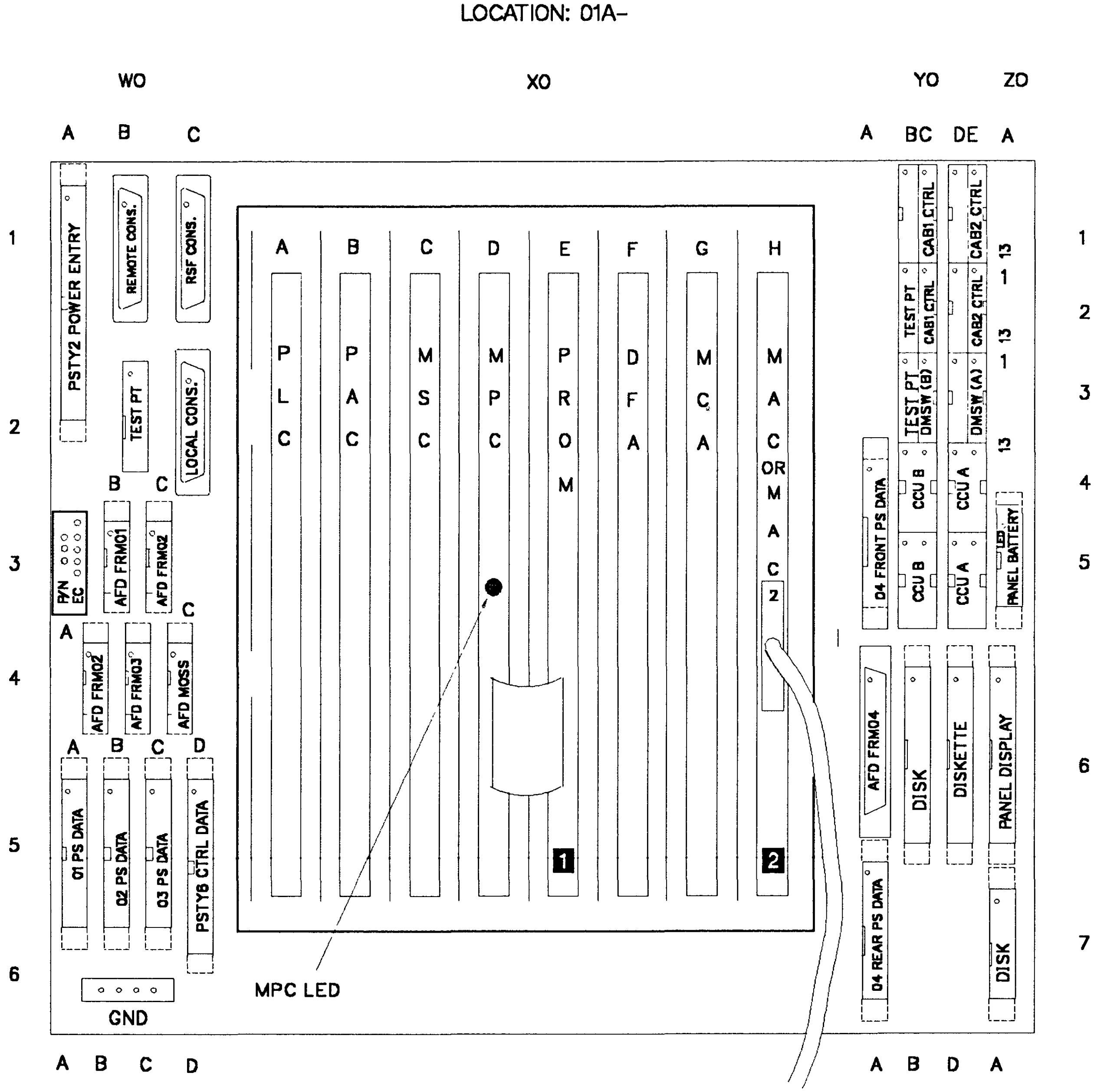


Figure 5-150. Cables and Cards of the MOSS

6. Refer to Figure 5-150.

   Verify if the cards are labelled according their locations. If not, label them.

   WARNING: Use the ESD kit and procedures.

   Remove the cards and put them in a safe place.

7. Refer to Figure 5-150.

   Verify that all the cables are labelled according their locations, if not, label them.

   Disconnect the cables from the 01A-W0, 01A-Y0 and 01A-Z0 areas.

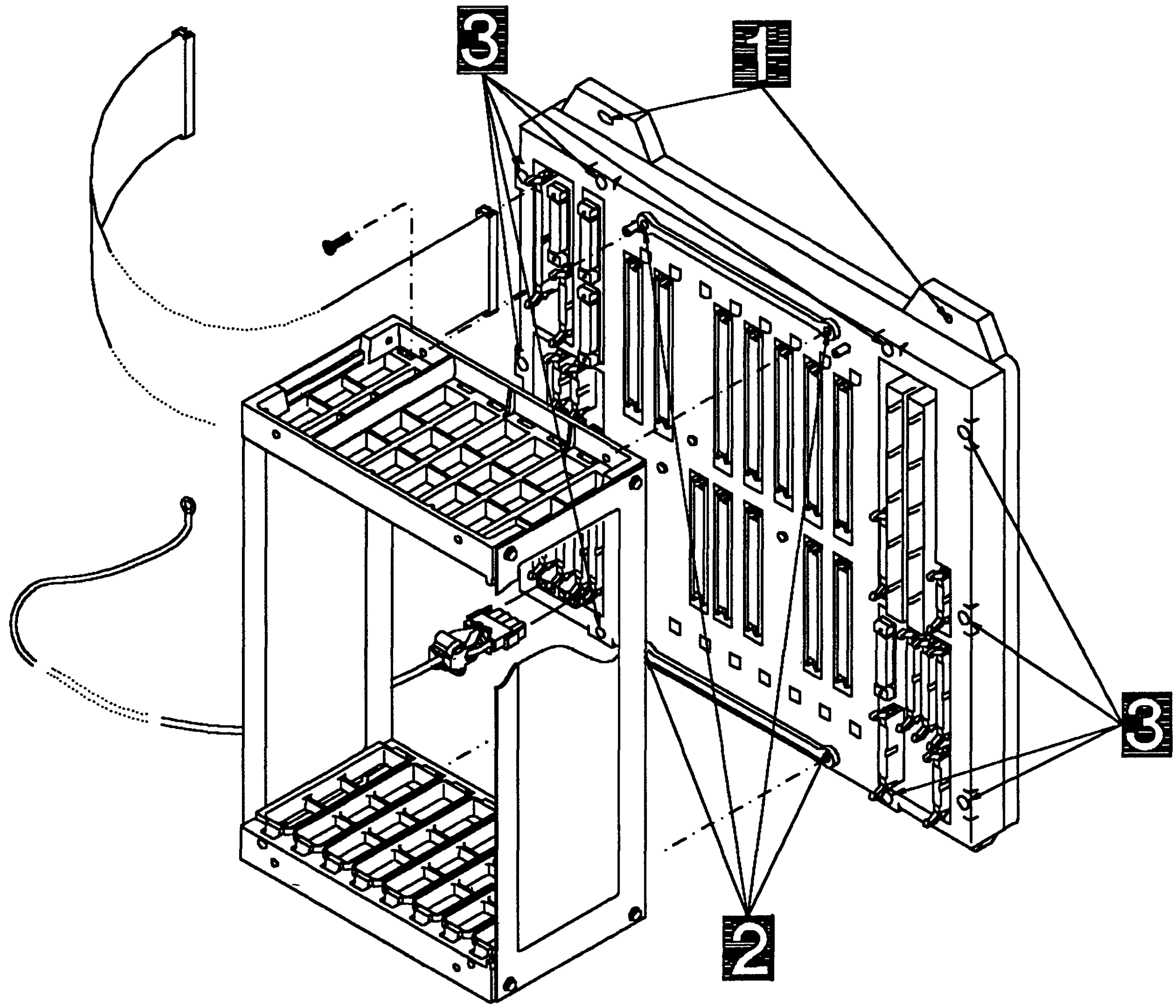


Figure 5-151. MOSS Board and Card Rail Assemblies

8. Refer to Figure 5-151.

   a. Remove the 4 screws **1** holding the MOSS board assembly to the machine frame. Remove the MOSS board assembly. Place the board assembly in a work area for further work.

   b. Remove the 4 screws **2** holding the rail assembly on the FRU board. Remove the rail assembly and store it for later use.

   c. Remove the 10 screws **3** holding the top stiffener of the MOSS board. Carefully remove the top stiffener. Lift the MOSS board out of the bottom stiffener.

Installation Procedure

1. Place the new MOSS board in the bottom stiffener.
2. Refer to Figure 5-151 on page 5-150.
   a. Replace the top stiffener and attach it with the 10 screws **3**
   b. Attach the rail assembly to the top stiffener with the 4 screws **2** ,
   c. Attach the moss board and rail assembly to the base frame with the 4 screws **1** ,
3. Refer to Figure 5-150 on page 5-149.

   Install cables at 01A-W0, 01A-Y0 and 01A-Z0 in their correct locations according to their labels.
4. **WARNING: Use the ESD kit and procedures.**

   Install the cards in their correct locations according to their labels, refer to Figure 5-150 on page 5-149.
5. Refer to Figure 5-150 on page 5-149.

   Reconnect the flat cable **2** coming from the MPC card 01A-X0D1, to the PROM card 01A-X0E1.

   Reconnect the cable **1** to the MAC/MAC2 card 01A-X0H1.
6. Close the internal covers.
7. Switch CB1 ON.
8. Close the doors of the base frame.
9. Turn the machine ON, using the control panel as follows :
   a. Press the 'Power Control' key until (**3**) appears in the Power Control window (Power Control in local).
   b. Press the 'Validate' key.
   c. Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).
   d. Press the 'Validate' key.
   e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).
   f. Press the 'Validate' key.
   g. Press the 'power ON Reset' key.

   Note: The former actions will turn the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
10. Go to "Repair Verification Procedure" on page 5-170.

Notes:

SAC Gate Assembly Exchange Procedure for Models 210 and 410

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**
2. Press 'Power OFF' on the control panel.
3. Switch CB1 OFF. Refer to Figure 5-152 for the location of the CB1.
4. Refer to Figure 5-153 on page 5-154 to locate the SAC boards (SACU & SACL).
5. Refer to Figure 5-154 on page 5-155. Working from the rear of the frame 01, do the following:
   a. Loosen the 4 screws which maintain the internal cover and remove the cover.
   b. Remove the blanking plate assembly by removing the 4 screws **1**
   c. **WARNING: Use the ESD kit and procedures.**

      Check that the cards are labelled according to their positions, if not, label them. Refer to Figure 5-156 on page 5-156 and remove the cards as follows:
      1) Using both hands, release levers A and B simultaneously by moving them upwards and outwards.
      2) Press catches C and D in gently and pull the card assembly out of the SAC gate assembly.

   d. Note the locations and remove the cables from the Z row of the SACL board.
   e. Remove the cable cover **2** by removing the 2 screws **3**
   f. Note the locations and remove the trilead packs from the SACL board.
   g. Note the locations and remove the cables from the Y row of the SACL board.
   h. Make sure that all the removed cables are well clear of the board assembly.

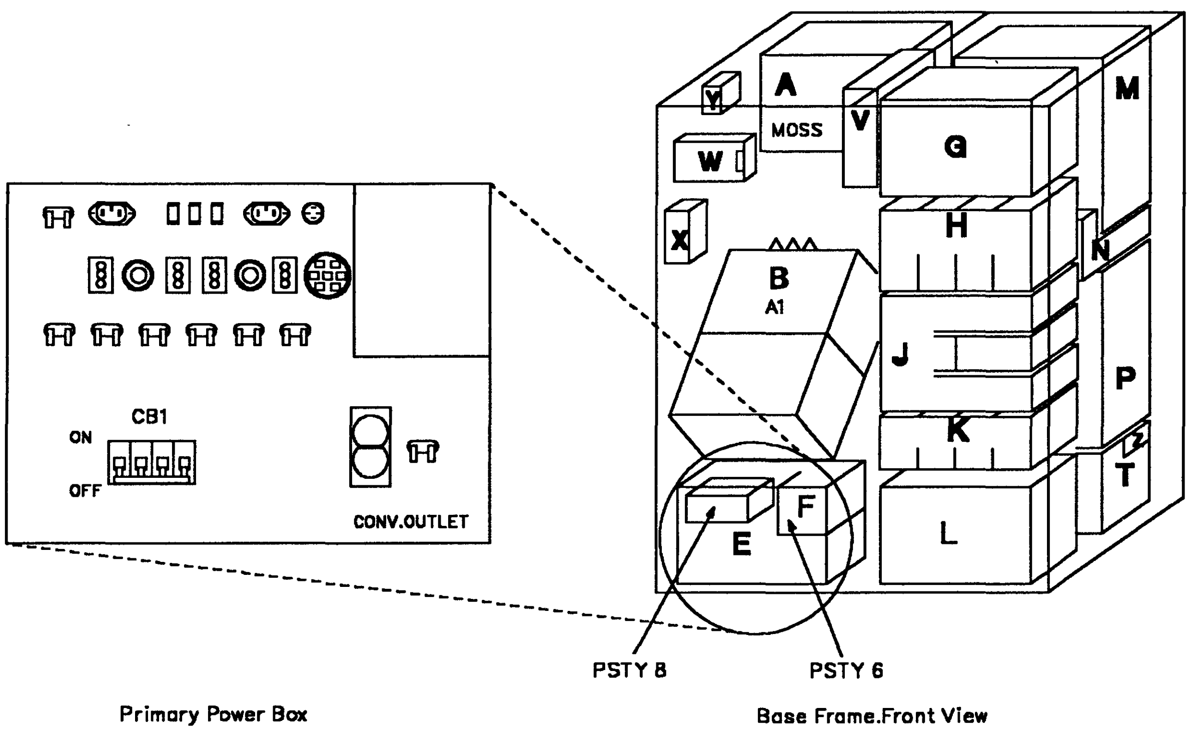
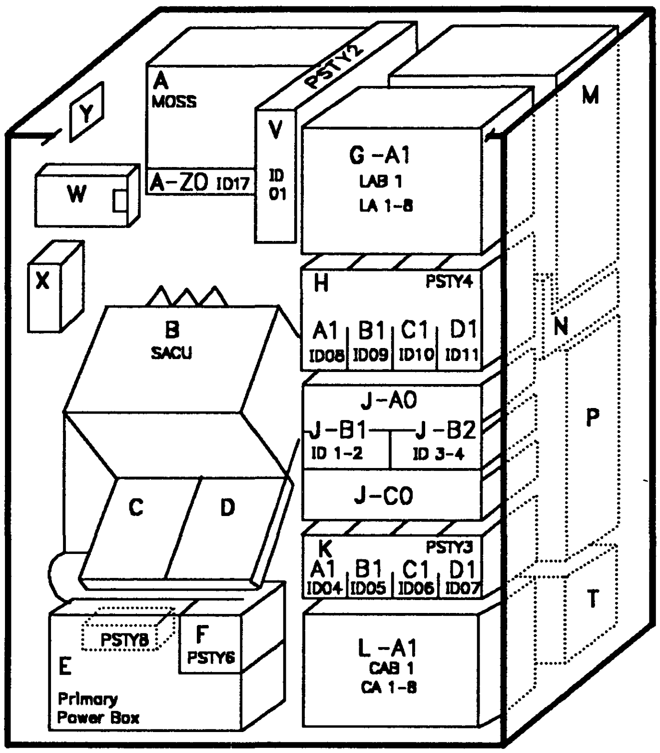


Figure 5-152. Primary Power BOX in Frame 01

Front View



PTER

Rear View

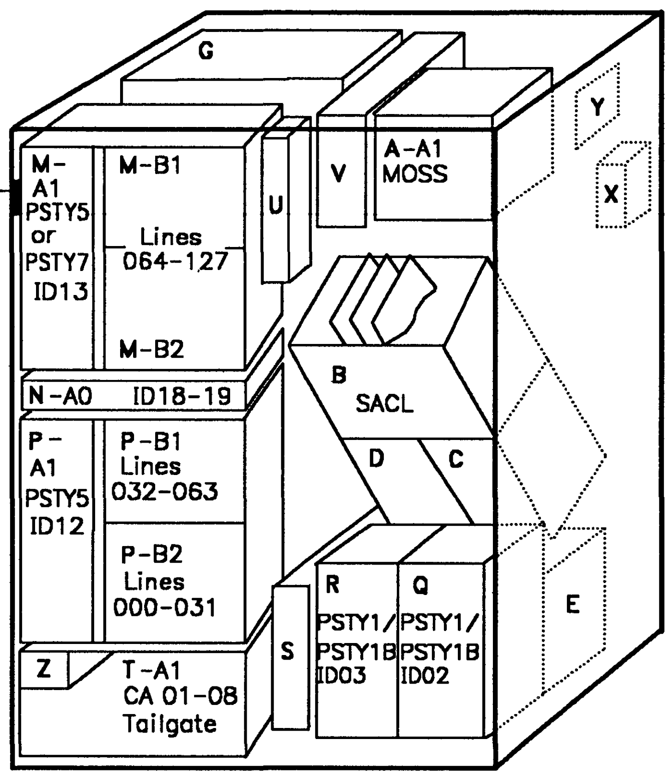


Figure 5-153. Frame 01 Front and Rear View

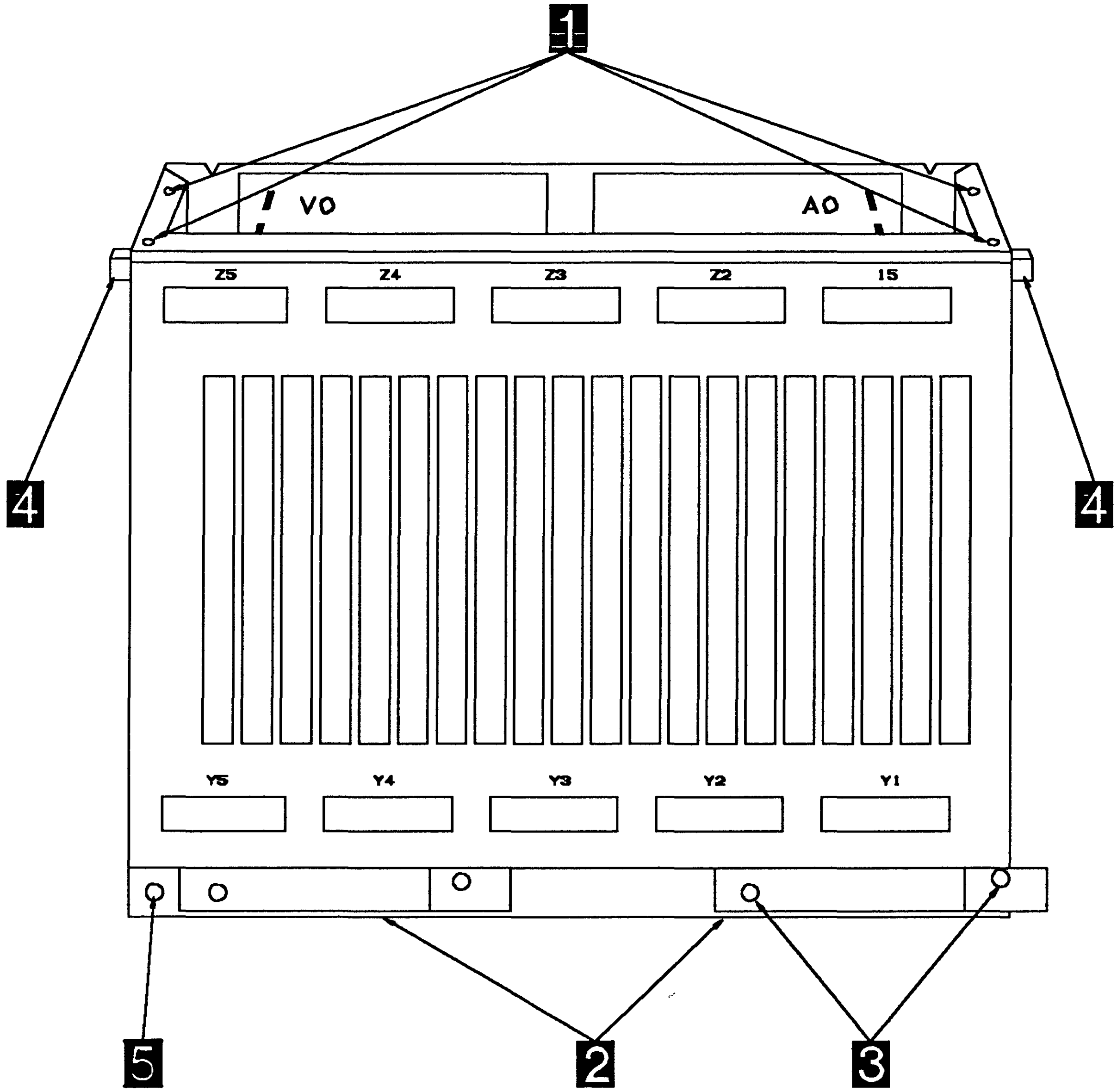


Figure 5-154. Rear View of the SAC Gate Assembly

6. Refer to Figure 5-155 on page 5-156. Working from the front of frame 01, do the following:
   a. Open the internal door.
   b. Open the control panel door.
   c. Note the locations and remove the cables from the Z row of the SACU board.
   d. Note the locations and remove the ribbon cables from the SACU board.
   e. Note the locations and remove the cables from the Y row of the SACU board.
   f. Make sure all the removed cables are well clear of the SAC gate assembly.

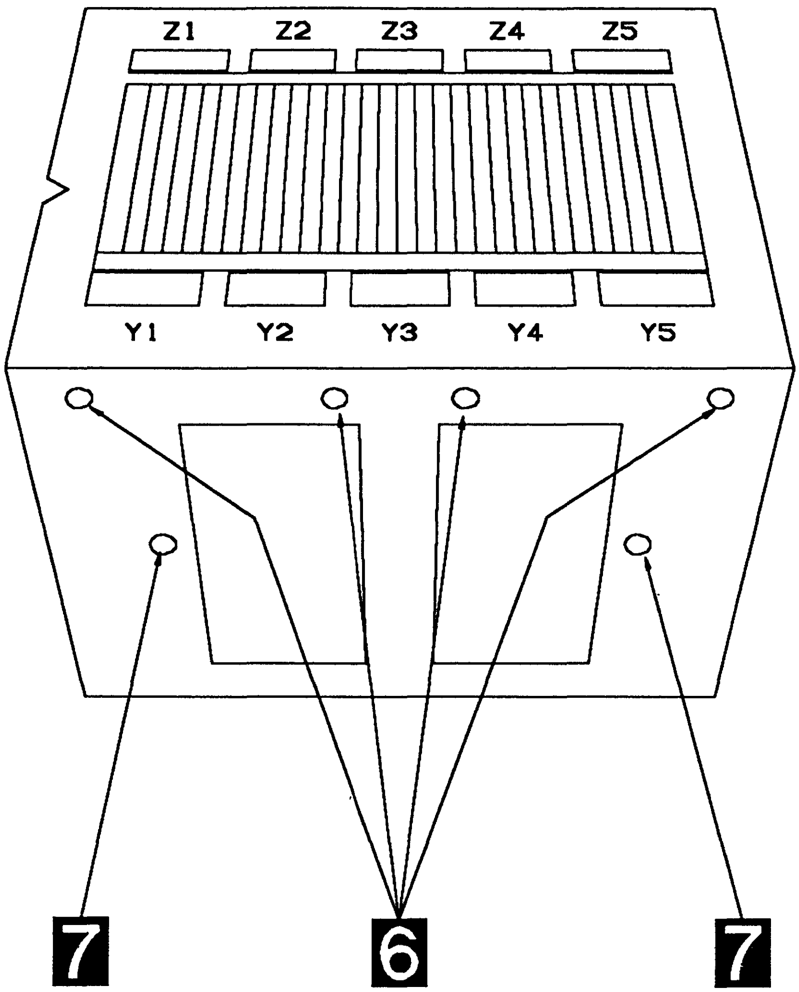


Figure 5-155. Front View of the SAC Gate Assembly

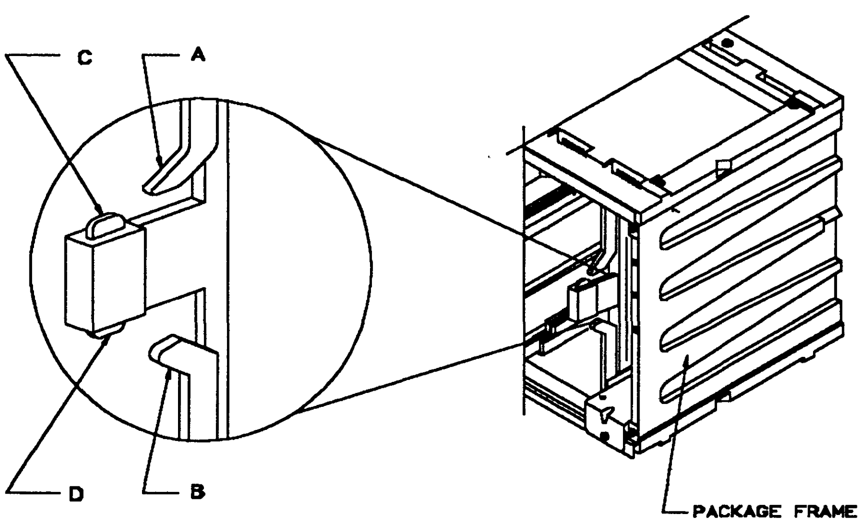


Figure 5-156. Card Clamp Mechanism

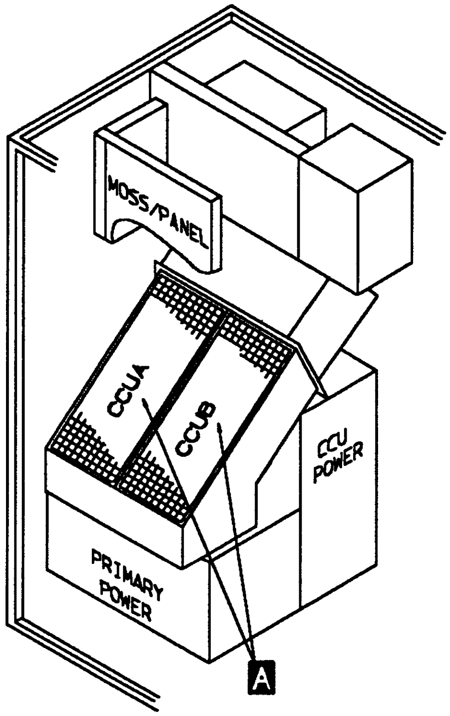


Figure 5-157. SAC Air Moving Device Unit Location

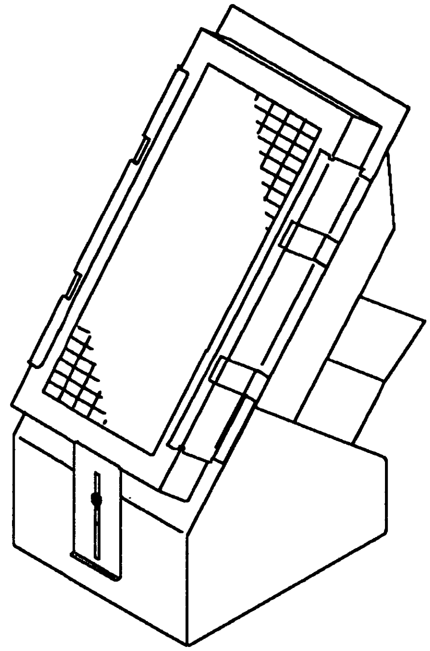


Figure 5-158. SAC Air Moving Device

7. Refer to Figure 5-157 and to Figure 5-158 and remove the Air Moving Device(s) as follows:
   a. Unplug the Air Moving Device power cord.
   b. Remove the 4 mounting screws from the Air Moving Device unit.
   c. To remove the Air Moving Device, swing the bottom of the unit out and lift the Air Moving Device out.
   d. Repeat the procedure for the second Air Moving Device if present, otherwise remove the blanking cover by removing the 4 mounting screws.
8. Refer to Figure 5-155 on page 5-156. Then remove the 4 screws **6** holding the SAC gate assembly.
9. Refer to Figure 5-154 on page 5-155. Working from the rear of frame 01, do the following:
   a. Open the cable clips **4** and remove the FDS cables.
   b. Remove the 2 screws **5** holding the gate assembly to the frame.
   c. Referring to Figure 5-155 on page 5-156 and working through the gate assembly, remove the last 2 screws **7** still holding the gate assembly to the frame.
   d. **WARNING: The SAC gate assembly weighs approximately 10 kg.**
   e. Very carefully remove the SAC gate assembly by lifting it upwards with both hands.

Installation Procedure

1. Install the labels shipped with the new SAC gate assembly using the enclosed instructions.

Refer to Figure 5-154 on page 5-155 and Figure 5-155 on page 5-156

2. Working from the rear, do the following:
   a. Put the new SAC gate assembly in place.
   b. Fasten the SAC gate assembly to the frame with the 2 center screws 7 and 2 bottom screws 5. Do not tighten the screws.
3. Working from the front do the following:
   a. Install the 4 top screws 6. Do not tighten the screws.
   b. Align the SAC gate assembly with the bottom and sides of the opening and tighten all 8 screws.
   c. Reconnect the ribbon cables to the SACU board.
   d. Reconnect the cables to Z and Y rows of the SACU board, refer to Figure 5-11 on page 5-16.
   e. Re-install the Air Moving Device(s).
4. Working from the rear do the following:
   a. Feed the FDS cables going to the SACU board from the rear through the cable clips 4. Close the clips.
   b. Reconnect the cables to the Y row of the SACL board, refer to Figure 5-13 on page 5-18.
   c. Reconnect all the trilead packs on the SACL board.
   d. Reconnect the cables to the Z row of the SACL board.
   e. Re-install the cable cover 2 by installing the 2 screws 3 ensuring that no trileads are trapped.
   f. **WARNING: Use the ESD kit and procedures.**
   g. Re-install the cards.

      Note: In order to improve contact, maneuver card seating levers 3 times for every card.
   h. Re-install the blanking plate assembly by installing the 4 screws 1
   i. Re-install the SAC gate assembly internal cover.
5. Close the front internal door and the control panel door.
6. Switch the CB1 ON.
7. Close the frame doors.
8. Turn the machine ON using the control panel as follows:
   a. Press the 'Power Control' key until (*3*) appears in the Power Control window (Power Control in Local).
   b. Press the 'Validate' key.
   c. Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).
   d. Press the 'Validate' key.
   e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).
   f. Press the 'Validate' key.
   g. Press the 'power ON Reset' key.

   Note: The former actions will turn the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**,**F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14
9. Run the CCU and the IOC bus diagnostics. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1.
10. Go to "Repair Verification Procedure" on page 5-170.

Notes:

SAC2 Gate Assembly Exchange Procedure for Models 310 and 610

Removal Procedure

1. **Advise the customer that the 3745 is to be turned OFF.**
2. Press 'Power OFF' on the control panel.
3. Open the doors of frame 01 (base frame).
4. Switch CB1 OFF. Refer to Figure 5-159 for the location of CB1.

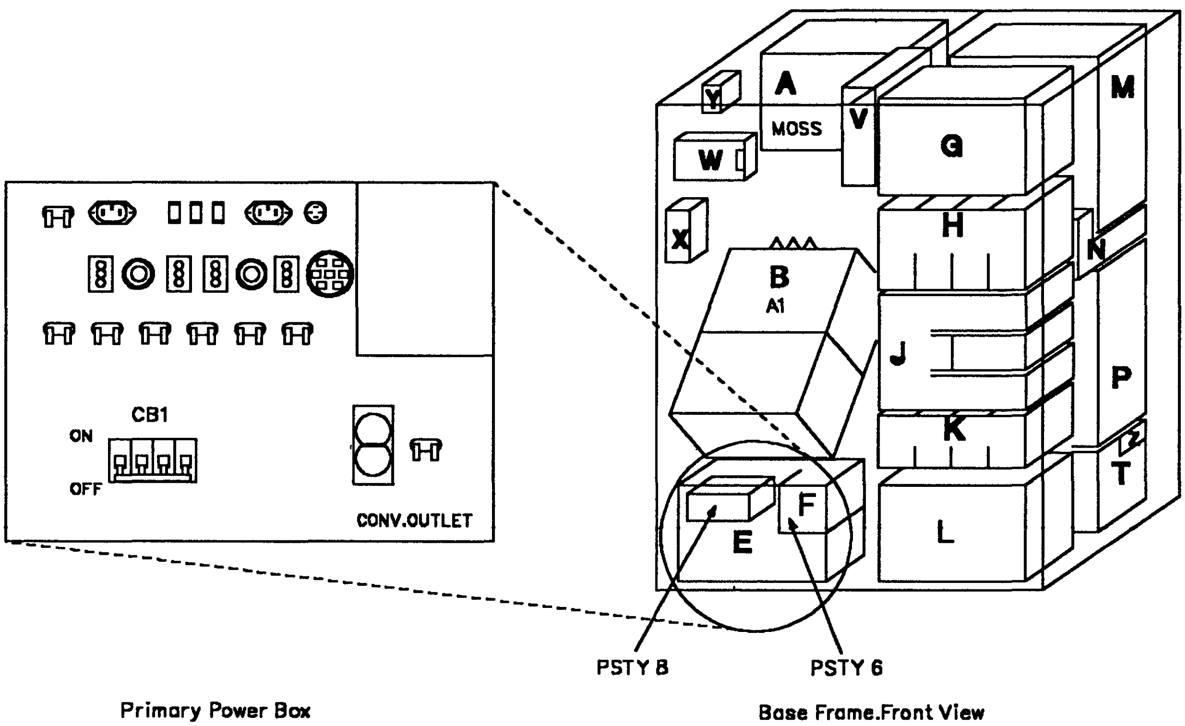


Figure 5-159. Primary Power BOX in Frame 01

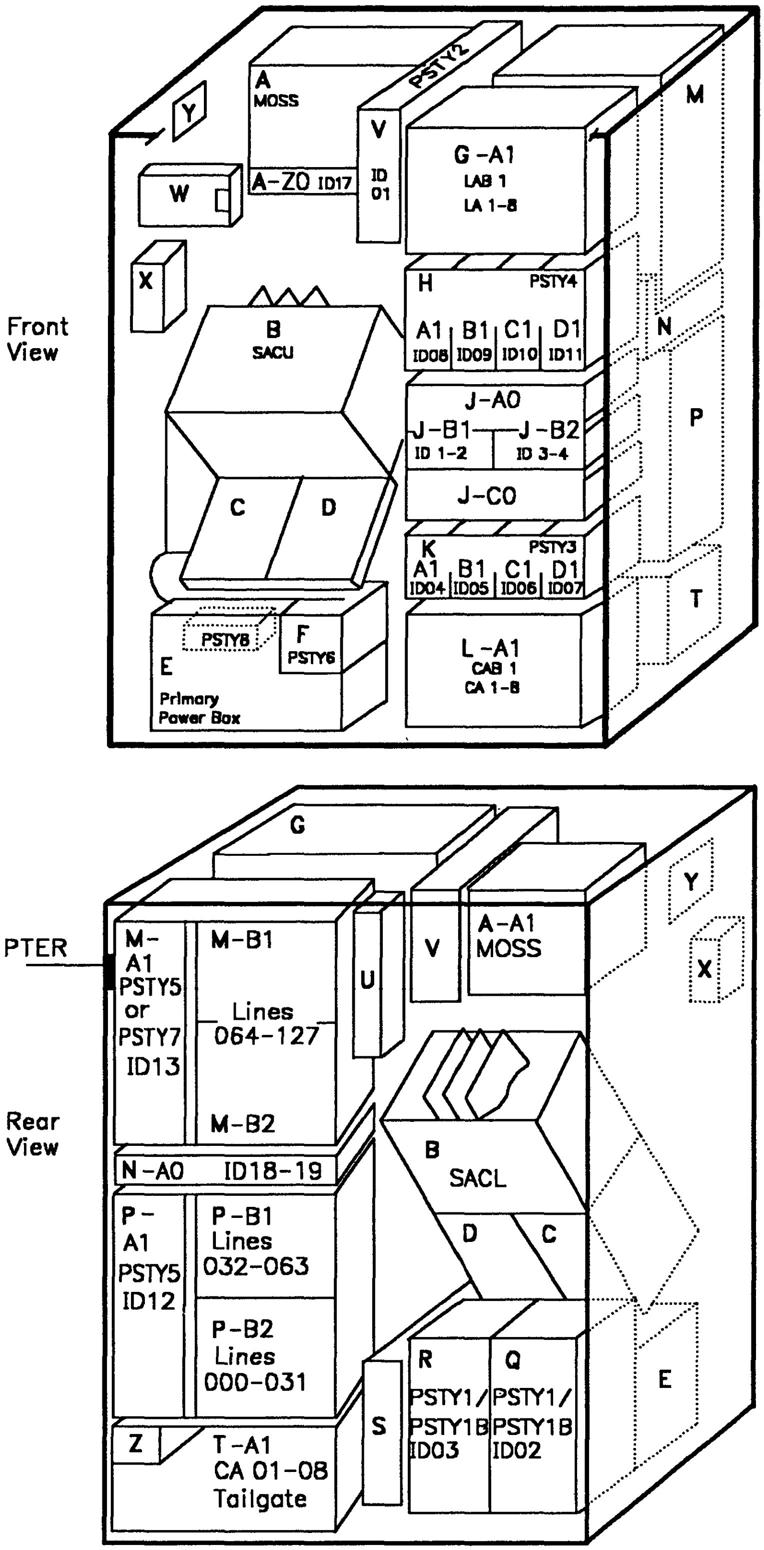


Figure 5-160. Frame 01 Front and Rear View

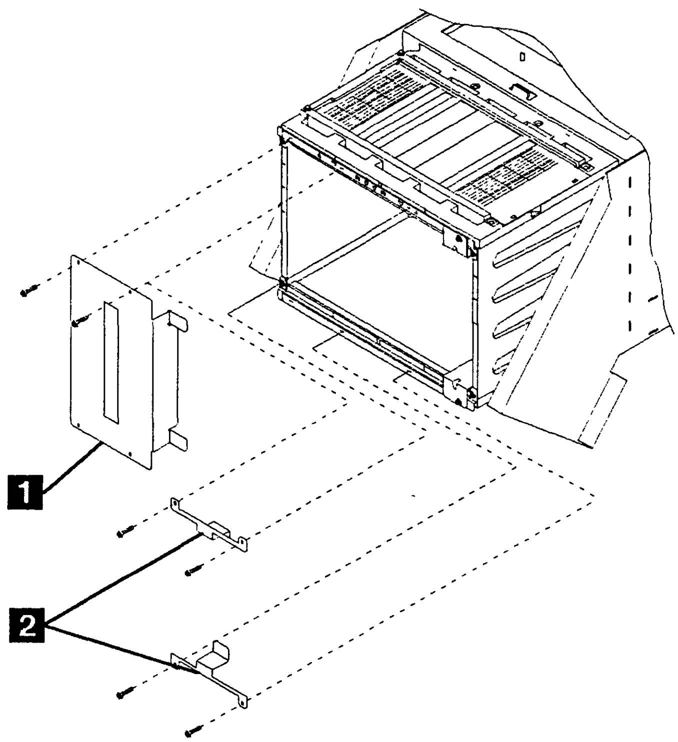


Figure 5-161. SAC Gate Assembly - Brackets

5. Refer to Figure 5-160 on page 5-161 to locate the SAC boards (SACU & SACL).
6. Refer to Figure 5-161. Working from the rear of frame 01, do the following:
   a. Remove the bracket(s) which maintain(s) the central card(s). One bracket **1** for the 3745 simplex model, two brackets **2** for the 3745 duplex model. Four screws have to be removed to do that.

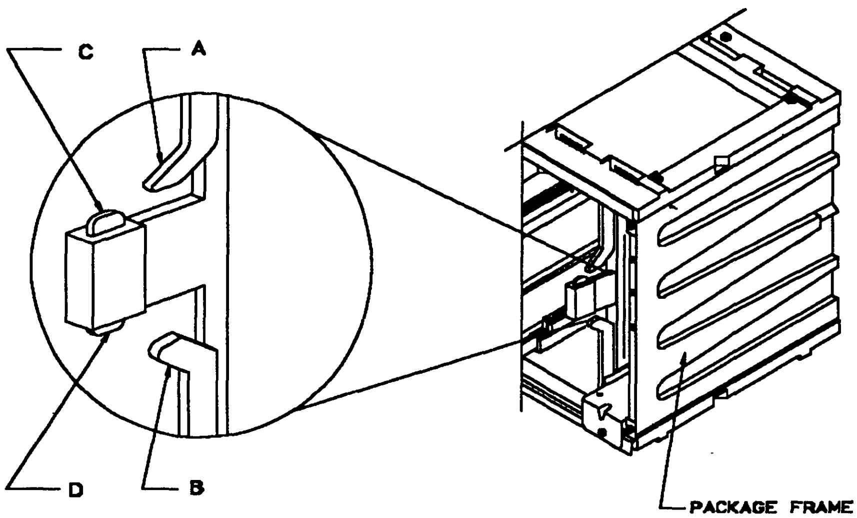


Figure 5-162. Card Clamp Mechanism

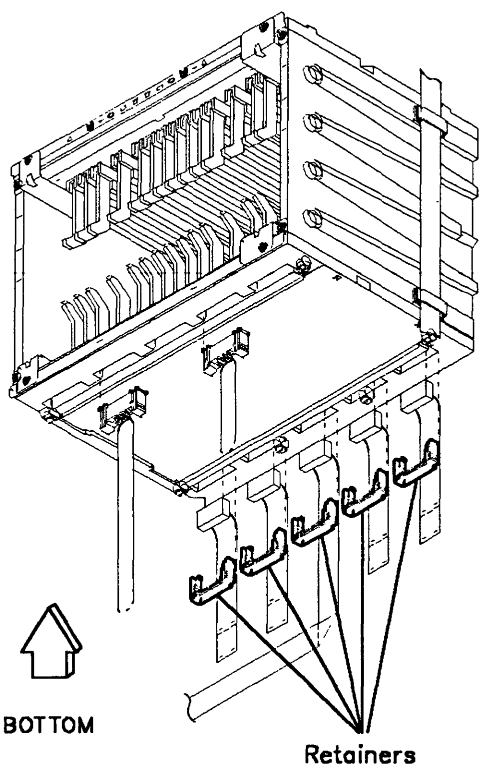


Figure 5-163. Lower view of the SAC Gate Assembly

b. **WARNING: Use the ESD kit and procedures.**

c. Check that the cards are labelled according to their positions, if not, label them. Refer to Figure 5-162 and remove the cards as follows:

   1) Using both hands, release levers A and B simultaneously by moving them upwards and outwards.

   2) Press catches C and D in gently and pull the card assembly out of the SAC gate assembly.

d. Refer to Figure 5-163. Check if the cables are labelled according to their positions, if not, label them. Remove the retainers and the cables from the Y and Z rows.

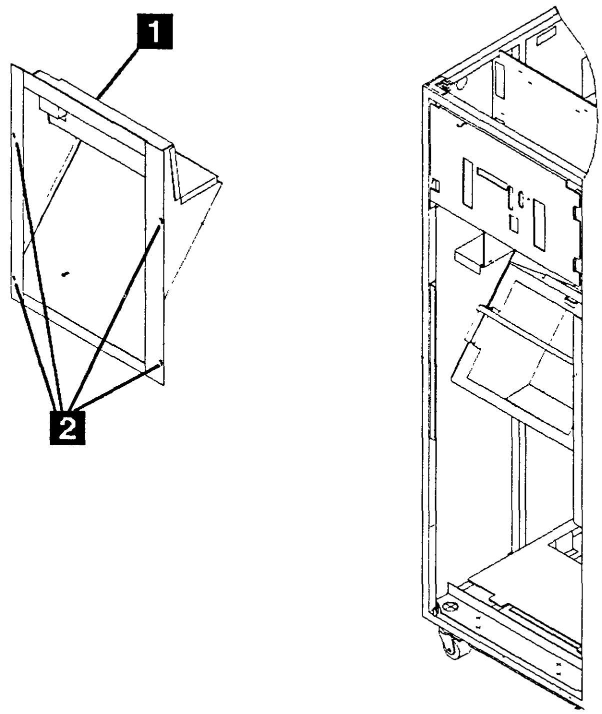


Figure 5-164. Air Duct

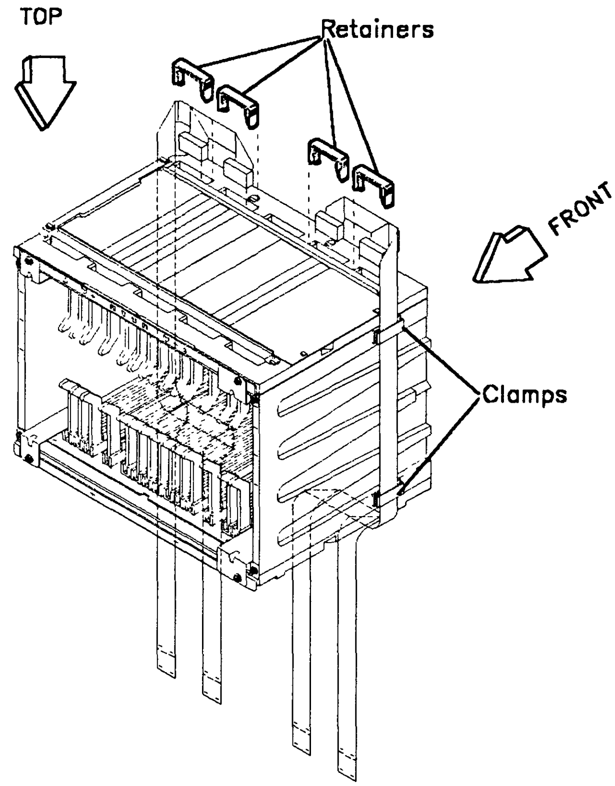


Figure 5-165. Upper View of the SAC Gate Assembly

7. Refer to Figure 5-164. Working from the front side, do the following:
   a. Loosen the four screws **2** which maintain the air duct **1** on the frame.
   b. Lift the air duct up and remove it.
8. Refer to Figure 5-165. Working from the front of frame 01, do the following:
   a. Check that the cables are labelled according to their positions, if not, label them.
   b. Remove the ribbon cables from the central area of the SACU board.
   c. Open the clamps, then remove the retainers and the cables from row Y of the SACU board.
   d. Make sure all the removed cables are well clear of the SAC gate assembly.

9. Refer to Figure 5-166 and to Figure 5-167 and remove the air moving device(s) as follows:

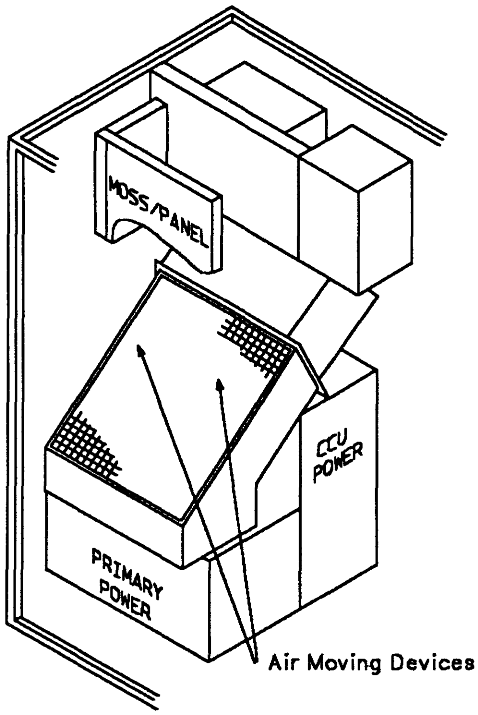


Figure 5-166. SAC Air Moving Devices Unit Location

a. Unplug the air moving device power cord(s).
b. Remove the plate **1** and the braket **3** by removing the five screws **2**.
c. Remove the the upper filter.
d. Disconnect the ground wire(s) **7**.
e. Remove the two air moving device units **5** (or the left air moving device and the right plate if you work on a 3745 simplex model). To do that, eight nuts **4** have to be removed.
f. Remove the two pads **6**.
g. You can now access the eight screws **8** wich maintain the SAC gate assembly **9**.
h. **WARNING: The SAC gate assembly weighs approximately 10 kg.**
i. A second person must support at the rear side the SAC gate assembly while you remove the eight screws.
j. Working from the rear side, very carefully remove the SAC gate assembly by lifting it upwards with both hands.

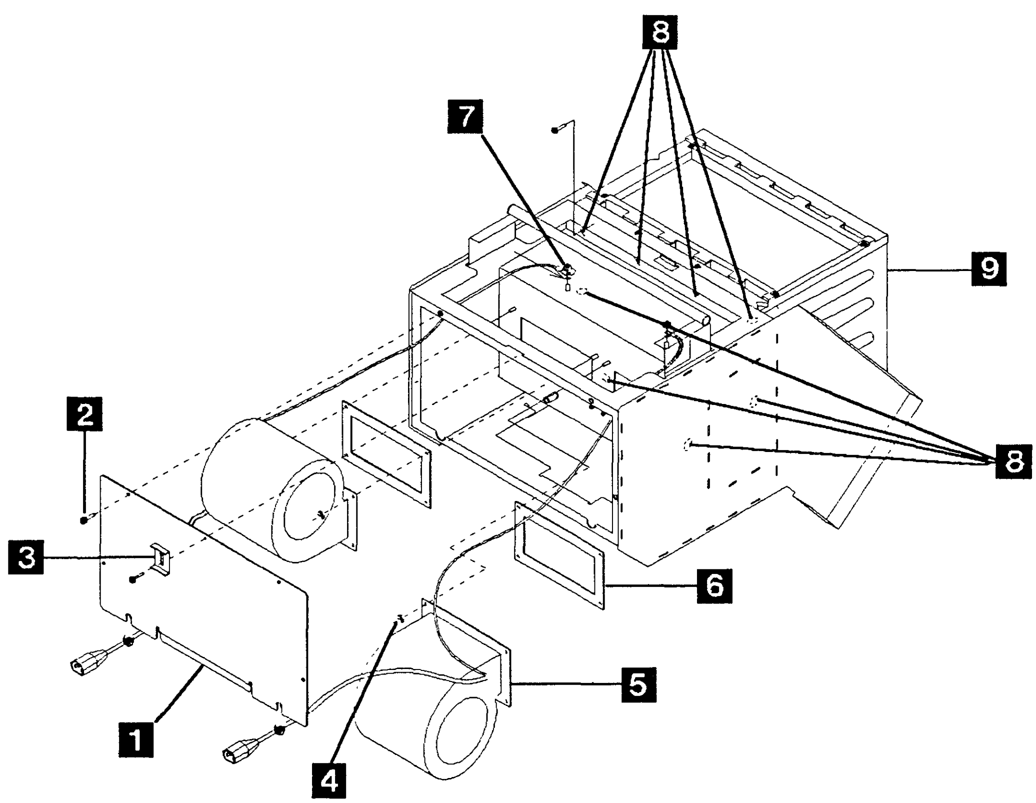


Figure 5-167. Air Moving Device Unit Removal

Installation Procedure

1. Install the labels shipped with the new SAC gate assembly using the enclosed instructions.
2. Refer to Figure 5-167 on page 5-165 then do the following :
   a. From the rear side, put the new SAC gate assembly **9** in place.
   b. While you support the SAC gate assembly, a second person has to install the eight screws **8** at the front side.
   c. At the front side, install the two pads **6**.
   d. Re-install the two air moving devices unit (or the left air moving device unit and the right plate if you work on a 3745 simplex model). Tighten the eigth nuts **4** which maintain the air moving device unit(s).
   e. Reconnect the ground wire(s) **7**.
   f. Re-install the upper filter.
   g. Re-install the plate **1** and the bracket **3** using the five screws **2**.
   h. Replug the air moving device power cord(s).
3. Refer to Figure 5-165 on page 5-164, then, at the front side, do the following :
   a. Reconnect the cables to the Y row of the SACU board.
   b. Re-install the retainers and close the clamps.
   c. Reconnect the ribbon cables to the central area of the SACU board.
4. Refer to Figure 5-163 on page 5-163, then at the rear side, do the following :
   a. Reconnect the cables to the Y and Z row of the SACL board.
   b. Re-install the retainers.
5. Refer to Figure 5-164 on page 5-164, then at the front side, re-install the air duct as follow :
   a. Slide down the air duct **1** on the four loosened screws **2**.
   b. Tighten the four srews.
6. Refer to Figure 5-161 on page 5-162, then from the rear side, do the following :
   a. **WARNING: Use the ESD kit and procedures.**
   b. Re-install the cards.

      Note: In order to improve contact, maneuver the card seating levers 3 times for every card.
   c. Re-install the brackets(s) **1** or **2** which maintain(s) the central cards using the four screws.
7. Switch CB1 ON.
8. Close the frame doors.
9. Turn the machine ON using the control panel as follows:
   a. Press the 'Power Control' key until (*3*) appears in the Power Control window (Power Control in Local).
   b. Press the 'Validate' key.
   c. Press the 'Function' key until (*1*) appears in the function window (function in MOSS IML).
   d. Press the 'Validate' key.
   e. Press the 'Service' key until (*1*) appears in the service window (service in MAINTENANCE 1).
   f. Press the 'Validate' key.
   g. Press the 'power ON Reset' key.

   Note: The former actions will turn the machine ON and also run MOSS diagnostics and complete a MOSS IML. A successful completion will result in a code **F0E**, **F0F** or **000**. If any other code is displayed, an error was detected. See "Panel Codes" on page 2-14.
10. Run the CCU and the IOC bus diagnostics. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1.
11. Go to "Repair Verification Procedure" on page 5-170.

TCM Board Exchange Procedure

The following procedures concern the removal and installation of the Thermal Conduction Modules (TCM) board.

This procedure is valid for both CCUs.

WARNING: Keep aware that the TCM is susceptible to mechanical shock damage. Carefully observe handling instructions and keep the TCM in its shipping container whenever it is not in the machine.

Removal and Replacement Procedure

WARNING: Advise the customer that the 3745 is to be turned off.

In order to access the TCM board it is necessary to remove the TCM.

WARNING: Always remove the TCM before exchanging a TCM board. If not, you could damage the TCM.
Refer to "TCM Removal" on page 5-96.

TCM Board Removal

1. Referring to Figure 5-168 on page 5-168:
   - Using the torque tool, disconnect the 3 supergroupers **A** positions B1, A2, A4 located on the TCM board (TCM side).
   - Go to the rear of the machine, open the cover.
   - Unscrew the FDS retaining screws.
   - Remove the FDS bracket.
   - Disconnect the FDS **B** positions C1, A3, C4.
   - Disconnect the sense cable **C**.
2. Remove the PS type 1 (except TB-1 disconnect) refer to "PS Type 1 Exchange Procedure for Models 210 and 410" on page 5-103.
3. Referring to Figure 5-169 on page 5-169, use the torque tool and, remove the 10 mounting screws.

   Note: To access the 2 lower screws, you will have to slide the SAC cage assembly about 15 centimeters.
   Some but not all the cables must be disconnected to allow the SAC cage to slide back.
4. Carefully remove the TCM board from the machine.
5. Remove the metallic RFI cover, and save it for later use.

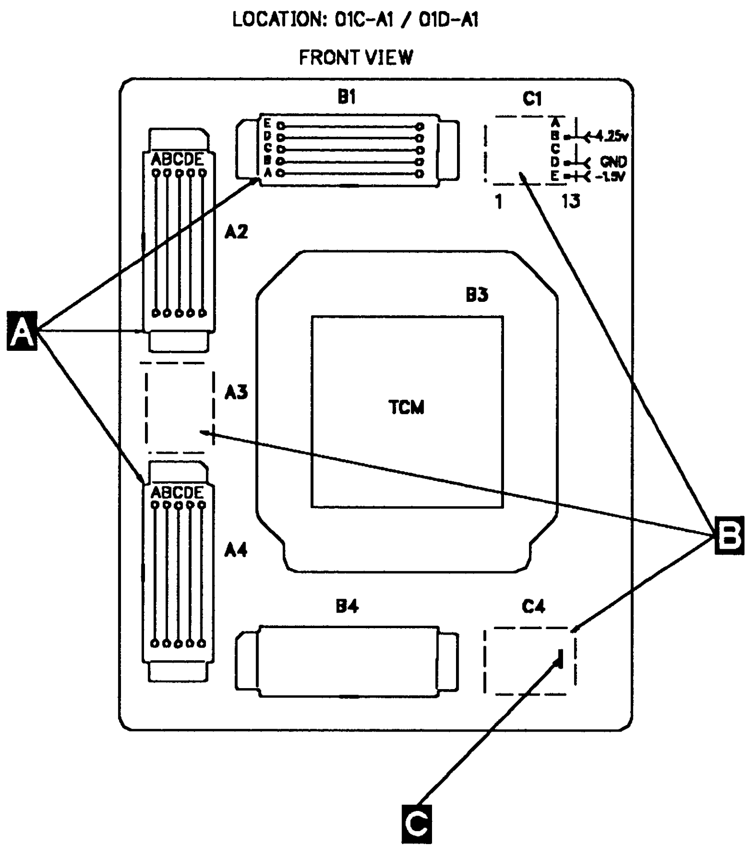


Figure 5-168. TCM Board

TCM Board Installation

WARNING: Before installing the TCM board, inspect it for dirt or damage. *DO NOT INSTALL* the TCM board if damaged, or in doubtful shape.

Proceed as follows:

1. Before installing the new board, install the RFI metallic cover over the plastic cover, using the plastic cover screws.
2. Carefully install the TCM board into the machine.
3. Use the torque tool and fasten the 10 mounting screws.
4. Re-install the PS type 1 refer to "PS Type 1 Exchange Procedure for Models 210 and 410" on page 5-103.
5. Re-install the TCM using "TCM Installation" on page 5-100.
6. Refer to Chapter 4, "How to Run the 3745 Diagnostics" on page 4-1, and run the CCU diagnostics.
7. Go to "Repair Verification Procedure" on page 5-170.

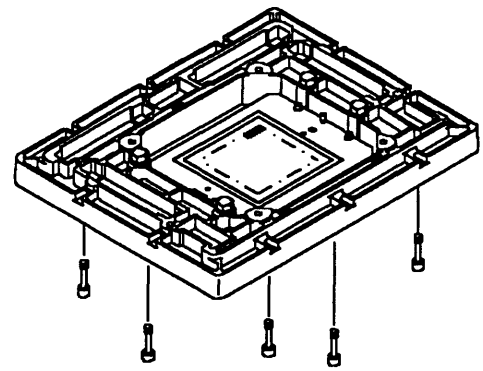


Figure 5-169. Board Screws

Repair Verification Procedure

Verification Procedure 0001

001

Have you been told to exchange all FRUs for an intermittent problem ? (From step 17. "Action to Take After a Diagnostic Run" on page 4-43).
Yes No

002

Go to Step 008.

003

Did the diagnostics run error free or power successfully on ?
Yes No

004

You have a problem with the new FRU. Try another one or put the original back in. Go to Chapter 5, "3745 FRU Exchange" on page 5-1.

005

Have all the FRUs called been exchanged ?
Yes No

006

Go to Chapter 5, "3745 FRU Exchange" on page 5-1 for next FRU called.

007

Go to "CE Leaving Procedure" on page 5-172.

008

Was the FRU other than a power supply ?
Yes No

009

Has the power supply successfully powered up ?
Yes No

010

Go to Step 021 on page 5-171.

011

(Step **011** continues)

011 (continued)

Go to "CE Leaving Procedure" on page 5-172.

012

Did the last run of diagnostics or IML detect an error ?
Yes No

013

Go to "CE Leaving Procedure" on page 5-172.

014

Is the error the same as before ?
Yes No

015

Go to Step 019.

016

— As the problem is not solved by changing this FRU you have to put the original back in.

Have all the FRUs called been changed ?
Yes No

017

Go to "FRU Machine Requirements" on page 2-34 for next FRU called.

018

Go to Step 021 on page 5-171.

019

— Check what you have done:

- Cards, seating
- Cables
- Crossovers, location and orientation
- Switches in correct position.

— Run diagnostics again, IML or any other action you were asked after FRU exchange.

(Step **019** continues)

019 (continued)

Was a failure detected ?

Yes No

020

Go to "CE Leaving Procedure" on page 5-172.

021

During your path through the MIP, have you recorded an "Other Action" or "MAP" to use ?

Yes No

022

You may have a defective new FRU, or multiple problems. Try to determine if restarting the full procedure, or if an other symptom may help you.
Suspect also cables, boards and voltages. It could also be necessary to run diagnostics with the 'ALL' option in offline mode. In any case, contact your support structure for further assistance.

023

Go there now.

CE Leaving Procedure

The maintenance package has determined that the 3745 is ready to be returned to normal operation. You should use the following list to ensure that the machine is in suitable condition for customer operation and that call information is recorded.

1. Replace any cables removed.
2. Do all actions that apply in the following list:

If You Have	What You Should Do
Exchanged all the FRUs called for an intermittent problem or a problem not detected by the diagnostics (tentative repair which could be unsuccessful).	Use the manual BER correlation to point out some additional potentially failing FRUs. Proceed as follows: 1. Find in the Error Log Display the alarm with the Reference Code you used to exchange the FRUs. 2. Select the BER range which occurs in the same time frame as the alarm. 3. In the menu '**3**' type '**BRC**'. 4. Enter the most recent and the oldest BER in the range you have selected then press 'SEND'. 5. Note the extra FRUs, if any, provided by the BER correlation and advise the HSC/HCS or update the PMH in case of problem reoccurrence.
Used the MIP for an installation	Go back to the installation procedure in the Installation Manual.
Exchanged the PLC card	• Set the time-of-day clock and recreate the power configuration table, refer to the Service Functions Chapter 12. • Tell the customer that the "scheduled power ON" services will have to be recreated.
Exchanged the HDD	Tell the customer that he will have to : 1. Refresh the NCP on this disk if he uses HDD to load the control program. 2. Update the passwords.
Exchanged a PUC	Return IMMEDIATELY the old PUC to your Branch Office Stores. (Shipment can then occur to the designated plant to permit Failure Analysis)
Run the wrap diagnostic on the CA or power bus	Ensure that the wrap plug is removed and replaced by the normal cable.
Run the offline diagnostics	Ensure that you have terminated diagnostics by pressing the 'F1' key., Otherwise, MOSS will remain in 'service' mode.
Been working on a model 410 or 610 machine (2 CCUs)	Ensure that no CCU is in the 'down' state; if one is in the down state, use the '**REP**' facility in menu **2** to change the failing CCU from the 'down' to the 'ready' state.

Been working on the channels area in concurrent maintenance mode with ACF/NCP Version 5 Release 2 or higher	Restore the adapters back to NCP, using the channel service screen; refer to "CA Restore Procedure" on page 5-175.
Been working on the TSS or HPTSS adapter area in concurrent maintenance mode	• Remove all wrap plugs installed during this service call. • Replace all modem and line cables removed during this service call. • If you altered CDFs during this service call, check CDFs and update if necessary, refer to the "3745 Service Functions, Chapter 9". • IML the scanners disconnected from the NCP during this call; this can be done by selecting '**IMS**' from menu **1**. When IML is complete, the adapters will automatically be connected to the NCP. • Ask the customer to reactivate the lines stopped during the maintenance.
Been working with TRSS in concurrent maintenance mode	• Connect the TRAs you disconnected during this service call back to the NCP, refer to "TRA Reconnect Procedure" on page 5-175. • Ask the customer to reactivate the rings stopped during the maintenance.

3. IML the MOSS as follows:
   - Set service to (***0***) (normal mode).
   - Press the Validate key.
   - Set function to (***1***) (MOSS IML).
   - Press the Validate key.
4. Set the console in use according to customer requirements.
5. Restore the power mode as it was before your intervention.
6. Do all actions that apply in the following list:

If You Have	**What You Should Do**
Disabled a complete CSS	Ask the customer to IPL that CSS and load the NCP. Verify that the IPL completes without errors. If the system is not available to load the NCP into the box, return the console to maintenance mode and IPL step-by-step. At the beginning of phase 4, verify that you do not have the message 'SCANNER(s) not IMLED xxxx' displayed. Continue to end of phase 4.
Had the whole configuration	Ask the customer to IPL and load the NCP into both CCUs. Verify that both IPLs complete without errors. If the system is not available to load the NCP into both CCUs, return the console to maintenance mode and IPL each CCU (which does not have NCP loaded) step-by-step. At the beginning of phase 4, verify that you do not have the message 'SCANNER(s) not IMLED xxxx' displayed. Continue to end of phase 4.

Repaired a CCU unused by the customer (stand-by mode)	Inform the customer that this CCU is ready for IPL.
If you are in fallback mode	Ask the customer to 'switch back' the complete system, and to reactivate the resources.
Disabled some channels	Ask the customer: • To re-enable them using the CID screen. • To put them online from the host.

7. Ensure that all latches holding the internal covers are in the vertical position. This is to prevent the ESD door rubbers from being damaged, and to ensure a proper contact with the machine frame.

8. Replace all covers.

9. Leave the machine in a **safe** condition.

10. Record the actions taken and the FRUs replaced during the call. If the origin of the intervention was an alarm A5 or AA, report as preventive maintenance (Service Code 08).

11. Update the PMH record for this call.

12. Return parts to the stock room.

CA Restore Procedure

1. On the 3745 console, call menu 3 and type 'CAS' in the selection area for channel adapter services.
2. Press SEND.
3. Type '**4**' for concurrent maintenance commands.
4. Press SEND.
5. Type the channel adapter number corresponding to this FRU in the CA number ===>field.
6. Press SEND.
7. Type '**RES**' in the command ===>field.
8. Press SEND.
9. Re-initiate the same procedure from step 5 for the associated CA if any.

TRA Reconnect Procedure

For this procedure you may wish to refer to Figure 2-23 on page 2-93, Figure 2-25 on page 2-94 and Figure 2-24 on page 2-93.

1. Call menu 3 and enter '**TRS**' for TRSS services.
2. Press SEND.
3. Type '**1**' in the selection area to choose Select.
4. Press SEND.
5. In the input area enter the TRA number.
6. Press SEND.
7. In the selection area enter '**2**' for connect/disc.
8. Press SEND.
9. In the input area enter '**CT**' to connect the selected adapter to the NCP.
10. Press SEND.

How to Put MOSS Online

Note: MOSS can be put online only if the NCP is running.

1. Using the console, call menu 2.
2. If you are working on a 3745-210 or 310 type '**MON**' in the selection area.
3. Press SEND.
4. 'MOSS ONLINE' will be displayed on the screen.
5. If you are working on a 3745-410 or 610, from menu 2 select CCU SEL/RELEASE by entering '**CSR**'.
6. Press SEND.
7. On the CCU selection screen, enter '**1**' to select CCU A.
8. Press SEND.
9. Type '**MON**' in the selection area.
10. Press SEND.
11. 'MOSS ONLINE' will be displayed on the screen.
12. On the CCU selection screen, enter '**2**' to select CCU B.
13. Press SEND.
14. Type '**MON**' in the selection area.
15. Press SEND.
16. 'MOSS ONLINE' will be displayed on the screen.

Appendix A. Control Panel Code Definitions

Table A-1 (Page 1 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
000	IPL has completed; The MOSS IML was performed from the disk; The control program is loaded and MOSS is ONLINE.
001	Moss ROS code unable to get control or unable to execute scheduled processing.
002	Problem detected with the MMIO interface.
003	Moss Re-IML has been initiated.
004	Power bus test successfully completed.
005	Problem detected during the power bus test.
006	AC Input Fault detected
007	Moss battery down
008	Power control not initialised
009	Moss power supply ID 1 error detected - "NO REPLY"
00A	Moss power supply ID 1 error detected - "PROBLEM WITH INTERFACE"
00B	Moss power supply ID 1 error detected - "OVERCURRENT FAULT"
00C	Moss power supply ID 1 error detected - "POWER SUPPLY FAULT" (overvoltage or undervoltage).
00D	NOT USED
00E	Problem detected on power supply ID 2
00F	Problem detected on power supply ID 3
010	Problem detected on power supply ID 4
011	Problem detected on power supply ID 5
012	Problem detected on power supply ID 6
013	Problem detected on power supply ID 7
014	Problem detected on power supply ID 8
015	Problem detected on power supply ID 9
016	Problem detected on power supply ID 10
017	Problem detected on power supply ID 11
018	Problem detected on power supply ID 12
019	Problem detected on power supply ID 13
01A	Problem detected on power supply ID 14
01B	Problem detected on power supply ID 15
01C	Problem detected on power supply ID 16
01D	Problem detected on power supply ID 17
01E	Problem detected on power supply ID 18
01F	Problem detected on power supply ID 19
020	Problem detected on power supply ID 20
021	Problem detected on power supply ID 21
022	Problem detected on power supply ID 22
023	Problem detected on power supply ID 23
024	Problem detected on power supply ID 24
025	Problem detected on power supply ID 25
026	Problem detected on power supply ID 26
027	Problem detected on power supply ID 27
028	Problem detected on power supply ID 28
029	Problem detected on power supply ID 29
02A	Problem detected on power supply ID 30
02B	Problem detected on power supply ID 31
02C	Problem detected on power supply ID 32
02D	Problem detected on power supply ID 33
02E	Problem detected on power supply ID 34
02F	Problem detected on power supply ID 35

An * following a panel code denotes that the code should 'Blink'.

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Table A-1 (Page 2 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
030	Problem detected with MOSS blower
031	Problem detected with base frame blower
032	Problem detected with Expansion Unit A11 blowers - front side
033	Problem detected with Expansion Unit A11 blowers - rear side
034	Problem detected with Expansion Unit A12 blowers
035	Cooling problem for the LICs in the Base Frame
036	Cooling problem for the LICs in the Expansion Unit L13 Front side
037	Cooling problem for the LICs in the Expansion Unit L13 Rear side
038	Cooling problem for the LICs in the Expansion Unit L14 Front side
039	Cooling problem for the LICs in the Expansion Unit L14 Rear side
03A	Cooling problem for the LICs in the Expansion Unit L15 Front side
03B	Cooling problem for the LICs in the Expansion Unit L15 Rear side
03C to 044	NOT USED
045	CCU A power OFF due to overheating.
046	CCU B power OFF due to overheating.
047 to 04F	NOT USED
050	Initial MOSS processor reset state is incorrect.
051	NOT USED
052	Initial MOSS processor state OK - diagnostics progression code
053	Unexpected level 0 interrupt present in IOIRV
054	Unexpected level 1 interrupt present in IOIRV
055	Unexpected level 2 interrupt present in IOIRV
056	Unexpected level 3 interrupt present in IOIRV
057	Unexpected level 4 interrupt present in IOIRV
058	Unexpected level 5 interrupt present in IOIRV
059	Unexpected level 6 or 7 interrupt present in IOIRV
05A	Moss processor condition codes is incorrect
05B	NOT USED
05C	Moss processor cache is incorrect
05D	Moss processor instruction failure during 1st part of test
05E	NOT USED
05F	MOSS ROS check sum is incorrect
060	MOSS ROS bad parity location not detected
061	NOT USED
062	MOSS EIRV did not report the forced errors
063 to 065	NOT USED
066	PIO bus test did not run completely
067	PIO bus test; some error(s) occurred - first IO problem found is read TOD BSTAT not as expected
068	PIO bus test; some error(s) occurred - first IO problem found is set TOD BSTAT bits 5/6
069	PIO bus test; some error(s) occurred - first IO problem found is reset TOD BSTAT bits 5/6

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 3 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
06A	PIO bus test; some error(s) occurred - first IO problem found is set TOD BSTAT bit 6
06B	PIO bus test; some error(s) occurred - first IO problem found is read DFA BSTAT not as expected
06C	PIO bus test; some error(s) occurred - first IO problem found is set DFA BSTAT bits 5/6/7
06D	PIO bus test; some error(s) occurred - first IO problem found is reset DFA BSTAT bits 5/6/7
06E	PIO bus test; some error(s) occurred - first IO problem found is read MCCU A STAT0 not as expected
06F	PIO bus test; some error(s) occurred - first IO problem found is set MCCU A STAT0 bits 5/6
070	PIO bus test; some error(s) occurred - first IO problem found is reset MCCU A STAT0 bits 5/6
071	PIO bus test; some error(s) occurred - first IO problem found is read MCCU B STAT0 not as expected
072	PIO bus test; some error(s) occurred - first IO problem found is set MCCU B STAT0 bits 5/6
073	PIO bus test; some error(s) occurred - first IO problem found is reset MCCU A STAT0 bits 5/6
074	PIO bus test; some error(s) occurred - first IO problem found is read MCAD INTP1 not as expected
075	PIO bus test; some error(s) occurred - first IO problem found is set MCAD INTP1 bits 5/6
076	PIO bus test; some error(s) occurred - first IO problem found is reset MCAD INTP1 bits 5/6
077	PIO bus test; some error(s) occurred - first IO problem found is read SWAD BSTAT not as expected
078	PIO bus test; some error(s) occurred - first IO problem found is set SWAD BSTAT bits 5/6
079	PIO bus test; some error(s) occurred - first IO problem found is reset SWAD BSTAT bits 5/6
07A	PIO bus test; some error(s) occurred - first IO problem found is command read PCA (local port) BSTAT not as expected
07B	PIO bus test; some error(s) occurred - first IO problem found is command set PCA (local port) BSTAT bit 6
07C	PIO bus test; some error(s) occurred - first IO problem found is command reset PCA (local port) BSTAT bit 6
07D	PIO bus test; some error(s) occurred - first IO problem found is command read PCA (remote port) BSTAT not as expected
07E	PIO bus test; some error(s) occurred - first IO problem found is command set PCA (remote port) BSTAT bit 6
07F	PIO bus test; some error(s) occurred - first IO problem found is command reset PCA (remote port) BSTAT bit 6
080	PIO bus test; some error(s) occurred - first IO problem found is command read PCA (RSF port) BSTAT not as expected
081	PIO bus test; some error(s) occurred - first IO problem found is command set PCA (RSF port) BSTAT bit 6
082	PIO bus test; some error(s) occurred - first IO problem found is command reset PCA (RSF port) BSTAT bit 6
083 to 089	NOT USED
08A	Progression code for PIO tests Part 1 successful without severe errors or problems in PIO test part 2

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 4 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
08B	All PIO bus tests failed
08C	Only IOs to TOD adaptor were successful during PIO tests
08D	All IOs to the DFA failed during PIO tests
08E	All IOs to the MAC failed during PIO tests
08F	All IOs to the MCCU-A of the MAC failed during PIO tests
090	All IOs to the MCCU-B of the MAC failed during PIO tests
091	All IOs to the MCAD of the MAC failed during PIO tests
092	All IOs to the SWAD of the MAC failed during PIO tests
093	All IOs to the MCA failed during PIO tests
094	All IOs to the local PCA of the MCA failed during PIO tests
095	All IOs to the remote PCA of the MCA failed during PIO tests
096	All IOs to the RSF PCA of the MCA failed during PIO tests
097	NOT USED
098*	Unexpected data during specific pattern test on PIO bus
099	Progression code for successful completion of PIO pattern test
09A to 09C	NOT USED
09D	Unexpected error from PLC when request definition was originated
09E	NOT USED
09F	Control lost in mainline controller after checking the request
0A0	Moss storage tests in progress
0A1*	Unexpected error in MOSS EIRV register
0A2*	Unexpected error in MOSS EIRV register during memory access
0A3*	Control panel 'valid' option cannot be disabled
0A4*	Reconfigure bit 5 in TOD mode register is permanently ON
0A5*	No address increment during write/read storage operation
0A6*	Data mismatch during write/read storage operation
0A7*	No expected check in EIRV bit 3 during ROS invalid address check
0A8*	No expected check in EIRV bit 3 after maximum storage exceeded
0A9*	All memory locations contained errors
0AA*	Error interrupt in EIRV during memory access to all locations
0AB to 0AC	NOT USED
0AD*	Appropriate single bit errors were never corrected during ECC
0AE*	Single bit errors were badly corrected during ECC
0AF	NOT USED
0B0*	ECC mechanism failed during double bit error correction
0B1*	Different loaded and stored contents of a memory location
0B2*	Reconfigure bit 5 in TOD mode register cannot be set
0B3	NOT USED
0B4*	Different loaded and stored contents of a memory location
0B5*	Double uncorrectable error during spare bit swapping
0B6*	Control panel 'valid' option cannot be enabled
0B7*	Unexpected error in EIRV at completion of memory tests
0B8 to 0BE	NOT USED
0BF	Moss memory tests complete - progress to next test
0C0	Problem found during initialization of ROS mainline controller
0C1	Control lost after initialization of ROS mainline controller
0C2	Control lost during PSV swap test
0C3*	Storage check occurred when accessing register space
0C4*	Scheduled progression not performed during PSV test

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 5 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
0C5*	Cache in/cache out operation was not successful
0C6	NOT USED
0C7	PSV swap tests complete - progress to next test
0C8 to 0CF	NOT USED
0D0*	DFA test entry and progression
0D1*	DFA; Unexpected error interrupt in EIRV during reset
0D2*	DFA; Unexpected interrupt in IOIRV during reset
0D3*	DFA; BSTAT bits 0,1 or 6 not in busy or in enable after reset
0D4	NOT USED
0D5*	DFA; BSTAT bits 0,1 not in idle state after reset
0D6*	DFA; Different loaded and stored contents during PIO commands
0D7*	DFA; Register not in reset state after reset command
0D8*	DFA; Invalid command not recognised
0D9*	DFA; Unexpected error interrupt in EIRV during PIO command test
0DA*	DFA; Unexpected interrupt in IOIRV during PIO command test
0DB*	DFA; BSTAT bits 0,1 are not in idle state during initialization
0DC*	DFA; Unexpected error interrupt in EIRV during initialization
0DD*	DFA; Unexpected interrupt in IOIRV during initialization
0DE*	DFA; Unexpected error interrupt in EIRV during transfer initialisation
0DF*	DFA; No interrupt request in IOIRV during transfer initialization
0E0*	DFA; Error occurred during CHIO transfer
0E1*	DFA; BSTAT bits 0,1 and 6 not in idle or enable during diagnostic command test
0E2*	DFA; Data transmission error - HSTAT and BSTAT bits are incorrect during diagnostic command test
0E3*	DFA; Different content between 1st and 2nd part of sector buffer during diagnostic command test
0E4*	DFA; Error found in drive status of SSB byte 0 during diagnostic command test
0E5*	DFA; Error found in adaptor status of SSB byte 1 and 2 during diagnostic command test
0E6*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during drive initialization
0E7*	DFA;HDD; No interrupt request in IOIRV during drive initialization
0E8*	DFA;HDD; Unexpected error interrupt in EIRV during drive initialization
0E9*	DFA;HDD; Data transmission error - HSTAT bits are incorrect during drive initialization
0EA*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during seek command before recalibrate test
0EB*	DFA;HDD; No interrupt request in IOIRV during seek command before recalibrate test
0EC	NOT USED
0ED*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable before recalibrate command
0EE*	DFA;HDD; No interrupt received in IOIRV during recalibrate command
0EF*	DFA;HDD; Unexpected error interrupt in EIRV during recalibrate command
0F0	NOT USED
0F1*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during recalibrate command
0F2*	DFA;HDD; No cylinder zero in SSB byte 0, bit 7 during recalibrate command
0F3*	DFA;HDD; Drive status error in SSB byte 0 during recalibrate command
0F4*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 during recalibrate command
0F5*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during read ID command
0F6*	DFA;HDD; No interrupt request in IOIRV during read ID command
0F7*	DFA;HDD; Unexpected error interrupt in EIRV during read ID command
0F8*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during read ID command
0F9*	DFA;HDD; Error on head addressing mechanism during read ID command

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 6 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
0FA*	DFA;HDD; Drive status error in SSB byte 0 during read ID command
0FB*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 during read ID command
0FC*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during recalibrate before seek command
0FD*	DFA;HDD; No interrupt request in IOIRV during recalibrate before seek command
0FE	NOT USED
0FF*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during seek command
100	NOT USED
101	Hard disk initial state not ready. Recovery in process.
102	Hard disk not ready after recovery.
103 to 110	NOT USED
111*	DFA;HDD; No interrupt request in IOIRV during seek command
112*	DFA;HDD; Unexpected error interrupt in EIRV during seek command
113*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during seek command
114*	DFA;HDD; Different head numbers during seek command
115*	DFA;HDD; Drive status error in SSB byte 0 during seek command
116*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 during seek command
117*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during read/write a sector command
118*	DFA;HDD; No interrupt request in IOIRV during read/write a sector command
119*	DFA;HDD; Unexpected error interrupt in EIRV during read/write a sector command
11A*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during read / write a sector command
11B*	DFA;HDD; Different written and read sectors after read/write a sector command
11C*	DFA;HDD; Drive status error in SSB byte 0 after read/write a sector command
11D*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 after read/ write a sector command
11E*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during read /write a full track command
11F*	DFA;HDD; No interrupt request in IOIRV during read/write a full track command
120*	DFA;HDD; Unexpected error interrupt in EIRV during read/write a full track command
121*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during read/write a full track command
122*	DFA;HDD; Different written and read tracks after read/write a full track command
123*	DFA;HDD; Drive status error in SSB byte 0 after read/write a full track command
124*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 after read/ write a full track command
125*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during read/ write no data command
126*	DFA;HDD; No interrupt request in IOIRV during read/write no data command
127*	DFA;HDD; Unexpected error interrupt in EIRV during read/write no data command
128*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during read/write no data command
129*	DFA;HDD; Different written and read sectors after read/write no data command
12A*	DFA;HDD; Drive status error in SSB byte 0 after read/write no data command
12B*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 after read/ write no data command
12C*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during read check/write verify command
12D*	DFA;HDD; No interrupt request in IOIRV during read check/write verify command
12E*	DFA;HDD; Unexpected error interrupt in EIRV during read check/ write verify command
12F*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during read check/write verify command
130*	DFA;HDD; Drive status error in SSB byte 0 after read check/ write verify command

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 7 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
131*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 after read check /write verify command
132*	DFA;HDD; Different written and read sectors after read check/ write verify command
133*	DFA;HDD; BSTAT bits 0,1 or 6 not in idle or enable during ECC correction test
134*	DFA;HDD; No interrupt request in IOIRV during ECC correction test
135*	DFA;HDD; Unexpected error interrupt in EIRV during ECC correction test
136*	DFA;HDD; Data transmission error - HSTAT and BSTAT bits incorrect during ECC correction test
137*	DFA;HDD; Error on a selected sector during ECC correction test
138*	DFA;HDD; Expected error in SSB byte 1, bit 1 did not occur during burst length 16 ECC correction test
139*	DFA;HDD; Expected correction did not occur during ECC correction test
13A*	DFA;HDD; Expected error in SSB byte 1, bit 1 did not occur during burst length 17 ECC correction test
13B*	DFA;HDD; Unexpected correction occurred during ECC correction test
13C*	DFA;HDD; Drive status error in SSB byte 0 after ECC correction test
13D*	DFA;HDD; Adaptor status error in SSB byte 1 or 2 after ECC correction test
13E*	DFA;HDD; Different written and read sector contents during ECC correction test
13F*	DFA;FDD; Diskette change information is not present in SSB byte 0, bit 4
140*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable during drive initialization
141*	DFA;FDD; No interrupt request in IOIRV during drive initialization
142*	DFA;FDD; Unexpected error interrupt in EIRV during drive initialization
143*	DFA;FDD; Data transmission error - HSTAT bits are incorrect during drive initialization
144*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable during seek command before recalibrate test
145*	DFA;FDD; No interrupt request in IOIRV during seek command before recalibrate test
146	NOT USED
147*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable before recalibrate command
148*	DFA;FDD; No interrupt received in IOIRV during recalibrate command
149*	DFA;FDD; Unexpected error interrupt in EIRV during recalibrate command
14A*	DFA;FDD; Data transmission error - HSTAT and BSTAT bits incorrect during recalibrate command
14B*	DFA;FDD; No cylinder zero in SSB byte 0, bit 7 during recalibrate command
14C*	DFA;FDD; Drive status error in SSB byte 0 during recalibrate command
14D*	DFA;FDD; Adaptor status error in SSB byte 1 or 2 during recalibrate command
14E*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable during read ID command
14F*	DFA;FDD; No interrupt request in IOIRV during read ID command
150*	DFA;FDD; Unexpected error interrupt in EIRV during read ID command
151*	DFA;FDD; Data transmission error - HSTAT and BSTAT bits incorrect during read ID command
152*	DFA;FDD; Error on head addressing mechanism during read ID command
153*	DFA;FDD; Drive status error in SSB byte 0 during read ID command
154*	DFA;FDD; Adaptor status error in SSB byte 1 or 2 during read ID command
155*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable during recalibrate before seek command
156*	DFA;FDD; No interrupt request in IOIRV during recalibrate before seek command
157	NOT USED
158*	DFA;FDD; BSTAT bits 0,1 or 6 not in idle or enable during seek command
159*	DFA;FDD; No interrupt request in IOIRV during seek command
15A*	DFA;FDD; Unexpected error interrupt in EIRV during seek command
15B*	DFA;FDD; Data transmission error - HSTAT and BSTAT bits incorrect during seek command

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 8 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
15C*	DFA;FDD; Different head numbers during seek command
15D*	DFA;FDD; Drive status error in SSB byte 0 during seek command
15E*	DFA;FDD; Adaptor status error in SSB byte 1 or 2 during seek command
15F	Completion of DFA diagnostics
160 to 16F	NOT USED
170	Ros code had control for a Re-IML but the Re-IML reset sequence was not performed
171	Re-IML sequence was performed but an error occurred in the MOSS reset test
172 to 177	NOT USED
178	Control was lost during the processing of the 'Moss diags by-pass option' request (origin default parms set)
179 to 17A	NOT USED
17B	Control was lost during the processing of the 'Moss diags by-pass option' request
17C	NOT USED
17D	Storage access problem - dump request cannot be processed
17E	NOT USED
17F	Completion of ROS part of MOSS Diagnostics
180	Entry into RAM part of MOSS Diagnostics
181*	Level 6 program level interrupt not as expected
182	Progression code indicating RAM Diagnostic has full control
183 to 187	NOT USED
188	Control lost during MOSS instruction test Part 2
189*	Error occurred during 2nd part of MOSS instruction execution
18A	Successful completion of MOSS instruction test Part 2
18B	NOT USED
18C	Control lost during TOD tests
18D	TOD tests complete - progress to next test
18E to 18F	NOT USED
190	Start of MCA tests
191*	PCA1; Hardwired conditions do not allow access to PCA1
192*	PCA1; Error during PCA1 asynchronous test
193*	PCA1; Unexpected level 0 interrupt during PCA1 test
194*	PCA1; Error during PCA1 internal wrap asynchronous test
195*	PCA1; Unexpected level 0 interrupt during PCA1 wrap test
196*	PCA2; Hardwired conditions do not allow access to PCA2
197*	PCA2; Error during PCA2 asynchronous test
198*	PCA2; Unexpected level 0 interrupt during PCA2 test
199*	PCA2; Error during PCA2 internal wrap asynchronous test
19A*	PCA2; Unexpected level 0 interrupt during PCA2 wrap test
19B*	PCA3; Hardwired conditions do not allow access to PCA3
19C*	PCA3; Error during PCA3 asynchronous test
19D*	PCA3; Unexpected level 0 interrupt during PCA3 test
19E*	PCA3; Error during PCA3 internal wrap asynchronous test
19F*	PCA3; Unexpected level 0 interrupt during PCA3 wrap test
1A0	Local link test; wrap block does not appear to be installed on local console cable/connector

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 9 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
1A1	Local link test; Local console cable is at fault
1A2	Local link test; Local console PCA1 is at fault
1A3	Remote/Alternate link test; wrap block does not appear to be installed on remote/alternate console cable/connector
1A4	Remote/Alternate link test; Remote/Alternate console cable is at fault
1A5	Remote/Alternate link test; Remote/Alternate console PCA2 is at fault
1A6	RSF link test; wrap block does not appear to be installed on RSF console cable/connector
1A7	RSF link test; RSF console cable is at fault
1A8	RSF link test; RSF console PCA3 is at fault
1A9 to 1AF	NOT USED
1B0	Completion of MCA tests
1B1	Start of Local Console link test
1B2	Completion of Local Console link test
1B3	Start of Remote / Alternate Console link test
1B4	Completion of Remote / Alternate Console link test
1B5	Start of RSF Console link test
1B6	Completion of RSF Console link test
1B7 to 1CF	NOT USED
1D0	MAC; Start of MAC tests
1D1	NOT USED
1D2*	MAC; Solid error detected in one of the MCAD registers (2nd pass)
1D3*	MAC; 100 milli second timer in MCAD is not operational
1D4*	MAC; Permanent interrupt request level 1 in IOIRV during MCCU tests
1D5*	MAC; Permanent interrupt request level 4 in IOIRV during MCAD tests
1D6*	MAC; Interrupt request level 1 of MCAD was not reported to Solo
1D7*	MAC; MCCU A reset line did not activate 'Moss inop bit'
1D8*	MAC; MCCU B reset line did not activate 'Moss inop bit'
1D9*	MAC; Permanent interrupt request level 0 in IOIRV during MCCU tests
1DA*	MAC; Solid error detected in one of the MCCU A registers (1st pass)
1DB*	MAC; Solid error detected in one of the MCCU A registers (2nd pass)
1DC*	MAC; Solid error detected in one of the MCCU B registers (1st pass)
1DD*	MAC; Solid error detected in one of the MCCU B registers (2nd pass)
1DE*	MAC; Permanent interrupt request level 0 in IOIRV during SWAD tests
1DF*	MAC; 'Switch MOSS Inop'- bit 0 in SWAD disconnect register was not reset during test.
1E0*	MAC; Internal clock check occurred - bit 4 in SWAD disconnect register
1E1*	MAC; Solid error detected in one of the SWAD registers (1st pass)
1E2*	MAC; Solid error detected in one of the SWAD registers (2nd pass)
1E3*	MAC; Unable to set MOSS Inop bit in MCCU A
1E4*	MAC; Unable to set MOSS Inop bit in MCCU B
1E5*	MAC; TCM A power off information is not available in MCCU A
1E6*	MAC; TCM B power off information is not available in MCCU B
1E7*	MAC; No interrupt reporting possible in MCCU A
1E8*	MAC; No interrupt reporting possible in MCCU B
1E9 to 1EE	NOT USED
1EF	MAC; Completion of MAC tests
1F0 to 1FD	NOT USED

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 10 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
1FE*	Control lost during return to RAM IML processor
1FF	Completion of RAM MOSS diagnostics
200 to 9FF	NOT USED
A00*	Moss level 0 error detection; MCCU A or MCCU B or SWAD Adaptor is 'down'; Excess spurious errors
A01*	Moss level 0 error detection; PCA1; Adaptor is 'down'
A02*	Moss level 0 error detection; PCA1; PIO Bus Check; Inbound parity
A03*	Moss level 0 error detection; PCA1; PIO Bus Check; Adaptor not detected
A04*	Moss level 0 error detection; PCA1; PIO Timeout; Outbound; Address parity check
A05*	Moss level 0 error detection; PCA1; PIO Timeout; Outbound; Command/data parity check
A06*	Moss level 0 error detection; PCA2; Adaptor is 'down'
A07*	Moss level 0 error detection; PCA2; PIO Bus Check; Inbound parity
A08*	Moss level 0 error detection; PCA2; PIO Bus Check; Adaptor not detected
A09*	Moss level 0 error detection; PCA2; PIO Timeout; Outbound; Address parity check
A0A*	Moss level 0 error detection; PCA2; PIO Timeout; Outbound; Command/data parity check
A0B*	Moss level 0 error detection; PCA3; Adaptor is 'down'
A0C*	Moss level 0 error detection; PCA3; PIO Bus Check; Inbound parity
A0D*	Moss level 0 error detection; PCA3; PIO Bus Check; Adaptor not detected
A0E*	Moss level 0 error detection; PCA3; PIO Timeout; Outbound; Address parity check
A0F*	Moss level 0 error detection; PCA3; PIO Timeout; Outbound; Command/data parity check
A10*	Moss level 0 error detection; MCCU A; Adaptor is 'down'
A11*	Moss level 0 error detection; MCCU A; Adaptor is 'down'; Excess spurious errors
A12*	Moss level 0 error detection; MCCU A; Adaptor check; 1 usec counter parity
A13*	Moss level 0 error detection; MCCU A; Adaptor check; MIOC/CCU timeout parity
A14*	Moss level 0 error detection; MCCU A; CHIO Bus check
A15*	Moss level 0 error detection; MCCU A; CHIO Timeout
A16*	Moss level 0 error detection; MCCU A; CHIO; Storage ECC error; Register space parity during main store.
A17*	Moss level 0 error detection; MCCU A; CHIO; Storage ECC error; Multiple bits in DIV Register
A18*	Moss level 0 error detection; MCCU A; CHIO; Storage ECC error; No bits active in DIV Register
A19*	Moss level 0 error detection; MCCU A; CHIO; Exception; Address exception on main store data access
A1A*	Moss level 0 error detection; MCCU A; CHIO; Exception; Operation exception; CHCV Reg invalid
A1B*	Moss level 0 error detection; MCCU A; CHIO; Exception; Register precision; CHP Reg bits 0-7 are not zero
A1C*	Moss level 0 error detection; MCCU A; CHIO; Exception; Specification exception with invalid address on main store data access
A1D*	Moss level 0 error detection; MCCU A; CHIO; Exception; Multiple bits in DIV Register
A1E*	Moss level 0 error detection; MCCU A; CHIO; Exception; No bits active in DIV Register
A1F*	Moss level 0 error detection; MCCU A; CHIO; Internal check; Cache parity check
A20*	Moss level 0 error detection; MCCU A; CHIO; Internal check; Invalid address on CHP Reg access
A21*	Moss level 0 error detection; MCCU A; CHIO; Internal check; Multiple bits in DIV Register
A22*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; Step counter parity

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 11 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
A23*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; Half word/burst counter parity
A24*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; CCU busy; Timeout
A25*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; MIOC timeout
A26*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; MIOC parity check - in
A27*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; MIOC parity check - out
A28*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; Adaptor failure
A29*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; Multiple bits detected in Stat reg
A2A*	Moss level 0 error detection; MCCU A; CHIO; Adaptor check; No CHIO in progress in Adaptor Control Block
A2B*	Moss level 0 error detection; MCCU A; CHIO; Multiple bits detected in EIRV reg
A2C*	Moss level 0 error detection; MCCU A; CHIO; No CHIO in progress in Adaptor Control Block
A2D*	Moss level 0 error detection; MCCU A; Device; Adaptor check; Step counter parity
A2E*	Moss level 0 error detection; MCCU A; Device; Adaptor check; MIOC timeout
A2F*	Moss level 0 error detection; MCCU A; Device; Adaptor check; MIOC parity check - in
A30*	Moss level 0 error detection; MCCU A; Device; Adaptor check; MIOC parity check - out
A31*	Moss level 0 error detection; MCCU A; Device; Adaptor check; Adaptor failure
A32*	Moss level 0 error detection; MCCU A; Device; Adaptor check; Multiple bits detected in Stat reg
A33*	Moss level 0 error detection; MCCU A; Device; Adaptor check; No Common Adaptor Code running
A34*	Moss level 0 error detection; MCCU A; PIO; Bus check; Inbound parity
A35*	Moss level 0 error detection; MCCU A; PIO; Bus check; Adaptor failure
A36*	Moss level 0 error detection; MCCU A; PIO; Bus check; Adaptor not detected
A37*	Moss level 0 error detection; MCCU A; PIO; Timeout; Invalid command
A38*	Moss level 0 error detection; MCCU A; PIO; Timeout; Outbound address parity check
A39*	Moss level 0 error detection; MCCU A; PIO; Timeout; Adaptor not detected
A3A*	Moss level 0 error detection; MCCU A; PIO; Timeout; Adaptor failure
A3B*	Moss level 0 error detection; MCCU A; PIO; Timeout; Multiple bits detected in Stat reg
A3C*	Moss level 0 error detection; MCCU B; Adaptor is 'down'
A3D*	Moss level 0 error detection; MCCU B; Adaptor is 'down'; Excess spurious errors
A3E*	Moss level 0 error detection; MCCU B; Adaptor check; 1 usec counter parity
A3F*	Moss level 0 error detection; MCCU B; Adaptor check; MIOC/CCU timeout parity
A40*	Moss level 0 error detection; MCCU B; CHIO Bus check
A41*	Moss level 0 error detection; MCCU B; CHIO Timeout
A42*	Moss level 0 error detection; MCCU B; CHIO; Storage ECC error; Register space parity during main store.
A43*	Moss level 0 error detection; MCCU B; CHIO; Storage ECC error; Multiple bits in DIV Register
A44*	Moss level 0 error detection; MCCU B; CHIO; Storage ECC error; No bits active in DIV Register
A45*	Moss level 0 error detection; MCCU B; CHIO; Exception; Address exception on main store data access
A46*	Moss level 0 error detection; MCCU B; CHIO; Exception; Operation exception; CHCV Reg invalid
A47*	Moss level 0 error detection; MCCU B; CHIO; Exception; Register precision; CHP Reg bits 0-7 are not zero
A48*	Moss level 0 error detection; MCCU B; CHIO; Exception; Specification exception with invalid address on main store data access
A49*	Moss level 0 error detection; MCCU B; CHIO; Exception; Multiple bits in DIV Register
A4A*	Moss level 0 error detection; MCCU B; CHIO; Exception; No bits active in DIV Register
A4B*	Moss level 0 error detection; MCCU B; CHIO; Internal check; Cache parity check

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 12 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
A4C*	Moss level 0 error detection; MCCU B; CHIO; Internal check; Invalid address on CHP Reg access
A4D*	Moss level 0 error detection; MCCU B; CHIO; Internal check; Multiple bits in DIV Register
A4E*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; Step counter parity
A4F*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; Half word/burst counter parity
A50*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; CCU busy; Timeout
A51*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; MIOC timeout
A52*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; MIOC parity check - in
A53*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; MIOC parity check - out
A54*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; Adaptor failure
A55*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; Multiple bits detected in Stat reg
A56*	Moss level 0 error detection; MCCU B; CHIO; Adaptor check; No CHIO in progress in Adaptor Control Block
A57*	Moss level 0 error detection; MCCU B; CHIO; Multiple bits detected in EIRV reg
A58*	Moss level 0 error detection; MCCU B; CHIO; No CHIO in progress in Adaptor Control Block
A59*	Moss level 0 error detection; MCCU B; Device; Adaptor check; Step counter parity
A5A*	Moss level 0 error detection; MCCU B; Device; Adaptor check; MIOC timeout
A5B*	Moss level 0 error detection; MCCU B; Device; Adaptor check; MIOC parity check - in
A5C*	Moss level 0 error detection; MCCU B; Device; Adaptor check; MIOC parity check - out
A5D*	Moss level 0 error detection; MCCU B; Device; Adaptor check; Adaptor failure
A5E*	Moss level 0 error detection; MCCU B; Device; Adaptor check; Multiple bits detected in Stat reg
A5F*	Moss level 0 error detection; MCCU B; Device; Adaptor check; No Common Adaptor Code running
A60*	Moss level 0 error detection; MCCU B; PIO; Bus check; Inbound parity
A61*	Moss level 0 error detection; MCCU B; PIO; Bus check; Adaptor failure
A62*	Moss level 0 error detection; MCCU B; PIO; Bus check; Adaptor not detected
A63*	Moss level 0 error detection; MCCU B; PIO; Timeout; Invalid command
A64*	Moss level 0 error detection; MCCU B; PIO; Timeout; Outbound address parity check
A65*	Moss level 0 error detection; MCCU B; PIO; Timeout; Adaptor not detected
A66*	Moss level 0 error detection; MCCU B; PIO; Timeout; Adaptor failure
A67*	Moss level 0 error detection; MCCU B; PIO; Timeout; Multiple bits detected in Stat reg
A68*	Moss level 0 error detection; SWAD; Adaptor is 'down'
A69*	Moss level 0 error detection; SWAD; Adaptor is 'down'; Excess spurious errors
A6A*	Moss level 0 error detection; SWAD; Adaptor check; Internal clock check 1
A6B*	Moss level 0 error detection; SWAD; Adaptor check; Internal clock check 2
A6C*	Moss level 0 error detection; SWAD; Adaptor check; Multiple bits detected in Disconnect reg
A6D*	Moss level 0 error detection; SWAD; Device; Adaptor check; State counter parity
A6E*	Moss level 0 error detection; SWAD; Device; Adaptor check; Shift pulse counter parity
A6F*	Moss level 0 error detection; SWAD; Device; Adaptor check; Ground fault detected on a driver line
A70*	Moss level 0 error detection; SWAD; Device; Adaptor check; Interface check
A71*	Moss level 0 error detection; SWAD; Device; Adaptor check; Interface timeout
A72*	Moss level 0 error detection; SWAD; Device; Adaptor check; Interface parity check
A73*	Moss level 0 error detection; SWAD; Device; Adaptor check; Multiple bits detected in EB Stat reg
A74*	Moss level 0 error detection; SWAD; Device; Adaptor check; Switch interface error
A75*	Moss level 0 error detection; SWAD; Device; Adaptor check; Switch driver fault
A76*	Moss level 0 error detection; SWAD; Device; Adaptor check; Switch serial link parity
A77*	Moss level 0 error detection; SWAD; Device; Adaptor check; Switch invalid command

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 13 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
A78*	Moss level 0 error detection; SWAD; Device; Adaptor check; Multiple bits detected in Device stat reg
A79*	Moss level 0 error detection; SWAD; Device; Adaptor check; Adaptor failure
A7A*	Moss level 0 error detection; SWAD; Device; Adaptor check; No Common Adaptor Code running
A7B*	Moss level 0 error detection; SWAD; PIO; Bus check; Inbound parity
A7C*	Moss level 0 error detection; SWAD; PIO; Bus check; Adaptor failure
A7D*	Moss level 0 error detection; SWAD; PIO; Bus check; Adaptor not detected
A7E*	Moss level 0 error detection; SWAD; PIO; Timeout; Invalid command
A7F*	Moss level 0 error detection; SWAD; PIO; Timeout; Outbound address parity check
A80*	Moss level 0 error detection; SWAD; PIO; Timeout; Overrun
A81*	Moss level 0 error detection; SWAD; PIO; Timeout; Adaptor not detected
A82*	Moss level 0 error detection; SWAD; PIO; Timeout; Adaptor failure
A83*	Moss level 0 error detection; SWAD; PIO; Timeout; Multiple bits detected in Stat reg
A84*	Moss level 0 error detection; MCAD; Adaptor is 'down'
A85*	Moss level 0 error detection; MCAD; PIO; Bus check; Inbound parity
A86*	Moss level 0 error detection; MCAD; PIO; Bus check; Adaptor failure
A87*	Moss level 0 error detection; MCAD; PIO; Bus check; Adaptor not detected
A88*	Moss level 0 error detection; MCAD; PIO; Timeout; Invalid command
A89*	Moss level 0 error detection; MCAD; PIO; Timeout; Outbound parity check
A8A*	Moss level 0 error detection; MCAD; PIO; Timeout; Adaptor not detected
A8B*	Moss level 0 error detection; MCAD; PIO; Timeout; Adaptor failure
A8C*	Moss level 0 error detection; MCAD; PIO; Timeout; Multiple bits detected in Stat reg
A8D*	Moss level 0 error detection; DFA; Adaptor is 'down'
A8E*	Moss level 0 error detection; DFA; CHIO Bus check
A8F*	Moss level 0 error detection; DFA; CHIO Timeout
A90*	Moss level 0 error detection; DFA; CHIO; Storage ECC error; Register space parity during main store.
A91*	Moss level 0 error detection; DFA; CHIO; Storage ECC error; Multiple bits in DIV Register
A92*	Moss level 0 error detection; DFA; CHIO; Storage ECC error; No bits active in DIV Register
A93*	Moss level 0 error detection; DFA; CHIO; Exception; Operation exception; CHCV Reg invalid
A94*	Moss level 0 error detection; DFA; CHIO; Exception; Register precision; CHP Reg bits 0-7 are not zero
A95*	Moss level 0 error detection; DFA; CHIO; Exception; Specification exception with invalid address on main store data access
A96*	Moss level 0 error detection; DFA; CHIO; Exception; Address exception on main store data access
A97*	Moss level 0 error detection; DFA; CHIO; Exception; Multiple bits in DIV Register
A98*	Moss level 0 error detection; DFA; CHIO; Exception; No bits active in DIV Register
A99*	Moss level 0 error detection; DFA; CHIO; Internal check; Cache parity check
A9A*	Moss level 0 error detection; DFA; CHIO; Internal check; Invalid address on CHP Reg access
A9B*	Moss level 0 error detection; DFA; CHIO; Internal check; Multiple bits in DIV Register
A9C*	Moss level 0 error detection; DFA; CHIO; Multiple bits detected in EIRV reg
A9D*	Moss level 0 error detection; DFA; CHIO; No CHIO in progress in Adaptor Control Block
A9E*	Moss level 0 error detection; DFA; PIO; Bus check; Inbound parity
A9F*	Moss level 0 error detection; DFA; PIO; Bus check; Adaptor failure
AA0*	Moss level 0 error detection; DFA; PIO; Bus check; Adaptor not detected
AA1*	Moss level 0 error detection; DFA; PIO; Timeout; Invalid command
AA2*	Moss level 0 error detection; DFA; PIO; Timeout; Outbound address parity check
AA3*	Moss level 0 error detection; DFA; PIO; Timeout; Outbound command/data parity check
AA4*	Moss level 0 error detection; DFA; PIO; Timeout; Adaptor failure

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 14 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
AA5*	Moss level 0 error detection; DFA; PIO; Timeout; Multiple bits detected in Stat reg
AA6*	Moss level 0 error detection; TOD; Adaptor is 'down'
AA7*	Moss level 0 error detection; TOD; PIO; Bus check; Inbound parity
AA8*	Moss level 0 error detection; TOD; PIO; Bus check; Adaptor not detected
AA9*	Moss level 0 error detection; TOD; PIO; Timeout; Outbound address parity check
AAA*	Moss level 0 error detection; TOD; PIO; Timeout; Outbound command/data parity check
AAB*	Moss level 0 error detection; PLC; Adaptor is 'down'
AAC to AAD	NOT USED
AAE*	Moss level 0 error detection; PLC; MMIO Interface error OR Invalid address during main store data access (ON level 2)
AAF*	Moss level 0 error detection; PLC; MMIO Parity error OR Memory storage; Storage ECC; Data parity (ON level 2)
AB0	NOT USED
AB1*	Moss level 0 error detection; UC Bus; Bus is 'down'
AB2*	Moss level 0 error detection; Register Storage; PIO Storage ECC; Data parity whilst accessing MPC
AB3*	Moss level 0 error detection; Register Storage; PIO Storage ECC; Data parity whilst accessing MSC
AB4*	Moss level 0 error detection; Register Storage; PIO Storage ECC; Unresolved problem
AB5*	Moss level 0 error detection; Register Storage; Storage ECC; Check during PSV swap
AB6*	Moss level 0 error detection; Memory Storage; CHIO Storage ECC; Data parity
AB7*	Moss level 0 error detection; Memory Storage; Storage ECC; Data parity (NOT ON level 2)
AB8*	Moss level 0 error detection; Memory Storage; Storage ECC; Instruction fetch parity
AB9*	Moss level 0 error detection; Loop; Excessive MOSS IML loop is detected via a TOD interrupt
ABA*	Moss level 0 error detection; Erroneous MOSS code; Program error; IO address is not authorized
ABB*	Moss level 0 error detection; Diag code; Program error; Power on reset / start; Unresolved
ABC*	Moss level 0 error detection; Level 0 code; Program error; Invalid BER set during Checkpoint Retry Recovery
ABD*	Moss level 0 error detection; Level 0 code; Program error; Invalid BER set during Postponed Retry Recovery
ABE*	Moss level 0 error detection; Level 0 code; Program error; Invalid BER set during Transparent Retry Recovery
ABF*	Moss level 0 error detection; Level 0 code; Program error; Program request dispatcher - module CHGHOPGM - is in an unexpected state
AC0*	Moss level 0 error detection; Level 0 code; Program error; Invalid adaptor ID present in module CHGHOBUS
AC1*	Moss level 0 error detection; Level 0 code; Program error; Ram processor is in an unexpected state
AC2*	Moss level 0 error detection; Level 0 code; Program error; Ros processor is in an unexpected state
AC3*	Moss level 0 error detection; Level 0 code; Program error; Call address stack table is full
AC4*	Moss level 0 error detection; Level 0 code; Program error; Return address stack table is empty
AC5*	Moss level 0 error detection; Level 0 code; Program error; The type of BER created does not exist in the BER table
AC6*	Moss level 0 error detection; Level 0 code; Program error; Moss already IML'd routine before the IML routine
AC7*	Moss level 0 error detection; Unexpected spurious interrupt; CHIO error detected

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 15 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
AC8*	Moss level 0 error detection; Unexpected spurious interrupt; Level 0 interrupt detected
AC9*	Moss level 0 error detection; Unexpected spurious interrupt; Level 0 interrupt in IOIRV detected
ACA*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Bus check; No adaptor found with Last Priority Level
ACB*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Bus check; Instruction was not an IO type
ACC*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Bus check; Detected on level 2
ACD*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Bus check; Detected on level 6
ACE*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Timeout; No adaptor found with Last Priority Level
ACF*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Timeout; Instruction was not an IO type
AD0*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Timeout; Detected on level 2
AD1*	Moss level 0 error detection; Unexpected spurious interrupt; PIO Timeout; Detected on level 6
AD2*	Moss level 0 error detection; Unexpected spurious interrupt; Program request detected in PIRV
AD3*	Moss level 0 error detection; Unresolved Exception error; Addressing exception during Instruction fetch
AD4*	Moss level 0 error detection; Unresolved Exception error; Addressing exception during Main store data access
AD5*	Moss level 0 error detection; Unresolved Exception error; Fixed point overflow exception
AD6*	Moss level 0 error detection; Unresolved Exception error; Invalid address exception during non main store access
AD7*	Moss level 0 error detection; Unresolved Exception error; Multiple bits detected in DIV
AD8*	Moss level 0 error detection; Unresolved Exception error; Multiple bits detected in EIRV
AD9*	Moss level 0 error detection; Unresolved Exception error; Operation exception; Invalid opcode detected
ADA*	Moss level 0 error detection; Unresolved Exception error; Register precision exception
ADB*	Moss level 0 error detection; Unresolved Exception error; Specification exception; Invalid address during Instruction fetch
ADC*	Moss level 0 error detection; Unresolved Exception error; Specification exception; Invalid address during Main store data access (NOT ON level 2)
ADD*	Moss level 0 error detection; Unresolved Exception error; Specification exception; Invalid address during non GPR access
ADE*	Moss level 0 error detection; Unresolved Exception error; Specification exception; Invalid execution of KI instruction
ADF*	Moss level 0 error detection; Unresolved Exception error; Specification exception; PSV bits (40-44-47) are not zero
AE0*	Moss level 0 error detection; Unresolved Internal Check; Cache register parity check
AE1*	Moss level 0 error detection; Unresolved Internal Check; Invalid address during GPR access
AE2*	Moss level 0 error detection; Unresolved Internal Check; Invalid address during PSV swap
AE3*	Moss level 0 error detection; Unresolved Internal Check; Multiple bits detected in DIV
AE4*	Moss level 0 error detection; Unresolved Internal Check; Multiple bits detected in EIRV
AE5*	Moss level 0 error detection; Unresolved Storage/ECC Check; Multiple bits detected in DIV

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 16 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
AE6*	Moss level 0 error detection; Unresolved Storage/ECC Check; Multiple bits detected in EIRV
AE7*	Moss level 0 error detection; Unresolved Storage/ECC Check; No bits detected in DIV
AE8 to BFE	NOT USED
BFF*	Moss level 0 Incoherence; Problem within the level 0 code
C00 to C03	NOT USED
C04*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid SVTTRC
C05*	Moss level 0 error detection; MOSS ABEND; Supervisor; More than one request
C06*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid SVTDRC
C07*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid TCB ID
C08*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid Adaptor ID
C09*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid Timer request
C0A*	Moss level 0 error detection; MOSS ABEND; Supervisor; Lost BER counter is full
C0B*	Moss level 0 error detection; MOSS ABEND; Supervisor; BER length null
C0C*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid macro ID in CHGSUBEM
C0D*	Moss level 0 error detection; MOSS ABEND; Supervisor; Invalid adaptor ID in CHGSUBEA
C0E*	Moss level 0 error detection; MOSS ABEND; Keyboard/Display Support; Invalid function request
C0F*	Moss level 0 error detection; MOSS ABEND; Keyboard/Display Support; End I/O without FRB
C10*	Moss level 0 error detection; MOSS ABEND; Keyboard/Display Support; Program interrupt without FRB
C11*	Moss level 0 error detection; MOSS ABEND; Keyboard/Display Support; Invalid interrupt
C12*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid function request
C13	NOT USED
C14*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid header label
C15 to C16	NOT USED
C17*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid LM elements
C18	NOT USED
C19*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid completion status with preemptive request
C1A	NOT USED
C1B*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Control record found
C1C*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid completion status with exception detected
C1D*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Program problem detected by CAC
C1E*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid completion status with error detected
C1F*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Invalid completion status with complete but with neither exception nor error detected
C20*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Unexpected completion status or interrupt

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 17 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
C21*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Bad disk IOCS initialize
C22*	Moss level 0 error detection; MOSS ABEND; Disk/Diskette Support; Threshold exceeded on unexpected interrupt
C23*	Moss level 0 error detection; MOSS ABEND; CCU Support; No action for Scanner AC hit
C24	NOT USED
C25*	Moss level 0 error detection; MOSS ABEND; CCU Support; Undefined interrupt
C26*	Moss level 0 error detection; MOSS ABEND; CCU Support; Unexpected Mailbox IN rejected
C27*	Moss level 0 error detection; MOSS ABEND; CCU Support; Invalid ID from scanner selected
C28*	Moss level 0 error detection; MOSS ABEND; CCU Support; Invalid adaptor address
C29*	Moss level 0 error detection; MOSS ABEND; CCU Support; Undefined CHIO request
C2A*	Moss level 0 error detection; MOSS ABEND; CCU Support; Switch adaptor CAC requests an ABEND
C2B to C2D	NOT USED
C2E*	Moss level 0 error detection; MOSS ABEND; CCU Support; Invalid PCW command
C2F to C30	NOT USED
C31*	Moss level 0 error detection; MOSS ABEND; Operator Control; Load module not found
C32*	Moss level 0 error detection; MOSS ABEND; Operator Control; Logical Disk error
C33*	Moss level 0 error detection; MOSS ABEND; Operator Control; Invalid cancel request
C34*	Moss level 0 error detection; MOSS ABEND; Operator Control; Moss IML request by operator
C35*	Moss level 0 error detection; MOSS ABEND; Operator Control; Data stream out is greater than 1024 bytes
C36*	Moss level 0 error detection; MOSS ABEND; CCU Functions; End of DCF application
C37*	Moss level 0 error detection; MOSS ABEND; CCU Functions; Incorrect load module identified
C38*	Moss level 0 error detection; MOSS ABEND; CCU Functions; Logical disk error
C39*	Moss level 0 error detection; MOSS ABEND; CCU Functions; Unknown operator control return code
C3A*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Load module not found
C3B*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Logical disk error
C3C*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Unknown operator control return code
C3D*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Conflicting dump file information
C3E*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Scanner not installed or SCB not flagged "auto dump"
C3F*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Control program invalid answer
C40*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Disconnect not allowed
C41*	Moss level 0 error detection; MOSS ABEND; Transient Tasks; Buffer limit reached
C42*	Moss level 0 error detection; MOSS ABEND; Box Error Logging; Invalid BER stack
C43*	Moss level 0 error detection; MOSS ABEND; Mail Box Support; Load module not found
C44*	Moss level 0 error detection; MOSS ABEND; Mail Box Support; Mail box request rejected
C45*	Moss level 0 error detection; MOSS ABEND; Mail Box Support; Unsolicited call
C46*	Moss level 0 error detection; MOSS ABEND; Mail Box Support; Invalid RU

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 18 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
C47*	Moss level 0 error detection; MOSS ABEND; Macro Invocation; Started bit in request
C48*	Moss level 0 error detection; MOSS ABEND; System IPL; Start IPL refused
C49*	Moss level 0 error detection; MOSS ABEND; Disk Functions; Disk unusable
C4A*	Moss level 0 error detection; MOSS ABEND; Disk Functions; Unable to load CHGDFINT
C4B*	Moss level 0 error detection; MOSS ABEND; Power Functions; Incorrect access to PCST
C4C*	Moss level 0 error detection; MOSS ABEND; Power Functions; Invalid data - threshold
C4D*	Moss level 0 error detection; MOSS ABEND; Power Functions; Next request received before RP
C4E*	Moss level 0 error detection; MOSS ABEND; Level 1; Permanent HLIR - kill MOSS
C4F*	Moss level 0 error detection; MOSS ABEND; Level 1; Excess amount of spurious errors
C50*	Moss level 0 error detection; MOSS ABEND; Level 1; Soft checker - snap shot
C51*	Moss level 0 error detection; MOSS ABEND; MSD; Invalid frame number
C52*	Moss level 0 error detection; MOSS ABEND; IMIN2; No timer IMIN2
C53*	Moss level 0 error detection; MOSS ABEND; TRSS; NCP pointer not found
C54*	Moss level 0 error detection; MOSS ABEND; TRSS; Invalid field format received
C55*	Moss level 0 error detection; MOSS ABEND; TRSS; Invalid TIC storage
C56*	Moss level 0 error detection; MOSS ABEND; TRSS; TRA/TIC not installed or ASB not flagged "Auto TIC Dump"
C57 to D00	NOT USED
D01*	Moss level 0 error detection; Disk errors during IML/Dump; Adaptor busy - attn
D02*	Moss level 0 error detection; Disk errors during IML/Dump; FRB busy
D03 to D04	NOT USED
D05*	Moss level 0 error detection; Disk errors during IML/Dump; Adapter busy - CHIO
D06*	Moss level 0 error detection; Disk errors during IML/Dump; Adapter busy - reset
D07	NOT USED
D08*	Moss level 0 error detection; Disk errors during IML/Dump; SCA 1 not open
D09*	Moss level 0 error detection; Disk errors during IML/Dump; SCA 2 not open
D0A*	Moss level 0 error detection; Disk errors during IML/Dump; Adapter not open
D0B*	Moss level 0 error detection; Disk errors during IML/Dump; Pre-emptive request complete
D0C*	Moss level 0 error detection; Disk errors during IML/Dump; Pre-emptive request rejected
D0D*	Moss level 0 error detection; Disk errors during IML/Dump; SCA 1 already open
D0E*	Moss level 0 error detection; Disk errors during IML/Dump; SCA 2 already open
D0F to D10	NOT USED
D11*	Moss level 0 error detection; Disk errors during IML/Dump; FRB Program check
D12*	Moss level 0 error detection; Disk errors during IML/Dump; BCL Program check
D13*	Moss level 0 error detection; Disk errors during IML/Dump; Invalid PIO command (hardware & equipment checks)
D14 to D1F	NOT USED
D20*	Moss level 0 error detection; Disk errors during IML/Dump; Indeterminate equipment check (hardware error in adapt.)
D21	NOT USED
D22*	Moss level 0 error detection; Disk errors during IML/Dump; Device (SCA) ready (hardware error in adaptor)

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 19 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
D23 to D27	NOT USED
D28*	Moss level 0 error detection; Disk errors during IML/Dump; Seek check (DATA transmission problems)
D29 to D2F	NOT USED
D30*	Moss level 0 error detection; Disk errors during IML/Dump; Device (SCA) not ready (no error)
D31*	Moss level 0 error detection; Disk errors during IML/Dump; Control record found (error / not successful class. sequence errors)
D32*	Moss level 0 error detection; Disk errors during IML/Dump; Sector Buffer Parity error
D33*	Moss level 0 error detection; Disk errors during IML/Dump; Termination error with no specific error
D34*	Moss level 0 error detection; Disk errors during IML/Dump; Cylinder overrun
D35*	Moss level 0 error detection; Disk errors during IML/Dump; Write/Protect fault with FDD
D36*	Moss level 0 error detection; Disk errors during IML/Dump; Write fault with HDD
D37*	Moss level 0 error detection; Disk errors during IML/Dump; Halt during a CHIO operation
D38*	Moss level 0 error detection; Disk errors during IML/Dump; I/O bus parity error
D39*	Moss level 0 error detection; Disk errors during IML/Dump; CCB with no active CSB
D3A*	Moss level 0 error detection; Disk errors during IML/Dump; Invalid command in CCB or SSB
D3B*	Moss level 0 error detection; Disk errors during IML/Dump; ERP invoked by DFA
D3C*	Moss level 0 error detection; Disk errors during IML/Dump; Internal parity error
D3D*	Moss level 0 error detection; Disk errors during IML/Dump; Data error (SSB byte 1)
D3E*	Moss level 0 error detection; Disk errors during IML/Dump; Record not found (L/operator intervention required)
D3F	NOT USED
D40*	Moss level 0 error detection; Disk errors during IML/Dump; CRC/ECC error on ID
D41*	Moss level 0 error detection; Disk errors during IML/Dump; CRC/ECC error on data
D42*	Moss level 0 error detection; Disk errors during IML/Dump; Bad track detected
D43*	Moss level 0 error detection; Disk errors during IML/Dump; Format error detected
D44*	Moss level 0 error detection; Disk errors during IML/Dump; Unable to find ID
D45*	Moss level 0 error detection; Diskette errors during IML/Dump; Format error detected
D46 to D4F	NOT USED
D50*	Moss level 0 error detection; Disk errors during IML/Dump; Disk change information
D51 to D75	NOT USED
D76*	Moss level 0 error detection; Disk errors during IML/Dump; PIO MCK (non-recursive)
D77 to DF5	NOT USED
DF6*	Moss level 0 error detection; Disk errors during IML/Dump; PIO MCK (recursive) - (preemptive request class.)
DF7	NOT USED
DF8*	Moss level 0 error detection; Device errors during IML/Dump; Dump directory entry not found
DF9*	Moss level 0 error detection; Device errors during IML/Dump; Hard Disk not initialised
DFA*	Moss level 0 error detection; Device errors during IML/Dump; Hard Disk not formatted
DFB*	Moss level 0 error detection; Device errors during IML/Dump; Invalid IML request

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 20 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
DFC*	Moss level 0 error detection; Device errors during IML/Dump; Volume IML check
DFD*	Moss level 0 error detection; Device errors during IML/Dump; Data compare check
DFE*	Moss level 0 error detection; Device errors during IML/Dump; Disk time out
DFF*	Moss level 0 error detection; Device errors during IML/Dump; Diskette time out
E00 to EFF	NOT USED
F00	Status / Progression step; Start of MOSS Dump
F01	Status / Progression step; Moss Dump has been completed without error
F02	Status / Progression steps which occur during the IML sequence; IML Initialisation
F03	Status/Progression steps which occur during the IML sequence; Open adaptor
F04	Status/Progression steps which occur during the IML sequence; Open SCA (either disk or diskette)
F05	Status/Progression steps which occur during the IML sequence; Check disk or diskette ID
F06 to F07	NOT USED
F08	Status/Progression steps which occur during the IML sequence; Find directory entry
F09	Status/Progression steps which occur during the IML sequence; IML end - go to MOSS loader
F0A	Status/Progression steps which occur during the IML sequence; Ram entry (Start of MOSS Init step 1)
F0B	Status/Progression steps which occur during the IML sequence; End of MOSS Init step 1
F0C	Status/Progression steps which occur during the IML sequence; Start of MOSS Init step 2 (Moss level 7)
F0D	Status/Progression steps which occur during the IML sequence; IML complete with errors detected during MOSS Diagnostics.
F0E	Status/Progression steps which occur during the IML sequence; IML complete - MOSS ALONE
F0F	Status/Progression steps which occur during the IML sequence; IML Complete - CCU connected - MOSS OFFLINE or MOSS Offline command successful
F10	Errors detected during the IPL sequence; Solid error during MIOC operation
F11	Errors detected during the IPL sequence; CCU hardcheck during a CCU IPL in progress
F12	Errors detected during the IPL sequence; Host IPL request during CCU IPL in progress
F13	Errors detected during the IPL sequence; Unidentified IPL selection
F14	Errors detected during the IPL sequence; CDS not correctly built by the CDF
F15	NOT USED
F16	Errors detected during the IPL sequence; CCU memory test failed
F17	Errors detected during the IPL sequence; CCU test failed
F18	Errors detected during the IPL sequence; IOC BUS test failed
F19	Errors detected during the IPL sequence; IPL port table has been incorrectly built via the CDF
F1A	Errors detected during the IPL sequence; CLDP not accessible
F1B	Errors detected during the IPL sequence; CLDP/SALT abend. (output 70)
F1C	Errors detected during the IPL sequence; CLDP/MOSS interface error
F1D	Errors detected during the IPL sequence; NCP/EP init abend
F1E	Errors detected during the IPL sequence; CLDP time out on 'IN MAILBOX' acknowledgement
F1F	Errors detected during the IPL sequence; MOSS time out on waiting NCP/EP init MB out

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 21 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
F20	Errors detected during the IPL sequence; MOSS time out on waiting NCP/EP init MB in acknowledgement
F21	Errors detected during the IPL sequence; NCP/EP INIT/MOSS interface error acknowledgement
F22 to F23	NOT USED
F24	Errors detected during the IPL sequence; No scanner IMLed after scanner IML routine (phase 3)
F25	Errors detected during the IPL sequence; No valid scanner in the CDS
F26	Errors detected during the IPL sequence; LSSD residual count > 7
F27	Errors detected during the IPL sequence; LSSD string select error during a read or write LSSD
F28	Errors detected during the IPL sequence; IPL phase 1A load module not accessible
F29	Errors detected during the IPL sequence; IPL phase 1B load module not accessible
F2A	Errors detected during the IPL sequence; IPL phase 2 load module not accessible
F2B	Errors detected during the IPL sequence; IPL phase 3 load module not accessible
F2C	Errors detected during the IPL sequence; IPL phase 4 load module not accessible
F2D	Errors detected during the IPL sequence; Too many CCU RE-IPL (PGM abend or hardcheck)
F2E	Errors detected during the IPL sequence; Wrong CCU LSSD initialization
F2F	Errors detected during the IPL sequence; No IPL port is available (Neither the Link nor Channel) and no load module on the Disk is available
F30	Errors detected during the IPL sequence; CPIT error: • CPIT length different from CHGCONCP • Some CPIT fields not initialized
F31	Errors detected during the IPL sequence; IPL phase 1C load module not accessible
F32	Errors detected during the IPL sequence; CCU check occured during Phase 1C
F33	Errors detected during the IPL sequence; SALT not accessible
F34 to F47	NOT USED
F48	Errors detected during the IPL sequence; CCU and CACHE checkout failed SCTL checkout failed
F4A	Errors detected during the IPL sequence; SCTL initialization failed
F4B	Errors detected during the IPL sequence; Switch checkout failed
F4C	Errors detected during the IPL sequence; IOC bus problem.
F4D	Errors detected during the Fallback/Switchback sequence; Channel monitoring failure in normal monitor mode during Fallback or Switch back
F4E	Errors detected during the Fallback/Switchback sequence; Reset adaptors can not be performed during Fallback or Switchback
F4F	Errors detected during the Fallback/Switchback sequence; Problem detected by the CDF
F50	Errors detected during the Fallback/Switchback sequence; The control program cannot be set ONLINE by the Fallback or Switchback
F51	Errors detected during the IPL Fallback/Switchback sequence; Switch operation failed
F52	Errors detected during the IPL sequence; Problem detected with the MCAD interface
F53	Errors detected during the Fallback/Switchback sequence; Fall back function not supported
F54	Errors detected during the Fallback/Switchback sequence; No buffer available for NCP during fallback
F55	Errors detected during the Fallback/Switchback sequence; NCP / MOSS fallback interface error
F56	Errors detected during the Fallback/Switchback sequence; Interface problem detected between Fallback / Switchback and Channel Monitoring

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 22 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
F57	Errors detected during the IPL sequence; CCU power has dropped during the IPL
F58	Error detected during Switchback sequence; Error found in Switchback protocol
F59	Error detected during MOSS IML Diagnostics; IPL can not be performed on the selected CCU
F60	Error detected during MOSS IML Diagnostics; IPL can not be performed on all CCUs
F61	Errors detected during the IPL sequence; Load module not accessible after a 'suspend' procedure
F62	Errors detected during the IPL sequence; IPL cancelled after stop in phase 1 diags.
F63	Errors detected during the IPL sequence; IPL cancelled after stop in phase 1 diags. CCU unknown.
F64 to FCF	NOT USED
FD0	Status/Progression steps which occur during a configuration sequence; Fall back complete
FD1	Status/Progression steps which occur during a configuration sequence; Fall back complete but with errors
FD2	Status/Progression steps which occur during a configuration sequence; Switch back complete
FD3	Status/Progression steps which occur during a configuration sequence; Switch back complete but with errors
FD4	Status/Progression steps which occur during a configuration sequence; Fall back in progress
FD5	Status/Progression steps which occur during a configuration sequence; Switch back in progress
FD6	Status/Progression steps which occur during the IPL sequence; The control program loading is started from the Disk
FD7	Status/Progression step; Dump Control Program onto MOSS disk in progress
FD8	Status / Progression step; Save Control Program on MOSS disk in progress
FD9	Status / Progression step; Phase 1C test in progress on the standby CCU
FDA	Status / Progression step; Phase 1C test cancelled on the standby CCU
FDB to FE0	NOT USED
FE1	Errors detected during IML sequence; Disk initialisation failure
FE2	Errors detected during IML sequence; Disk load operation failure
FE3	Errors detected during IML sequence; Power error A - Get end of IML data
FE4	Errors detected during IML sequence; Power error B - Get stacked error
FE5	Errors detected during IML sequence; Panel error
FE6	Errors detected during IML sequence; MIOC error with CCU A operation
FE7	Errors detected during IML sequence; MIOC error with CCU B operation
FE8	Errors detected during IML sequence; Disk error when reading CDF
FE9	Errors detected during IML sequence; CDF not created
FEA	Errors detected during IML sequence; CDF access function(s) error
FEB	Errors detected during IML sequence; NCP timeout on mailbox to CCU A
FEC	Errors detected during IML sequence; NCP timeout on mailbox to CCU B
FED	NOT USED
FEE	Errors detected during IML sequence; MOSS data saving error
FEF	Errors detected during IML sequence; Disk error when reading Port Swap file
FF0	Status/Progression steps which occur during the IPL sequence; IPL entered
FF1	Status/Progression steps which occur during the IPL sequence; IPL phase 1 started
FF2	Status/Progression steps which occur during the IPL sequence; IPL phase 2 started
FF3	Status/Progression steps which occur during the IPL sequence; IPL phase 3 entered
FF4	Status/Progression steps which occur during the IPL sequence; IPL phase 4 entered

An * following a panel code denotes that the code should 'Blink'.

Table A-1 (Page 23 of 23). MOSS Control Panel Codes

PANEL CODE	DEFINITION
FF5	Status/Progression steps which occur during the IPL sequence; The control program Load / Dump is started on a channel attached 3745
FF6	Status/Progression steps which occur during the IPL sequence; The control program Load / Dump is started on a Link attached 3745
FF7	Status/Progression steps which occur during the IPL sequence; control program is loaded and initialization has started
FF8	NOT USED
FF9	Status / Progression steps which occur during a configuration sequence; Switchback was cancelled by the 3745 operator.
FFA	Status / Progression steps which occur during the IPL sequence; IPL has completed but has detected a PCA1 adapter error; Local console may not be accessible
FFB	Status / Progression steps which occur during the IPL sequence; IPL was cancelled by the 3745 Console Operator
FFC	Status / Progression steps which occur during a configuration sequence; Fallback was cancelled by the 3745 Console Operator
FFD	Status / Progression steps which occur during the IPL sequence; IPL has completed; The MOSS IML was performed from the diskette; control program is loaded and MOSS is operational
FFE	Status / Progression steps which occur during the IPL sequence; IPL has been completed but has detected some error during the sequence.
FFF	IPL canceled after error detection.

An * following a panel code denotes that the code should 'Blink'.

Appendix B. Maintenance Aids

PKD Maintenance Aids

Configuration

On a LIC type 5 or 6, the configuration parameters are set from the PKD,
refer to the "3745 Connection and Integration Guide" for detailed procedure.

On a LIC type 5, the following configuration parameters are "service representative only":
MODE (native or CCITT), CD SENSIT (normal or low) and L XMIT LEVEL.
They must be set by using the **'B'** command as follows:

1. Enter the **B 300** at the PKD.
2. Press **GO** several times to get the desired option message.
3. Press **ERASE** and enter the new value if applicable.
4. Press **GO** to validate the new value.

B Commands (Only for LIC Type 5)

The following other **B** commands can be used by the CE for miscellaneous actions:

- B 100 Reload default configuration.
- B 555 Address a remote modem (using the modem serial number) to change some parameters.
- B 666 Increase the timeout from 30 seconds to 10 minutes.
- B 703/704/705 CO/CS functions, allows remote commands.
- B 730 Send a 1004 HZ tone on telephone line.

Manual Tests

The following manual test can be executed on a LIC type 5:

- Local self-test
- Remote self-test
- Local status report
- Remote status report
- Analog test (line analysis)
- Digital test (transmit/receive test)
- Manual loopback

The following manual test can be executed on a LIC type 6:

- Local self-test
- Digital test (transmit/receive test)
- Manual loopback

Refer to the "3745 Connection and Integration Guide" Part 3 for detailed procedure.

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Contacting Support

You may wish to record your support structure telephone number here.

You may be directed to call support for various reasons. When support is called you may be asked to perform specific tasks. In the following pages you will find information about why you call support and references to where you will find information about the tasks you may have to perform.

- "Control Program Maintenance Aids" on page B-4.
- "MOSS Microcode Maintenance Aids" on page B-6.
- "Scanner Microcode Maintenance Aids" on page B-8.
- "Channel Microcode Maintenance Aids" on page B-10.

Notes:

Control Program Maintenance Aids

The following list gives some possible causes of control program errors.

- A hardware configuration change has been performed and there is a difference between the hardware configuration and the control program generation.
- The customer has made some software changes.
- A PTF has been incorrectly applied.
- A PTF exists for the problem but has not been applied.

The following table shows where to find useful information in case of a suspected control program error.

Information	**Where to find it**
Customer procedures for diagnosis	"ACF/SSP Diagnosis Reference, LY30-3060"
How to perform control program procedures	"Advanced Operation Guide, Chapter 3"
How to execute NCP functions	"Advanced Operation Guide, Chapter 26"
Line Interface Display (LID)	"Advanced Operation Guide, Chapter 12"
Token-ring Interface Display (TID)	"Advanced Operation Guide, Chapter 23"
Port Swap	"Advanced Operation Guide, Chapter 17"
LIC Swap	"Advanced Operation Guide, Chapter 17"
Access method traces	"Maintenance Information Reference Manual, Chapter 13"
Scanner Interface Trace (SIT)	"Maintenance Information Reference Manual, Chapter 13"
Stand-Alone Link Test (SALT)	"Advanced Operation Guide, Chapter 20"
Catalogued Procedures (CP1 to CP6)	"Advanced Operation Guide, Chapter 3"
LIC internal wrap test	"3745 Problem Determination Guide, Chapter 10"
LIC wrap test with wrap plugs	"Advanced Operation Guide, Chapter 24"
NETVIEW* alerts	NETVIEW Bibliography.

Notes:

MOSS Microcode Maintenance Aids

The following table shows where to find useful information in case of a suspected microcode error.

Information	Where to find it
How to apply MCF	"3745 Service Functions, Chapter 7"
How to display, delete a MOSS dump.	"3745 Service Functions, Chapter 6"
Theory of MOSS and MOSS adapters	"Maintenance Information Reference Manual, Chapter 8"
How to perform traces and dumps	"Maintenance Information Reference Manual, Chapter 13"
Save, restore, format the MOSS hard disk drive.	"3745 Service Functions, Chapter 11".
How to dump MOSS	"Control Panel Use" on page 1-33

Notes:

Scanner Microcode Maintenance Aids

The following table shows where to find useful information in case of a suspected scanner microcode error.

Information	Where to find it
MCF	"3745 Service Functions, Chapter 7"
Patches	"3745 Service Functions, Chapter 8"

Notes:

Channel Microcode Maintenance Aids

The following table shows where to find useful information in case of a suspected channel microcode error.

Information	Where to find it
Channel Adapter Description	"Maintenance Information Reference Manual, Chapter 7"

List of Abbreviations

A	ampere
abend	abnormal end of task
AC	1) alternating current 2) abandon call 3) address compare
ACB	adapter control block
ACF	Advanced Communications Function
ACK	affirmative acknowledgment (BSC)
ACR	1) add character register (instruction) 2) abandon call request
ACU	automatic calling unit
AE	address exception
AEK	address exception key
AFD	airflow detector
AGC	automatic gain control (signal)
AHR	add halfword register (instruction)
AIO	adapter-initiated operation
AIT	algorithm interface table
ALC	Airlines Line Control
ALU	arithmetic and logic unit
AMD	air moving device
ANSI	American National Standards Institute
AR	add register (instruction)
ARI	add register immediate (instruction)
AS	autoselection chain
ASCII	American National Standard Code for Information Interchange
AXB	adapter expansion block
B	branch (instruction)
BAL	branch and link (instruction)
BALR	branch and link register (instruction)
BB	branch on bit (instruction)
BCC	block check character (BSC)
BCCW	bit clock control word
BCD	binary-coded decimal notation
BCL	branch on C latch (instruction)
BCT	branch on count (instruction)
BER	box event record
B/M	bill of material
BPC1	bus propagation card to replace the CAL card
BPC2	bus propagation card to replace the TRM card
bps	bits per second
BR	bus request
BRC	BER correlation
BSC	binary synchronous communication
BT	branch trace
BTAM	Basic Telecommunications Access Method
BTAM-ES	BTAM extended support
BZL	branch on Z latch (instruction)
C	(1) Celsius (2) control (X.21 signal)
CA	channel adapter
CAB	channel adapter board
CAC	common adapter code
CACM	channel adapter concurrent maintenance
CAL	channel adapter logic card
CADR	channel adapter driver receiver card
CADRUK	channel adapter driver receiver type UK card
CATPS	channel adapter with two-processor switch
CB	circuit breaker
CCITT	Comite Consultatif International Telegraphique et Telephonique
CCMD	current command (storage)
CCN	communications controller node
CCR	compare character register (instruction)
CCU	central control unit
CCW	channel command word
CD	1) carrier detector (signal) 2) connector
CDF	configuration data file
CDG	concurrent diagnostic
CDS	configuration data set (NCP/EP)
CE	customer engineer
CEPT	Comite Europeen des Postes et Telecommunications
CHCW	channel control word
CHPID	channel path identification
CHR	compare halfword register (instruction)
CI	calling indicator (signal)
CID	channel interface display
CLDP	controller load/dump program
CMOS	complementary metal oxide semiconductor
CNM	communication network management

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CNMI	communication network management interface
CNSL	console
CO/CS	contact operate/contact sense
CONFSW	configuration switch
CP	1) communication processor, control program 2) circuit protector
CPIT	control program information table
CPM	connection point manager
CPT	checkpoint trace
CR	(1) compare register (instruction) (2) call request (signal)
CRC	cyclic redundancy check character
CRI	compare register immediate (instruction)
CRP	check record pool
CRQ	call request
CRU	customer replaceable unit
CS	(1) cycle steal (2) communication scanner
CSA	common subassembly
CSCW	cycle steal control word
CSG	cycle steal grant
CSGH	cycle steal grant high
CSGL	cycle steal grant low
CSP	communication scanner processor
CSR	cycle steal request
CSRH	cycle steal request high
CSRL	cycle steal request low
CSS	control subsystem
CSU	1) customer setup 2) customer service unit (DCE-like for high-speed communication lines)
CSW	channel status word
CTS	clear to send (signal)
CW	control word
CZ	carry/zero (latch)
DAF	destination address field (SNA)
DB	data byte
DC	1) direct current 2) data chaining (channel status)
DCE	data circuit-terminating equipment
DCF	diagnostic control function
DCM	diagnostic control monitor
DCRLSD	data channel receive line signal detector (same as CD)
DE	device end (channel status)
DFA	disk file adapter card
DFI	defect-free installation
DI	data in
DIFF	differentiator
DLE	data link escape character
DLO	data line occupied (signal)
DMA	direct memory access
DMSW	direct memory access switch card
DMUX	double multiplex card for board on LIC unit 1
DO	data out
DOI	duration of interrupt
DP	digit present (signal)
DPR	digit present request
DRA	duration of repair action
DRS	data rate select
DRV	driver
DS	data streaming
DSC	distant station connected
DSR	data set ready (signal)
DSRS	data signaling rate selection (signal)
DSU	data service unit (DCE-like for high-speed communication lines)
DTE	data terminal equipment
DTER	DMA bûs terminator
DTR	data terminal ready (signal)
DVB	device block
DX	duplex
EBCDIC	extended binary-coded decimal interchange code
EC	engineering change
ECC	error checking and correction
EDE	elementary data exchange
ED/FI	error detection/fault isolation
EIA	Electronic Industries Association
EIB	error intermediate block
ELCS	extended line communication status
EMEA	Europe, Middle East, Africa
ENQ	enquiry (BSC)
EOT	end of transmission (BSC)
EP	emulation program
EPO	emergency power-off
ERC	error reference code
EREP	environmental recording, editing, and printing (program)
ERP	error recovery procedure
ESC	emulation subchannel (address)
ESCH	emulation subchannel high (address)

ESCL	emulation subchannel low (address)
ESD	electrostatic discharge
ETB	end-of-transmission block character (BSC)
ETX	end-of-text character (BSC)
EXP	expected
FAC	flag address control (SDLC frame)
FCC	Federal Communications Commission
FCPS	final call progress signals (X.21)
FCS	frame check sequence
FDD	flexible disk drive
FDS	flat distribution system
FDX	full-duplex (synonym for duplex)
FE	field engineering
FEIS	field engineering information system
FERR	FESA error register
FES	front-end scanner
FESA	front-end scanner adapter
FESH	front-end scanner (high-speed)
FESL	front-end scanner (low-speed)
FID4	format identification 4
FM	frequency modulation
FPS	FES parameter/status
FRU	field-replaceable unit
ft	foot
GPR	general purpose register
GPT	generalized PIU trace
GTF	generalized trace facility
HCS	Hardware Central Service
HDD	hard disk drive
HDX	half-duplex
hex	hexadecimal
hh	hexadecimal value hh
HLIR	high-level interrupt request
HLU	highest logical unit (largest CPU in an establishment)
HPTSS	high-performance transmission subsystem
HSB	high-speed buffer
HSC	high-speed channel
HSS	high-speed scanner
HW	hardware
Hz	Hertz
I	indication (signal)
IACK	interrupt acknowledgement
IAR	instruction address register
IBE	internal box error
IC	insert character (instruction)
ICA	integrated communication adapter
ICB	interface control block (storage)
ICF	internal clock function
ICT	insert character and count (instruction)
ICW	interface control word
ID	identifier
IEEE	Institute of Electrical and Electronics Engineers
IFT	internal function test
IMB	in mailbox (MOSS)
IML	initial microcode load
in.	inch
IN	input (instruction)
INN	intermediate network node
INOP	inoperative (line, modem, or terminal)
INS	information network system
IOC	input/output control
I/O	input/output
IOCB	input/output control bus
IOCS	input/output control system
IOH	input/output halfword (instruction)
IOHI	input/output halfword immediate (instruction)
IOIRR	input/output interrupt request register
IOSW	input/output switch (card)
IPF	instruction pre-fetch
IPL	initial program load
IPR	isolated pacing response (SNA)
IR	interrupt request
IRR	interrupt request removed
ISDN	integrated service digital network
ISL	inbound serial link
ISO	International Organization for Standardization
ITB	intermediate text block (BSC)
ITER	IOC bus terminator
IVT	isolation verification tests
K	1024 (bytes or words)
KB	kilobyte (1024 bytes)
KBD	keyboard
kbps	kilobits per second
kg	kilogram
kHz	kilohertz
ko	not ok
L	load (instruction)

LA	1) load address (instruction) 2) line adapter
LAB	line adapter board
LAN	local area network
LAP	line adapter processor
LAR	lagging address register
LCB	line control block (storage)
LCD	line control definer (storage)
LCOR	load character with offset register (instruction)
LCR	load character register (instruction)
LCS	line communication status (storage)
LDF	line description file
LED	light-emitting diode
LERR	line error register/driver check
LH	load halfword (instruction)
LHOR	load halfword with offset register (instruction)
LHR	load halfword register (instruction)
LIB	1) line interface buffer 2) LIC board
LIB1	LIC board type 1 for LICs type 1, 3, and 4
LIB2	LIC board type 2 for LICs type 5 and 6
LIC	line interface coupler card
LIC1	line interface coupler type 1 (card)
LIC3	line interface coupler type 3 (card)
LIC4	line interface coupler type 4 (card)
LIC5	line interface coupler type 5 (card)
LIC6	line interface coupler type 6 (card)
LID	line interface display
LIU	line interface coupler unit
LIU1	LIC unit 1 for LICs type 1, 3, and 4
LIU2	LIC unit 2 for LICs type 5, and 6
LLAP	LIC line analysis procedure
LLB	local loopback
LLIR	low-level interrupt request
LL2	link level 2 test
LNVT	line vector table
LOR	load with offset register (instruction)
LPDA	Link Problem Determination Aid
LR	load register (instruction)
LRC	longitudinal redundancy check
LRI	load register immediate (instruction) local storage
LRU	least-recently used
LS	local storage
LSAR	local storage address register
LSI	large scale integration
LSR	local storage register (CSP)
LSS	low-speed scanner
LSSD	level-sensitive scan design
LT	local test
LTC1	line terminator card for CAB1 addressing
LTC2	line terminator card for CAB2 addressing
LU	logical unit
m	meter
mA	milliampere
MAC	MOSS adapter card
MAP	maintenance analysis-procedure
MB	megabyte; 1 048 576 bytes
MCA	MOSS console adapter card
MCPC	machine check/program check
MCC	MOSS control card
MCF	microcode fix
MCT	machine configuration table
MDOR	MOSS data operand register
MDR	miscellaneous data record
MERR	MUX error
MES	miscellaneous equipment specification
MFM	modified frequency modulation
MHz	megahertz
MICB	MOSS interface control block
MIM	Maintenance Information Manual
min	minute
MIO	MOSS input/output
MIOC	MOSS I/O control bus
MIOH	MOSS input/output halfword
MIOHI	MOSS input/output halfword immediate
MIP	Maintenance Information Procedures
MIR	Maintenance Information Reference
MIT	MOSS interface table
MLC	machine level control
MLT	machine load table
mm	millimeter
MMIO	memory mapped input/output
MOD	modifier
MOSS	maintenance and operator subsystem
MPC	MOSS processor card
MPS	multiple port sharing
ms	millisecond
MSA	machine status area

MSAU	multistation access unit
MSC	MOSS storage card
MSD	machine status display
MUX	multiplex function
mV	millivolt
MVS	Multi Virtual Storage
NA	not applicable
NAK	negative acknowledgment character (BSC)
NCCF	Network Communications Control Facility
NCP	Network Control Program
NCR	AND character register (instruction)
NCTE	network communication terminal equipment
NHR	AND halfword register (instruction)
NLDM	Network Logical Data Manager
NMPF	network management program facilities
NMVT	network management vector transport
NO-OP	no-operation instruction
NOSP	network operation support program (VTAM) <D> Use storage
NPDA	Network Problem Determination Application
NPM	NetView performance monitor
NPSI	network packet switching interface
NR	AND register (instruction)
NRI	AND register immediate (instruction)
NRZI	see NRZ-1
NRZ-1	non return-to-zero change on ones recording
NS	new sync (signal)
ns	nanosecond
NSC	native subchannel (address)
NTO	Network Terminal Option
NTT	Nippon Telegraph and Telephone (Japanese PTT)
oc	overcurrent
OCR	OR character register
ODG	offline diagnostic
OEM	original equipment manufacturer
OEMI	original equipment manufacturer's interface
OHR	OR halfword register
OLT	online test
OLTEP	online test executive program
OLTSEP	online test stand-alone execution (program)
OLTS	online test system
OLTT	online terminal test
OMB	out mailbox
OP	operation decode
OR	OR register (instruction)
ORI	OR register immediate (instruction)
OS	Operating System
OSL	outbound serial link
OUT	output (instruction)
ov	overvoltage
PAC	power analog card
PAP	previous adapter present
PAR	problem analysis and repair
PC	personal computer
PCB	power control bus
PCF	primary control field (storage)
PCI	program-controlled interrupt
PCR	power check reset
PCSS	power control subsystem
PCW	processor control word
PCWC	power control wrap card
PD	problem determination
PDAID	problem determination aids
PDB	power distribution board
PDF	parallel data field (storage)
PE	Product Engineering
PEP	partitioned emulation program
PF	programmable function
PFAR	prefetch address register
PI	power indication (signal)
PIO	program-initiated operation
PIRR	program interrupt request register
PIU	pass information unit
PKD	portable keypad display
PLC	power logic card
PN	part number
PND	present next digit (signal)
POPR	prefetch operation register
POR	power-ON reset
POS	power ON services
PROM	programable read-only memory
PS	power supply
PSA	program status area
PSS	power subsystem
PSTCE	product support trained CE
PSTY	power supply type
PSV	program status vector

PSW	program status word
PSx	power supply type x
PTCE	product-trained CE
PTER	power bus terminator
PTF	program temporary fix
PTT	Post, Telephone and Telegraph (agency)
PTX	phototransistor
PU	physical unit
PV	parity valid (signal)
QAM	quadrature amplitude modulation
RA	repair action
RAC	repair action code
RAS	reliability, availability, and serviceability
RC	receive clock
RCDB	reference code data base
RCV	receive
RD	receive data (signal)
RDB	reference code data base
RECFMS	record formatted maintenance statistics
RECMS	record maintenance statistics
REQMS	request for maintenance statistics
RETAIN	Remote Technical Assistance Information Network
RFS	ready for sending (signal) (or clear to send CTS)
RH	request/response header
RI	1) register to immediate operand (instruction) 2) ring indicator (same as CI)
RIM	request initialization mode (SDLC)
RLSD	receive line signal detector
RNIO	OS/VS VTAM IO trace
ROK	read-only key
ROS	read-only storage
ROSAR	read-only storage address register
rpm	revolutions per minute
RPO	1) remote power-off 2) request power-off
RPQ	request for price quotation
RR	register-to-register (instruction)
RS	register-to-storage (instruction)
RSA	register-to-storage with addition (instruction)
RSET	receive signal element timing (same as RC)
RSF	remote support facility
RTC	retry count (X.21)
RTM	retry timer (X.21)
RTS	request to send (signal)
RU	request/response unit (SNA)
RVI	reverse interrupt (BSC)
R/W	read/write
s	second
SAC	storage and control board assembly
SACL	storage and control lower assembly
SACU	storage and control upper assembly
SALT	stand-alone link test
SAR	storage address register
SCB	scanner control block (storage)
SCF	secondary control field (storage)
SCP	signal converter product (or DCE)
SCR	(1) subtract character register (instruction) (2) serial clock receive (signal)
SCT	serial clock transmit (signal)
SCTL	storage control card
SD	send data (signal)
SDF	serial data field (storage)
SDLC	Synchronous Data Link Control
SE	system engineer
SES	secondary status (storage)
SET	signal element timing (signal)
SHM	short hold mode
SHR	subtract halfword register (instruction)
SI	select in
SIDI	serial in data in
SIM	set initialization mode (SDLC)
SIO	start input/output
SIT	scanner internal trace
SKA	storage key address
SKDR	storage-protect key data register
SL	serial link
SMPS	switching module power supply
SMUXA	single multiplex card for lower board on LIC 2
SMUXB	single multiplex card for upper board on LIC 2
SNA	Systems Network Architecture
SNRM	set normal response mode (SDLC)
SO	select out
SODO	serial out data out
SOH	start of heading (BSC)
SP	storage protect
SPAE	storage protect/ address exception

SPK	storage protect key
SR	subtract register (instruction)
SRI	subtract register immediate (instruction)
SRL	shift register latch
SS	start-stop
SSB	system status block
SSCP	system services control point
SSP	system support programs
ST	store (instruction)
STC	store character (instruction)
STCT	store character and count (instruction)
STER	switch terminator
STH	store halfword (instruction)
STG	storage
STO	storage (card)
STX	start of text (BSC)
SVC	supervisor call
SW	switch
SWER	switch error register
SYN	synchronous idle (BSC)
SYSGEN	system generation
T	transmit (signal)
TA	tag address
TAP	trace analysis program
TAR	temporary address register
TB	terminator block
TC	transmit clock
TCAM	Telecommunications Access Method
TCB	task control block
TCC	trace correlation counter (storage)
TCM	1) thermally-controlled module 2) treillis coded modulation
TCP	test connector pin
TCS	two-channel switch
TCTR	transient error counter
TD	1) tag data 2) transmitted data (signal)
TERM	terminator
TG	transmission group
TH	transmission header
TI	test indicator (signal)
TIC	token-ring interface coupler
TIC1	token-ring interface coupler type 1 (card)
TIC2	token-ring interface coupler type 2 (card)
TICB	trace interface control block
TIO	test I/O
TLNVT	trace line vector table
TOD	time of day
TPS	two-processor switch
TPSA	trace parameter status area
TRA	token-ring adapter
TRM	1) token-ring multiplexer card that controls up to two TICs 2) test register under mask (instruction)
TRSS	token-ring subsystem
TRU	trace record unit
TSET	transmitter signal element timing (signal, same as TC)
TSS	transmission subsystem
TSSB	FRU name for LA board (basic) with no TRA adapters
TSST	FRU name for LA board (basic) with TRA adapters
TTA	translate table area
TTD	temporary text delay (BSC)
T1	US service for very high speed transmissions at 1.5 million bps
UA	unnumbered acknowledgment (SDLC)
UC	universal controller
UCW	unit control word
UE	unit exception (channel status)
UEPO	unit emergency power-off
UK	United Kingdom
UKA	user key address
UKP	user key program
UKDR	user key data register
UKL	user key level interrupt
URSF	universal remote support facility
USASCII	(see *ASCII*)
µs	microsecond
uv	undervoltage
V	volt
VB	valid byte (signal)
VAC	volts, alternating current
VCNA	VTAM node control application
VDC	volts, direct current
VFO	variable frequency oscillator
VH	valid halfword (signal)
VPD	vital product data
VRC	vertical redundancy check
VS	virtual storage
VSE	Virtual Storage Extended

VTAM	Virtual Telecommunications Access Method
V.24	CCITT V.24 recommendation
V.25	CCITT V.25 recommendation
V.28	CCITT V.28 recommendation
V.35	CCITT V.35 recommendation
W	watt
WACK	wait before transmit positive acknowledgment (BSC)
WB	wrapback (signal)
WKR	work register
WSDR	wide storage data register
XI	X.25 SNA interconnection
XID	exchange identification
XCR	exclusive OR character register (instruction)
XHR	exclusive OR halfword register (instruction)
XOR	exclusive OR
XR	exclusive OR register (instruction)
XREG	external registers
XRI	exclusive OR register immediate (instruction)
X.21	CCITT X.21 recommendation
X.25	CCITT X.25 recommendation
YZxxx	wiring diagram
ZI	zero insert
ZREG	Z register

Glossary

This glossary defines all new terms used in this manual. It also includes terms and definitions from the *IBM Dictionary of Computing*, GC20-1699.

adapter-initiated operation (AIO). A transfer of up to 256 bytes between an adapter (CA or LA) and the CCU storage. The transfer is initiated by an IOH/IOHI instruction, and is performed in cycle stealing via the IOC bus.

addressing. A technique where the control station selects, among the DTEs that share a transmission line, the DTE to which it is going to send a message.

alarm. A message sent to the MOSS console. In case of an error a reference code identifies the nature of the error.

alert. A message sent to the host console. In case of an error a reference code identifies the nature of the error.

asynchronous transmission. Transmission in which each character is individually synchronized, usually by the use of start and stop elements. The start-stop link protocol, for example, uses asynchronous transmission. Contrast with *synchronous transmission*.

auto-answer. A machine feature that allows a DCE to respond automatically to a call that it receives over a switched line.

auto-call. A machine feature that allows a DCE to initiate a call automatically over a switched line.

autoBER. A program to automatically analyse a BER file.

automaint. A function that uses autoBER to isolate failing FRUs.

availability. The degree to which a system or resource is ready when needed to process data.

Bell 212A. Bell recommendations on transmission interface

binary synchronous communication (BSC). A uniform procedure, using standardized set of control characters and character sequences, for synchronous transmission of binary-coded data between stations.

box event record (BER). Information about an event detected by the controller. It is recorded on the disk/diskette and can be displayed on the operator console for event analysis.

block multiplexer channel. A multiplexer channel that interleaves blocks of data. See also *byte multiplexer channel*. Contrast with *selector channel*.

byte multiplexer channel. A multiplexer channel that interleaves bytes of data. See also *block multiplexer channel*. Contrast with *selector channel*.

cache. A high-speed buffer storage that contains frequently accessed instructions and data; it is used to reduce access time.

central control unit (CCU). In the 3745, the controller hardware unit that contains the circuits and data flow paths needed to execute instructions and to control its storage and the attached adapters.

channel. A one-way path between a host and the controller.

channel adapter (CA). A communication controller hardware unit used to attach the controller to a host processor.

channel interface. The interface between the controller and the host processors.

clear channel. Mode of data transmission where the data passes through the DCE and network, and arrives at the receiving communication controller (for example, the IBM 3745) unchanged from the data transmitted. The DCE or network can modify the data during transmission because of certain network restrictions, but must ensure the received data stream is the same as the transmitted data stream.

command list. In NetView, a sequential list of commands and control statements that is assigned a name. When the name is invoked (as a command) the commands in the list are executed.

communication common carrier. In the USA and Canada, a public data transmission service that provides the general public with transmission service facilities. For example, a telephone or telegraph company (see also *Post Telephone and Telegraph* for countries outside the USA and Canada).

communication controller. A communication control unit that is controlled by one or more programs stored and executed in the unit. Examples are the IBM 3705, IBM 3725/3726, IBM 3720, and IBM 3745.

communication network management (CNM) application program. An ACF/VTAM application program authorized to issue formatted management services request units containing physical-unit-related requests and to receive formatted management services request units containing information from physical units.

communication scanner. See *scanner*.

communication scanner processor (CSP). The processor of a scanner.

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communication subsystem. The part of the controller that controls the data transfers over the transmission interface.

configuration data file (CDF). A MOSS file that contains a description of all the hardware features (presence, type, address, and characteristics).

control panel. A panel that contains switches and indicators for the use of the customer's operator and service personnel.

control program. A computer program designed to schedule and to supervise the execution of programs of the controller.

control subsystem (CSS). The part of the controller that stores and executes the control program, and monitors the data transfers over the channel and transmission interfaces.

customer engineer (CE). See *IBM service representative*

cyclic redundancy check. A system of error checking performed at both the sending and receiving station after a block check character has been accumulated.

cyclic redundancy check character (CRC). A character used in a modified cyclic code for error detection and correction.

data circuit-terminating equipment (DCE). The equipment installed at the user's premises that provides all the functions required to establish, maintain, and terminate a connection, and the signal conversion and coding between the data terminal equipment (DTE) and the line. For example, a modem is a DCE (see *modem.*)

Note: The DCE may be separate equipment or an integral part of other equipment.

data communication channel. See *channel*.

data host. A host running application programs only.

data terminal equipment (DTE). That part of a data station that serves as a data source, data sink, or both, and provides for the data communication control function according to protocols.

DIN. Technology of connector contacts.

direct attachment. The attachment of a DTE to another DTE without a DCE.

direct-current interlock (DCI). A mode of data transfer over an I/O interface to enable communication between data processing systems through a channel.

diskette. A thin, flexible magnetic disk, and its protective jacket, that records diagnostics, microcode, and 3745 files.

diskette drive. A mechanism that reads and writes diskettes.

DOS/VS. Disk Operating System/Virtual Storage.

duplex transmission. Data transmission in both directions at the same time. Contrast with *half-duplex*.

Emulation Program (EP). An IBM licensed program that allows a channel-attached communication controller to emulate the functions of an IBM 2701 Data Adapter Unit, an IBM 2702 Transmission Control, or an IBM 2703 Transmission Control.

error recovery procedure (ERP). A procedure designed to help isolate and, where possible, to recover from errors in equipment. The procedures are often used in conjunction with programs that record the information on machine malfunctions.

fallback. In twin-backup mode, a state where the traffic of the failing CCU has been redirected to the second one.

In standby mode, a state where the traffic of the failing CCU has been redirected to the standby CCU after it is IPLed.

front-end scanner (FES). A circuit that scans the transmission lines, serializes and deserializes the transmitted characters, and manages the line services. It is part of the scanner.

half-duplex. Data transmission in either direction, one direction at a time. Contrast with *duplex*.

high-performance transmission subsystem (HPTSS). The part of the controller that controls the data transfers over the high-speed transmission interface (speed up to 2 million bps).

The HPTSS consists of up to eight high-speed scanners (HSSs).

high-speed scanner. Line adapter for lines up to 2 million bps, composed of a communication scanner processor (CSP) and a front-end high-speed scanner (FESH).

high-speed transfer. A mode of high-speed data transmission over an I/O interface to enable communication between data processing systems through a channel.

hit. In cache operation, indicates that the information is in the cache storage.

host processor. (1) A processor that controls all or part of a user application network. (2) In a network, the processing unit in which the access method for the network resides. (3) In an SNA network, the processing unit that contains a system services control point (SSCP). (4) A processing unit that executes the access method for attached communication controllers. Also called *host*.

IBM service representative. An individual in IBM who performs maintenance services for IBM products or systems.

initial microcode load (IML). The process of loading the microcode into a scanner or into MOSS.

initial program load (IPL). The initialization procedure that causes 3745 control program to commence operation.

input/output control (IOC). The circuit that controls the input/output from/to the channel adapters and scanners via the IOC bus.

internal clock function. A LIC function that provides a transmit clock for sending data, and retrieves a receive clock from received data, when the modem does not provide those timing signals. When the terminal is connected in direct-attach mode (without modem) the ICF also provides the transmit and receive clocks to the terminal, via the LIC card.

internal function test (IFT). A set of diagnostic programs designed and organized to detect and isolate a malfunction.

LIC module. A group of four adjacent LICs.

LIC unit. A line interface coupler unit (LIU) consisting of:

- One power supply (PS) associated with
- Two LIC boards (LIBs), housing
- Multiplex cards (DMUX, SMUXA, or SMUXB), and
- Line interface coupler cards (LICs)

line. See *transmission line*.

line adapter (LA). The part of the TSS, HPTSS, or TRSS that scans and controls the transmission lines. Also called *scanner*.

For the TSS the line adapters are low-speed scanners (LSSs).

For the HPTSS the line adapters are high-speed scanners (HSSs).

For the TRSS the line adapters are token-ring adapters (TRAs).

line interface coupler (LIC). A circuit that attaches up to four transmission cables to the controller.

Link Problem Determination Aid (LPDA). A set of test facilities resident in the IBM 386X/586X modems and activated from the control program in the controller and from host.

link protocol. The set of rules by which a logical data link is established, maintained, and terminated, and by which data is transferred across the link.

Logrec. Error logging program managed via the operating system.

longitudinal redundancy check (LRC). A system of error checking performed at the receiving station after a block check character has been accumulated.

low-speed scanner. Line adapter for lines up to 256 kbps, composed of a communication scanner processor (CSP) and a front-end low-speed scanner (FESL).

maintenance and operator subsystem (MOSS). The part of the controller that provides operating and servicing facilities to the customer's operator and the IBM service representative.

microcode. A program, that is loaded in a processor (for example, the MOSS processor) to replace a hardware function. The microcode is not accessible to the customer.

miss. In cache operation, indicates that the information is not in the cache storage.

modem (modulator-demodulator). A functional unit that transforms logical signals from a DTE into analog signals suitable for transmission over telephone lines (modulation), and conversely (demodulation). A modem is a DCE. It may be integrated in the DTE.

MOSS input/output control (MIOC). The circuit that controls the input/output from/to the MOSS.

multiplexer channel. A channel designed to operate with a number of I/O devices simultaneously. Several I/O devices can transfer records at the same time by interleaving items of data. See also *byte multiplexer, block multiplexer*.

multiplexing. In data transmission, a function that permits two or more data sources to share a common transmission medium so that each data source has its own channel.

multipoint connection. A connection established for data transmission among more than two data stations. The connection may include switching facilities.

NetView. An IBM licensed program used to monitor a network, manage it, and diagnose its problems.

network. See *user application network*.

Network Control Program (NCP). An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability.

nonswitched line. A connection between systems or devices that does not have to be made by dialing. The connection can be point-to-point or multipoint. The line can be leased or private. Contrast with *switched line*.

online tests. Testing of a remote data station concurrently with the execution of the user's programs (that is, with only minimal effect on the user's normal operation).

Operating System/Virtual Storage (OS/VS). A family of operating systems that control IBM System/360 and System/370 computing systems. OS/VS includes VS1, VS2, MVS/370, and MVS/XA:

operator console. The IBM Operator Console that is used to operate and service the 3745 through the MOSS. A local console must be located within 7 m of the 3745. Optionally an alternate console may be installed up to 120 m from the 3745, or a remote console may be connected to the 3745 through the switched network.

owning host. A host which can IPL a 3745 and also run application programs.

partitioned emulation programming (PEP) extension. A function of a network control program that enables a communication controller to operate some telecommunication lines in network control mode while simultaneously operating others in emulation mode.

phototransistor. An electronic part used to sense the light of a light-emitting diode.

point-to-point connection. A connection established between two data stations for data transmission. The connection may include switching facilities.

polling. The process whereby remote stations are invited, one at a time, to transmit.

post telephone and telegraph (PTT). A generic term for the government-operated common carriers in countries other than the USA and Canada. Examples of the PTT are British Telecom in the United Kingdom, Deutsche Bundespost in Germany, and Nippon Telephone and Telegraph Public Corporation in Japan.

program-initiated operation (PIO). A transfer of four bytes between a general register in the CCU and an adapter (channel or scanner). The transfer is initiated by IOH/IOHI instruction and is executed via the IOC bus.

reliability. The ability of a functional unit to perform a required function under stated conditions, for a stated period of time.

scanner. A device that scans and controls the transmission lines. Also called *line adapter*.

selector channel. An I/O channel designed to operate with only one I/O device at a time. Once the I/O device is selected, a complete record is transferred one byte at a time. Contrast with *block multiplexer channel, multiplexer channel.*

services. A set of functions designed to facilitate the maintenance of a device or system.

serviceability. The capability to perform effective problem determination, diagnosis, and repair on a data processing system.

single. Configuration with one CCU

start-stop. A data transmission system in which each character is preceded by a start signal and is followed by a stop signal.

switchback. Operation to reset a twin-backup configuration from fallback to initial state.

switched line. A transmission line with which the connections are established by dialing, only when data transmission is needed. The connection is point-to-point and uses a different transmission line each time it is established. Contrast with *nonswitched line.*

Synchronous Data Link Control (SDLC). A discipline conforming to subsets of the Advanced Data Communication Control Procedures (ADCCP) of the American National Standards Institute (ANSI) and High-level Data Link Control of the International Organization for Standardization, for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges may be duplex or half-duplex over switched or nonswitched links. The configuration of the link connection may be point-to-point, multipoint, or loop.

synchronous transmission. Data transmission in which the sending and receiving instruments are operating continuously at substantially the same frequency and are maintained, by means of correction, in a desired phase relationship. Contrast with *asynchronous transmission.*

Systems Network Architecture (SNA). The description of the logical structure, formats, protocols, and operational sequences for transmitting information through a user application network. The structure of SNA allows the users to be independent of specific telecommunication facilities.

time out. The time interval allotted for certain operations to occur.

token-ring subsystem (TRSS). The part of the controller that controls the data transfers over an IBM Token-Ring Network.

The TRSS consists of up to four token-ring adapters (TRAs).

token-ring adapter (TRA). Line adapter for an IBM Token-Ring Network, composed of one token-ring multiplexer card (TRM), and two token-ring interface couplers (TICs).

The TRSS consists of up to four token-ring adapters (TRAs).

transmission interface. The interface between the controller and the user application network.

transmission line. The physical means for connecting two or more DTEs (via DCEs). It can be nonswitched or switched. Also called *line.*

transmission subsystem (TSS). The part of the controller that controls the data transfers over low- and medium-speed, switched and non switched transmission interfaces.

The TSS consists of:

- Up to 32 low-speed scanners (LSSs) associated with
- LIC units (LIUs), through
- Serial links (SLs).

TSST board. line adapter board for token-ring adapters

twin. Configuration with two CCUs.

twin-dual. Mode of operation with two CCUs operating simultaneously in two distinct subareas.

twin-backup. Mode of operation identical to twin-dual with fallback capability.

twin-standby. Mode of operation with one CCU active and the other in standby, ready to take over.

two-processor switch (TPS). A feature of the channel adapter that connects a second channel to the same adapter.

user application network. A configuration of data processing products, such as processors, controllers, and terminals, for the purpose of data processing and information exchange. This configuration may use circuit-switched, packet-switched, and leased-circuit services provided by carriers or the PTT. Also called *user network*.

vertical redundancy check (VRC). An odd parity check performed on each character of a block as the block is received.

V.24,25,35. EIA/CCITT recommendations on transmission interfaces

X.20 bis, 21, 21 bis, 21 native, 25. CCITT recommendations on transmission interfaces

IBM 3745 Communication Controller
Models 210, 310, 410, and 610
Maintenance Information Procedures (MIP)
Part 2
Order No. SY33-2054-6

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