IBM 3720 Communication
Controller, and
IBM 3721 Expansion Unit

IBM Maintenance Library:

Service Guide

System/370, 30xx, 4300
and 9370 Processors

IBM

Where to Go if you Want to:

- Connect to MOSS and access MOSS function menus, Know your console and understand MOSS panels.   Chap.1 | Introduction |

- Understand BER (Box Event Record) panels, BER/FRU/Reference code correlation.   Chap.2 | BER |

- Run diagnostics and OLTs from the console.   Chap.3 | Diagnostics |

- Display/alter scanner control storage and registers, dump/IML a scanner, or scanner AC (address compare), start scanner checkpoint trace.   Chap.4 | TSS Functions |

- Display storage, dumps and modules (hexadecimal). Delete dump files or the BER file.   Chap.5 | Display/Delete |

- Handle (apply and restore) microcode fixes (MCFs).   Chap.6 | MCF |

- Handle (create, modify, and apply) microcode patches.   Chap.7 | Microcode Patch |

- Create, upgrade, and display/update the configuration data file (CDF).   Chap.8 | CDF |

- Display and use control panel functions from the console.   Chap.9 | Panel Functions |

- Save, restore, format, and change the MOSS disk. Install an engineering change (EC).   Chap.10 | Disk Functions |

- Display, alter, or dump token-ring registers, storage, and parameter blocks.   Chap.11 | TRSS Functions |

- IPL the 3720 or IML a scanner, display Machine Level Table (MLT), run in diskette mode, use wrap tests, perform the Stand Alone Link Tests (SALT), take a MOSS, scanner or TIC dump, transfer files to the host.   Chap.12 | Other Functions |

- Run MOSS and transfer/print files from/to remote PC.   Appx.A | Remote PC |

- See the explanation and action for messages or alarms.   Appx.B | Messages |

Other functions: See next page for the information on the functions, procedures and items that are described in other manuals.

The following table lists the functions available to the user. This table also indicates in which manual you can find how to select and run the function, and a detailed description of that function.

Abbreviations Used for 3720 Publications

Throughout this manual we will use abbreviations when referring to manuals:

- *PD* for *3720/3721 Problem Determination*
- *ES* for *3720/3721 Extended Services*
- *Diag* for *3720 Diagnostic Descriptions*
- *MIP* for *3720 Maintenance Information Procedures*
- *MIR* for *3720 Maintenance Information Reference*
- *OPG* for *3720 Operator's Guide*
- *SU* for *3720 Setup Instructions*
- *IM* for *3720-1/11 Installation Manual*
- *SI* for *3720 System Integration*

Note: For more information concerning these manuals, see the 3720 bibliography (vi).

Functions described	In
Control program procedure (C).	ES
Configuration data file (CDF).	also ES
Line description file (LDF).	ES only
Line interface display (LID).	ES only
Link IPL ports (LKP).	ES
Link test (responder and requester).	ES
Port swap (PS).	ES
Stand-Alone Link Test (SALT)	also ES
Token-ring interface (TRI).	ES
Wrap tests(Internal, Modem, cable, tailgate)	also ES
CCU functions such as address compare, CA state,	ES
data exchange, display alter, display long,	ES
MOSS online or offline, set/reset branch trace.	ES
Immediate Functions such as stop, set/reset IOC, CCU	ES
Alert/Alarm/messages and password management (P)	also PD
Installation (customer) of 3721 or 3720-2/12 (no CA)	SU
Installation (maintenance) of 3720-1/11 (with CA)	IM
Integration of the 3720 into the network	SI
3720 power ON and OFF (local, remote host/network)	OPG
3720 IPL from control panel	OPG
Control panel description	OPG, MIP
Hexadecimal codes (Panel)	MIP, MIR
Diagnostics from panel, reference codes and FRUs	MIP
Reference information on: CCU, TSS, TRA and CAs,	
MOSS and adapters, buses and redrives,	
disk and diskette drives, power supplies,	
traces, dumps, BERS	MIR
Detailed description on diagnostics	Diag

Note: *also* means that the function is described in this manual, as well as in the manual listed.

Read this First

This Manual Is Addressed To...

The service representatives who maintain the 3720 Communication Controllers.

This manual describes how the service functions, which are specifically for the CE and not intended for customer use, are used from the operator console.

Note: The operator panel procedures are not given in this manual.

Primary audience: Product Support Trained (PST) CE

Secondary audience: Area Support, Program Service Representative, Product Engineering

A more complete definition of the service personnel is given in "Service Personnel Definitions" on page vii.

This manual must be used in conjunction with the 3720 bibliography, as described in "Bibliography" on page vi.

Safety Inspection Procedures

Any deficiencies detected by running safety inspection procedures, if they make the 3720/3721 unsafe, must be reported to the owner and/or user. Then, before any repair action is performed, the IBM CE will correct these deficiencies by:

- Following the repair procedures given in the maintenance package.

- Ordering the missing or failing parts, using the *3720 Parts Catalog*.

The 3720 areas and functions checked through safety inspection 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
8. Emergency power OFF.

Important note: The *Safety Inspection Procedures* section at the beginning of the *Maintenance Information Reference* manual, SY33-2040, gives all details concerning:

- The various safety labels, and where they are located

- The circuit breakers (CBs) and circuit protectors (CP) locations, identifications, and ratings.

Bibliography

Customer Documentation

Volume	Model	Manual	Form No.
VOL A	3720-1 3720-2 3720-11 3720-12 All models	Feature Addition Instructions Setup Instructions Feature Addition Instructions Setup Instructions System Integration	GA33-0110 GA33-0112 GA33-0111 GA33-0113 GA33-0067
	3721	Setup Instructions	GA33-0114
VOL B	All models	Operator's Guide Problem Determination Guide	GA33-0065 GA33-0086
VOL C	All models	Extended Services	GA33-0066

Service Documentation

Volume	Model	Manual	Form No.
VOL 1	3720-1/2 3720-11/12	Maintenance Information Procedures (MIP) MIP	 SY33-2050 SY33-2060
VOL 2	All models	Quick Reference Summary Maintenance Information Reference (MIR). 2 volumes	SY33-2058 SY33-2040
VOL 3	All models	Service Guide	SY33-2039
VOL 4	3720-1/11 All models	Installation Manual Parts Catalog	SY33-2053 S135-2009
VOL 5	All models	Wiring Diagram	(Part No.)
Other service Documentation (not in shipping group)			
	3720/3721	RETAIN URSF Guide (IBM internal use only)	ZZ33-7001
	3720/3721	Diagnostic Descriptions	SY33-2042
	3720/3721	Channel Adapter On-Line Tests (with S/370 CAOLT tape)	D99-3720-A

Note: "Service Personnel Definitions" on page vii describes the user of the service documentation.

Volume and Kit Relationship

Most volumes are delivered in kit form, as follows:

Kit SK2T-0271: Volume 1 (3720-1, 3720-2)
Kit SK2T-0272: Volume 2-1 and 2-2
Kit SK2T-0273: Volume 3
Kit SK2T-0274: Volume 4
Kit SK2T-0275: Volume 4
Kit SK2T-0277: Volume B
Kit SK2T-0278: Volume C
Kit SK2T-0279: Volume 1 (3720-11, 3720-12)
Kit SK2T-0280: Volume A (3720-1)
Kit SK2T-0281: Volume A (3720-11)
Kit SK2T-0282: Volume A (3720-2)
Kit SK2T-0283: Volume A (3720-12)

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
	Control panel
	RETAIN URSF Guide
	MIP
	Parts Catalog
	3720-1/11 Installation Manual
	Problem Determination Guide
	Extended Services
	Operator's Guide
	System Integration
	Setup Instructions
	(Occasionally: 3720 console and 3720 Service Guide)

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:
	3720 console
	Service Guide
	MIR
	Quick Reference Summary
	YZ pages
	Diagnostics Descriptions
	Principles of Operation

Higher Support:
 	
    Area
    Country
    PE
    Lab Specialist
	Same as PST CE, plus:
	
	Engineering Tools
	Specifications
	Workbooks

Hardware Central Service (HCS)
 	
May include:
 	
    Dispatchers
    PT CEs
    PST CEs
	All 3720 tools and books

Program Service Representative (PSR)
 	
Also called:
 	
    Product Support CE
    Software CE
	NCP/EP library

Contents

Chapter 1. Introduction

Controller Organization

Depending on the Model used, the 3720 Communication Controllers are equipped with one or more of the following subsystems:

- Control subsystem
- Transmission subsystem
- Token-ring subsystem
- Maintenance and operator subsystem

Control Subsystem

The control subsystem (CSS) controls data transfers over the channel interface and executes the control program. It is composed of the central control unit (CCU) with its associated storage, and from zero to two channel adapters (CA).

Transmission Subsystem

The transmission subsystem (TSS) controls data transfers over the transmission interface. It consists basically of up to three communication scanner processors (CSPs) and a certain number of line interface couplers (LICs).

Token-Ring Subsystem

The token-ring subsystem (TRSS) controls data transfers over IBM token-ring local area networks. It consists basically of one token-ring multiplexor (TRM) which controls up to two token-ring interface couplers (TICs). A TRM and its TIC(s) are referred to as the token-ring adapter (TRA).

Maintenance and Operator Subsystem

The maintenance and operator subsystem (MOSS) provides the operating and service facilities to the customer's operator and to the customer engineer (CE). The MOSS includes a processor and storage, a diskette drive, a disk drive, a control panel, and their adapters.

An operator console can be direct-attached to the MOSS. A DCE-attached console may reach the 3720 by dialing through a telecommunication network.

Interfaces

All 3720 communication controllers interface with the user network via the transmission interface or the token-ring interface.

The 3720 Models 1 and 11 interface with the host processor(s) via the channel interface.

Programming Support for the 3720

The control program that runs in the CCU may be:

- ACF/NCP

  Advanced Communication Functions for Network Control Program (ACF/NCP) (simply called the NCP in this manual) is an IBM licensed program product. The NCP provides major capabilities for SNA user application networks with SDLC. However, the NCP is not limited to SDLC devices, and existing start-stop and binary synchronous networks can be migrated to the 3720.

The token-ring interconnection is integrated in the NCP. It is referred to as NTRI (Network Token-Ring Interconnection). NTRI also ensures the detection of ring-related problems.

The NCP works with ACF/VTAM.

The NCP supports the communication network management (CNM) concept when operating with the following IBM licensed programs:

- NetView, a network management product which integrates NCCF, NPDA, NDLM, VCNA, and NMPF
- Network Communication Control Facility (NCCF)
- Network Problem Determination Application (NPDA)
- Network Logical Data Manager (NLDM)

In the 3720, the communication network management is supported by sending failure messages called alerts from the MOSS to the host for display. For most failures, these messages are sufficiently explicit so that the customer can take the appropriate corrective action. Similar messages, called alarms, are sent to the operator console of the controller.

- The Emulation Program

The Emulation Program for the 3720 (EP/3720, simply called the EP in this manual) emulates most of the functions of the IBM 2701, 2702, or 2703, and can communicate with various access methods running in the host. The EP can run only in a channel-attached 3720. When the EP is used, the host must provide a separate subchannel for each line.

The EP works with TCAM, BTAM, and BTAM Extended Support.

The EP does not support the token-ring attachment (3720 Models 11 and 12).

- The Partitioned Emulation Programming (PEP) Extension.

The PEP is the Network Control Program and Emulation Program merged into one.

- Programming Support for the Host

A number of IBM system support programs (SSPs) are available. They are executed in the host and are used to generate the control programs and load them into the controller, dump the controller storage on the host printer, and transfer disk files to the host.

Maintenance Philosophy

The maintenance of the 3720 is based on:

1. Error detection by hardware and software.

2. Error collection by the control program and the MOSS microcode.

3. Error notification to the customer through alarm and alert messages (NetView or NPDA), or alarm messages (EP).

4. Problem determination by the customer at the host site and the controller' site so as to call the appropriate service personnel.

5. Problem isolation by service personnel.

6. FRU replacement, repair, and verification.

Concurrent Maintenance

Generally, the controller is not available to the customer when the diagnostics are being run, or if a field-replaceable unit (FRU) is being replaced. However, the controller is available to the customer when a repair is being made in the disk/diskette drive or the operator console, or when diagnostics are being run only for testing the MOSS.

This mode of operation is called concurrent maintenance.

Repair Action in Case of Solid Error

A failing FRU may be indicated by the following error information:

- Repair action codes (RACs) given by the offline diagnostics on the operator console or on the control panel's hexadecimal display.

- Error codes given by the IPL checkout programs on the control panel's hexadecimal display.

Intermittent Error

If an intermittent error is not confirmed by the diagnostics, the automatic BER analysis program may issue a reference code that identifies the suspected FRUs.

Any error indication points to a list of suspected FRUs and replacement procedures in the *3720 Maintenance Information Procedures* (MIP) (SY33-2050 or SY33-2060 depending on the model that is being serviced).

MOSS Operator Consoles

Console Hardware Prerequisite

The console to be used to communicate with MOSS is:

- The IBM 3161 Models 11 and 12 in 3101 emulation mode.
- The IBM 3163 Models 11 and 12 in 3101 emulation mode.
- The IBM 3164 Models 11 and 12 in 3101 emulation mode.
- The IBM PC 5150, 5160, 5155, 5170, or 5550 with an Asynchronous Communication Adapter (or equivalent), running the IBM 3101 emulation program number 6024-042.
- The IBM 3101 Model 23 or any other operator console with the same characteristics.

The related documentation is:

- The IBM PC 3101 Emulation program, 6024042
- The IBM 3101 Display Terminal Description, GA18-2033
- The IBM 3161/3163 ASCII Display Station Description, GA18-2310

Note: The service personnel, when at the 3720 location, and when no customer console is available, uses the IBM Portable PC (5155) with the 3101 emulation program or the PT2.

Possible Console Connection to MOSS
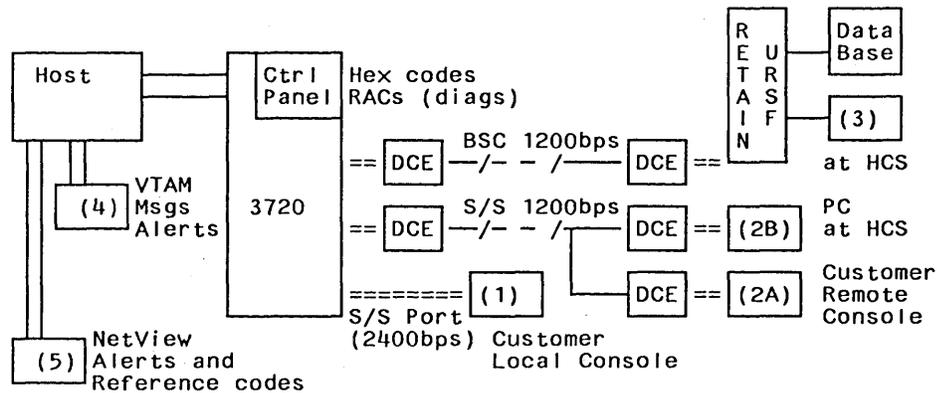
Figure 1-1. Remote and Onfsite Service By PS CE

- Console *1* is the customer's or IBM's local console (PC or PT2).
- Consoles *2A, 2B* are the customer's or IBM's remote console.
- Console *3* is the IBM RSF (RETAIN) console.
- Consoles *4, 5* are the customer's VTAM and NetView consoles.

Note: All the consoles of Figure 1-1 may not be present, depending on the customer's installation. **If RSF is not provided, there must be at least one local 3101-like customer's console available for the 3720.** This console need not be dedicated to the 3720.

MOSS Console Screen Layout

The console and keyboard of the 3101-like terminal are fully described in the *IBM 3101 Display Terminal Description*, GA18-2033.

The MOSS operator screen is divided as illustrated in Figure 1-2.

```
                            MACHINE STATUS AREA (MSA)


    CUSTOMER ID: .............        3720-1              SERIAL NUMBER: xxxxx
    -------------------- MAINTENANCE MODE --------------------------------
    FUNCTION ON SCREEN              FUNCTION PENDING:


    SYSTEM INPUT AREA (SIA) ===>     <---- Selection Message Area (45) ---->
    T:TERMINATE  OFF: LOGOFF  PF1: MOVE TO SIA   PF2: CCU FNCTN   PF3: ALARM


                       3720  FUNCTION   MENU
                                or
                    CCU  FUNCTION   MENU
                                or
          FUNCTION AREA when a function is selected



    <-----------------FUNCTION MESSAGE AREA---------------------------->
    ALARM:
```
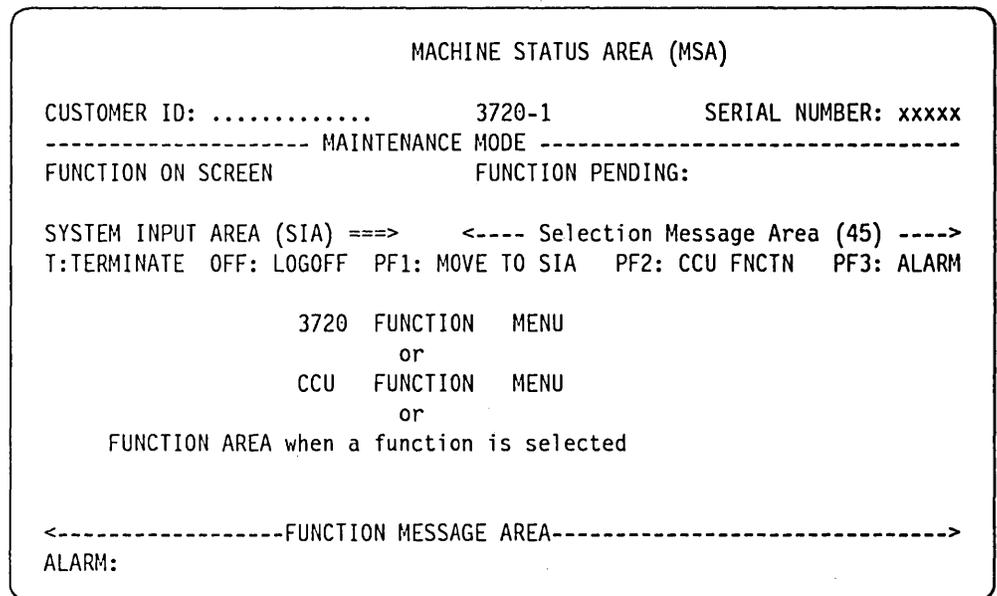
Figure 1-2. The 3720 Console Screen Main Areas

MACHINE STATUS AREA: Shows the current status of the 3720, or IPL progression (see details in "Machine Status Area" on page 1-20).

CUSTOMER ID: Customer identification. Permanently displayed.

> This information is entered by the customer using the *password management function*.

MAINTENANCE MODE: This line is displayed on all screens when MOSS is used by the maintenance personnel.

> **Warning:** If MOSS is used in local mode, it means that the MOSS CE switch 3 is ON, and that MOSS can be accessed without a password.

> Follow the *Leaving Procedure After Local Connection* before giving the 3720 back to the customer:

> 1. Set Panel-Console switch to Panel.
> 2. Set MOSS CE Switch 3 to the OFF position.
> 3. IML MOSS from panel.

FUNCTION ON SCREEN: This sentence appears when a function is displayed. The name of the function is written next to it.

SERIAL NUMBER: Machine serial number of the 3720. Permanently displayed.

> This information is entered by manufacturing, or when formatting a new disk.

FUNCTION PENDING: This sentence appears when a function is pending. The name of the function is written next to it.

SYSTEM INPUT AREA (SIA) ==> Where the cursor should be to:

- Select a function
- Terminate (T) the MOSS function that was running
- Log off (OFF) from the MOSS application

Use PF1 to place the cursor in the *SIA*.

SELECTION MESSAGE AREA: Area (45 characters) in which to display messages relative to what you entered in the selection area.

FUNCTION AREA: Function display and operator input.

FUNCTION MESSAGE AREA: Area (80 characters) in which to display messages relative to the function area.

ALARM AREA: Area (65 characters) on line 24 in which to display alarms.

The alarms give the probable cause, the area of the error, and a reference code that may lead to a FRU list.

All alarms are listed in the *3720 Problem Determination* manual, GA33-0066, and in "Alarms" on page B-4.

Each new alarm replaces the previous one on the display (up to six).

When there is more than one alarm, the word **ALARM** is blinking.

Pressing PF3 displays the previous alarm.

Note: Input is possible only in the system input area or in the function area.

Explanations of Common Commands and PF Keys on Panel

OFF (Log off): If you enter *OFF* in the system input area, you are disconnected from MOSS.

Notes:

1. You **cannot** use *OFF* while a function is active or pending: use *T* to terminate it.

2. You **cannot** use *OFF* while the **CCU function menu** panel is displayed. Use *PF2* to return to the **3720 function menu** panel.

T (Terminate): If you enter *T* (terminate) in the system input area:

- If a function is running, it will terminate the function.

- The previous panel (**3720 function menu** panel or **CCU function menu** panel) will be displayed.

PF1: MOVE to SIA: Moves the cursor to the system input area, for you to type the function you selected, or T to terminate, or OFF to disconnect the user from MOSS.

PF2: CCU FNCTN: Pressing PF2 when you are on the **3720 function menu** panel (or using one of the functions of that panel), displays the **CCU function menu** panel (Figure 1-10 on page 1-17).

Pressing PF2 when you are on the **CCU function menu** panel (or using one of the functions of that panel), displays the **3720 function menu** panel (Figure 1-8 on page 1-15).

PF3: ALARM: Erases the latest alarm (if any) from the alarm area.

Displays the previous alarms.

Warning: Please note all information, especially the reference code, before erasing the alarm.

This information can still be found by displaying the BERs.

Keyboard Differences

Since the consoles may be of different types, the keyboards used may vary, from country to country, and from customer to customer.

For standardization, we use a specific terminology when referring to some keys of the keyboard.

Keyboard Terminology

SEND: This is the key pressed to confirm the data just typed. Sometimes called the *ENTER* key.

BREAK: This is the key pressed to interrupt the automatic transmission, in order to communicate directly with the system. Also called the *ATTN* key. Sometimes called the INTERRUPT key.

PFn: This is one of the programmable function keys (PF1-PF8) of the keyboard. Also called the *F* key.

For 3101-like operation information, see the description in the corresponding manual.
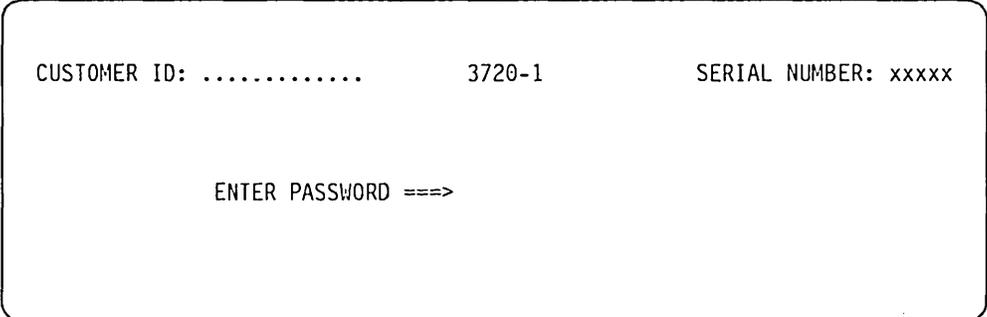
```
CUSTOMER ID:  ............      3720-1         SERIAL NUMBER: xxxxx



              ENTER PASSWORD ===>


```

Figure   1-3. The 3720 Console Password Entry Panel

How to Start, Select, and Perform a MOSS-3720 Function

The connection to MOSS can be:

- Local or remote, by the customer, using a 3101-like console (see the *3720/3721 Operator's Guide*, GA33-0065).

- Remote, by the service personnel, with or without RETAIN (see page 1-10).

- Local, by the service personnel (see page 1-12).

```
 ┌─────────┐                                      
 │         │    Start/Stop 2400 bps      ┌───────┐─ Portable PC
 │  3720   │J3│============================│       │─ PT2
 │         │    (direct-attached)         │       │─ Customer
 │         │                              └───────┘  Local Console
 └─────────┘                                      
```
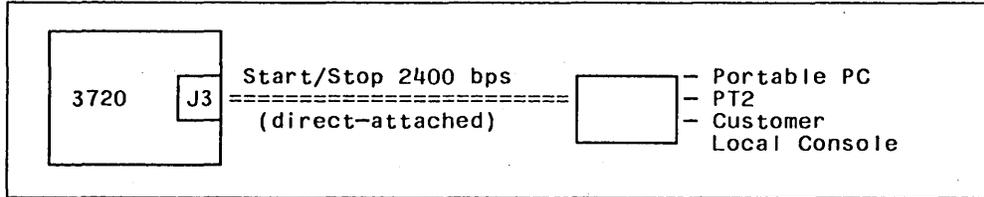
Figure 1-4. On†site Service By Product Support CE

```
                   Start/Stop 1200 bps       ┌───────┐ PC in 3101
 ┌─────────┐                                 │       │ Emulation
 │  3720   │J2│==│DCE│—/— — — — /—│DCE│==     │       │ Mode
 │         │                                 └───────┘
 └─────────┘

Or

 ┌─────────┐                                                    RETAIN
 │  3720   │                              ┌──────┐ ┌───────┐   Terminal
 │         │           BSC 1200 bps       │ URSF │ │       │
 │         │                              │      │ │       │
 │         │J4│==│DCE│—/— — — — /—│DCE│==│RETAIN│ └───────┘
 │         │                              │System│==
 └─────────┘                              └──────┘
```
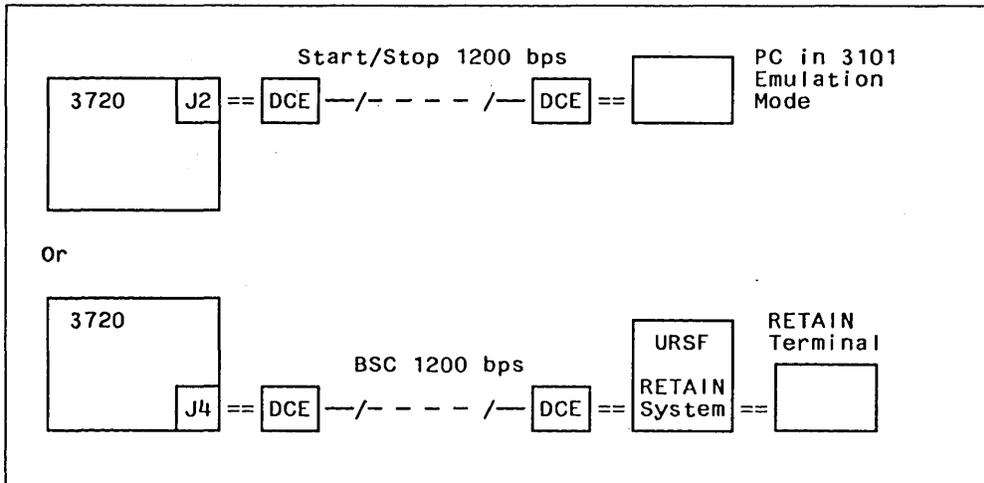
Figure 1-5. Remote Service By Product Support CE

Modem (DCE) Requirements for the Remote Console

This section will only explain the requirements for modems connected to the remote console.

The requirements for the other modems (URSF or 3720 side) are explained in the latest edition of the *3720 Configuration Guide*, GA33-0061.

Modem Transmission Standards

Modem with auto-answer and compatible with:

- IBM 5841 or equivalent (compatible with Bell 212-A) or IBM 5842 at 1200 bps or equivalent (CCITT V.22 bis) in the USA and Canada
- CCITT V.22 alternate B or V.22 bis (1200 bps) in other countries

Control Panel

Modem Operating Characteristics

- Asynchronous transmission
- Duplex operation
- Connection over a switched line
- Transmission speed: 1200 bps
- Ten bits per character
- Even parity for auto-dialing
- Talk/data switch for manual dialing
- Transmission in block mode
- Auto-answer is not used

Notes:

1. The modem at the 3720 end must be set to auto-answer, and have the auto-disconnect feature.
2. **Manual dialing is recommended** (with talk/data switch).

Example of 5841 Modem Switch Setting

The example below sets the switches of an IBM 5841 modem at the remote console site. (The modem at the 3720 site, if it is a 5841, should be set in the same way.)

```
Switch 1: ON;  RSLD (Received Line Signal Detector)
Switch 2: OFF; (not used)
Switch 3: OFF; Transmit Timing not applicable
Switch 4: ON;  Asynchronous mode
Switch 5: ON;  DTR (Data Terminal Ready)
Switch 6: OFF; Transmit Clock not applicable
Switch 7: ON;  RTS (Request to Send)
Switch 8: OFF; DSR (Data Set Ready)
```

Remote Connection to MOSS (without RETAIN)

If RETAIN is Available

All explanations on how to use URSF via RETAIN are given in the *3720 RETAIN URSF Guide*, ZZ33-7001.

The connection must be made through the *remote support facility (RSF) port* of the 3720. This connection could be used to run MOSS functions or send files (MCF or patch) onto the MOSS disk. Note that the connection of RETAIN to MOSS requires that no other console be using MOSS, and that MOSS be active.

If RETAIN is not Available

The remote connection to MOSS should be via a switched line to the customer's *remote console port*. This is the same port the customer would use for the connection of a remote 3101-like console to run MOSS functions.

The requirements and procedures are fully described below.

Remote Connection Procedure

1. Request the customer's permission to connect to the MOSS of the 3720.

2. Request the *remote maintenance password*.

3. Have the customer's operator log off any local or remote console that would still be using MOSS.

4. Make sure that MOSS is active (otherwise request a MOSS IML from the 3720 control panel).

5. Set the power on switch of the console to *ON*.

6. Set up the console as required:

   - If it is a PC: load the 3101 emulation program and set the required operating conditions (define the transmission parameters, or use the ones already defined as described in "Setting the Operating Conditions for an IBM PC" on page 1-12).

   - If it is a 3161, 3163, or 3164: set the console to 3101 mode and set the required operating conditions (define the transmission parameters, or use the ones already defined as described in "Setting the Operating Conditions for an IBM 3161/3163" on page 1-14).

   - If it is a 3101 Model 23: set the required operating conditions by setting the setup switches as follows (u= up, d= down):

     ```
     12345678    12345678    12345678    12345678
     --------    --------    --------    --------
     uuuu uu      uu uu      uuu uu       u u u u
          d d     d d  dd        d dd    d d d d
     ```

7. Power on the modem

   What the modem should be, and how the modem switches should be set is explained in "Modem (DCE) Requirements for the Remote Console" on page 1-9.

8. Dial manually, **using the telephone**, the number corresponding to the remote port of the 3720 through the switched network.

   When you receive the ring back tone, wait until you hear the answer tone, then set your modem to data mode and hang up.

9. The **Copyright** panel is displayed, then, when you press *SEND*, the **Password** panel is displayed (see Figure 1-3 on page 1-7).

10. From this panel:

- Type the *remote maintenance password* given to you by the customer, and press *SEND*.

  Note: This password must have been set previously by the customer, and activated:

  — **permanently**, in which case you may connect to MOSS several times, using the same password, or

  — **temporarily**, in which case, if you want to connect a second time to MOSS, the customer must first reactivate the remote maintenance password, using option 6 or 7 of the password update panel.

  If you enter an incorrect password, you are invited to re-enter the password, and at the third unsuccessful attempt, the terminal is disconnected from MOSS.

- Once the correct password is entered, the **3720 function menu** panel is displayed (Figure 1-8 on page 1-15).

Local Connection to MOSS by Service Personnel

If no customer console is available, the local connection to MOSS by service personnel should be made using a PT2 or a portable PC.

If MOSS is down, use the 3720 control panel: see the *3720 Maintenance Information Procedures* manual (MIP).

1. If using the IBM console (PC or PT2), make sure that the customer's remote console is disconnected from MOSS: Have the customer's operator type *OFF* in the *SIA* field of any MOSS panel, then press *SEND*.

2. Connect the console to the *Local console port* of the 3720, that is, out of the three, the middle one (02D-J3).

   Note: For the PT2 and the portable PC, do not forget to add the 'stub' cable, P/N 7 837 400, to the console cable.

3. Place the *MOSS CE Switch 3* (the third from the top), in the *ON* position.

4. Set the power on switch of the console to *ON*.

5. Set up the console as required:

   • If it is a PC: load the 3101 emulation program and set the required operating conditions (define the transmission parameters, or use the ones already defined as described in 1-12).

   • If it is a PT2: load the 3101 emulation program and set the required operating conditions for the 3720, following the instructions displayed on the PT2 panel.

   • If it is a 3161, 3163, or 3164: set the console to 3101 mode and set the required operating conditions (define the transmission parameters, or use the ones already defined as described in 1-14).

   • If it is a 3101 Model 23, set the required operating conditions by setting the setup switches as follows (u = up, d = down):

   ```
   12345678     12345678     12345678     12345678
   --------     --------     --------     --------
   uuuu uu       uu uu       uuu uu       uuu uuu
        d  d    d  d  dd         d  dd   d   d
   ```

   Note: For all types of console, the transmission speed must be set to 2400 bps.

6. IML the MOSS

   a. Set the *CA switches* to the state of the CA lamps.
   b. Set the Panel-Console switch to *panel*.
   c. Set the Function select switch to the *MOSS IML* position.
   d. Press *Function Start*.

The IML of MOSS takes place (shown by changes in the value of the hexadecimal display), and, after a few seconds (up to a minute), the **Copyright** panel is displayed, then, when you press *SEND*, the **3720 maintenance function menu** panel is displayed.

Setting the Operating Conditions for an IBM PC

If you have an IBM PC 5150, 5160, 5155, or 5170, select the required operating condition for the 3101 emulation mode by using the IBM PC Emulation Program.

See *IBM 3101 Emulation Program*, 6024042, for details on how to create or modify the parameters of your PC to emulate a 3101.

Procedure

1. Load the 3101 emulation program, if not already on the disk/diskette of your PC.

2. Type *SETUP* to call the setup program.

   A menu with 3 options will be displayed:

   > 1 - Select a specification file
   > 2 - Modify the specification file
   > 3 - Create a specification file

3. If it is the first time:

   a. Choose option 3 (create), and answer all questions as follows:

Question	Default	Enter
LINE SPEED (baud rate) to be used?	300	1200/2400 *
BLOCK MODE ? (Y=Block N=Character)	N	Y
PARITY ? (1=Odd 2=Even 3=Mark 4=Space)	2	2
STOP BITS ? (1 or 2)	1	2
AUTOMATIC LINE FEED ? (Y=Yes)	N	Y
CARRIAGE RETURN ? (Y=CR N=CR-LF)	Y	Y
NULL SUPPRESS ? (Y=Yes)	Y	Y
CHARACTER SENT AT END OF MESSAGE ? (1=ETX 2=CR 3=EOT 4=XOFF)	2	4
SCROLLING ? (Y=Yes)	Y	N

* Set speed to 1200 for remote console, 2400 for local console.

Figure 1-6. Parameters Defining the MOSS-PC Transmission

   b. Type only the parameters that are different from the default values.

   c. Give a file name to the set of specifications.

4. If it is **not** the first time: Choose option 1, and give the name of the specification file already created (or modified).

5. Type: **terminal**.

Setting the Operating Conditions for an IBM 3161/3163

IBM 3161/3163 ASCII Display Station description, GA18-2310, gives all details on how to create or modify the parameters of your 3161/3613 terminal.

Procedure

1. Press the Setup key.

   The *SETUP MENU* will be displayed.

2. Update the fields as shown in Figure 1-7:

   - Set machine mode to IBM 3101.
   - Keep the operating mode in block mode, that is, block and half-duplex operation.
   - Keep line control to RS232C (equivalent to CCITT V.24).
   - Set line speed to 1200 (2400 for local console).
   - Set parity to EVEN.
   - Set turnaround character to DC3 (X'19').
   - Set Stop bit to 2 (two stop bits for the console provide a long stop that will handle low quality transmissions).

   Note: Word length, response delay, break signal, and terminal ID have values set for the 3161. These values cannot be modified.

```
 _____
|                                                                |
|  Machine Mode        IBM 3101                                  |
|  Operating Mode      BLOCK                                     |
|                                                                |
|                      Main Port      Aux. Port                  |
|                                                                |
|  Interface           RS232C                                    |
|  Line Control        PRTS                                      |
|  Line Speed (Bps)    1200           1200                       |
|  Parity              EVEN           EVEN                       |
|  Turnaround character DC3 (X'19')                              |
|  Stop Bit            2              2                          |
|  Word Length (bits)  7              7                          |
|  Response Delay (ms) 100                                       |
|  Break signal (ms)   500                                       |
|                                                                |
|    Terminal ID     xxxxxxxxxxxxxxxx                            |
|_____|
```

Figure 1-7. Setting the Operating Conditions on a 3161/3163

3. Press the Select key.

   The *SELECT MENU* will be displayed.

4. Modify the SCROLL field to OFF. All other values are default values, and need not be changed. The select line must display the following:

```
 _____
|                                                                |
|  SELECT: SCROLL=OFF RETURN=CR LINE WRAP=ON AUTO LF=ON SEND=PAGE NULL SUPP=ON |
|_____|
```

Accessing MOSS Functions by Service Personnel

You have reached MOSS by one of the following means:

- In remote mode by entering the correct *remote maintenance password* on the **Password** panel.

- In local and disk mode, where MOSS is IMLed with the *MOSS IML* rotary position, AND with the MOSS CE Switch 3 set *ON* (in which case the logon process is bypassed).

- In local and diskette mode, where MOSS is IMLed with the *DISKETTE MODE* rotary position, AND with the MOSS CE Switch 3 set *ON* (in which case the logon process is bypassed).

In all cases the **3720 function menu** panel is displayed (see Figure 1-8).

```
                        MACHINE STATUS AREA (MSA)


 CUSTOMER ID: .............        3720-1            SERIAL NUMBER: xxxxx
 -------------------- MAINTENANCE MODE --------------------------------
 SYSTEM INPUT AREA (SIA) ===>      <---- SELECTION MESSAGE AREA (45) ---->
 T:TERMINATE  OFF: LOGOFF  PF1: MOVE TO SIA   PF2: CCU FNCTN   PF3: ALARM


 CONF DATA SET.....: CDF  LINE DESCR FILE..: LDF  MACHINE LVL TABLE: MLT
 CNTRL PROGM PROC..: C    LINE INTERF DPLY.: LID  MICROCODE FIXES..: MCF
 DISK FUNCTIONS....: DF   LINE THRESHOLD...: LTH  PANEL FUNCTIONS..: PAF
 EVENT LOG DISPLAY.: E    LINK IPL PORTS...: LKP  PASSWORDS........: P
 IML MOSS..........: IML  LINK TEST........: LT   PORT SWAP FILES..: PS
 IML ONE SCANNER...: IS   LOAD LK TEST REQ.: LOQ  TOKEN-RING INTR..: TRI
 IPL 3720..........: IPL  LOAD LK TEST RESP: LOS  WRAP TEST........: WT



 BER CORRELATION...: BC   MODULE DISPLAY...: MD   TRSS FUNCTIONS...: TRS
 DUMP DISPLAY/DEL..: DD   MOSS STORE DPLY..: MS   TSS FUNCTIONS....: TS
 DIAGNOSTICS.......: DG
```

Figure 1-8. The 3720 Function Menu Panel (Service Mode)

Requesting a Function from the 3720 Function Menu

1. Press PF1 to place the cursor in the System Input Area (if the cursor is not already there).
2. Type the acronym corresponding to the function requested (for example *IS* for IML one scanner).
3. Press *SEND*.

The panel corresponding to the function requested will be displayed.

Figure 1-9 lists the manuals, sections or pages that give all details concerning each function available from the **3720 function menu** panel.

Note: *ES* means *3720/3721 Communication Controllers Extended Services*; *SG* means *Service Guide*: this manual.

3720 function menu	Details in
BER CORRELATION..: BC	SG only, Chapter 2.
CNTRL PROGM PROC.: C	ES only
CONF DATA SET....: CDF	ES and SG, Chapter 8.
DISK FUNCTIONS...: DF	ES and SG, Chapter 10.
EC Installation	
Save	
Restore	
Disk Init and format	
Diskette format	
Position disk arm	
Repair disk	
EVENT LOG DISPLAY: E	SG, Chapter 2.
IML MOSS.........: IML	ES
IML ONE SCANNER..: IS	SG, Chapter 12.
IPL 3720.........: IPL	SG, Chapter 12.
LINE DEF FILE....: LDF	ES
LINE INTERF DSPLY: LID	ES only
LINK IPL PORTS...: LKP	ES only
LINK TEST........: LT	ES
LINE THRESHOLD...: LTH	ES only
LOAD LK TST REQ..: LOQ	ES, Chapter 12
LOAD LK TST RESP.: LOS	ES, Chapter 12
MACHINE LVL TABLE: MLT	ES, Chapter 12
MICROCODE FIXES..: MCF	
Microcode fixes	ES and SG, Chapter 6.
Microcode Patches	SG only, Chapter 7.
PASSWORDS........: P	ES (also customer identification)
PROGR. LINE SPEED: CDF	ES (for customer only)
PANEL FUNCTIONS..: PAF	ES and SG, Chapter 9.
PORT SWAP FILE...: PS	ES only
NTRI FUNCTIONS...: TRI	ES only
WRAP TEST........: WT	ES and SG, Chapter 12.
DIAGNOSTICS......: DG	Diag. desc. and SG, Chapter 3.
DUMP/DISPLAY/DEL.: DD	SG only, Chapter 5.
Hex display of dumps	
Dump/BER file Delete	
MOSS STORE DPLY..: MS	SG only, Chapter 5.
MODULE DISPLAY...: MD	SG only, Chapter 5.
TRSS FUNCTIONS...: TRS	SG only, Chapter 11.
TSS FUNCTIONS....: TS	SG only, Chapter 4.

Figure 1-9. Where to Find 3720 Function Menu Information

Accessing CCU Functions

Press PF2 when the **3720 function menu** panel is displayed.

The **CCU function menu** panel is displayed (see below).

```
                         MACHINE STATUS AREA (MSA)

   CUSTOMER ID: .............        3720-1          SERIAL NUMBER: xxxxx
   -------------------- MAINTENANCE MODE -------------------------------
   SYSTEM INPUT AREA (SIA) ===>     <---- SELECTION MESSAGE AREA (45) ---->
   T:TERMINATE  OFF: LOGOFF  PF1: MOVE TO SIA   PF2: CCU FNCTN   PF3: ALARM
                        CCU FUNCTION MENU

   AC/BT PARAMETERS.: ABP   DISPLAY LONG......: DL    RESET CCU/LSSD....: RCL
   CCU STATE........: CST   MOSS OFFLINE......: MOF   SET ADDRESS COMP..: AC
   CHL ADAPT STATE..: CH    MOSS ONLINE.......: MON   SET BRANCH TRACE..: BT
   DATA EXCHANGE....: DEX   RESET ADDR COMP...: RAC
   DISPLAY ALTER....: DA    RESET BRANCH TRACE: RBT


                       IMMEDIATE CCU FUNCTIONS

   BYPASS CCU CHECK.: BCK   RESET CCU........: RST    START CCU.........: S
   BYPASS IOC CHECK.: BIK   RESET CCU CHECK..: RCK    STOP CCU..........: STP
   CCU LVL3 INTRPT..: IL3   RESET IOC........: RIO    STOP ON CCU CHECK.: SCK
   CCU NORMAL MODE..: NM    RESET I-STEP.....: RI     STOP ON IOC CHECK.: SIK
   CCU DATE/TIME....: Q     SET I-STEP.......: SIP

   ALARM:
```

Figure   1-10. CCU Function Menu Panel (Customer and Service Mode)

This panel displays the list of all CCU functions, including the immediate CCU functions.

All functions are available to the service personnel as well as to the customer.

Requesting a CCU Function

1. Press PF1 to place the cursor in the System input Area (SIA) (if the cursor is not already there)
2. Type the acronym (for example DA for display alter) corresponding to the function requested
3. Press *SEND*

The result will be:

- Either a panel corresponding to the CCU function requested, or
- A message to acknowledge the execution of the request or an error message.

All details concerning each CCU function (panels and procedures) are given in various chapters of the *3720/3721 Extended Services* manual.

Some Messages after a Function Selection

The messages listed below represent only some of the messages that could be displayed during a function (3270 or CCU).

Messages that are self-explanatory, or messages that do not require a specific action are not listed.

CCU FUNCTION STILL PENDING: A LOGOFF request is issued while a CCU function is still pending (address compare, branch trace, ...).

CCU NOW IN PROCESS MODE: Reply to command: RESET I-STEP.

3720 FUNCTION STILL PENDING: A LOGOFF request is issued while a 3720 function is still pending (wrap, TSS address compare, ...).

NOTHING TO TERMINATE: Reply to command: Reply to a 'T' command when no function has been selected.

REENTER: Re-transmission required due to contention.

REMOTE CONSOLE CALLING: A remote operator tries to connect to MOSS while the local console is in use.

LOCAL CONSOLE CALLING: A local console operator tries to connect to MOSS while the remote console is in use.

Leaving the MOSS (Log Off)

Before leaving the MOSS, **do not forget to update the alarm BER, if any**, as explained in "Updating the Service Information Field in Alarm BERs" on page 2-11.

Leaving Procedure after Remote Connection

1. You must inform the customer (or whoever is at the 3720 location) that you are going to free the connection to MOSS.

2. Type *OFF* in the *SIA* field of the current panel, then press *SEND*.

   Note: You may type *OFF* only when no function is active or pending, and the **3720 function menu** panel is displayed.

   The procedure will then depend on the type of terminal through which the connection was started.

   - If it is a PC with a 3101 emulation program or a 3101-like terminal, you are disconnected from MOSS, and the message TERMINAL DISCONNECTED is displayed in the middle of the console panel.

   - If it is a RETAIN terminal, you return to the RETAIN/URSF application and you are disconnected from MOSS.

Leaving Procedure after Local Connection

1. Type *OFF* in the *SIA* field of the current panel, then press *SEND*.

   Note: You may type *OFF* only when no function is active or pending, and the **3720 function menu** panel is displayed.

2. If it is a service console (portable PC or PT2), disconnect it from the local console port (second from the top).

3. Set the *CA switches* to the state of the CA lamps.

4. Set the *Console-Panel* switch in the *Panel* position.

5. Place the *MOSS CE Switch 3* (the third from the top), to the *Off* position.

6. IML the MOSS:

   a. Set the Function select switch to the *MOSS IML* position.
   b. Press *Function Start*.

   Note: An IML requested from the console would display the maintenance function menu (the MOSS CE switch position is not sensed by an IML from the console).

7. Set the *Console-Panel* switch to the *Console* position.

At the end of the IML, if a console is connected and powered on, the **Copyright** panel is displayed. Then, when you press *SEND*, the **Password** panel is displayed, and the customer password may be entered.

Warning: YOU MUST SET THE MOSS CE SWITCH 3 OFF, otherwise MOSS can be accessed without a password.

Machine Status Area

You are made permanently aware of the 3720 status by the information displayed on the first three lines of the operator console screen: the machine status area (MSA).

The first two lines of the MSA show CCU and MOSS information. The third one shows:

- Selected scanner information (service personnel only); *or*
- CCU/Scanner IPL information; *or*
- Token-ring adapter and TIC information

In all figures shown below, each letter is a key that refers to an explanation.

The MSA is updated every 500ms.

MSA with Scanner Information

a	b	c	d	e	f	
g	h	i	j	k	l	
m		n	o		p	q

MSA with CCU/Scanner IPL Information

a	b	c	d	e	f		
g	h	i	j	k	l		
r		s	t	u	v	w	x

MSA with Token-Ring Adapter Information

a	b	c	d	e	f	
g	h	i	j	k	l	
mm	nn	oo	pp	qq		

Figure 1-11. MSA Fields

MSA with Scanner and CCU/Scanner IPL Information

a	b	c	d	e	f
g	h	i	j	k	l
m		n	o		p	q

Field a

Field 'a' displays the CCU mode:

PROCESS: Normal processing.

I-STEP: Instruction step.

Field b

Field 'b' displays the CCU check mode:

STOP-CCU-CHK: The system will stop on a CCU check (default or after function RESET BYPASS CCU CHECK).

BYP-CCU-CHK: You initiated function SET BYPASS CCU CHECK so the system will not stop on a CCU check.

Field c

Field 'c' indicates whether MOSS is connected to the CCU control program:

MOSS-ONLINE: MOSS is connected to the CCU control program.

MOSS-OFFLINE: MOSS is not connected to the CCU control program.

MOSS-ALONE: MOSS is operational while the CCU control program is not loaded or no longer operational.

SERVICE-MODE: MOSS is in service mode (service personnel only).

The statuses of the MOSS after the different IMLs and IPLs are as follows:

After	MOSS Status	Hex Display
Initialization (general IPL)	MOSS-ONLINE	X'000'
MOSS IML	MOSS-ONLINE or MOSS-OFFLINE (CP loaded)	X'000' X'FEE'
	MOSS-ALONE (CP not loaded)	X'FEF'
CCU/Scanner IPL	MOSS-ONLINE	X'000'
STEP BY STEP IPL	MOSS-ONLINE	X'000'
BYPASS PHASE 1 IPL	MOSS-ONLINE	X'000'

Field d

Field 'd' displays information on the CCU Address Compare (AC) function:

AC: (highlighted) The Address Compare function is active.

If you selected MOSS INTERRUPT=Y and/or CCU STOP=Y when defining the address compare, the following is displayed:

AC HIT: (highlighted) A single or double address compare is successful.

Field e

Field 'e' is updated each time an output X'71' instruction is executed, by the control program, for example, when using the CCU data exchange function or the control program procedures, or during 3720 initialization.

Output X'71' contents are buffered. If the buffers are overrun due to intensive output, some data may be lost; however, the last value in output will be displayed.

X71=xxxxxx: Contents of CCU X'71' output register

X71=ERROR: Error when accessing the register. Register contents cannot be displayed.

At initialization time, field 'e' displays: X71:xxyyzz

where xx are the 3720 initialization flags with the following meaning:

- 01 = IPL request detected on a link-attached 3720.
- 02 = IPL request detected on a channel-attached 3720.
- 05 = Dump in progress on a link-attached 3720.
- 06 = Dump in progress on a channel-attached 3720.
- 09 = CP load in progress on a link-attached 3720.
- 0A = CP load in progress on a channel-attached 3720.
- 11 = Remote Power Off (RPO) command is detected.
- 20 = CLDP abend before an IPL request detected on a channel- or link-attached 3720.
- 21 = CLDP abend on an IPL request detected on a link-attached 3720.
- 22 = CLDP abend on an IPL request detected on a channel-attached 3720.
- 25 = CLDP dump abend on a link-attached 3720 dump.
- 26 = CLDP dumpabend on a channel-attached 3720 dump.
- 29 = CLDP abend on a link-attached 3720 CP.
- 2A = CLDP CP abend on a channel-attached 3720 CP.
- 40 = Load dump request from disk.
- 44 = Dump to disk in progress.
- 48 = CP load from disk in progress.
- 60 = CLDP request from disk abend.
- 64 = CLDP from disk abend.
- 68 = CLDP/CP from disk abend.

Note: CP = control program, CLDP = control program loader/dump

where yyzz indicates the IPL port address. This encoded address is displayed in decoded form in field w, preceded by CA or L (see field w).

except when xx = 00, in which case:

- yy indicates the link ports defined in the Link IPL port table.
- zz indicates the link IPL ports that are presently enabled.

Field f

Field 'f' is displayed, along with field 'l', when the CCU status is STOP X'70', STOP PGM, STOP BT, STOP AC, or HARDSTOP (see field g).

```
LAR=xxxxxx  OP=xxxx    C=x    (field f)
IAR=xxxxxx  ILVL=xxxx  Z=x    (field l)
```

LAR=xxxxxx: Address of the last executed instruction.

OP=xxxx: Last executed instruction.

C=x: Value of the C-latch (0 or 1).

IAR=xxxxxx: Address of the next instruction to be executed.

ILVL=xxxx: Active CCU interrupt levels.

Z=x: Value of the Z-latch (0 or 1).

```
 CCU INTERRUPTS DISABLED    (field f)
    nothing displayed       (field l)
```

No interrupts can be received from the CCU:

- During a MOSS IML from the control panel, just after power on.
- While performing CCU IPL to avoid automatic CCU re-IPL in case of HARDCHECK (see field g).
- While mounting a new diskette (service personnel only).
- While performing some utility programs (service personnel only) to prevent interference with the utility program. All communications between the CCU and MOSS are delayed. For example, a BER generated by the control program is kept until the utility program ends and MOSS is back online.

```
CCU REGISTERS      (in field f)
NOT ACCESSIBLE     (in field l)
```

Appropriate registers cannot be read, so it is impossible to display LAR, OP, C, IAR, ILVL, and Z information.

Field g

Field 'g' displays the CCU status:

RUN: Instructions are being executed or data is being transferred.

RESET: The control program stopped since you initiated function RESET CCU; to restart the CCU, perform an IPL.

HARDCHK: The control program stopped on a hardcheck error. An automatic re-IPL is attempted. In certain cases however, (for example if the hardcheck occurs during a general IPL) there is no re-IPL.

HARDSTOP: You selected the CCU check reset function to reset the CCU check condition. To restart, select the CCU Start function from the 3720 function menu or press PF6 = CCU START or PF6 = S if displayed on the screen.

IPL-REQ: A CCU IPL was requested and is in progress.

STOP-X70:   The control program stopped on an output X'70' instruction executed by the control program.

STOP-PGM: The control program stopped because you initiated function CCU STOP or function SET I-STEP.

STOP-BT: The control program stopped because the branch trace function that you initiated with CCU STOP has become deactivated.

STOP-AC: The control program stopped because the address compare function that you initiated with CCU STOP (CCU ACTION = S) is successful.

Field h

Field 'h' shows whether the 3720 will stop on an IOC check.

BYP-IOC-CHK: The system will not stop on an IOC check. (default or after a RESET IOC CHECK STOP).

STOP-IOC-CHK: You initiated the function SET IOC CHECK STOP to force the system stop on an IOC check.

Field i

Field 'i' displays the last MOSS check code (see the *Maintenance Information Reference* manual, SY33-2040).

LASTMCHK=xxx last MOSS check code

Simultaneously, additional information is provided, such as Alarms/Alerts, MOSS inoperative lamp.

Field j

Field 'j' displays BT (highlighted) when the branch trace function is active.

Field k

Field 'k' is updated each time an output X'72' instruction is executed by the control program. For example, when using the CCU data exchange function, the control program procedures, or the 3720 initialization.

Output X'72' contents are buffered. If the buffers are overrun due to intensive outputting, some data may be lost; however, the last value outputted will be displayed.

X72=xxxxxx: Contents of CCU X'72' output register.

X72=00xxxx: Control program load/dump abend code.

X72=ERROR: Error when accessing the register. Register contents cannot be displayed.

Field l

Field 'l' is displayed along with field f when the CCU is in the STOP state. (See field 'f' description).

Scanner Information (in MSA)

Field m

Field 'm' displays information on the selected scanner:

NO SCANNER SELECTED: You selected a scanner function before selecting a scanner.

SCANNER XX yyyyyyyyyyyy:

Where xx is the number of the selected scanner (1, 3, or 4), and yyyyyyyyyyyy is any of the following:

CONNECTED: The scanner is operational and under control of the CCU control program.

INITIALIZED: The control code is loaded and the front-end adapter is operational.

INOPERATIVE: The scanner is inoperative, or the CCU is not in RUN status.

DISCTD-STOP: Disconnected-stop: The control code is no longer under control of the CCU control program, either after a STOP command or after a scanner address compare hit.

DISCTD-GO: Disconnected-go: You entered the GO command while in status DISCTD/STOP. The scanner remains disconnected but control code execution continues.

RESET: You entered the RESET command, and you may initiate an IML or a DUMP.

UNKNOWN-MODE: The scanner is selected but it is impossible to identify its status.

Field n

Field 'n' displays the scanner option:

IML: A scanner IML is being started.

DUMP: A dump is in progress.

SST abcde: One or more snapshot traces have been started.

a = 1 if trace 1 is active, b = 1 if trace 2 is active, ...

a = E if trace 1 fails, b = E if trace 2 is fails, ...

Field o

Field 'o' shows that the scanner address compare function is:

HIT-FS: Successful on I-fetch, load, or store.

HIT-RW: Successful on read or write.

ERROR: Successful but an error is encountered while performing the action you specified.

Fields o and p

Fields 'o and p' display the scanner address compare parameters that you specified:

AC xxxx yyyy zzzzzzz

where:

xxxx: Is the address

yyyy: Is the type of access:
F for I-fetch or data-fetch
S for data store
R for cycle steal read
W for cycle steal write

zzzzzzz: is the action:

DISPLAY

ALTER

STOP

OP-MSG (no action)

Fields p and q

Fields 'p and q' display the function for which you requested a delay in the execution (scanner display/alter functions):

DELAYED-ALTER
or
DELAYED-DISPLAY

The wait status of the CCU is now displayed and refreshed into the MSA.

CCU/Scanner IPL Information (in MSA)

CCU/scanner IPL information instead of scanner information is displayed on the third line.

A short time after successful completion of the IPL, the third line of the MSA is cleared if the IPL was requested from the control panel or from the host. If the IPL was requested from the operator console (function IPL CCU/TSS), the third line is cleared when selecting terminate function (T in SIA)).

a	b	c	d	e	f		
g	h	i	j	k	l		
r		s	t	u	v	w	x

Field r

IPL: Shows that a CCU IPL is started.

Field s

PHASE 1:   Indicates the start of phase 1 (CCU test and initialization). This field is blank when phase 1 is bypassed.

Field t

PHASE 2:   Shows the start of phase 2 (load from the disk and start the control program loader/dump). This field is always present.

Field u

PHASE 3:   Shows the start of phase 3 (load and initialize the scanners).

Field v

PHASE 4:   Shows the start of phase 4 (load from the host and initialize the control program). This field is always present.

Field w

Field 'w' displays one of the following:

CA IPL DETECTED ON CA x: The control program loading/dumping is started on a channel-attached 3720. x is the channel adapter number.

CONTROL PROGRAM LOADED: The control program is loaded.

CP SAVE IN PROGRESS ON DISK: The control program is being saved on the 3720 disk.

DUMP IN PROGRESS ON CA x: A control program dump is being taken on a channel-attached 3720. The progression of the dump is indicated in MSA field k which displays control program storage addresses. x is the channel adapter number.

DUMP IN PROGRESS ON DISK: A control program dump is being taken on the 3720 disk.

DUMP IN PROGRESS ON L xxx: A control program dump is being taken on a link-attached 3720. The progression of the dump is indicated in MSA field k which displays control program storage addresses. xxx is the decimal telecommunication line address.

ENABLED PORTS CA xx L xxxxxxxx (3720 Model 1/11): or

ENABLED PORTS L xxxxxxxx (3720 Model 2/12): Indicates which channel adapters or link IPL ports are enabled. x can be either Y or N. In the CA field, Ys indicate which channel adapters are enabled, and Ns which channel adapters are not enabled. The positions of the Ys and Ns give the channel adapter number.

In the 'I' field, Ys indicate which link IPL ports are enabled. N is used for the link IPL ports not enabled. The positions of the Ys and Ns give the position of the Link IPL port in the link IPL port table.

IPL CANCELED: The 3720 initialization is canceled by:

- The operator (immediate terminate function).
- Operator console power-off when the IPL was requested from the console.
- The operator console switching from normal mode to test mode.
- MOSS automatic re-IML during a CCU/scanner step-by-step IPL, or
- Two MOSS automatic re-IMLs during a CCU/scanner IPL.

IPL CHECK xxx: The IPL ends abnormally. The check code (xxx) is also displayed on the hex display of the control panel.

IPL CHECK F1B CLDP ABEND xxxx: The IPL ends abnormally. xxxx is the hexadecimal control program loader/dump abend code.

IPL COMPLETE: The IPL is successfully completed.

IPL COMPLETE + ERRORS: The IPL is complete although an error has been encountered. If the error comes from a scanner, alarm A11 is displayed. For any other intermittent errors (for example, diskette errors) no alarm is displayed. The 3720 should run normally.

LINK IPL DETECTED ON L xxx: The control program loading/dumping is started on a link-attached 3720.

LINK TEST PROGRAM ABEND: A hardware error occurred at Phase 3, while loading the stand-alone link test.

LINK TEST PROGRAM LOADED: The link test program is loaded.

LOAD IN PROGRESS ON CA x: The control program is being loaded on a channel-attached 3720. The progression of the load is indicated in MSA field k where CCU storage addresses are displayed. x is the channel adapter number.

LOAD IN PROGRESS FROM DISK: The control program is being loaded from the 3720 disk.

LOAD IN PROGRESS ON L xxx: The control program is being loaded on a link-attached 3720. The progression of the load is indicated in MSA field k where CCU storage addresses are displayed. xxx is the decimal telecommunication line address.

RPO DETECTED ON L xxx: The remote power off (RPO) command is detected on telecommunication line xxx. xxx is the decimal telecommunication line address.

SCANNER(S) NOT IMLED: xxxx: Indicates that one or more scanners are not IMLed. xxxx consists of four hexadecimal digits (16 bits). Each bit corresponds to a scanner (CS) number.

Field x

IPL STOP: Indicates that the IPL stopped at the beginning of a phase or on the operator's request (PF4 = STOP).

Token-Ring Information in MSA

When the TRSS services or the Token-Ring Interconnection function is active, line 3 of the MSA contains information relative to the TRM card and selected TIC cards.

a	b	c	d	e	f
g	h	i	j	k	l
mm	nn	oo	pp	qq	

Field mm

Displays the TRA number (# 02 for the 3720 Models 11 and 12). Indicates that the TRA has been selected (TRSS or TRI function).

Field nn

Displays the TRA mode. This field is updated after the TRA selection (option *1* in **TRSS function selection** panel, page 11-2).

Note: If field *f* indicates CCU INTERRUPTS DISABLED, the TRA mode has no meaning.

The possible modes are:

CONNECT: The TRA is operational and is under NTRI control. The control program handles all interrupts (except in the case of an MIOH error).

The PIO DISABLE and the DISCONNECT bits in the TRM Level 1 Error Status are OFF.

DISCONNECT: The TRA does not run under the control of the control program but under the control of the MOSS microcode. MOSS handles all interrupts and PIOs to/from the TIC.

The PIO DISABLE and the DISCONNECT bits in the TRM Level 1 Error Status are OFF.

UNKNOWN: A non-recoverable error occurred during the connection/disconnection process, or an MIOC/IOC error occurred while getting level 1 error status during TRA selection. Connect/Disconnect may be re-tried.

Field oo

Is the TIC selected.

TIC n: Shows the number of the TIC selected (n is 1 or 2). The correspondence between TRA, line address is the following: TRA is #02, TIC #1 has line address 016, TIC #2 has line address 017. This field is updated after a TIC selection (see **TRSS Functions** panel, page 11-3).

Field pp

Field 'pp' displays the current mode of the selected TIC. This field is updated after a TIC selection or a refresh of the screen display. (see *TRI Functions* in *3720 Extended Services* manual.)

Each of the two possible TICs must be in one of seven modes (as reported by NTRI):

IDLE: The TIC has not yet been reset by NTRI.

RESET: The TIC has been reset by NTRI but not yet initialized.

INITIALIZED: The TIC has been initialized but not yet OPEN or DISABLED. Initialization parameters have been passed to the TIC by NTRI.

OPEN: The TIC has been inserted into the token-ring and is in normal operation. Open parameters have been passed and receive and transmit operations have been started.

CLOSED: The TIC has been opened since initialization, but has since been closed (by the host).

FROZEN: An error was detected and the following actions were taken by NTRI

- Interrupts from this TIC are disabled.
- DMA from this TIC is disabled.
- The TIC is reset.

DISABLED: The associated TRA has been disconnected by MOSS. NTRI will send no PIO to this TIC.

(blank):   There is no TIC mode if NTRI is not online.

The TIC mode is derived from the NTRI MAC layer status obtained from NTRI. The following table gives the correspondence.

Medium Access Control (MAC) Status	TIC Mode
Idle	Idle
TIC resetting hard	Idle
TIC resetting soft	Idle
Initialization list transfer	Reset
Initialized	Initialized
Open started	Initialized
Receive initialization	Initialized
Transmit initialization	Initialized
Started	Open
Transmit in progress	Open
Close in progress	Open
Closed	Closed
Frozen	Frozen
Disconnected	Disabled

Figure 1-12. TIC Mode and MAC Status

Field qq

NTRI OFFLINE indicator:

Indicates that:

- At the IPL of NCP, NTRI was not available and did not pass necessary TRSS information to MOSS, or

- An error has occurred when trying to access NTRI control blocks needed by TRSS services.

Several functions which depend upon NTRI will not be available. This field is updated after each function selection of the TRSS secondary menu. (See **TRSS function selection** panel, page 11-2.)

Chapter 2. Analyzing BERs (Box Event Records)

Box Event Record Generation

Each error occurrence, either in case of intermittent failure or in case of a 3720 down (controller re-IPL), is processed by the event logging procedure of the MOSS.

Event Logging Procedure

BERs are handled by a set of functions that:

- Count the event and error occurrences
- Time stamp the BER
- Record the BER on a MOSS disk data file (CHGCIL)
- Generate an error signal (such as ALERT or ALARM)

The BERs are created from error information supplied either by NCP/EP, by the MOSS itself, or during IFTs.

Notes:

1. If the MOSS is offline or not operational, NCP/EP stores the error information in the check record pool (CRP) located in main storage.

2. When the disk is not operational, the MOSS keeps the BERs in the 1024-byte buffer in MOSS RAM.

3. No BER logging takes place in *Diskette Mode* (see "Diskette Mode" on page 12-6).

Automatic BER Analysis

This MOSS facility translates the BER associated with the last alert issued into a specific eight-digit reference code that characterizes the 3720 hardware error, the environment anomaly, or the most probable microcode error.

MOSS Consolidated BER

MOSS code packs I/O-related BERs into a *consolidated* BER: (Type 01, ID 85).

Consolidated BER Example

If a MOSS level 0 occurs during a disk I/O operation related to a LOAD request from an application, a BER 0185 will be logged. This BER will contain:

- BER 0111, disk adapter
- BER 0103, CAC
- BER 0100, level 0

The BER 0185 will be displayed with the event description related to the latest BER put into BER 0185, and the **BER detail** panel will allow you to scroll to display the other BERs contained in BER 0185.

In the example above, the event description will refer to BER 0111, and the **BER detail** panel will allow you to display BER 0111, then to scroll to BER 0103, then BER 0100.

BER 0185 applies to the following accesses:

- File access

- NCP/EP access (Mailboxes)
- CCU access
- Display/Keyboard access

BER Storage on Disk

The MOSS stores the BERs, prepared in the MOSS RAM, on the *wraparound* BER file on disk (CHGCIL) in order of arrival. The BER file (CHGCIL) can contain several hundred BERs (including *Consolidated BERs*).

When the BER file is full, the next BER to arrive overwrites the oldest BER (or BERs) in the BER file.

Purpose of this Section

The purpose of this section is to explain *HOW TO DISPLAY*, using MOSS console, all types of BER panels (summary, list or detail).

This section gives also an explanation for all fields that appear on a BER panel and are common to all or most BER types.

Detailed and complete information concerning BERs can be found in Chapter *Box Event Records*, in the *Maintenance Information Reference* manual.
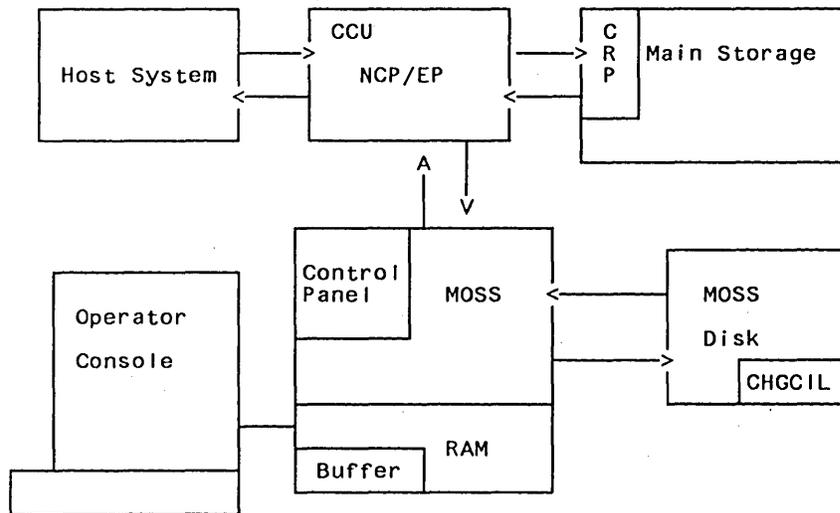
Figure 2-1. Error Log Overview

BER Type and ID

All BERs are characterized by a **type** and an **ID**.

BER Type

The type points to the general area of BER occurrence:

- 01: MOSS-related errors (plus errors/events recorded by MOSS when MOSS takes control of the box or operations such as CCU Hardcheck, scanner errors...)
- 10: Errors related to Channel Adapter operations
- 11: Errors related to Transmission Subsystem operations

- 12: Control Program exceptions (software errors detected by the hardware, or hardware errors corrupting software)

- 13: CCU-related errors when NCP/EP has control (excluding the CCU Hardcheck)

- 14: IOC Bus-related errors (when not possible to attribute them to a specific adapter)

- 15: Errors related to token-ring subsystem operations

BER ID

When the BER is created by NCP/EP, the ID identifies the most probable cause of error (Control Program, Hardware, or Microcode) and the program level that recorded the error/event.

When the BER is created by MOSS, the ID identifies the origin of error or event (MOSS interrupt level, disk support, ...).

For MOSS BERs, the error categories are found in another field called MOSS CHECK Code or ERROR Code.

The Chapter describing BERs in the *Maintenance Information Reference* manual, gives all possible BER contents and layouts.

Where to Find More BER Information

Display at console	This chapter
Host print request for BERs	ACF for NCP/SSP for the 3720 Diagnosis Guide Chapter "Printing NCP, MOSS, or CSP Dump"
BER format	"Maintenance Information Reference", Chapter "BERs".
BER save and purge	"Deleting Files", page 5-12.

Figure 2-2. Where to Find More BER Information

BER Display Sequence

There are three kinds of BER display panels:

- BER summary
- BER list
- BER detail

When faultfinding, you should normally display the BER summary, then the BER list, and lastly the BER detail(s) appropriate to the fault. An example is given in Figure 2-3.

```
Application Entry
                      PF4                          PF4
          <------------------------------<----------------------+
          |                              |                       |
        +--------+  1.CA    +---------+  |   +--------+          |
        |Summary |------->  | CA List |------>| Detail |-------+ |
        +--------+          +---------+       +--------+       | |
                    2.TSS      +----------+     PF7 or    V    | |
                    ---------->| TSS List |     PF8 or         | |
                    CSn        +----------+     Flag           | |
                    ---------->  | CSn List |-------------------+
                    CSn Linem   +-----------+
                    -----------> | CSn LINEm List |
                    CAn         +-----------------+
                    ----------->  | CAn List |
                    3.CP        +------------+
                    ----------->  | CP List |
                    4.CCU       +-----------+
                    ---------->   | CCU List |
                    5.IOC       +------------+
                    ---------->    | IOC List |
                    6.MOSS      +------------+
                    ---------->    | MOSS List |
                    7.Alarms    +-------------+
                    ---------->     | Alarms List |
                    8.TRSS      +---------------+
                    ---------->      | TRSS List |
                    9.All       +-------------+
                    ----------->       | All List |
                                     +-----------+
```
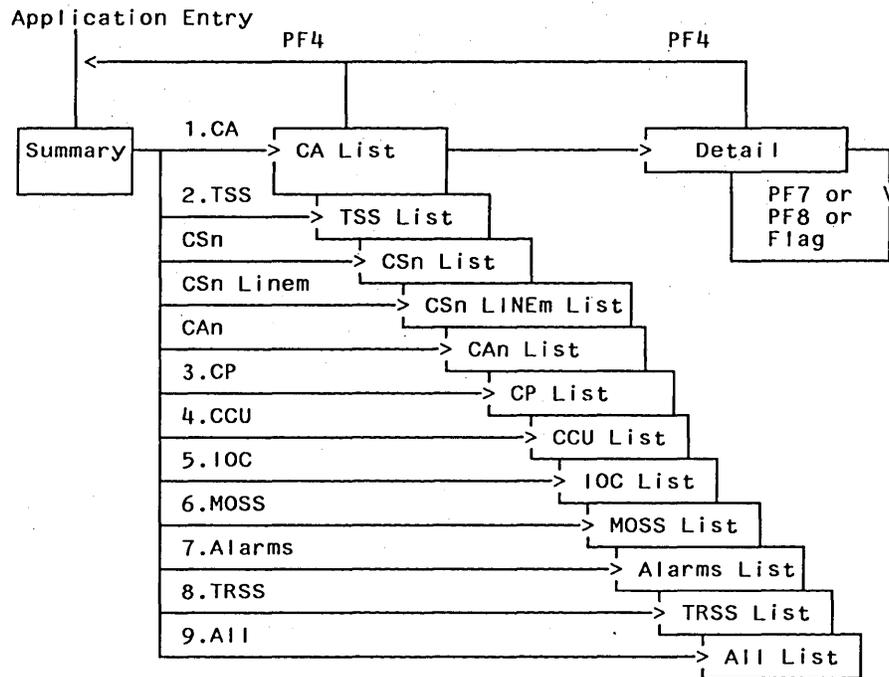
Figure 2-3. Sample of a BER Display Sequence

Requesting the BER Display

You must first display the **3720 function menu** panel (first panel displayed after you entered the maintenance password on the **Password** panel.

1. Type *E* (for Event log display) in the *SIA*, then press *SEND*

The **BER summary** panel will be displayed (see Figure 2-4).

```
                MSA line 1
                MSA line 2
                MSA line 3
CUSTOMER ID: .............        3720-1          SERIAL NUMBER: xxxxx
-------------------- MAINTENANCE MODE ----------------------------------
FUNCTION ON SCREEN: EVENT LOG DISPLAY


SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM
                              BER SUMMARY
SEL# NAME                                    TYPE  PENDING  DATE 1ST BER  TOTAL
                                                   BER     MM/DD HH:MM   IN FILE
   1  CA   (CHANNEL ADAPTERS)                 10    0                       0
   2  TSS  (TRANSMISSION SUBSYSTEM)           11    5     04/23 20:38       5
   3  CP   (CONTROL PROGRAM)                  12    0                       0
   4  CCU  (CENTRAL CONTROL UNIT)             13    0                       0
   5  IOC  (I/O CONTROL)                      14    0                       0
   6  MOSS (MAINTENANCE OPERATOR SUBSYSTEM)   01    1     04/21 07:00       2
   7  ALARMS                                        1     04/23 20:40       2
   8  TRSS (TOKEN-RING SUBSYSTEM)             15    0                       0
   9  ALL  (ALL FILE CONTENTS)                      7                       9

   ENTER SEL# OR NAME  ==>
```

Figure 2-4. BER Summary Panel (Sequence Example)

If you type *ALL* or *9* on the **BER summary** panel, a **BER list** panel is displayed (see example in Figure 2-5).

```
                             ALL   LIST                         TOTAL:9
  SEL# DATE/TIME  FLAG  NAME      TYPE ID  ERROR DESCRIPTION
    9  04/23 20:40       ALARMS              A16 SCANNER 01 DOWN(LINE 0-27) RE-IML
    8  04/23 20:40       CS1  LINE31 11 98  PIO OUT ERROR
    7  04/23 20:39       CS1  LINE31 11 98  PIO OUT ERROR
    6  04/23 20:38       CS1  LINE31 11 98  PIO OUT ERROR
    5  04/23 20:38       CS1  LINE31 11 98  PIO OUT ERROR
    4  04/23 20:38       CS1  LINE31 11 B1  SCANNER COMMAND TIME OUT
    3  04/22 08:00 FF ALARMS            A4  DISKETTE ERROR
    2  04/22 08:00 FF MOSS DISK   01 03  CRC ON READ DATA FILE:CHGPROC
    1  04/21 07:00       MOSS APPL   01 06  BER FILE DELETED
  *** END OF FILE ***
  - ENTER SEL# OR NAME  ==>
  PF4:BER SUMMARY    PF7:BACKWARD   PF8:FORWARD
```

Figure 2-5. BER List Panel (Sequence Example)

In service (maintenance) mode, if you type *4* (SEL #) on the **BER list** panel, a **BER detail** panel, is displayed (see example in Figure 2-6 on page 2-6).

```
                              BER DETAIL
SEL#:00004 FLAG:00 DATE:04/23 TIME:20:38 TYPE:11 ID:B1  LOST:    CP-ABEND:
CS1  LINE31  SCANNER COMMAND TIME OUT
 F:10000000
 TA:10  TD:1F  NW:DCC0  LNVT:08F0  LCS:00
 PSA:DA06 0000 0000 0000 0191 0000 0000 0000 0592 0800 0000 0000 0191 0000



 OVERRIDE FLAG VALUE WITH NEW HEXADECIMAL VALUE
 PF4: BER SUMMARY   PF5: BER LIST   PF7: PREVIOUS        PF8: NEXT
```

Figure 2-6. BER Detail Panel (Sequence Example)

This panel contains the coded service information appropriate to the type of BER.

Note: If you use the customer password, the panel that will be displayed will not contain coded service information, and the following **BER detail** panel is displayed (see example in Figure 2-7).

```
                              BER DETAIL
 SEL#:00004 FLAG:00 DATE:04/23 TIME:20:38 TYPE:11 ID:B1 LOST:ddd CP-ABEND:hhhh
 CS1  LINE31  SCANNER COMMAND TIME OUT


 PF1: BER SUMMARY   PF2: BER LIST   PF4: PREVIOUS BER   PF5: NEXT BER
```

Figure 2-7. Customer BER Detail Panel (Sequence Example)

BER Display Panels

BER Summary Display

```
                                BER SUMMARY
        SEL# NAME                              TYPE  PENDING  DATE 1ST BER  TOTAL
                                                      BERS    MM/DD HH:MM   IN FILE
         1   CA   (CHANNEL ADAPTERS)            10     0                     0
         2   TSS  (TRANSMISSION SUBSYSTEM)      11     5      04/23 20:38    5
         3   CP   (CONTROL PROGRAM)             12     0                     0
         4   CCU  (CENTRAL CONTROL UNIT)        13     0                     0
         5   IOC  (I/O CONTROL)                 14     0                     0
         6   MOSS (MAINTENANCE OPERATOR SUBSYSTEM) 01   1      04/21 07:00    2
         7   ALARMS                                     1      04/23 20:40    2
         8   TRSS (TOKEN-RING SUBSYSTEM)        15     0      04/21 07:00    0
         9   ALL  (ALL FILE CONTENTS)                  7      04/21 07:00    9

         ENTER SEL# OR NAME  ==>
```

Figure   2-8. BER Summary Panel (Description)

Field Description for BER Summary Panel

SEL#:   A number in the left-hand column, which may be typed at the
            cursor position, to select the appropriate BER list panel.

NAME: An acronym in the next column, which may be typed at the cursor
            position, in place of SEL# to select the appropriate BER list.

TYPE: The number that categorizes the BER by its origin.

PENDING BERS: BERs that contain a flag with value 00 (that is, not yet updated).

DATE 1ST BER: The time and date of the oldest BER in this category that is not
              updated (pending BER).

TOTAL IN FILE: The total number of BERs of this category in the BER file.

You use the data in this panel to help you in selecting the BER list.

Note: If you already know the precise origin of the fault (such as CS3, or
LINE7), you can type this at the cursor position instead of SEL# or NAME. For
example, typing CS3 displays only those BERs associated with CS3.

BER List Display

As an example, the display below shows a BER *ALL LIST* panel.

```
                                 ALL    LIST                         TOTAL: 9
        SEL# DATE/TIME FLAG   NAME      TYPE ID   ERROR DESCRIPTION
           9 04/23 20:40      ALARMS              All SCANNER 01 DOWN(LINE 0-31)IPL SCAN
           8 04/23 20:40      CS1  LINE31 11 98   PIO OUT ERROR
           7 04/23 20:39      CS1  LINE31 11 98   PIO OUT ERROR
           6 04/23 20:38      CS1  LINE31 11 98   PIO OUT ERROR
           5 04/23 20:38      CS1  LINE31 11 98   PIO OUT ERROR
           4 04/23 20:38      CS1  LINE31 11 B1   SCANNER COMMAND TIME OUT
           3 04/22 08:00 FF ALARMS        `  A4   MEDIA ERROR
           2 04/22 08:00 FF MOSS DISK   01 03   CRC ON READ DATA FILE.CHGPROC
           1 04/21 07:00    MOSS APPL   01 06   BER FILE DELETED
        *** END OF FILE ***
        - ENTER SEL# OR NAME   ==>
        PF4:BER SUMMARY    PF7:BACKWARD    PF8:FORWARD
```

Figure   2-9. BER List Panel (Description)

Field Description for BER List Panel

XXX LIST: The criterion XXX of selection from the BER summary, or from the previous BER list (ALL in this example).

TOTAL: The number of BERs corresponding to the selection from the BER summary.

SEL#: The sequence number of the BER in the BER file. BERs are numbered in ascending order from the oldest to the most recent. (compare with DATE 1ST BER in BER summary).

Enter this SEL# when you want the corresponding **BER detail** panel. The detail panel gives additional service information concerning a BER.

Note: The BER file is not frozen while you work. New BERs may be logged while you troubleshoot, but they do not appear on the panel. These new BERs (with a new BER number) will appear next time a BER LIST display is requested.

DATE: Four digits defining month and day. EP does not handle the date (in EP, DATE = 00/00).

TIME: Four digits defining hour and minute.

Note: Under NCP, the time and date information comes from the host. If the host is remote, the time recorded on the BER may differ from the 3720 time.

FLAG: Two hex digits (00-FF) being the status of the BER. The FLAG field is not updatable on the LIST panel. For better readability, a 00 flag does not appear on this panel, and is therefore left blank.

NAME: More precise information about the origin of a BER (for example, CS, line, or channel number). The NAME may be typed at the cursor position to obtain the appropriate BER list. The NAME is repeated in the error description line of the **BER detail** panel.

TYPE: The number that categorizes the BER.

ID: Two hex digits that give more precision to the origin of the BER.

ERROR DESCRIPTION: Up to 40 characters that describe the error.

PF Keys on BER List Panel

PF4:   Return to the **BER summary** panel.

PF7:   This key enables you to scroll backwards, 10 BERs at a time, for
             the same component.

PF8:   This key enables you to scroll forwards, 10 BERs at a time for the
             same component.

BER Detail Display

To display an individual **BER detail** panel, type the corresponding SEL# (BER
sequence number in BER file) on the **BER list** panel, at the cursor position. The
layout is the following:

```
                              BER DETAIL
  SEL:ddd    FLAG:hh DATE:dd/dd TIME:dd:dd TYPE:hh ID:hh LOST:ddd CP-ABEND:hhhh
  <            error description line           >
  X:bbbbbbbb
  XX:hh  XX:hh  XX:hhhh  XXXX:hhhh  XXX:hh
  XXX:hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh hhhh




  OVERRIDE FLAG VALUE WITH NEW HEXADECIMAL VALUE
  PF4: BER SUMMARY   PF5: BER LIST   PF7: PREVIOUS      PF8: NEXT
```

Figure   2-10. BER Detail Panel (Description)

This panel contains the coded service information appropriate to the type of
BER selected.

Note: When used in customer mode, the panel layout is different (an example
with real data for *service* and *customer* display panels is given on Figures 2-10
and 2-7).

If you scroll through **BER detail** panels and see one that shows anomalies, such
as a blank panel or unformatted hexadecimal characters, this means that the
BER file is full and cannot number the BERs correctly. To correct this problem,
press PF5. This gives a new, correct BER list.

Common Fields in Header Lines

In each detail panel, the top two lines and the bottom line always have the
same format. The field descriptions are:

SEL#:   Three digits (from 1 to 999) defining the BER# (BER sequence
             number in BER file). This is either the BER corresponding to the
             SEL# (from the **BER list** panel), or the next or previous BER of the
             same selection criteria (obtained when pressing PF7 or PF8). You
             may alter these three digits by placing the cursor under the digits,
             then pressing *SEND*. This displays the **BER detail** panel corre-
             sponding to that new BER#.

FLAG: Two hexadecimal digits defining the BER status.

             This field may be updated on the **BER detail** panel.

DATE:	Four digits defining month and day (contains 00/00 in EP). Same as in the **BER list** panel.
TIME:	Four digits defining hour and minute. Same as in the **BER list** panel.
TYPE:	Two-digit hexadecimal number that categorizes the BER.
ID:	Two-digit hexadecimal number that specifies the origin of the BER (BER identifier).

For a BER created by NCP/EP, the first byte of the BER ID contains the interrupt level at which the error was detected and recorded:

- 1, 2, 3, and 4: most probable cause is the control program, and the program level that recorded the event/error was 1, 2, 3, or 4 respectively.

- 9, A, B, and C: most probable cause is the hardware or the microcode, and the program level that recorded the event/error was 1, 2, 3, or 4 respectively.

LOST:	Three digits defining the number of BERs that have been lost after creation of this BER, the field is displayed only when BERs have been lost. This field applies only to CP BERs.
CP-ABEND:	Four hexadecimal digits defining the abend code (this field does not apply to MOSS BERs). The field is displayed only when there is an abend code.

ERROR DESCRIPTION: One line giving a description of the error (same as on the **BER list** panel, but the maximum length is 80).

PF Key on BER Detail Panel

PF4:	Display BER summary.
PF5:	Display the **BER list** panel. Pressing this key displays the **BER list** panel from which the **BER detail** panel was selected. The new **BER list** panel starts with the BER requested in the **BER detail** panel.
PF7:	Scroll back to previous BER (this is the previous BER in the list from which the BER detail was selected).
PF8:	Scroll forward to next BER (this is the next BER in the list from which the BER detail was selected).

Note: Using PF7 or PF8, you may request a BER that is outside the selected list.

BER File Erasure

The entire BER file can be erased using the 3720 function *DD* (DUMP/DISPLY DEL), see "Deleting a File from MOSS Disk" on page 5-12.

The BER file should be erased only in exceptional cases, since:

1. It is not possible to erase individual BERs in the file, but only the entire BER file.

2. The service personnel might need old BERs for history purposes.

3. The BER file, when full, writes the most recent BERs on the disk space used by the *oldest* BERs (wraparound file). When the BER file is erased, a BER to this effect is logged in the file.

Updating the Service Information Field in Alarm BERs

To update the *information* field in the Alarm BER, use the following procedure:

1. Display the **BER detail** panel corresponding to the alarm for which you want to record comments (see Figure 2-11).

2. Place the cursor at the beginning of the first empty line (under the text of the alarm).

3. Type up to 40 characters of information.

4. Press *SEND*.

You may then quit, your comments have been recorded, and could be used later.

```
                                   BER DETAIL
  SEL:ddd    FLAG:hh DATE:dd/dd TIME:dd:dd TYPE:hh ID:hh LOST:ddd CP-ABEND:hhhh
  HARDWARE ERROR: CHANNEL ADAPTER 1 DOWN                   hhmmss   refcoocde
  <    comment line                            >



   OVERRIDE FLAG VALUE WITH NEW HEXADECIMAL VALUE
  PF4: BER SUMMARY    PF5: BER LIST    PF7: PREVIOUS       PF8: NEXT
```

Figure 2-11. Alarm BER Detail Panel (Sample)

Manual BER Correlation and Reference Code Interpretation

This function allows the service personnel to display:

- For a range of BERs, all suspected FRUs that have been associated to the BERs and the number of time they were suspected.

- For a reference code, its associated FRU list.

This function is allowed in maintenance mode only.

BER Correlation Procedure.

1. Type *BC* on the **3720 function menu** panel.

   The **BER correlation selection** panel will be displayed with a request for the range of BERs for which you want a correlation (see Figure 2-12).

2. Type the LATEST BER NUMBER (the default is last BER logged) and the OLDEST BER NUMBER (the default is wrap around to the one-before-last BER logged)

3. Press *SEND*

   The **BER correlation result** panel displays an ordered list of all FRUs that were involved by the BERs defined in the BER range (see Figure 2-13). The list gives also the number of times each FRU has been selected.

```
                          MANUAL CORRELATION
      ENTER LATEST BER NUMBER ==>    (DEFAULT VALUE IS LAST LOGGED)
      ENTER OLDEST BER NUMBER ==>    (DEFAULT VALUE IS WRAP AROUND)



                    PF5=REFERENCE CODE INTERPRETATION
```

Figure 2-12. BER Correlation Selection Panel

```
                          MANUAL CORRELATION
      ENTER LATEST BER NUMBER ==> 23 (DEFAULT VALUE IS LAST LOGGED)
      ENTER OLDEST BER NUMBER ==> 01 (DEFAULT VALUE IS WRAP AROUND)

                       BER CORRELATION RESULTS
                          FRU(S) ORDERED LIST

      CSP2 01D-A1S2 ( 2)   CSP1 01D-A1T2 ( 2)   RDV  01D-A1B2 ( 2)
      MAC  02D-A1B2 ( 1)   PUC  02D-A1C2 ( 1)   CSPS 01D-A1V2 ( 1)
      FES  01D-A1Q2 ( 1)

      PF4=BER SUMMARY    PF5=REFERENCE CODE INTERPRETATION
```

Figure 2-13. BER Correlation Result Panel

PF5:   Requests the *Reference Code Interpretation* function (see "Reference Code Interpretation into FRUs" on page 2-13).

Reference Code Interpretation into FRUs

This function allows you to display, for a reference code, the list of the suspected FRUs

Procedure

From the **BER correlation result** panel (Figure 2-13 on page 2-12), you pressed *PF5*:

The **Reference code interpretation selection** panel is displayed (see Figure 2-14).

On this panel:

1. Type the full *reference code* (or its four last digits) to get a list of suspected Field-Replaceable Units (FRUs) for that code.
2. Press *SEND*

The **Reference code interpretation FRU list** panel is displayed (see Figure 2-15).
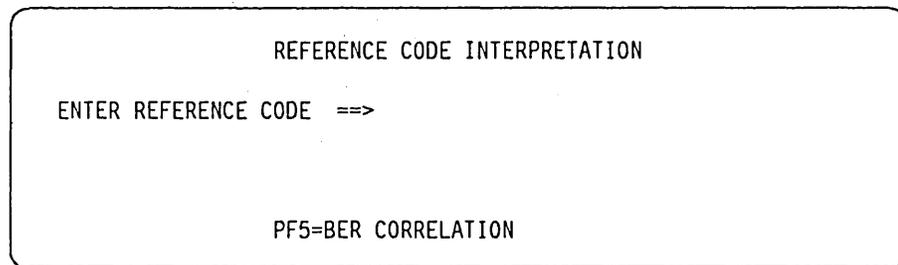
```
                    REFERENCE CODE INTERPRETATION


    ENTER REFERENCE CODE  ==>




                    PF5=BER CORRELATION
```

Figure   2-14. Reference Code Interpretation Selection Panel
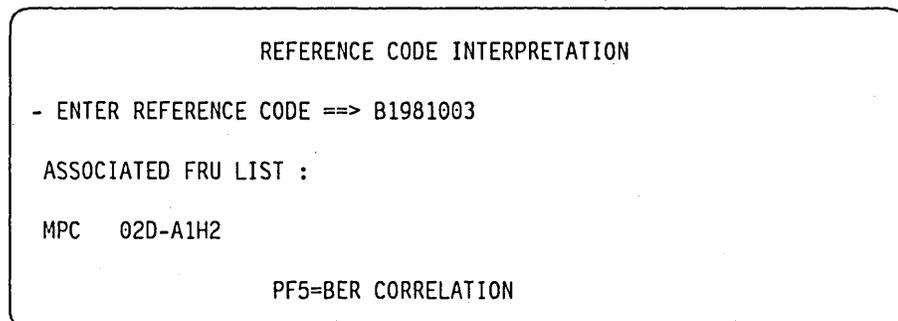
```
                    REFERENCE CODE INTERPRETATION

   - ENTER REFERENCE CODE ==> B1981003

    ASSOCIATED FRU LIST :

    MPC    02D-A1H2

                    PF5=BER CORRELATION
```

Figure   2-15. Reference Code Interpretation FRU List Panel

PF5:   Requests the *BER Correlation* function (see "BER Correlation Procedure." on page 2-12).

Chapter 3. Running Diagnostics from Console

What Are 3720 Diagnostics

Warning: When you are running the diagnostic programs, the customer cannot use the 3720.

Diagnostics consist of:

- IML checkout programs.

- Offline diagnostics stored on the disk.

- Channel adapter OLTs stored in the host, and the OLT responder stored on the disk (see "How to Run Channel Adapter Online Tests (OLTs)" on page 3-32).

- ST370, NST-2, and ST4300 (system tests).

Note: For details of IML checkout programs and system test programs, see the *Maintenance Information Reference* manual (MIR), SY33†2040, or the corresponding *User's Guide*.
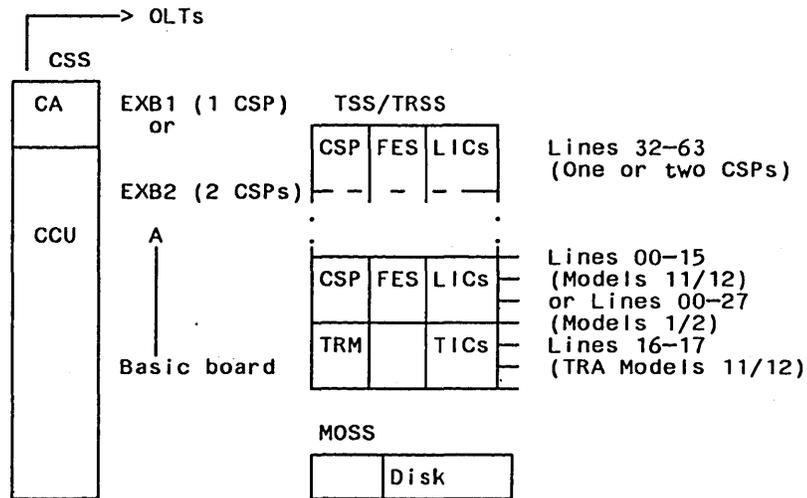
Figure 3-1. Diagnostic Locations

The diagnostic programs are run to detect solid failures caused by the hardware in the 3720, and to isolate the field-replaceable unit(s) that caused the failure. They are also run after a repair is performed to check that the controller is working correctly. Diagnostics must be run before and after an EC or an MES is installed.

Only the channel adapters, scanners, TRA, and telecommunication lines defined in the 3720 configuration data file are tested.

Run the CDF 'verify' option when you suspect a discrepancy between the machine configuration and the CDF.

Error During Diagnostics

When a diagnostic program detects a failure, a repair action code (RAC), an address, an error return code (ERC), and error messages are displayed on the console screen.

"RAC (Repair Action Code)" on page 3-22 explains how to use this information.

Note: When diagnostics are requested from the control panel, the results are shown on the hexadecimal display with a RAC and a secondary code displayed alternately.

**THIS CHAPTER EXPLAINS ONLY
HOW TO RUN OFFLINE DIAGNOSTICS AND OLTs
FROM THE OPERATOR CONSOLE**

All diagnostic routines are explained in the *3720 Diagnostic Descriptions* manual, SY33-2042.

Offline Diagnostics Monitoring

To run offline diagnostics, **MOSS must be initialized with its microcode (IML)**.

The offline diagnostics are monitored by the diagnostic control monitor (DCM) and the command processor (CP).

The diagnostic control monitor is loaded when you select the diagnostic utility programs from the **3720 function menu** panel. It automatically restricts the diagnostic testing to elements defined in the configuration data file (CDF).

Communication with the DCM is through the operator console. The DCM allows diagnostic program selection and choice of options within the selection. It sends your commands to the command processor and displays diagnostic results , such as a repair action code (RAC), on the console.

The command processor is loaded in the 3720 subsystem (CCU, MOSS, or TSS) where the selected diagnostic is to be run. It reports diagnostic events and diagnostic results.

Diagnostic Structure

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

Group: Set of *IFTs* that tests a 3720 subsystem (the TSS group for example).

IFT: Internal functional test that is often divided into *sections* that can be loaded and executed one at a time.

Section: Set of routines that tests 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:
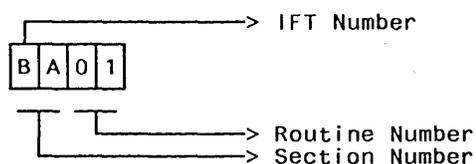
```
  ┌────────────────> IFT Number
  │
 ┌─┬─┬─┬─┐
 │B│A│0│1│
 └─┴─┴─┴─┘
  ─┬  ─┬
   │   └─────────> Routine Number
   └─────────────> Section Number
```

List and Duration of Diagnostics

The timing estimates for the diagnostics groups and their IFTs are the following:

CCU IFTs: >5 min	(A: 1.5, B: .2, C: 1, D: 2, E: 1)
IOCB IFTs:(3-5 min)	(I: 2-3, J: 2)
CA IFT: (2 min)	(L: 2)
TSS IFTs:(2-6 min)	(P: 1-5, Q: .2-.5, R: .5-1.0)
TRSS IFTs:(1-2 min)	(T: 1-2)

Total run 'all' = 13 (minimum) to 18 (maximum) minutes.

Notes:

1. The MOSS is diagnosed while running MOSS IML (For details of MOSS IML, see the *Maintenance Information Reference* manual, and Chapter 6 of the *3720 Diagnostic Description* manual).

2. For details of CCU, IOCB, CA, TSS and TRSS diagnostics, see the corresponding chapter of the *3720 Diagnostic Descriptions* manual.

Manual Routines

Manual routines are:

- **Manually invoked** routines, that is, routines that will not run during diagnostics unless they are specifically requested.

  These routines are:

  - **CA05** (solid 1-bit error detection) which is used to analyze the CCU storage. A specific pico-diagnostic routine is running for this test (fourth pico-diagnostic module). Its purpose is to show which storage card has a number of solid single-bit errors higher than a given threshold.

    The 'ADDIT INFO' field indicates which storage card is faulty (SBC or SEC).

    Note: You must run **ALL (1)** or **CCU (2)** diagnostics before requesting routine **CA05**.

  - **EB03** which is used to test the network power off capability (see page 3-6).

  - **IB01**, which is a scoping routine for the IOC bus.

    Details of how and when to use this routine can be found in Chapter 8 of the *3720 Maintenance Information Reference (MIR)* manual.

- **Manual intervention** routines, that is, routines that in some circumstances, require a manual intervention, such as removing a card or installing a wrap plug on 3720 components.

  These manual intervention routines are:

  - **QCxx**, TSS wrap test routines for Worldwide (see 3-4).

  - **QDxx**, TSS wrap test routines for Japan only (see 3-4). They are specific to the Nippon Telegraph Telephone (NTT) administration.

Worldwide Wrap Test during Diagnostics (at Tailgate)

A default pattern is available with all LIC types for the tailgate level wrap. If you want to create your own pattern, refer to the *3720 Extended Services* manual.

Routines QC01 through QC07, when selected, require you to plug a wrap block or a wrap cable instead of the terminal or modem connector on the 3720 or 3721 LIC port (tailgates). They run automatically when the TSS group or the IFT Q is selected, provided that the wrap block (LIC type 1, 2, or 4) or the wrap cable (LIC type 3) is plugged on the selected line and the CDF is properly updated. If it is not:

1. Remove cable from the LIC port of the selected line.

2. Place the wrap block or wrap cable on the selected line.

3. Update the cable identification "I" to:

   - '1' for wrap block (LIC1, 2, or 4)
   - '2' for wrap cable (LIC3)

   Update also the clock information "C" if no clock is defined (clock value must be non-zero), using the CDF display/update scanner function (see "Service CDF Display/Update" on page 8-7).

4. Run the QC section (or all TSS IFTs) on the selected scanner and line (QCxx routines are automatically called if the CDF specifies that there is a wrap block or wrap cable for that line).

5. Take off the wrap plug or wrap cable.

6. Reconnect the LIC cable for the line.

7. Update the CDF accordingly.

Note: In order to fully test the LIC3 card, it is necessary to reverse the LIC3 wrap cable after a first test pass, then run the test again. One of the tests must be valid.

If no error is found, you may now test the cable that goes from the LIC to the modem (see next section).

Testing the Cable

1. Build a wrap block for the cable 'blue box' (V.24 interface only). (See Chapter 2 of the *Maintenance Information Reference* manual for details.)

2. Run QC only for the selected line.

Wrap Test during Diagnostics for Japan Only

Routines QD01 through QD05 are reserved for the Nippon Telegraph Telephone (NTT) administration. They check the data wrap regardless of the LIC type. They also check the modem control leads depending on the LIC type (modem-in wrap).

They must be selected; they do not run automatically like the QCxx routines.

QD01: NTT On/Off Driver Test: This routine sets permanently on or off all the used line drivers of a LIC card to allow measurements by the NTT service personnel.

The routine must be specifically selected together with the selected scanner and line, as shown in the following example:

```
DIAG==> QD01  ADP#==> 3  LINE==> 2  OPT==> N
```

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

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

CHECK IF DRIVERS ARE AS REQUESTED. PRESS SEND TO CONTINUE

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

QD02: NTT Data Wrap Test: This routine checks the data wrap path (transmit to receive) regardless of the LIC type. 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 4x: Set the DCE Test/Operate switch to T1.

QD03, QD04, QD05: NTT Modem-In Wrap Test: These routines 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 4x: Set the DCE Test/Operate switch to T1.

Line Testing Possibilities

A line position can be plugged with a line cable, or be without a line cable, or can be plugged with a wrap block (LIC type 1, 2, 4A, or 4B), or with a wrap cable (LIC type 3). The CDF for each line must be updated accordingly.

When the TSS IFTs are run, the hardware for a selected line is:

1. Tested up to the LIC drivers if the line cable is present.

2. Tested up to the LIC and ICC (if present) card level for a line without cable.

3. Fully tested if a wrap block or a wrap cable is present on the selected line. Plugging a wrap block or wrap cable automatically selects the manual intervention section QC.

   Note: The CDF must be updated accordingly.

4. In order to fully test the LIC3 card, it is necessary to reverse the LIC3 wrap cable after a first test pass, then run the test again. One of the tests must be valid.

For wraps during normal operation, see the *3720 Extended Services* manual.

Remote Power-Off Test procedure.

This procedure is slightly different for a remote or a local 3720.

STEP 1: Run CCU diagnostic routine EB03.

When prompted by:

```
CHECK POWER CONTROL SWITCH IS ON LOCAL, THEN PRESS SEND (for local 3720)
or
CHECK REMOTE POWER OFF SWITCH IS ON DISABLE, THEN PRESS SEND (for remote 3720)
```

set the switch as requested, then press *SEND*.

If this does not cause the 3720 to be powered OFF, go to step 2.

If this causes the 3720 to be powered OFF, it is wrong:

1. First check the power control rotary switch (see power MAPs of the *Maintenance Information Procedure* manual).
2. Then, if the power control rotary switch was not the faulty element, exchange the PUC card (and the MAC card), then run EB03 once more.
3. If the results are still bad, exchange the PWC card.
4. If the results are still bad, see Chapter 10 of the *MIR*.

Step 2:

When prompted by:

```
TURN POWER CONTROL SWITCH TO NETWORK, THEN PRESS SEND (for local 3720)
or
TURN REMOTE POWER OFF SWITCH ON ENABLE, THEN PRESS SEND (for remote 3720)
```

set the switch as requested, then press *SEND*.

If this causes the 3720 to be powered OFF, it is OK, the RPO function works properly.

If this does not cause the 3720 to be powered OFF:

RAC '8DD' is displayed (FRU group with PUC and MAC cards)

1. Exchange the cards and run EB03 once more.

   If all FRUs have been exchanged and the results are still bad,

2. Check the power control rotary switch (see power MAPs of the *MIP*).
3. If the results are still bad, exchange the PWC card.
4. If the results are still bad, see Chapter 10 of the *MIR*.

Note: RAC '87A' corresponds to FRU group 1069 which includes:

- PUC 02D A1C2
- MAC 02D A1B2
- CRDV 02D A1A2.

How to Run Offline Diagnostics from the Operator Console

The diagnostic control facility (DCF) can be selected from the control panel or from the operator console.

The *Maintenance Information Procedures* (MIP) manual explains how to run diagnostics from the 3720 control panel, that is:

1. Use the various switches to start the DCF.
2. Interpret the results from the hexadecimal display of the 3720 control panel.

Warning: The 3720 may be operational; ask the customer to de-activate the 3720 and all connected resources before starting the diagnostics.

Before entering the following procedure, set all the Channel adapters to 'disabled' and wait for the 'all channel adapter disabled' light (green light) to be on. Set the Panel-console switch to Panel.

Selecting the Offline Diagnostics

You must first display the **3720 function menu** in *maintenance* mode (see Figure 3-2).

"Local Connection to MOSS by Service Personnel" on page 1-12 explains how to obtain this display.

1. Type *DG* (for diagnostic programs) in the *SIA* (press PF1 if cursor is not in *SIA*).

2. Press *SEND*.

The **diagnostic request** panel will be displayed (see Figure 3-3 on page 3-8).

Note: If one (or more) of the channel adapter interfaces is enabled, the function message area displays:

```
CAUTION: CA INTERFACE(S) ENABLED: B2 A2 B1 A1
```

```
       MOSS-ALONE          CCU INTERRUPTS DISABLED

CUSTOMER ID: .............         3720-11        SERIAL NUMBER: xxxxxxx
-------------------- MAINTENANCE MODE ----------------------------
SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA    PF2: CCU FNCTN PF3: ALARM




BER CORRELATION...: BC   MODULE DISPLAY...: MD   TRSS FUNCTIONS...: TRS
DUMP DISPLAY/DEL..: DD   MOSS STORE DPLY..: MS   TSS FUNCTIONS....: TS
DIAGNOSTICS.......: DG
```

Figure   3-2. 3720 Function Menu Panel (Maintenance Fields)

```
  PROCESS   STOP-CCU-CHK SERVICE-MODE
            BYP-ADP-CHK


  CUSTOMER ID: .............        3720-11        SERIAL NUMBER: xxxxxxx
  -------------------- MAINTENANCE MODE --------------------------------
  FUNCTION ON SCREEN: DIAGNOSTICS


  SYSTEM INPUT AREA (SIA) ===>
  T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA    PF2: CCU FNCTN PF3: ALARM


  DIAG  |ADP# |LINE |

  1 ALL
  2 CCU
  3 IOCB
  4 CA   |01-02|
  5 TSS  |01-01|00-31
  6 OLT  |01-02|
  7 TRSS |02-02|01-02


          AND                                        DIAG - RUN INIT


  OPT = Y IF MODIFY
  OPTION REQUIRED    |< Function Message Area >
                     | ENTER REQUEST ACCORDING TO THE DIAG MENU
                     | DIAG==>       ADP#==>      LINE==>      OPT==> N
  ===>
```

Figure   3-3. Diagnostic Request Panel

Selecting from Diagnostic Request Menu

- Select from the **diagnostic request** panel the parameters you wish to enter on the selection line (DIAG, ADP#, LINE, OPT).

  To select diagnostics, use the DIAG field, and type:

  — 1 through 7 to select all diagnostics (1), or a whole diagnostic group (see "Explanation for Diagnostic Request Panel Menu").

  — X, where X is the letter corresponding to a specific IFT (for example P for the FES IFT P).

  — XY, where X is the IFT, and Y the specific section (for example PA for section A of FES IFT P).

  — XYZZ, where X is the IFT, Y the specific section, and ZZ is the routine number (for example PA10 for routine 10 of section A of FES IFT P).

  Move the cursor from its initial position (DIAG= = >) to the next after each parameter is entered. To skip a parameter entry, press the -->| key.

- Press *SEND* to execute the request.

- Read what is displayed in the work area, and proceed with the next action according to the displayed menu or message. The fields in the work area are explained in "Work Area Description (Common Fields)" on page 3-20.

Entering Additional Parameters

A diagnostic may require you to enter parameters. The request is displayed on the message line. For example:

ENTER LEVEL YOU WANT: 01, 02, 03, 04, 05

This requires a full reply: You **must not** reply with a null entry or 'R' only, but with 'R' and the parameters.

In this example, if you want to run the routine on CCU interrupt level 2, you must reply R02.

Selection Example

DIAG==> 5   ADP#==> 1   LINE==> 14   OPT==> Y

In this example, the TSS diagnostic group is selected (5), and tests line 14 of scanner 1. The modify option is requested.

Explanation for Diagnostic Request Panel Menu

1 ALL: The object of this selection is to run the diagnostics without manual intervention.

It causes the offline diagnostics to run in the mandatory sequence. The console panel shows the progress of the diagnostic by updating the DIAG STATUS AREA every time a new routine is entered. Channel adapters, scanners, TRAs, and telecommunication lines are all tested in turn if present in the 3720 CDF.

The OLTs and the manual routines are not run when ALL is selected. This selection provides a quick check that the communication controller is working.

2 CCU: To run the CCU diagnostics.

3 IOCB: To run the redrive and the IOCB diagnostics.

4 CA |01-02|: In this example '01' and '02' are the channel adapters present on the machine. You may select a channel adapter in the range given. If you do not select a channel adapter, all are tested in turn, up to the last one defined in the 3720 CDF.

5 TSS |01-01|00-31|: In this example '01' is the scanner present on the machine (00-31 are the possible lines of a scanner)

When DIAG 5 is entered with no further parameters, all the lines on every scanner are tested if defined in the 3720 CDF. You may test all the lines attached to a scanner, or one line only on a particular scanner. For detailed information and line testing possibilities, see the *Maintenance Information Reference* manual.

6 OLT |01-02|: '01-02' represents the channel adapters (see CA|01-02|). This selection loads the channel adapter responder program into CCU storage, and responds to the requests of the host OLTs. You must select a channel adapter defined in the 3720 CDF.

7 TRSS |02-02|01-02|: '02-02' represents the TRA number; '01-02' represents the possible TICs installed.

When DIAG 7 is entered with no further parameters, all the TICs of the TRA (only one TRA on 3720 Model 11/12) are tested. You may test all the TICS (up to 2), or one TIC only. For detailed information and line testing possibilities, see the *Maintenance Information Reference* manual.

Selection Line Explanation for Diagnostic Request Panel

DIAG ==>: The diagnostic group (1 - 7), IFT, section, or routine that you want to run.

- Enter 1 through 7 to select all diagnostics or a whole diagnostic group (see "Explanation for Diagnostic Request Panel Menu" on page 3-9).
- To run a specific IFT, enter the corresponding letter (for example P for the FES IFT P).
- To run a specific Section of an IFT, enter the corresponding value (for example PA for section A of FES IFT P).
- To run a specific routine of a Section of an IFT, enter the corresponding value (for example PA10 for routine 10 of section A of FES IFT P)

ADP#==>: The adapter number (see page 3-9):

- Channel number (1 to 2) for CA and OLT
- TSS number (1, 3, or 4)
- TRA number (2 for 3720 model 11/12)

LINE===>: The number of a specific line (0-31) attached to a particular scanner (Models 1 and 2), or the TIC (1 or 2) attached to the TRM (Models 11 and 12).

OPT===>: Default options are:

- S: STOP ON FIRST ERROR

  The diagnostic request is executed. On detection of the first error, testing stops and the error information is displayed.

- NW: NO WAIT BEFORE EXECUTION OF EACH ROUTINE

  Allows the request to execute without a stop before routine execution.

- C1: CYCLE = 1

  The request is executed **once**, and ends with the REQUEST COMPLETE message.

- R1: REPEAT EACH ROUTINE ONCE

  Each routine is executed once.

  Enter 'Y' after OPT==> to display the **diagnostic selection modify** panel from which you may modify the options. The default value is N (no modification).

  "Diagnostic Options" on page 3-17 lists all possible options, and how they can be modified.

"List and Duration of Diagnostics" on page 3-3 gives the list of all IFTs together with their duration estimates.

Manual Intervention

A diagnostic may also require you to follow a manual intervention associated with troubleshooting (the associated procedure is provided in the *3720 Maintenance Information Reference* manual.

Example:

```
RECONNECT RDV3 THEN PRESS SEND
```

The jumper placed on Redrive card number 3 must first be removed, then the SEND key must be pressed.

Diagnostic Running Procedure

The panels available when running diagnostics are as follows:

- Diagnostic request
- Diagnostic selection modify
- Diagnostic execution modify
- Diagnostic message

To stop a diagnostic program that is running, press the *BREAK* (ATTN) key.

Wait for the DCF to receive the break caused by this key, and to stop the diagnostic (up to 3 minutes).

Use of CCU Functions with Diagnostics

When running CCU diagnostics (IFTs A, B, C, D, and E), you cannot always use the CCU functions. If you try to use them when they are not allowed, the diagnostic menu displays: CCU FNCTN BARRED.

If you request RUN ALL, you may use the CCU functions **only after** IFTs A, B, C, D, and E have been run.

When running TSS diagnostics (IFT P, Q, and R) the CCU is not used as a processor.

Only the last 2K of CCU storage are used as 'scanner mailbox' for data exchange between the DCM in the MOSS and the CP-and-IFTs in the TSS. There is no need to use the CCU functions when running TSS diagnostics, except if you wish to display the 'scanner mailbox'. Setting an address compare, for example, has no meaning.

All CCU functions should be used only when running IFTs I, J, or L.

Instruction stepping is not supported by the DCF.

Restrictions of CCU Function Use with Diagnostics

The following CCU functions may lead to unpredictable results:

- CH (channel adapter state)
- RCL (reset CCU/LSSD)
- IL3 (CCU level 3 interrupt)
- RIO (reset IOC)

To use address compare and branch trace, the CCU must first be initialized. The setting of these two functions remains active as long as the CCU is not reinitialized (indicated by 'RESET' on the MSA).

Note: For branch trace, local storage X'7D' **must** contain X'10000' (address of the branch trace buffer), and local storage X'7C' **must** contain X'6000' (length of branch trace buffer). Check the local storages for these values, and set them to the correct values when required.

Selection of a CCU Function During Diagnostics

Proceed as follows:

- Enter your selection on the **diagnostic request** panel. (Enter G for go if you have modified one of the options.)

- Press the *BREAK* (ATTN) key to initiate a break.

  Note: If the request is 'RUN ALL', do not press the *BREAK* key before routine IA01 appears on the panel.

- After a short wait, you receive the 'BREAK RECEIVED' message.

  The CCU is now initialized.

  1. Press *PF2* to display the **CCU function menu** panel.
  2. Press *PF1* to place the cursor in the SIA.
  3. Type the acronym corresponding to the specific CCU function.
  4. Press *SEND*.

- The CCU function selected will run.

- Return to the DCF application by pressing *PF2* again, then enter G (for go).

- You will regain control after an address compare has occurred. The panel in Figure 3-4 is displayed:

DCF Display on CCU Stop Address Compare

You may now use the CCU functions (use PF2 to return to the DCF application).

```
PROCESS  STOP-CCU-CHK SERVICE-MODE AC HIT      LAR:...... OP:....  C:.
STOP-AC  BYP-ADP-CHK                           IAR:...... ILVL:.   Z:.

CUSTOMER ID: ............        3720-1        SERIAL NUMBER: xxxxxxx
-------------------- MAINTENANCE MODE ------------------------------
FUNCTION ON SCREEN: DIAGNOSTICS

SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN PF3: ALARM

A ABORT ROUTINE

C CANCEL REQUEST

RX..X     REPLY:
 ENTER R
 FOLLOWED BY X..X
 (IFT MESSAGE),    REQUEST: ....  .              DIAG RUNNING
 THEN PRESS SEND.  OPTIONS: S   NW C1   R1       ROUTINE ....
 (REPLY MAY BE A   REQUESTED CCU STOP OCCURRED.
 NULL STRING)
                   ENTER REQUEST ACCORDING TO THE DIAG MENU
                   ==>
===>
```

Figure 3-4. Diagnostic Execution Panel (Stop Address Compare)

Resuming DCF Processing

To resume DCF processing requires two steps:

1. START CCU
2. Restart the DCF.

Note: The second step (restart the DCF) is possible only when the CCU enters the run mode (see second line of MSA). One or several subsequent START CCU may be needed to move the CCU status to run mode, depending on the AC stop occurrences.

Any attempts to restart the DCF when the CCU is in STOP-AC mode may lead to unpredictable results.

Starting the CCU

1. Press PF1 to place the cursor in the SIA field.
2. Type S (for the START CCU function).
3. Press *SEND*.

Restarting the DCF

1. Place the cursor under the ENTER REQUEST line
2. Type:
   a. R, for continue
   b. A, for abort
   c. C, for cancel
3. Press *SEND*.

Diagnostic Selection Modify Menu

This is the panel presented after you selected a diagnostic on the **diagnostic request** panel, with the OPT==> field updated to the Y value, and before the selected diagnostic has been started.

In the example below, the option will be modified from S (stop on first error) to DM (display multiple errors).

Type G and press *SEND* to start the execution of the diagnostics with the new options.

```
G GO
C CANCEL REQUEST

M MODIFY OPTIONS:
 S/LS/AL/ALS/B/DM
 NW/W
 C1/CNNN/C          REQUEST: PB                        DIAG - RUN INIT
 R1/RNNN            OPTIONS: S    NW C1    R1


                    ENTER REQUEST ACCORDING TO THE DIAG MENU
                    ==> M DM W
 ===>
```

Figure   3-5. Diagnostic Selection Modify Panel

Diagnostic Execution Modify Menu

This is the panel presented after the **BREAK** (ATTN) key has been hit during the running of the diagnostic, and when the break has been received by the control program.

In the example below, G (for go) has been typed under the ENTER REQUEST.

Press *SEND* to restart the execution of the diagnostics.

```
G GO
C CANCEL REQUEST

M MODIFY OPTIONS:
 S/LS/AL/ALS/B/DM
 NW/W
 C1/CNNN/C          REQUEST: TSS 1              TSS  DIAG RUNNING
 R1/RNNN            OPTIONS: S    NW C1    R1         ROUTINE PA04 ADP 01

                    BREAK RECEIVED
                    ENTER REQUEST ACCORDING TO THE DIAG MENU
                    ==> G
 ===>
```

Figure   3-6. Diagnostic Execution Modify Panel

Commands of the Diagnostic Execution Modify Panel (A, G, C, R, or M)

The menu to the left of the panel lists the following set of commands:

A ABORT ROUTINE: The current routine is aborted. The next routine in sequence is entered, or the request is complete if the abort occurred on the last routine.

G GO:

1. (Selection Modify Menu):

    After your request is entered on the panel, GO starts the execution.

2. (Execution Modify Menu):

    After your request is entered on the panel, GO resumes the execution.

C CANCEL: The current request is canceled, allowing a new request. The current set of options is reset.

R RERUN: The diagnostic request is restarted from the beginning. The current set of options is not changed.

M MODIFY OPTIONS: The modify options (M) are separated by a slash (/) on each line of the menu. This means that on a given line, the options are mutually exclusive. However, you may select several options, one per line of the menu.

If you select more than one option for the same line, only the last one is accepted.

if you do not select any option, the initial values are:

    S (stop on first error)
    NW (no wait before execution of each routine)
    C1 (cycle = 1)
    R1 (repeat each routine once)

To change options, you must enter the following:

```
M DM W
|  L————————— Space required
|  L————————— Space required
M is required
```

To leave the modify option (M), enter any command (A, C, G, or R). The request is executed.

All options are listed in "Diagnostic Options" on page 3-17.

Diagnostic Options

Stop Option S/LS/AL/ALS/B/DM

S STOP ON FIRST ERROR: This is the default option.

> The diagnostic request is executed. On detection of the first error, testing stops and the error information is displayed.

> If you choose to continue the request by typing G (go), the request continues from the error until a second error is detected; at that time the error is displayed and the request stops again.

LS LOOP ON FIRST ERROR WITH STOP: The diagnostic request is executed until the first error is detected. The DCF then displays this error and stops. Entering G (go) causes the DCF to loop on the error, and to stop and display when the same error is detected again.

> The loop is maintained on this error display whether the error which initiated the loop remains. If a new error appears inside the loop, it is displayed as N ERC (new ERC) and N RAC (new RAC); but even then the loop is maintained on the first error detected.

> At each display stop, you may enter one of the commands of the menu (A, G, C, R, or M).

AL AUTOMATIC LOOP ON ERROR: The diagnostic request is executed until the first error is detected. The DCF displays this error and starts looping automatically on the error. The loop is maintained on this error whether the error which initiated the loop remains. If a new error appears inside the loop, it is displayed as N ERC (new ERC) and N RAC (new RAC), but even then, the loop is maintained on the first error detected.

> As there is no stop once the loop has been initiated, you have no other way to regain control than to press the *BREAK* (ATTN) key. The message BREAK RECEIVED then appears.

> The request is stopped and you may use one of the commands of the menu (A, G, C, R, or M).

ALS AUTOMATIC LOOP ON ERROR WITH NEW ERROR STOP: The diagnostic request is executed until the first error is detected. The DCF displays this error and begins to loop automatically on the error. The loop is maintained on this error display, whether the error that initiated the loop remains. If a new error appears inside the loop, it is displayed as N ERC (new ERC) and N RAC (new RAC); the DCF stops on this display.

> You may now enter any command of the 'execution modify' menu.

> For example:

> - GO restarts the loop (ALS option still active)

> - M S changes the ALS option to the stop on error option; entering 'G' (for go) then causes the DCF to continue the request sequentially to completion or until the next error is detected and displayed.

> > If no N ERC or N RAC occurs (no new error detected during the loop), there is no other way for you to regain control other than by pressing the *BREAK* (ATTN) key. The message BREAK RECEIVED appears, the request is stopped, and you may then enter one of the commands of the menu (A, G, C, R, or M).

B BYPASS ERROR STOPS: The diagnostic request is executed until an error is detected. On detection of the error, the DCF displays the error information; testing then resumes automatically until another error is

detected or until the request is complete. Every error detected is displayed in this way. You have no other way to regain control before the end of the request other than to press the *BREAK* (ATTN) key.

The message BREAK RECEIVED appears, the request is stopped, and you may then enter one of the commands of the menu (A, G, C, R, or M).

DM   DISPLAY MULTIPLE ERRORS: The diagnostic request is executed until an error is detected. On detection of the error, the DCF displays the error information, aborts the routine, and automatically starts the next routine. In this way, only the first error detected in each routine is displayed. Execution then continues automatically until the request is complete. You have no other way to regain control before the end of the request other than to press the *BREAK* (ATTN) key.

The message BREAK RECEIVED appears, the request is stopped, and you may then enter one of the commands of the menu (A, G, C, R, or M).

Note: You may use any command of the **diagnostic execution modify** panel to:

- Abort the routine and continue the request from the next routine (if any).

- Continue the request.

- Cancel the request.

- Rerun the request from the beginning.

- Modify the option to another, or add any compatible option, then enter G (for go). The request continues to completion, until REQUEST COMPLETE is displayed, or until an error is detected and displayed.

Wait Option NW/W

NW   NO WAIT BEFORE EXECUTION OF EACH ROUTINE: This is the default option.

It cancels the W option, and allows the request to execute without a stop before routine execution.

W   WAIT BEFORE EXECUTION OF EACH ROUTINE: The execution of the diagnostic request stops before each routine. Entering G (for go) starts the next routine in sequence.

The message ROUTINE READY TO START appears, the request is stopped, and you may then enter one of the commands of the menu (A, G, C, R, or M).

Cycle Option C1/Cnnn/C

C1   CYCLE = 1: This is the default option.

The request is executed **once**, and ends with the REQUEST COMPLETE message.

Cnnn   CYCLE nnn TIMES: The request is executed nnn times (nnn = 1 to 255)

After nnn cycles, the request ends and the message REQUEST COMPLETE is displayed.

C CYCLE ON REQUEST: The DCM executes the entire request, and then automatically restarts it.

This 'cycle' on the entire request continues indefinitely unless you press the *BREAK* (ATTN) key and change the option to C1.

Repeat Option R1/Rnnn

R1 REPEAT EACH ROUTINE ONCE: This is the default option.

Each routine is executed once.

If you have selected Rnnn and want to return to the default option, modify Rnnn to R1.

Rnnn REPEAT EACH ROUTINE nnn TIMES: Each routine is executed nnn times (nnn: 1 to 255) before the next routine is executed.

Diagnostic Work Area Description

Common and detailed diagnostic information is available on the diagnostic panels.

Common Information

The common information area is permanently updated, depending on the monitoring of the IFT diagnostic runs. The following panel is presented after an error has been found by the diagnostic, and the selected option is stop on error (with or without the loop option). The panel in Figure 3-7 is only an example, and should not be used for troubleshooting.

```
                         *****************
   A ABORT ROUTINE       * RAC   185      *
   G GO                  * ADDR 02 20    * ERR BIT  0001
   C CANCEL REQUEST      * ERC  QB010611.*                     ERROR COUNT   00001
   R RERUN REQUEST       *****************
   M MODIFY OPTIONS:
     S/LS/AL/ALS/B/DM
     NW/W                START 00:10:57   STOP 00:11:06
     C1/CNNN/C           REQUEST: TSS 1                   TSS  DIAG RUNNING
     R1/RNNN             OPTIONS: S   NW C1  R1           ROUTINE QB01 ADP 03 L 20
                             LINE AD 052
                         *** ERROR FOUND ***
   T COMMAND BARRED      ENTER REQUEST ACCORDING TO THE DIAG MENU
   CCU FNCTN BARRED      ==> G
   ===>
```

Figure 3-7. Diagnostic Request Panel

Work Area Description (Common Fields)

ADDR

Indicates the logical address of the failing element in the controller. The first two digits give the CA, RDV, TRA, or scanner number; The last two digits give the line address or TIC number, if any.

CE REPLY AREA

Initial request, command, answer to diagnostic message.

Command Barring

One of the following lines, or both, may appear on the panel:

- T COMMAND BARRED: The action to be performed is displayed in the diagnostic menu.

- CCU FNCTN BARRED

DCF MESSAGE AREA

ENTER REQUEST ACCORDING TO THE DIAG MENU

DCF RUNNING REQUEST

- Initial request and current run options:: REQUEST: TSS 1
  OPTIONS: S   NW C1   R1

DCF RUN STATUS

Break received, error reporting, and so on, for example::   *** ERROR FOUND ***

DIAG RUN STATUS

The information has the following format:: xxxx DIAG yyyyyyyy

where xxxx can be:

    CCU
    IOCB
    CA
    TSS
    TRSS

and yyyyyyyy can be:

    RUN INIT (DCF initialization phase)
    CCU INIT (CCU initialization phase)
    RUNNING
    RERUNNING
    CANCELED
    ENDED
    UNXPTD.ERR
    HUNG


```
ROUTINE QB01                ADP  01 L 20
       | | |               |       |
       | | Routine (01)    |    Line address 20 in scanner
       | Section (B)        |
       IFT (Q)          Scanner, TRA, or CA number
```

    LINE AD 052   (Line address 052 in 3720/21 (000 to 063))

ERC (Error Reference Code)

This indicates whether you are working on the same fault or a new one (after a
FRU replacement for example). It enables you to loop on one specific error
only, disregarding all others or new ones, if any. The first four digits show the
IFT number, section number, and routine number. The last four digits indicate
the error number.

```
GB 02                        78F6

 |  |----> Routine (GB02)    Error number (ERC)
 | |-----> Section (GB)
 |------->  IFT (G)
```

TIMING AREA

- Indicates the initial time (starting from 00:00:00 because of MOSS mainte-
  nance IML).

- Indicates the time of every stop (for stop on error, request complete, or
  request canceled).

ERR BIT

For the way in which to use its contents, see the *3720 Maintenance Information
Reference* manual.

DIAGNOSTIC MESSAGE AREA

Message from current IFT routine (blank in this routine).

RAC (Repair Action Code)

This code is used with the repair action code index in the *3720 Maintenance Information Procedures (MIP)* manual.: The RAC-FRU list correspondence table requires a secondary code. Use Figure 3-8 on page 3-23 to create this secondary code before going to the *Maintenance Information Procedures* manual (MIP) to determine the list of the suspected FRUs, and the procedure to follow for their replacement. FRUs are identified by their generic names (for example, LIC3). Look up the FRU name in the FRU correspondence table in the *MIP*. Use the logical FRU address as required to find out the corresponding FRU location in your machine.

With the line address, and using the scanner board information tables, locate the different cards used by this line.

RAC and Secondary Code

The FRU list table in the *Maintenance Information Procedures* manual requires both the RAC code and a secondary code. This secondary code is made up of the adapter number, the line number, and/or the suspected failing adapter.

In the example in Figure 3-7 on page 3-20:

- The RAC number is 185 the first value of the ADDR field.
- The adapter number is 01, that is, the first value of the ADDR field.
- The line number is 06, that is, the second value of the ADDR field.
- The ERC code is QB010611.

Build the secondary code using the correspondence rules of Figure 3-8 on page 3-23.

For example for RAC 185, if ADDR field = 01 06, the secondary code will be 106.

RAC Number or RAC Range	Adapter number (ADDR)	Secondary Code
TSS RACs (ADDR=Scanner)		
100 - 1FF (LAB type A)	01 03	1LA (note 1) 3LA
300 - 3BF (LAB type B)	03 04	3LA 4LA
TRSS RACs (ADDR=TRA)		
3C0 - 3FF (LAB type C)	02	200 (TRM down) 201 (TIC 1 down) 202 (TIC 2 down)
IOC RACs (ADDR=RDV) 602, 604-607, 60B, 616, 618, 61A, 61D, 620-628, 62C, 62E 640, 642, 645, 647, 64B-64F, 650-653, 656, 658-65A, 660, 662-664	01 02 03 04	Fx1 or 0x1 (note 2) Fx2 or 0x2 Fx3 or 0x3 Fx4 or 0x4
CA RACs (ADDR=CA)		
680-684, 686-6FF	01 02	100 200
685	01 02	1x2 (note 3) 2x1

Figure 3-8. Building the Secondary Code

Notes:

1. LA is the line address (second value of ADDR).

2. First digit is 'F' if ERC is in the form xxxxFFFF, first digit is '0' otherwise.

3. The third digit is in the ADDIT INFO field.

What to Do with the RAC

The repair action code displayed may be:

1. A real repair action code, which, associated to a secondary code, signals a hardware error and leads to a FRU list.

   Action:

   a. Find the FRU corresponding to that RAC in the RAC table in Chapter 3 of the the *Maintenance Information Procedures* manual.
   b. Change the FRU(s).
   c. Run the diagnostics again.

2. A code used by the diagnostic programs to signal an error while running the diagnostic programs:

   • The DCM has not been able to run the diagnostics requested.
   • An error occurred in one of the diagnostic programs.

   Action:

   a. Run the diagnostic again to see if the RAC is still displayed.
   b. Check the machine for loose cards.
   c. If you have a program name and an ERC, go to the diagnostic description manual.
   d. Contact your support structure to determine if a diagnostic microcode fix *MCF* is available to correct the problem.

3. A code not found in the following table.

   Action:

a. Run the diagnostic again to see if the code is still displayed
b. Check the machine for loose cards.
c. Contact your support structure to determine if a diagnostic microcode *fix* is available to correct the problem.

120-12C 170-196 320-369 3A0-3A1	150-169 1A0-1A1 370-38B 3C0-3FF	170-172 390-396		See RAC table in MIP
500-5FF				See Unexpected RACs (3-29)
601-602 60B 61A 62E 64B-64F 660 690-692 870-876 8DD	604-605 613 61D 640 650-653 662-664 878-882 8E0-8EA	607 616 620-628 642 656 670-671 886-88C 8EF-8FA	609 618 62C 645-647 658-65A 680-687 890-8C0 8FD-8FF	See RAC table in MIP
900-9FF				Control panel codes (see note)
EE6				Control panel during CSU

Figure 3-9. RACs displayed on Console

Note: 900-9FF codes are simple messages intended for the user of the control panel to whom they show the progression of the diagnostic programs. They **should not** appear on the console, and must be treated as unexpected RACs.

Detailed Diagnostic Information

There are two types of display:

- DIAG ERROR REPORTING (see Figure 3-10 on page 3-25) and
- DIAG/DCF UNEXPECTED ERROR (see Figure 3-11 on page 3-26).

These panels are examples, and should not be used for troubleshooting.

Diagnostic Error Reporting Display

This is the panel presented after an error has been found by the diagnostic, and the chosen option is STOP on ERROR.

Note: Fields having characters and dots (for example, LOOP COUNT...) are displayed only when necessary.

They are all shown here in order to indicate the maximum available information displayed on the panel in case of error reporting.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│                    │ **************** EXP DATA 0024 0000  LOOP COUNT   ..... │
│   A ABORT ROUTINE  │ * RAC  18A      * RCV DATA 1020 A00A  LOOP ERR.CNT ..... │
│   G GO             │ * ADDR 01 02    * ERR BIT  0004 0000  │
│   C CANCEL REQUEST │ * ERC  QA060411 * MASK     0FFF 0000  ERROR COUNT  00001 │
│   R RERUN REQUEST  │ **************** ADDIT INFO:           CYCLE COUNT  ..... │
│   M MODIFY OPTIONS:│ N RAC ...          ...........        REPEAT COUNT ... │
│     S/LS/AL/ALS/B/DM│ N ERC ........    ..................... │
│     NW/W           │ START 00:01:14   STOP 00:01:27 │
│     C1/CNNN/C      │ REQUEST: Q   1                 TSS  DIAG RUNNING │
│     R1/RNNN        │ OPTIONS: S   NW  C1  R1              ROUTINE QA06 ADP 01 │
│                    │                                                     │
│                    │ *** ERROR FOUND *** │
│                    │ ENTER REQUEST ACCORDING TO THE DIAG MENU │
│                    │ ==> A │
│   ===>             │                                                     │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure   3-10. Diagnostic Error Reporting Panel

Field Explanation for Diagnostic Errors

N ERC: Means new ERC (error reference code).

N RAC: Means new RAC (repair action code).

After a loop option is selected, a first error causes a loop to be maintained. If an error different from the first one occurs, it is displayed as N ERC and N RAC.

EXP DATA: 0024 0000

RCV DATA: 1020 A00A

ERR BIT: 0004 0000

MASK: 0FFF 0000

These four lines of information work together: any discrepancy between the EXP (expected) DATA and the RCV (received) DATA is taken into account if the corresponding MASK bit is on.

The ERR BIT can also be displayed alone. In this case, EXP DATA, RCV DATA and MASK fields are not displayed. For the way in which to use its contents, see the *3720 Maintenance Information Reference* manual.

ADDIT INFO: means additional information. The meaning varies with the routine that displays the additional information.

When the 'ADDIT INFO' field is used by a routine, its contents are to be found in the *Diagnostic Descriptions* manual.

LOOP COUNT: is incremented by one prior to the execution of a routine when looping on an error. The displayed value is incremented every time the loop is entered, whether the error occurs or not. The loop count is reset at the beginning of a request, at the start of a routine, or at any loop option change.

LOOP ERR CNT: means loop error count. The displayed value is incremented only when the referenced error (first error) occurs in the loop. The loop error count is reset at the beginning of a request, at the start of a routine, or at any loop option change. Comparing LOOP COUNT and

LOOP ERR CNT values helps determine the number of intermittent error occurrences.

ERROR COUNT: indicates the count of any error encountered while a request is running. A new request resets the error count. The displayed value is updated while the diagnostic is running.

CYCLE COUNT: indicates the current count of the Cnnn option you specified. The displayed value is updated while the diagnostic is running.

REPEAT COUNT: indicates the current count of the Rnnn option you specified. Modifying the option or starting a new request resets the repeat count.

Diagnostic Unexpected Error Display

This is the panel presented after an UNEXPECTED ERROR has been found by the diagnostic. This is a **major** error; the diagnostic run cannot continue.

Note: In this case, NEW REQUEST is proposed to the CE. This means that the following is allowed:

CCU FNCTN (F1)
MOVE TO SIA (F2)
ALARM (F3)
TERMINATE (T COMMAND)

```
SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF    PF1: MOVE TO SIA    PF2: CCU FNCTN  PF3: ALARM


DIAG   |ADP# |LINE |
                   |**************** ORIGIN: MOSS<-IFT
1 ALL              |* RAC  868      * LEVEL : X'01'
2 CCU              |*               * LVLMSK: X'FF'
3 IOCB             |*               * ROUTINE BA03
4 CA   |1-> 2|     |**************** ADDIT INFO:
5 TSS  |1-> 4|0->31|                RC= 84
6 OLT  |1-> 2|     |
                   |START 00:09:18 STOP 00:10:17
       AND         |REQUEST: BA03                   CCU  DIAG UNXPTD.ERR
                   |OPTIONS: S   NW C1   R1              ROUTINE BA03
OPT = Y IF MODIFY  |
 OPTION REQUIRED   |UNEXPECTED ERROR
                   |ENTER REQUEST ACCORDING TO THE DIAG MENU
                   |DIAG==>     ADP#==>     LINE==>     OPT==> N
 ===>
```

Figure 3-11. Diagnostic Unexpected Error Display (Sample)

DCF Unexpected Error Display

This is the panel presented after an UNEXPECTED ERROR has been found by the DCF. This is a **major** error; the diagnostic run cannot continue. This panel is an example, and should not be used for troubleshooting.

Note: The displayed RAC may have multiple causes. The additional information field (ADDIT INFO), gives more detailed information.

```
                       **************** ORIGIN: MOSS<-DCM
                       * RAC  50D     * LEVEL : X'01'
                       *              * LVLMSK: X'FF'
                       *              *
                       **************** ADDIT INFO:
  PANEL MAINTENANCE                      AREA= 02 EXC.COD= 00
  IML MANDATORY.                         ON DATA XFER     4500

                       REQUEST: Q    1                      DIAG HUNG
                       OPTIONS: S    NW C1    R1

                       UNEXPECTED ERROR
  T COMMAND BARRED

  ===>
```

Figure   3-12. DCF Unexpected Error Display Panel

Description of Fields for Unexpected DCF RACs

In catastrophic cases, such as erroneous logical status, or return code not null after an I/O operation, the diagnostic control facility (DCF) displays a panel containing a special repair action code (RAC) referring to an **unexpected error.**

These RACs may be requested by any DCF component:

- DCM: Diagnostic Control Monitor
- CP MOSS: Command Processor - MOSS
- CP CCU: Command Processor - CCU
- CP CSP: Command Processor - CSP

In principle, an unexpected error RAC is meaningful only in perfectly debugged code. Therefore, during an investigation into an unexpected error, as a last possibility, you should suspect a *software error* in the DCF.

```
┌─────────────────────────┐
│ 500-510: Common RACs    │
└─────────────────────────┘
   500   CDF not initialized
   501   Received event from CP  rejected by DCM.
   502   Received event from DCM rejected by CP.
   503   Diagnostic Routine, known by DCM, not found by CP.
   504   SST access required by DCM, rejected by CP.
   505   Routine class not found by DCM in routine signature.
   506   CCU hardcheck detected in DCF by CP-CCU PS.
   507   CP CSP time-out detected in DCF by CP-CSP PS.
   508   IOCBUS time-out detected in DCF by CP-CSP PS.
   509   Unexpected scanner RCV event detected in DCF
         by CP-CSP PS.
   50A   Console disconnected during a Diagnostic run done
         in Console mode.
   50B   CP CCU Time-out detected in DCF by CP-CCU PS.
   510   INVALID loading request.


┌──────────────────────────────────────┐
│ 511-519: RAC related to disk I/O error │
└──────────────────────────────────────┘
   511   DCF load module (for MOSS).
   512   CDF data set.
   513   PICO data set.
   514   DIAG load module (for MOSS).
   515   DIAG data set (for CCU or CSP).
   516   RLOAD load module requested by Diag (for MOSS).
   517   RLOAD data set requested by Diag (for CCU or CSP).
   518   CP load module (for MOSS).
   519   CP data set (for CCU or CSP).


┌────────────────────────────────────────────────┐
│ 520-52A: RAC related to data transfer (MOSS<──>CCU) │
└────────────────────────────────────────────────┘
   520   Write PICO data set into CCU.
   521   Write DIAG data set into CCU.
   522   Write RLOAD data set (requested by Diag) into CCU.
   523   Write CP data set into CCU.
   524   Write CDS data entry into CCU.
   525   Write SST data table into CCU.
   526   Write REPLY data (to Diag request RWTOR) into CCU.
   52A   Read ANY data from CCU.


┌──────────────────────────────────────────────┐
│ 530-54D: RAC related to PCW performed via IMAC │
└──────────────────────────────────────────────┘
   530   Disable MOSS from any interrupts but TIMER.
   531   Write Cyclic LSSD.
   532   Start PICO CODE.
   533   Start PICO DIAGS.
   534   Get PICO DIAGS results.
   535   Enable PU interrupts.
   536   Init CP-CCU.
   537   Enable CRDV.
   538   Enable REDRIVE.
   539   Set 'adapter reset IOC' bit.
   53A   Reset 'adapter reset IOC' bit.
   53B   Enable IOCB cycle steal.
   53C   Stop CCU.
   53D   CCU Mail-Box IN.
   53E   Disable IOCB cycle steal.
```

Figure 3-13 (Part 1 of 2). Unexpected RACs on Console

```
53F    Set MOSS operative.
540    Enable scanner interrupts.
541    Reset scanner.
542    Run CSP checkouts.
543    Get CSP checkout results.
544    Set MOSS area (in CCU) address.
545    Enable/Disable PA Interrupt.
546    ROS scanner Mail-Box IN + scanner IPL (CP-CSP loading)
547    ROS scanner Get command completion.
548    ROS scanner initialization.
549    Read CA Bus register.
54A    Write hexadecimal display value.
54B    Blank hexadecimal display value.
54C    Disable MOSS from PU and CSP interrupts.
54D    Read panel status.
```

553-556: RAC related to PICO DIAGS results

```
553    PICO DIAGS 3 result KO.
554    PICO DIAGS 4 result KO.
555    PICO DIAGS 5 result KO.
556    PICO DIAGS 6 result KO.
```

561-563: RAC related to CSP ROS return code

```
561    CSP ROS checkout KO.
562    CSP ROS IPL failing (CP-CSP loading).
563    CSP ROS Get command completion KO on scanner IPL.
```

581-58C: RAC related to CP MOSS

```
581    CP MOSS level 7. IFT domain active during CP process.
582    CP MOSS level 7. CP domain active without CP task.
583    CP MOSS level 0. No associated IFT.IH level 0.
584    CP MOSS level 1. No associated IFT.IH level 1.
585    CP MOSS level 4. No associated IFT.IH level 4.
586    CP MOSS level 0. Unexpected interrupt level 0 for CP.
587    CP MOSS level 1. Unexpected interrupt level 1 for CP.
588    CP MOSS level 4. Unexpected interrupt level 4 for CP.
58A    CP MOSS level 0. PCW exercised via CHGMACAC fails.
58B    CP MOSS level 1. PCW exercised via CHGMACAC fails.
58C    CP MOSS level 4. PCW exercised via CHGMACAC fails.
```

5A0-5A0: RACs related to CP CCU

```
5A0    CP CCU. Unexpected situations at any level.
```

5C0-5CE: RACs related to CP CSP

```
5C0    CP CSP. CP and IFT not working with same SRB
       (level      0, 1, 2, 7).
5C1    CP CSP. CP-DCM IOCB communication errors (level 0, 7).
5C3    CP CSP level 0. Interrupt requ. by CP without reason.
5C4    CP CSP level 7. IFT domain active during CP process.
5C5    CP CSP level 7. CP domain active without CP task.
5C6    CP CSP level 0. No associated IFT.IH level 0.
5C7    CP CSP level 1. No associated IFT.IH level 1.
5C8    CP CSP level 2. No associated IFT.IH level 2.
5C9    CP CSP level 0. Unexpected interrupt level 0 for CP.
5CA    CP CSP level 1. Unexpected interrupt level 1 for CP.
5CB    CP CSP level 2. Unexpected interrupt level 2 for CP.
5CC    CP CSP level 3. Unexpected interrupt level 3 for CP.
5CD    CP CSP level 4. Unexpected interrupt level 4 for CP.
5CE    CP CSP level 5. Unexpected interrupt level 5 for CP.
```

Figure   3-13 (Part 2 of 2). Unexpected RACs on Console

CP Additional Information Meaning

All RACs reported by each command processor (CP) are selftexplanatory; there is no standard format.

DCM Additional Information Meaning

This area is structured as follows:

- The first line indicates the exercised area (AREA=) and the current operation exception code (EXC.COD=) in this area.

- The second line displays the logical DCF status at the time of the operation. It consists of a DCF message with the following format:

ON condition = wxyz

where condition is the DCF logical status, and wxyz is the DCF value.

Exercised

Area Code	Area Name
00	Control code
01	Disk
02	Panel MIOC
03	CCU IOC
04	Timer

Exception Code Area

Area Code	Exception Code List
00	(not used)
01	Disk adapter list
02	Panel adapter list
03	Panel adapter list
04	Timer adapter list

Condition

ON condition	Area	Meaning
ON Event/State	00	Event wx received on state yz is rejected
ON Routine	00	Routine wxyz (for example AB01) does not exist in current IFT header
ON SST Offset	00	The offset wxyz in IFT Sequence table is wrong.
ON (module name) or ON (file name)	01	Module or file: empty or not found, already open or closed
ON Data Transfer	02	wxyz reflects last MIOC command sent
ON Data Transfer	03	wxyz reflects last message sent to CP

How to Run Channel Adapter Online Tests (OLTs)

Online tests (OLTs) are channel tests loaded from the host CPU as channel exercisers.

Detailed explanations of online tests are given in *3720 Communications Controller Channel Adapter Online Tests*, D99-3720A.

OLT Procedure.

1. Check that the host operator has loaded the correct level of OLTs for the 3720.

2. On the **diagnostic function selection** panel:

   a. Type *6* (for OLTs) next to DIAG==>.
   b. Type *1 or 2* next to ADP==> for the channel adapter you want to test.
   c. Press *SEND*.

3. When you are prompted to enable the channel adapter under test:

   a. Set to *Enbl* (up) the switch corresponding to that channel adapter on the control panel.
   b. Press *SEND*.

Chapter 4. Transmission Subsystem (TSS) Functions

Transmission subsystem (TSS) functions help you debug the 3720 scanners.

In this chapter we will see the panels and procedures for all scanner functions.

Selecting TSS Functions

First, display the **(Service) 3720 function menu** panel. This panel is displayed after you entered the maintenance password on the **Password** panel or if you used the MOSS CE switch 3.

- Type *TS* in the *SIA*, then press *SEND*.

The **TSS function selection** panel is displayed (see Figure 4-1).

All possible TSS functions are displayed in the *secondary* menu (left side of the panel):

1. SELECT/RELEASE; see page 4-3
2. DUMP/IML; see page 4-4
3. MODE CONTROL; see page 4-7
4. DPLY/ALT STORE; see page 4-9
5. DPLY/ALT BLOCKS; see page 4-11
6. DPLY/ALT LSR; see page 4-13
7. DPLY/ALT XREG; see page 4-14
8. ADDRESS COMPARE; see page 4-15
9. CHK-POINT TRACE; see page 4-17

```
                    MSA line 1
                    MSA line 2
                    MSA line 3
CUSTOMER ID: ............         3720-1          SERIAL NUMBER: xxxxxxx
-------------------- MAINTENANCE MODE ----------------------------------
FUNCTION ON SCREEN: TSS FUNCTIONS


SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF    PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM
1 SELECT/RELEASE
2 DUMP/IML
3 MODE CONTROL
4 DPLY/ALT STORE
5 DPLY/ALT BLOCKS
6 DPLY/ALT LSR
7 DPLY/ALT XREG
8 ADDRESS COMPARE
9 CHK-POINT TRACE
```

Figure 4-1. TSS Function Selection Panel

Scanner Selection

Before you call any TSS function (except for checkpoint trace where the selection is made automatically), you must select a scanner. If you try to call a TSS function before selecting a scanner, the message SELECT A SCANNER is displayed.

Warning: TSS functions may disrupt communications on the lines attached to the selected scanner.

The following table identifies the potential risks:

Function	Disruptive
2- Dump a scanner or IML a scanner	Always
3- Stop and reset scanner mode control	Always
4- Display/alter scanner control store	May be
5- Display/alter control blocks	May be
6- Display/alter local store registers	May be
7- Display/alter external registers	May be
8- Scanner address compare	Always
9- Scanner microcode checkpoint trace	May be

Messages

Refer to Appendix B for the message explanations and for the action to be taken for some messages displayed when TSS functions are run.

Select/Release Scanner Function

- Type *1* in the *SIA*, of the **TSS function selection** panel (see "Selecting TSS Functions" on page 4-1), then press *SEND*.

The **select/release scanner** panel will be displayed (see below).

```
FUNCTION ON SCREEN: TSS FUNCTIONS

SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM
1 SELECT/RELEASE  - TO SELECT A SCANNER, ENTER:
2 DUMP/IML
3 MODE CONTROL        THE SCANNER NUMBER PRECEDED BY S (S1 TO S4)
4 DPLY/ALT STORE      OR
5 DPLY/ALT BLOCKS     THE LINE ADDRESS (00 TO 63)
6 DPLY/ALT LSR                                              ==>
7 DPLY/ALT XREG   - TO RELEASE SELECTED SCANNER, ENTER REL
8 ADDRESS COMPARE
9 CHK-POINT TRACE
```

Figure 4-2. Select/Release Scanner Panel

Selecting a Scanner

To select a scanner you may:

1. Type either its number or the address of one of its lines:

   - Scanner 1 (3720-1/2): Line addresses 00 through 27
   - Scanner 1 (3720-11/12): Line addresses 00 through 15
   - Scanner 3 (3721-1): Line addresses 32 through 63
   - Scanner 3 (3721-2): Line addresses 32 through 47
   - Scanner 4 (3721-2): Line addresses 48 through 63

   Note: Scanner 2 does not exist.

2. Press *SEND*.

Releasing a Scanner

To release the scanner previously selected:

- Type *REL*, then press *SEND*.

Dump/IML (Scanner)

Before you call the DUMP/IML function, you must first select a scanner (4-3).

Warning: IML and dump functions are always disruptive to the selected scanner.

Before doing a scanner dump, it is desirable to disconnect the scanner. If the scanner is not disconnected, then, after re-IML, the following sequence should be done to inform the control program that a re-IML has taken place:

1. Connect
2. Disconnect
3. Connect

Dump or IML Selection Procedure

From the **TSS function selection** panel (see Figure 4-1 on page 4-1):

- Type 2 in the *SIA*, then press *SEND*.

The **DUMP or IML scanner** panel is displayed (see Figure 4-3).

From this panel you may:

- Request to dump a scanner; see page 4-5
- Request to IML a scanner; see page 4-6

```
- ENTER D FOR DUMP OR I FOR IML                  ==>
```
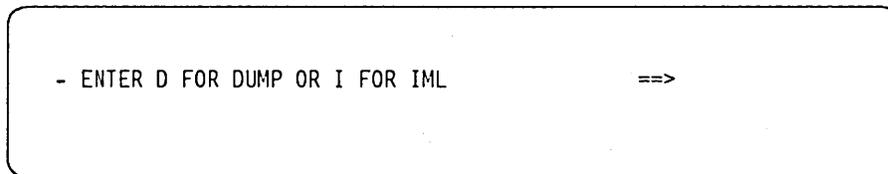
Figure   4-3. Dump or IML Scanner Panel

Dump a Scanner

You have entered *D* on the **Dump or IML scanner** panel.

The **scanner dump limits** panel is displayed (see Figure 4-4).

```
                           SCANNER DUMP

     - ENTER DUMP LIMITS:


             LOWER LIMIT ADDRESS (HALFWORDS)    ==> 8000
             UPPER LIMIT ADDRESS (HALFWORDS)    ==> FFFF



             HEX ROS LIMITS:  000 - FFF   (4K)
             HEX RAM LIMITS: 1000 - FFFF (60K)
```

Figure   4-4. Scanner Dump Limits Panel

Field Explanation for Scanner Dump Limits Panel

LOWER LIMIT ADDRESS: Enter the hexadecimal address corresponding to the point from which you want the dump to start.

UPPER LIMIT ADDRESS: Enter the hexadecimal address corresponding to the point at which you want the dump to finish.

HEX ROS LIMITS: Gives the ROS dump limit ranges.

HEX RAM LIMITS: Gives the RAM dump limit ranges.

Requesting a Scanner Dump.

From the **Scanner Dump Limits** panel:

1. Type the lower limit address.
2. Type the upper limit address.
3. Press *SEND*.

- If the CHHDMP file on MOSS disk is empty, the scanner dump is immediately taken and filed in the CHHDMP, and the message

  DUMP FILED IN CHHDMP. TO PRINT DUMP, TRANSFER IT TO HOST

  appears on the panel. (See "File Transfer and Print at Host Location" on page 12-14 for dump transfer.)

- If the CHHDMP dump file is already occupied with a previous dump, the **clear scanner dump file** panel is displayed (see Figure 4-5 on page 4-6), with the message:

  CHHDMP SCANNER DUMP FILE IS NOT EMPTY

  You may then clear or keep the scanner dump (see "Clearing or Keeping the Scanner Dump" on page 4-6).

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                     │
│   TO CLEAR DUMP FILE, ENTER C, OTHERWISE PRESS SEND ==>             │
│                                                                     │
│                                                                     │
│   CHHDMP SCANNER DUMP FILE IS NOT EMPTY                             │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```
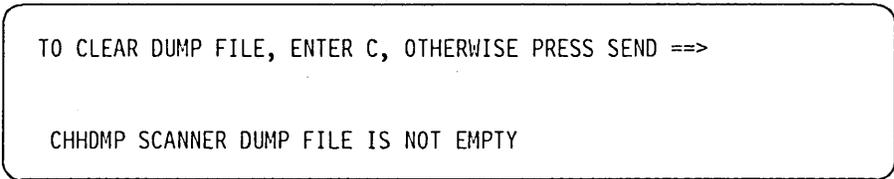
Figure 4-5. Clear Scanner Dump File Panel

Clearing or Keeping the Scanner Dump

You may either erase the previous dump or keep it.

- To clear the dump file

  — Type C next to ==>, then press SEND.

  If you clear the dump file, the new dump is immediately taken.

- To keep the previous dump file

  — Press SEND

  If you keep the dump, you may either display it at the operator console, transfer it to the host in order to print it, or transfer it to a support function, using a remote support facility (see "Receiving a File from MOSS" on page A-12).

IML a Scanner

You have entered / on the **dump/IML scanner selection** panel.

The IML takes place, and you are informed that the IML is complete by the following message:

IML FOR SCANNER XX COMPLETE - SCANNER CAN BE CONNECTED

Connect the scanner to the control program (see page 4-7).

If an error prevents a scanner from being re-IMLed, the following message is displayed:

SCANNER CHECKOUT FAILED: RC=xxxx

Note: The return code (RC) is found in the STAT field of the BER type 01, ID05, that has been created (see the chapter BER in the Maintenance Information Reference manual).

Scanner Mode Control

Scanner Mode Control Selection Procedure

Use this function to modify the mode of a scanner.

First, select a scanner.

1. Type 3 in the *SIA*, of the **TSS function selection** panel. (see Figure 4-1 on page 4-1)
2. Press *SEND*.

The **scanner mode control selection** panel is displayed (see Figure 4-6).

From this panel you may:

- Enter the new mode control, next to ==> (see "Mode Control Commands" for more details), then press *SEND*.

```
SELECT SCANNER CONTROL COMMAND (SP, ST, CT, DS, RT)==>

        SP = STOP
        ST = START
        CT = CONNECT
        DS = DISCONNECT
        RT = RESET
```

Figure   4-6. Scanner Mode Control Selection

Mode Control Commands

The table in Figure 4-7 on page 4-8 lists the scanner commands that you may use to modify the scanner mode. It also gives the new mode resulting from the command, and the indications that appear in the *MSA*. The DUMP and IML commands can be used by selecting DUMP/IML on the TSS function menu. The START, STOP, CONNECT, and RESET commands can be used by selecting MODE CONTROL on the TSS function menu.

MOSS must be in ONLINE mode:

- To control a scanner fully
- To IML a scanner

In MOSS OFFLINE mode, only the START, STOP, RESET, IML, and DUMP commands can be executed.

In MOSS-ALONE mode, only the RESET, DUMP, and IML commands can be executed.

Current Mode	Possible Scanner Commands	Resulting Mode	MSA Field m
Connected	STOP DISCONNECT RESET DUMP IML	Disconnected/stop Disconnected/stop Reset Reset Initialized	DISCTD/STOP DISCTD/STOP RESET RESET INITIALIZED
Disconnected/go	STOP CONNECT RESET DUMP IML	Disconnected/stop Connected Reset Reset Initialized	DISCTD/STOP CONNECTED RESET RESET INITIALIZED
Disconnected/stop	START CONNECT RESET DUMP IML	Disconnected/go Connected Reset Reset Initialized	DISCTD/GO CONNECTED RESET RESET INITIALIZED
Reset (or unknown mode)	RESET DUMP IML	Reset Reset Initialized	RESET RESET INITIALIZED
Initialized	STOP CONNECT RESET IML DUMP	Disconnected/stop Connected Reset Initialized Reset	DISCTD/STOP CONNECTED RESET INITIALIZED RESET
Inoperative	RESET DUMP IML	Reset Reset Initialized	RESET RESET INITIALIZED

Figure 4-7. Scanner Commands that Modify the Scanner Mode

Connected

The scanner is connected when it runs under the control of the control program. The errors on CCU I/O instructions are reported to the control program, and the errors on MOSS I/O instructions are reported to the MOSS.

Disconnected

The scanner is disconnected when it does not run under the control of the control program but under the control of the MOSS microcode. Only the MOSS I/O instructions are executed. Any instructions from the CCU are rejected (IOC timeout), or not answered.

Warning: RESET, IML, and DUMP are always disruptive. DISCONNECT and STOP may be disruptive.

Display/Alter Scanner Control Storage Function

Warning: Any alter may be disruptive.

Selecting Scanner Display/Alter Control Storage Function

Use this function to display the control storage of a selected scanner, or modify (alter) the contents of this storage.

First, select a scanner.

- Type 4 in the *SIA*, of the **TSS function selection** panel (see "Selecting TSS Functions" on page 4-1), then press *SEND*.

The **display/alter scanner storage selection** panel is displayed (see Figure 4-8).

Displaying the Scanner Control Storage

From the **display/alter scanner storage selection** panel:

1. Type the starting address (hexadecimal halfword).

2. Type the number of halfwords to be displayed (32 by default).

3. Type *D* or *I*:

   - If you enter *D*, the execution of the display is delayed (see "Scanner Address Compare" on page 4-15).

   - If you enter *I*, the execution of the display is immediate.

4. Press *SEND*.

When you press *SEND*, the **scanner storage display** panel is displayed (see Figure 4-9 on page 4-10).

The first four characters of each displayed line give the storage addresses.

Scanner Storage Display PF Keys

PF4=ALTER - See "Altering the Scanner Control Storage" on page 4-10.

PF5=REFRESH - Re-displays data every 500ms. This allows you to view data in its most updated state. To stop the refresh, press *BREAK* (ATTN).

PF7=BACKWARD - Displays preceding data. The amount of data that will be displayed has already been specified when defining the Display function.

PF8=FORWARD - Displays next data. The amount of data that will be displayed has already been specified when defining the Display function.

```
ENTER HALFWORD STORAGE ADDRESS                    ==> 8000
   ROS: 000 TO FFF   -  RAM: 1000 TO FFFF
ENTER NUMBER OF HALFWORDS TO DISPLAY (UP TO 32)==> 32


ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I

  TO ALTER DATA, SPECIFY AN IMMEDIATE DISPLAY
```

Figure 4-8. Display/Alter Scanner Storage Selection Panel

```
ENTER HALFWORD STORAGE ADDRESS                    ==> A700
 ROS: 000 TO FFF  -  RAM: 1000 TO FFFF
ENTER NUMBER OF HALFWORDS TO DISPLAY (UP TO 32)==> 32


ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I

 A700  2BF8 33FE 5072 67FD 5272 671D 50C2 686A
 A708  8A64 CB25 8A30 4A20 510E 9638 F76F 8C60
 A710  4B0B 33E1 51C6 E870 4318 31EE 219E 0700
 A718  31EE 0700 B10F 4820 67C9 D17F 4A82 CB05


PF4=ALTER  PF5=REFRESH   PF7=BACKWARD   PF8=FORWARD
```

Figure   4-9. Scanner Storage Display Panel

Altering the Scanner Control Storage

To alter data, press *PF4* on the **scanner storage display** panel.

The **scanner storage alter** panel is displayed (see Figure 4-10).

From this panel:

1. Move the cursor to the data you wish to modify (the cursor is automatically positioned below the first character of the displayed data).

2. Modify the data.

   - If you wish to delay the alter, replace I by D on the IMMEDIATE or DELAYED line, then move the cursor back to the data you want to alter.

   - If you enter I, the execution of the alter is immediate.

3. When you have altered all desired characters, press *SEND*.

All displayed data, altered or not, is transmitted to the scanner.

```
ENTER HALFWORD STORAGE ADDRESS                    ==> A700
 ROS: 000 TO FFF  -  RAM: 1000 TO FFFF
ENTER NUMBER OF HALFWORDS TO DISPLAY (UP TO 32)==> 32


ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I

 A700  2BF8 33FE 5072 67FD 5272 671D 50C2 686A
 A708  8A64 CB25 8A30 4A20 510E 9638 F76F 8C60
 A710  4B0B 33E1 51C6 E870 4318 31EE 219E 0700
 A718  31EE 0700 B10F 4820 67C9 D17F 4A82 CB05

PF6=IGNORE ALTER
TO DELAY ALTER, CHANGE I TO D. ENTER NEW DATA, PRESS SEND
```

Figure   4-10. Scanner Storage Alter Panel

Alter Scanner Control Storage PF Key: PF6=IGNORE ALTER: Cancels alter mode. The modifications you have already entered on the screen are ignored.

Display/Alter Scanner Blocks

Selecting Display/Alter Scanner Blocks

Use this function either to display the blocks of a selected scanner, or to modify (alter) the contents of these blocks.

First select a scanner.

From the **TSS function selection** panel:

- Type *5* in the *SIA*, then press *SEND*.

The **display/alter scanner blocks selection** panel is displayed (see Figure 4-11).

```
- ENTER HEX LINE INTERFACE ADDRESS (0 TO 3F)     ==>
- ENTER HALFWORD TO DISPLAY FIRST                ==> 0
- ENTER NBR OF HALFWORDS TO DISPLAY (OPTIONAL)   ==>
- ENTER BLOCK IDENTIFICATION (1 TO 10)           ==>
       1=ICB  3=LIB  5=RAMA  7=RAMC  9=LIC
       2=PSA  4=LCB  6=RAMB  8=ICC  10=FPS
- ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I

   TO ALTER DATA, SPECIFY AN IMMEDIATE DISPLAY.
```

Figure 4-11. Display/Alter Scanner Blocks Selection Panel

Field Explanation for Display/Alter Scanner Blocks

LINE INTERFACE ADDRESS: Specify a hexadecimal interface address,

> Between 00 and 37 for scanner 1 installed on the 3720 Models 1 and 2
> Between 00 and 1F for scanner 1 installed on the 3720 Models 11 and 12
> Between 00 and 3F for scanner 3 installed on a 3721-1
> Between 00 and 1F for scanner 3 installed on a 3721-2
> Between 00 and 1F for scanner 4 installed on a 3721-2

HALFWORD TO DISPLAY FIRST: Specify the halfword from which the block will be displayed; if you enter no operand, the block will be displayed from its first halfword.

NBR OF HALFWORDS: Specify the number of halfwords that you want to display, starting from the halfword specified on the previous line. The message INVALID INPUT is displayed when the input is incorrect (for example, 0 to specify the number of halfwords to be displayed).

The size of each block is:

ICB=16, PSA=16, LCB=16, LIB=32, FPS=16
ICC=1, LIC=2, RAMA=4, RAMB=4, RAMC=4

For ICC and LIC, you may ignore this request.

BLOCK IDENTIFICATION: Specify the block that you want to display:

> ICB: interface control block
> PSA: parameter/status area (copy of CCU PSA for this line)
> LIB: line interface buffer
> LCB: line control block

RAMA: random access memory A
RAMB: random access memory B
RAMC: random access memory C
ICC: internal clock circuit
LIC: line interface card
FPS: FES parameter/status

Refer to the *Maintenance Information Reference* manual for a detailed description of these blocks.

IMMEDIATE/DELAYED:

- If you enter *D* in the IMMEDIATE or DELAYED line, the execution of the display is delayed (see "Scanner Address Compare" on page 4-15).

- If you enter *I*, the execution of the display is immediate.

The message at the bottom line reminds you that, if you want to alter data, you must first perform an immediate display of the data to be altered.

When you press *SEND*, a panel similar to the **scanner storage display** panel is displayed. From this panel, you may press *PF4* to modify (alter) the data.

The display/alter block function, and the descriptions of the PF keys available, are similar to those of the display/alter storage function (explained in detail in "Displaying the Scanner Control Storage" on page 4-9).

However, the first four characters of each displayed line give:

- The address of the ICB, PSA, LIB, LCB, or FPS block, or
- The name of the RAMA, RAMB, RAMC, ICC, or LIC block

Display/Alter Scanner LSRs

Selecting Display/Alter Scanner LSR Function

Use this function to display the local store registers (LSR) of a selected scanner, or to modify (alter) the contents of these registers.

First select a scanner.

From the **TSS function selection** panel:

- Type 6 in the SIA, then press SEND.

The **display/alter scanner LSR selection** panel is displayed (see Figure 4-12).

```
- ENTER HEXADECIMAL PAGE NUMBER                  ==>

- ENTER ADDRESS OF LSR TO DISPLAY (0 TO 7)       ==>
    (FOR ALL LSRS OF THE PAGE, ENTER NOTHING)

- ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I

  LSR   0 1  2 3  4 5  6 7  8 9  A B  C D  E F
  DATA  1914 9914 0000 0000 0000 0000 C6EB 07AB


  TO ALTER DATA, SPECIFY AN IMMEDIATE DISPLAY
```

Figure 4-12. Display/Alter Scanner LSR Selection Panel

Field Explanation for Display/Alter Scanner LSRs

PAGE NUMBER: Enter x. (where x = 0 through F) to select one of the 16 LSR pages (one LSR page = 8 one-byte registers).

ADDRESS OF LSR: Enter the address of the register to be displayed, or press SEND.

- If a register address is entered, a single even/odd register pair is displayed. The least significant bit of the register address is ignored.
- If SEND is pressed (without LSR number), and the page number entered was even, then all 16 registers of the even/odd pages are displayed, numbered 0 through F.
- If SEND is pressed, and the page number entered was odd, only the eight registers of the odd page are displayed, numbered 0 through 7.

IMMEDIATE/DELAYED:

- If you enter D in the IMMEDIATE or DELAYED line, the execution of the display is delayed (see "Scanner Address Compare" on page 4-15).
- If you enter I, the execution of the display is immediate.

The message at the bottom line reminds you that, if you want to alter data, you must first perform an immediate display of the data to be altered.

When you press *SEND*, a panel similar to the **scanner storage display** panel is displayed. From this panel, you may press *PF4* to modify (alter) the data.

The display/alter LSR function, and the descriptions of the PF keys available, are similar to those of the display/alter storage function (explained in detail in 4-9).

The *LSR* line gives the LSR numbers, and the *DATA* line gives the LSR contents.

Display/Alter Scanner XREGs

Selecting Display/Alter Scanner XREG Function

Use this function to display the external registers (XREG) of a selected scanner, or to modify (alter) the contents of these registers.

First select a scanner.

From the **TSS function selection** panel:

• Type 7 in the *SIA*, then press *SEND*.

The **display/alter scanner XREGs selection** panel is displayed (see Figure 4-13).

```
- ENTER HEX ADDRESS OF XREG TO DISPLAY FIRST     ==>

- ENTER NUMBER OF XREGS TO DISPLAY               ==>

- ENTER I FOR IMMEDIATE EXECUTION, D FOR DELAYED ==> I
XREG 00 01 02 03 04 05    07 08
DATA xx xx xx xx xx xx ** xx xx ** ** ** ** ** ** **
XREG 10    12 13 14 15 16 17    19 1A 1B 1C 1D 1E 1F
     xx ** xx xx xx xx xx xx ** xx xx xx xx xx xx xx

  TO ALTER DATA, SPECIFY AN IMMEDIATE DISPLAY
```

Figure 4-13. Display/Alter Scanner XREGs Selection Panel

Field Explanation for Display/Alter Scanner XREGs

ADDRESS OF XREG: Enter the address of the register to be displayed, or press *SEND*.

NUMBER OF XREGS: Specify the number of external registers that you want to display. If *SEND* is pressed (without a number of XREGs), all 32 registers are displayed.

IMMEDIATE/DELAYED:

• If you enter *D* in the IMMEDIATE or DELAYED line, the execution of the display is delayed (see "Scanner Address Compare" on page 4-15).

• If you enter *I*, the execution of the display is immediate.

The message at the bottom line reminds you that, if you want to alter data, you must first perform an immediate display of the data to be altered.

When you press *SEND*, a panel similar to the **scanner storage display** panel is displayed. From this panel, you may press *PF4* to modify (alter) the data.

The display/alter XREG function, and the descriptions of the PF keys available, are similar to those of the display/alter storage function (see page 4-9).

However, the *XREG* line gives the XREG numbers, and the *DATA* line gives the XREG contents.

Notes:

1. Independent of the register specified or the number of registers displayed, the display always starts with an even register and ends with an odd register.

2. A pair of asterisks under a register position indicates that the register does not exist.

Scanner Address Compare

You execute a scanner address compare to force the scanner to perform an action when a storage address detected during a specific access operation matches the contents of a register.

You must specify the address, the access operation, and the scanner action.

Warning: The address compare function with action STOP is always disruptive.

Scanner Address Compare Selection

First select a scanner.

From the **TSS function selection** panel:

- Type *8* in the *SIA*, then press *SEND*.

The **scanner address compare selection** panel is displayed (see Figure 4-14).

```
- ENTER A TO ACTIVATE AC OR D TO DEACTIVATE    ==> A

- ENTER HALFWORD STORAGE ADDRESS (1000 TO FFFF)==> 1000

- SELECT 1 TO 4 STORAGE ACCESSES (F, S, R, W)  ==> RW
        F = I-FETCH OR DATA LOAD    S = DATA STORE
        R = CYCLE STEAL READ        W = CYCLE STEAL WRITE

- SELECT ONE SCANNER ACTION (1, 2, 3, 4, 5)    ==>
        1 = NO ACTION            2 = START DELAYED DISPLAY
        3 = START DELAYED ALTER  4 = STOP SCANNER
        5 = STOP SCANNER BUT LEAVE AC ACTIVE
```

Figure 4-14. Scanner Address Compare Selection Panel

Field Explanation for Scanner Address Compare Panel

ACTIVATE or DEACTIVATE: Enter *A* to activate the address compare. Enter *D* to deactivate the address compare (see 4-17).

STORAGE ADDRESS: Specify an address within the range indicated.

STORAGE ACCESSES: Specify any combination of the following storage access operations. When the storage address specified on the panel is detected during anyone of these operations, the address compare is successful.

> F: Address detected during I-fetch or load
> S: Address detected during store
> R: Address detected during cycle steal read
> W: Address detected during cycle steal write

The *SCANNER ACTION* you specify is executed immediately after the execution of the storage access operation (F, S, R, W).

SCANNER ACTION: You can specify only one scanner action:

1. NO ACTION: You just want to be informed of the completion of the address compare in fields *o* and *p* of the MSA.

   After completion, the address compare is automatically deactivated.

2. START DELAYED DISPLAY: When the address compare is successfully completed, the delayed display that you specified in a display/alter function is performed and the address compare is automatically deactivated. The keyboard is locked until the address compare is successfully completed. If you want to unlock the keyboard, press BREAK (ATTN). This action also deactivates the address compare.

   If you specified a delayed display, field *o* of the MSA displays DELAYED-DISPLAY.

   If you forgot to specify a delayed display and you specified in the address compare ACTION ==> 2, the following message is displayed:

   NO DELAYED DISPLAY. SPECIFY IT IN A DISP/ALT FUNCTION

3. START DELAYED ALTER: When the address compare is successfully completed, the delayed alter that you specified in a display/alter function is executed and the address compare is automatically deactivated. The keyboard is locked until the address compare is successfully completed. If you want to unlock the keyboard, press ATTN. This action also deactivates the address compare.

   If you specified a delayed alter, field *q* of the MSA displays DELAYED-ALTER.

   If you forgot to specify a delayed alter and you specified ACTION ==> 3 in the address compare, the following message is displayed:

   NO DELAYED ALTER. SPECIFY IT IN A DISP/ALT FUNCTION

4. STOP SCANNER: When the address compare is successfully completed, the scanner is no longer under control of the CCU control program and the address compare is automatically deactivated. The scanner is in DISCONNECTED/STOP state (see field *m* of the MSA).

5. STOP SCANNER BUT LEAVE AC ACTIVE: When the address compare is successfully completed, the scanner, in DISCONNECTED/STOP state, is no longer under control of the CCU control program but the address compare remains active.

To restart the scanner, use the scanner command START (see "Scanner Mode Control" on page 4-7).

Deactivating the Scanner Address Compare

- Scanner address compare is automatically deactivated after successful completion for address compare with ACTION 1, 2, 3, or 4.
- To deactivate the address compare function with ACTION 5, press D followed by SEND.
- To deactivate the scanner address compare function **before** completion of the address compare, proceed according to the type of scanner address compare action:
  - Action 1, 4, or 5: Type D, then press SEND.
  - Action 2 or 3: press BREAK (ATTN). If the address compare panel is no longer displayed, you must:
    1. Call again the Scanner Address Compare function (see beginning of this section).
    2. Type D instead of A in the activate/deactivate line.
    3. Press SEND.
- The scanner address compare is also deactivated when:
  - You release the scanner.
  - You type T (terminate) in the SIA.

Scanner Checkpoint Trace

The checkpoint trace is always ready to start at the same time as the SIT trace starts. Use this function to stop the checkpoint trace.

The checkpoint trace if fully described in the Maintenance Information Reference **manual.**

Selecting the Scanner Checkpoint Trace Function

From the **TSS function selection** panel:

- Type 9 in the SIA, then press SEND.

The **scanner checkpoint trace selection** panel is displayed (see Figure 4-15 on page 4-18).

```
- ENTER A DECIMAL LINE ADDRESS FROM 0 to  63  ==>

- ENTER T FOR TRANSMIT, R FOR RECEIVE          ==>

- ENTER ON OR OFF                              ==>

     ON  - CHECKPOINT TRACE WILL START WITH
              SCANNER INTERFACE TRACE (SIT)
     OFF - CHECKPOINT TRACE NOT EFFECTIVE

ENTER ANY INTERFACE:RELEASE/SELECT SCANNER IS AUTOMATIC
```

Figure 4-15. Scanner Checkpoint Trace Selection Panel

Chapter 5. Displaying Dumps, Storage, and Modules, Deleting Files

Displaying Dumps, Storage, and Modules

This section explains how to display:

- The NCP dump file on disk; see page 5-2
- The MOSS dump file on disk; see page 5-3
- The Scanner dump file on disk; see page 5-5
- The TIC dump files on disk; see page 5-7
- The MOSS storage; see page 5-9
- The modules (TSS, CCU, and MOSS); see page 5-10

To display you must use:

- A function called *Dump Display/Delete (DD)* for MOSS, TIC, and scanner dump display.

- A function called *MOSS Storage Display (MS)* for MOSS storage display.

- A function called *Module Display (MD)* for CCU, TSS and MOSS module display.

Note: All these functions are available only when the **3720 function menu** panel has been presented in service mode (maintenance password or MOSS CE switch 3 ON).

Displaying an NCP Dump

Procedure:

1. First, on the **3720 function menu** panel:

   - Type *DD* in the *SIA*, then press *SEND*.

2. From the **dump display/delete selection** panel that is then displayed (see Figure 5-1):

   - Type the name of the NCP dump file (CHGDMP1), then press *SEND*.

The **NCP dump** panel will be displayed.

Note: If you press *SEND* without any file name in the file name area, a summary list of the dump files will be displayed with the date and time of the dump (if it exists) and the reasons for taking the dump. See the sample panel in Figure 5-3 on page 5-3.

```
    - ENTER FILE NAME ==>

    CHGDMP1  = NCP  DUMP FILE
    CHGDMP   = MOSS DUMP FILE
    CHHDMP   = CS   DUMP FILE
    CHGTRSS  = TRSS DUMP FILE



    PF6: DELETE FUNCTION
    PRESS SEND TO DISPLAY DUMP TITLES
```

Figure   5-1. Dump Display/Delete Selection Panel (NCP dump)

The complete dump is displayed in **dump display** panels (12 lines per panel). How to read dump panels is explained in "Hexadecimal Display of Dumps" on page 5-11.

You may from this panel:

- Display the rest of the dump, using *PF7* (BACKWARD), *PF8* (FORWARD),

- Return to the **dump display/delete selection** panel by pressing *PF4*.

Displaying a MOSS Dump

Procedure:

1. First, on the **3720 function menu** panel:

   - Type *DD* (for DUMP DISPLAY/DEL) in the *SIA*, then press *SEND*.

2. From the **dump display/delete selection** panel that is then displayed (see Figure 5-2):

   - Type the name of the MOSS dump file (CHGDMP), then press *SEND*.

Note: If you press *SEND* without any file name in the file name area, a summary list of the dump files will be displayed with the date and time of the dump (if it exists) and the reasons for taking the dump (except for the TRSS dump file). See the sample panel in Figure 5-3.

```
-------------------- MAINTENANCE MODE ----------------------------
FUNCTION ON SCREEN: DUMP/DISPLAY DEL

SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM


   - ENTER FILE NAME ==>

  CHGDMP1  = NCP  DUMP FILE
  CHGDMP   = MOSS DUMP FILE
  CHHDMP   = CS   DUMP FILE
  CHGTRSS  = TRSS DUMP FILE

  PF6: DELETE FUNCTION
  PRESS SEND TO DISPLAY DUMP TITLES
```

Figure   5-2. Dump Display/Delete Selection Panel (MOSS Dump)

Dump File Summary Panel

This panel is displayed when no dump file name has been typed into the **dump display/delete selection** panel.

```
- ENTER FILE NAME ==>

CHGDMP1  = NCP  DUMP FILE
CHGDMP   = DATE/TIME:07/28/82 18:27:26 TRS:BAD CP ANS
CHHDMP   = CS   DUMP FILE
CHGTRSS  = TRSS DUMP FILE

PF6=DELETE FUNCTION
PRESS SEND TO DISPLAY DUMP TITLES
```

Figure   5-3. Dump File Summary Panel (Sample)

MOSS Dump Area Selection

You have selected to display the MOSS dump file CHGDMP, and the **MOSS dump area selection** panel is displayed (see Figure 5-4).

You may display either the full dump file or only a specific area.

- To display the full dump, press *SEND* **without** any selection. The complete dump is displayed in **dump display** panels (12 lines per panel). How to read dump panels is explained in "Hexadecimal Display of Dumps" on page 5-11.

- To display a specific area, type the number corresponding to that area (next to SELECT AN ITEM (0 to 19) ==>), then press *SEND*.

If the selection is correct, a specific part of the dump is displayed in the **MOSS area display** panel. You may from this panel:

- Display the rest of the dump, using *PF7* (BACKWARD), *PF8* (FORWARD), or *SEND* (see "Hexadecimal Display of Dumps" on page 5-11).

- Return to the **MOSS dump area selection** panel by pressing *PF4*.

```
  - SELECT AN ITEM (0 TO 19)  ==>
  CHGDMP   DATE/TIME=07/28/82 18:27:26 TRS=BAD CP ANS


                         ---TCB---      ---ACB---
  0 TO 7: INTERRUPT DATA  11: BER        17: CNSL
       8: ERROR COUNTERS  12: MSA        18: MIOC
       9: SVT             13: CCUBG      19: DISK
      10: BER STACK       14: CAM
                          15: OPCTL
                          16: IPL



  PF4: ITEM SELECT      PF7: BACKWARD    PF8: FORWARD
     PRESS SEND TO DISPLAY FILE
```

Figure 5-4. MOSS Dump Area Selection Panel

Displaying a Scanner Dump

Procedure:

1. First, on the **3720 function menu** panel:

   - Type *DD* in the *SIA*, then press *SEND*.

2. From the **dump display/delete selection** panel that is then displayed (see Figure 5-5):

   - Type the name of the Scanner dump file (CHHDMP), then press *SEND*.

The **scanner dump area selection** panel will be displayed (see "Scanner Dump Area Selection" on page 5-6).

Note: If you press *SEND* without any file name in the file name area, a summary list of the dump files will be displayed with the date and time of the dump (if it exists) and the reasons for taking the dump. See the sample panel in Figure 5-3 on page 5-3.

```
- ENTER FILE NAME ==>

CHGDMP1  = NCP  DUMP FILE
CHGDMP   = MOSS DUMP FILE
CHHDMP   = CS   DUMP FILE
CHGTRSS  = TRSS DUMP FILE



PF6: DELETE FUNCTION
PRESS SEND TO DISPLAY DUMP TITLES
```

Figure 5-5. Dump Display/Delete Selection Panel (CS dump)

Scanner Dump Area Selection

You have selected to display the Scanner dump file CHHDMP, and the **scanner dump area selection** panel is displayed (see Figure 5-6).

You may display either the full dump file or only a specific area.

- To display the full dump, press *SEND* **without** any selection. The complete dump is displayed in **dump display** panels (12 lines per panel). How to read dump panels is explained in "Hexadecimal Display of Dumps" on page 5-11.

- To display a specific area, type the number corresponding to that area (next to SELECT AN ITEM (0 or 1) ==>), then press *SEND*.

If the selection is correct, a specific part of the dump is displayed in the **scanner dump area display** panel. You may from this panel:

- Display the rest of the dump, using *PF7* (BACKWARD), *PF8* (FORWARD), or *SEND* (see "Hexadecimal Display of Dumps" on page 5-11).

- Return to the **scanner dump area selection** panel by pressing *PF4*.

```
- SELECT AN ITEM (0 OR 1)   ==>
CHHDMP     DATE/TIME=00/00/00 00:31:11  SCANNER 01

0: PAGES 0 TO B AND PSWS
1: EXTERNAL REGISTERS


PF4: ITEM SELECT      PF7: BACKWARD      PF8: FORWARD
PRESS SEND TO DISPLAY FILE
```

Figure   5-6. Scanner Dump Area Selection Panel

Displaying a TRSS (TIC) Dump

This function can be used to display or delete a TIC dump previously created with the TRS function *Dump TIC Storage* (option 6), or by an automatic TIC dump.

The TRSS dump file, CHGTRSS resides on MOSS disk along with the MOSS dump (CHGDMP) and the scanner dump (CHHDMP).

Procedure:

1. First, on the **3720 function menu** panel:

    • Type *DD* in the *SIA*, then press *SEND*.

2. From the **dump display/delete selection** panel that is then displayed (see Figure 5-7):

    • Type the name of the TRSS dump file (CHGTRSS), then press *SEND*.

Note: If you press *SEND* without any file name in the file name area, a summary list of the dump files will be displayed with the date and time of the dump (if it exists) and the reasons for taking the dump. See the sample panel in Figure 5-3 on page 5-3.

```
    - ENTER FILE NAME ==>

    CHGDMP1   = NCP   DUMP FILE
    CHGDMP    = MOSS  DUMP FILE
    CHHDMP    = CS    DUMP FILE
    CHGTRSS   = TRSS  DUMP FILE


    PF6: DELETE FUNCTION
    PRESS SEND TO DISPLAY DUMP TITLES
```

Figure 5-7. Dump Display/Delete Selection Panel (TRSS dump)

TIC Dump Selection

You have selected to display the TRSS dump file CHGTRSS, and the **TIC dump selection** panel is displayed. (see Figure 5-8 on page 5-8).

Since the TRSS dump contains up to 4 TIC dumps, the panel displays the time and date for each TIC dump present.

You may display up to four TIC dumps.

• To display a specific TIC dump, type the number corresponding to that area (next to SELECT AN ITEM (0 or 3) ==>), then press *SEND*.

    If the selection is correct, a summary of the TIC dump selected is displayed in the **TIC dump summary** panel (see Figure 5-9 on page 5-8).

• To display the complete TIC dump use the forward and backward PF keys.

```
- SELECT AN ITEM (0 TO 3) ==> _
CHGTRSS    TRSS   DUMP FILE

0: TRA:02 TIC:1    DATE/TIME:mm/dd/yy hh:mm:ss
1: TRA:02 TIC:2    DATE/TIME:mm/dd/yy hh:mm:ss
2: TRA:02 TIC:2    DATE/TIME:mm/dd/yy hh:mm:ss
3: TRA:02 TIC:1    DATE/TIME:mm/dd/yy hh:mm:ss
```

Figure   5-8. TIC Dump Selection Panel

```
- SELECT AN ITEM (0 TO 3)    ==>

TRA: 2  TIC: 1       CCUID: nnnnnnnn
TIME: nnnnnnnnnnnnnnnn   LID: nn
BUFFER: nnnnnn        CONTROL: nn
DIAG: nnnn           IR/BR: nn
L1ERR: nnnn          INTR: nn
IPB: nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
nnnnnnnnnnnnnnnnnnnnn  OPB: nnnnnnnnnnnnnnnnn
nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
nnnnnnnnnnnnnnnnnnnnn
CHKSTAT: nnnnnnnnnn
RINGSTAT: nnnn

PF4: ITEM SELECT
PRESS SEND TO DISPLAY FILE
```

Figure   5-9. TIC Dump Summary Panel

Press PF4 to return to the **TIC Dump Selection** panel.

Displaying the MOSS Storage

Procedure:

1. Type *MS* (for MOSS STORE DPLY) in the *SIA* on the **3720 function menu** panel.

2. press *SEND*.

The **MOSS storage area selection** panel is displayed (see Figure 5-10).

You may display either the full dump file or only a specific area.

* To display the full dump, press *SEND* **without** any selection. The complete dump is displayed in **dump display** panels (12 lines per panel). How to read these panels is explained in "Hexadecimal Display of Dumps" on page 5-11.

* To display a specific area, type the number corresponding to that area (next to SELECT AN ITEM (0 to 19) ==>), then press *SEND*.

If the selection is correct, a specific part of the dump is displayed in the **MOSS storage area display** panel. You may from this panel:

* Display the rest of the dump, using *PF7* (BACKWARD), *PF8* (FORWARD), or *SEND* (see "Hexadecimal Display of Dumps" on page 5-11).

* Return to the **MOSS storage area selection** panel by pressing *PF4*.

```
------------------- MAINTENANCE MODE ----------------------------
FUNCTION ON SCREEN: MOSS STORE DPLY


  - SELECT AN ITEM (0 TO 19)  ==>


                            ---TCB---      ---ACB---
  0 TO 7: INTERRUPT DATA     11: BER        17: CNSL
       8: ERROR COUNTERS     12: MSA        18: MIOC
       9: SVT                13: CCUBG      19: DISK
      10: BER STACK          14: CAM
                             15: OPCTL
                             16: IPL


  PF4: ITEM SELECT       PF7: BACKWARD     PF8: FORWARD
  PRESS SEND TO DISPLAY FILE
```

Figure 5-10. MOSS Storage Area Selection Panel

Module DPLY (Module Display)

This function allows you to display a CCU, TSS, or MOSS module.

Procedure

1. Type *MD* (for MODULE DISPLAY) in the *SIA* of the **3720 function menu** panel.
2. Press *SEND*.

The **module display selection** panel is displayed (see Figure 5-11).

If the selection is correct, the complete dump of the module is displayed in **dump display** panels (12 lines per panel). How to read dump panels is explained in "Hexadecimal Display of Dumps" on page 5-11.

```
 -------------------- MAINTENANCE MODE ---------------------------
 FUNCTION ON SCREEN: MODULE DISPLAY

 - ENTER FILE NAME ==> CHGUCMOD   AND MODULE NAME ==> CHGMOSS

   CHGUCMOD=  MOSS MODULES
   CHGMDJIB=  SCANNER MODULES
   CHGMOD37=  3720 MODULES
   CHGPIMOD=  PICOCODE MODULES
```

Figure 5-11. Module Display Selection Panel

Hexadecimal Display of Dumps

The dump is displayed on a panel in hexadecimal format.

From this panel you may:

- Display the contents of the previous lines (*PF7*, BACKWARD) or the next lines (*PF8*, FORWARD).

- Display another section of the dump by:

    1. Placing cursor at the left of the dump listing (any line)
    2. Overwriting list address with a specific address
    3. Pressing *SEND*.

    The panel will display a new section of the dump starting from the address you just entered.

- Display the **dump delete selection** panel by pressing *PF6*.

    This is valid only for MOSS or scanner dumps (see "Deleting a File from MOSS Disk" on page 5-12).

- Return to the **MOSS/scanner/TIC selection** panel by pressing *PF4*.

- Display another dump by typing its file name next to ENTER FILE NAME and pressing *SEND*.

Note: When using *PF7* and *PF8* keys after a new starting address has been selected, the scrolling affects only the lines following the new address entry line (the preceding lines remain unchanged).

Deleting a File from MOSS Disk

This section explains how to delete one or several of the following MOSS disk files:

- CHGDMP, the MOSS dump
- CHHDMP, the scanner dump
- CHGTRSS the TRSS dump
- CHGCIL, the BER file

To delete the MOSS dump files you must use a function called *Dump Display/Delete* which is available only when the **3720 function menu** panel has been presented via the maintenance password or when the MOSS CE switch 3 is on (see "How to Start, Select, and Perform a MOSS-3720 Function" on page 1-8)

Note: The NCP Dump file CHGDMP1 can only be deleted by a VTAM command sent from the host.

Selecting the File Delete Function

Procedure:

From the **3720 function menu** panel:

- Type *DD* (for DUMP DISPLAY/DEL) in the *SIA*, then press *SEND*.

The **dump display/delete selection** panel is displayed (see Figure 5-12).

To delete the NCP dump file, the MOSS dump file, the scanner dump file, the BER file, or a TIC dump:

- Press *PF6* without any file name.

The **file delete selection** panel is displayed (see Figure 5-13 on page 5-13).

```
   - ENTER FILE NAME ==>

   CHGDMP1   = NCP DUMP FILE
   CHGDMP    = MOSS DUMP FILE
   CHHDMP    = CS DUMP FILE
   CHGTRSS   = TRSS DUMP FILE

   PF6: DELETE FUNCTION
   PRESS SEND TO DISPLAY DUMP TITLES
```

Figure   5-12. Dump Display/Delete Selection Panel (Delete)

```
- ENTER FILE NAME TO BE DELETED ==>

CHGDMP   = MOSS DUMP FILE
CHHDMP   = CS DUMP FILE
CHGTRSS  = TRSS DUMP FILE
CHGCIL   = BER FILE


PF6=DUMP DISPLAY FUNCTION
```
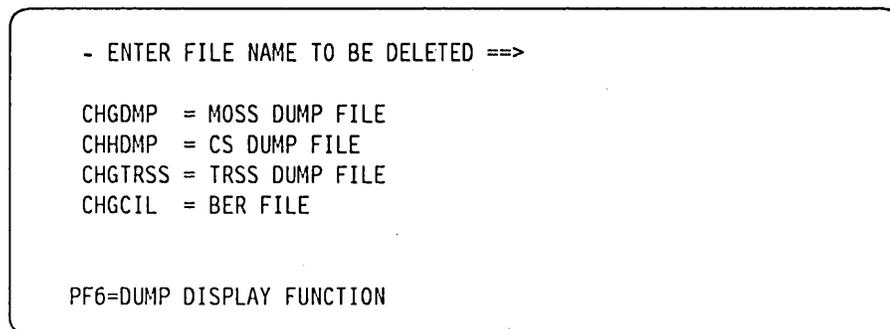
Figure 5-13. Dump or BER File Delete Panel

Deleting the MOSS Dump File

Procedure:

1. Select the *Dump Display/Delete* function (see page 5-12).
2. Press *PF6* (delete) without any name in the file name area.

From the **file delete selection** panel that is then displayed (see Figure 5-13):

1. Type CHGDMP, then press *SEND*.

The file will be deleted from the disk and an acknowledgment message will be displayed.

To return to the **dump display/delete selection** panel, press *PF6*.

Deleting the Scanner Dump File

Procedure:

1. Select the *Dump Display/Delete* function (see page 5-12).
2. Press *PF6* (delete) without any name in the file name area.

From the **file delete selection** panel that is then displayed (see Figure 5-13):

1. Type CHHDMP, then press *SEND*.

The file will be deleted from the disk and an acknowledgment message will be displayed.

To return to the **dump display/delete selection** panel, press *PF6*.

Deleting a TIC Dump

Procedure:

1. Select the *Dump Display/Delete* function (see page 5-12).
2. Press *PF6* (delete) without any name in the file name area.

From the **file delete selection** panel that is then displayed (see Figure 5-13):

1. Type CHGTRSS, then press *SEND*.

The **TIC Dump Delete Selection** panel will be displayed (see Figure 5-14 on page 5-14).

1. Enter the number (0 to 3) corresponding to the TIC dump (1 to 4) that you want to delete from the TRSS dump file.

2. Press *SEND*

The TIC dump will be deleted from the TRSS dump file (CHGTRSS). The TRSS dump file is deleted when all TIC dumps are deleted. Acknowledgment messages will be displayed.

To return to the **dump display/delete selection** panel, press *PF6*.

```
- SELECT AN ITEM (0 TO 3) ==> _

0: DUMP ITEM 0 - TRA:02 TIC:1
1: DUMP ITEM 1 - TRA:02 TIC:2
2: DUMP ITEM 2 - TRA:02 TIC:2
3: DUMP ITEM 3 - TRA:02 TIC:1

PF6: QUIT
```

```
- SELECT AN ITEM (0 TO 3) ==> 3

0: DUMP ITEM 0 - TRA:02 TIC:1
1: DUMP ITEM 1 - TRA:02 TIC:2
2: DUMP ITEM 2 - TRA:02 TIC:2
3: DUMP ITEM 3 - TRA:02 TIC:1

CHGTRSS DUMP ITEM 3 NOW EMPTY

PF6: QUIT
```

Figure   5-14. TIC Dump Delete Selection Panel (Sample)

TIC Dump Organization

Four TIC dumps may be stored on the CHGTRSS dump file on the disk.

The TIC dumps are assigned to a free "slot" in the TRSS dump file in the order they are taken. There is no static allocation of TIC dumps to the CHGTRSS file.

The sector in the CHGTRSS dump file is described in "TIC Dump Area" on page 11-12.

Deleting the BER File

Procedure:

1. Select the *Dump Display/Delete* function (see page 5-12).
2. Press *PF6* (delete) without any name in the file name area.

From the **file delete selection** panel that is then displayed (see Figure 5-13 on page 5-13):

1. Type CHGCIL, then press *SEND*.

The file will be deleted from the disk and an acknowledgment message will be displayed.

To return to the **dump display/delete selection** panel, press *PF6*.

Chapter 6. Applying and Displaying Microcode Fixes (MCF)

This chapter explains how the customer and the service personnel can:

- Upgrade the 3720 microcode to include the latest MCFs (and restore this microcode to its previous state).

- List old and new MCFs.

- Display the MCF history table.

Terminology notes:

- The procedure by which this set of MCFs will be applied to modify the existing microcode is referred to as **UPGRADE**

- The last MCF applied (previous EC or previous set of MCFs) is referred to as **last applied MCF**.

What Are Microcode Fixes and Patches

The MCF function available with 3720 MOSS is made of **two distinct functions**:

1. The **microcode fix** (MCF)

   This is the code distributed to correct a microcode defect.

   An MCF:

   - Is tested
   - Is a high quality change
   - Is suitable for broad distribution
   - Is considered functionally equivalent to a software PTF.

   This chapter explains **microcode fix** procedures.

2. The microcode patch (referred to as patch).

   A microcode patch corrects or bypasses a single microcode or hardware logic design defect.

   The patch management function is used by **IBM Product engineering (PE)** to make code changes to the microcode files on MOSS disk. (Chapter 7 explains in detail how to handle patches.)

MCF Organization

The MCF function can be used (upgraded, restored, and displayed) by the customer, as well as by the service personnel.

When to Use the MCF Function

This function should be used by the customer (or the service personnel):

- If an MCF is sent to the customer to correct some possible microcode error.

- If an engineering change (EC) has to be installed on the customer's 3720 (an EC diskette may contain some MCFs that have not been included in the EC itself).

"Installing Microcode Fixes (MCFs)" on page 6-12 explains the complete procedure to follow when installing an MCF. The customer or the service personnel may install MCFs but **the transfer of the MCF file is a CE function**.

Chapter 'MCF' of the *3720 Extended Services* manual (as well as this chapter) explain the procedures required to handle MCFs.

The MCF management is automatic, in order to decrease installation problems and manipulation errors.

Receiving MCFs:

MCFs are received by the 3720:

- From RETAIN via RSF.
- As an addition to ECs.
- From a PC diskette (see Appendix A, "MOSS File Transfer/Print from PC" on page A-1), when there is no RSF.

MCF File

The MCFs, once on the MOSS disk, are in a file that contains **all** the MCFs created since the last EC. This file is sorted in chronological order of MCF creation, so that new MCFs are *appended*.

The MCF file contains two types of MCFs:

- The *Old* MCFs, which have been applied in a earlier upgrade of the microcode, and which are now definitively part of the code.

- The *New* MCFs, which have just been transferred to the MCF file (not used to upgrade the code).

You may scan individually (display) old MCFs, but new MCFs are considered as a burst of MCFs that may be applied completely or not at all.

The procedure by which this set of MCFs will be applied to modify the existing microcode is referred to as **UPGRADE**.

An Upgrade is automatic; that is, if an upgrade cannot be terminated, all new MCFs that have just been applied are restored (Roll Back).

You may also request to come back to the previous microcode state using the RESTORE command, which restores the microcode as it was before you applied the last burst of MCFs.

MCF History Table

A history table is created to keep a trace capability. This table contains all upgrade and restore functions that have been executed, and, for each of these functions, the last applied MCF and the execution date.

Conditions for Handling Microcode Fixes

- MOSS must not be *ONLINE.*

- MOSS IML must have been made from the *disk*, **not in diskette mode**

Figure 6-1 shows the function and data flow in MCF management.

```
      ┌─────────────────────┐
      │                     │        Upgrade
      │   MICROCODE         │<───────────────
      │                     │        Restore
      └─────────────────────┘

                    MCF    FILE
         ┌──────────────────────────────┬───────────┐
         │  MCFs (Definitive   Changes)  │           │
         ├───────────────┬──────────────┤  Upgrade  │
         │     Old       │     New      │  History  │
         │  microcode    │  microcode   │   table   │
         │     fix       │     fix      │           │
         └───────────────┴──────────────┴───────────┘
            L─>─┘             L──>─┘       L──>─┘
            List             List         Display
            Scan             Scan
                             Upgrade
                             Restore

                              A
                              │
                            ──┴──
                             File
                           transfer
                             for
                           Upgrade
```
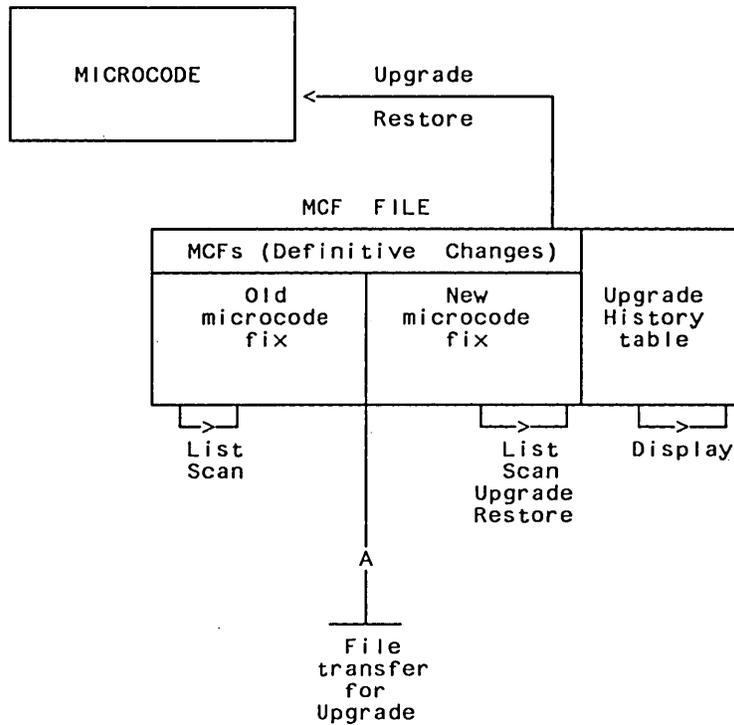
Figure   6-1. Microcode Fix Flow

Accessing the MCF Management Function

You must first display the **3720 function menu** panel (first panel displayed after you entered the password on the **Password** panel (or MOSS CE switch 3 on).

- Type *MCF* (for MCF/Patch) in the *SIA*, then press *SEND*.

The **MCF/patch selection** panel will be displayed (see Figure 6-2).

```
                MSA line 1
                MSA line 2
                MSA line 3
CUSTOMER ID: .............        3720-1          SERIAL NUMBER: xxxxxxx
-------------------- MAINTENANCE MODE ------------------------------
FUNCTION ON SCREEN: MICROCODE FIXES


SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM
    - SELECT FUNCTION  1 OR 2  ==>



     1 = MCF MANAGEMENT
         (UPGRADE OR RESTORE CODE, LIST, HISTORY TABLE)


     2 = PATCH MANAGEMENT


        EC LEVEL = 1234567
```

Figure 6-2. MCF/Patch Selection Panel

From the **MCF/patch selection** panel:

- Type *1* (for MCF) next to SELECT A FUNCTION, then press *SEND*.

The **MCF function selection** panel will be displayed (see Figure 6-3 on page 6-5).

From this panel you select to:

- Display the MCF history table; see page 6-6
- Upgrade the 3720 microcode to include the latest MCFs; see page 6-8
- Restore the 3720 microcode to its previous state (before including MCFs); see page 6-11
- List old and new MCFs; see page 6-7.

```
┌─────────────────────────────────────────────────────────────────────┐
│                         MCF MANAGEMENT                                │
│                                  LAST APPLIED MCF = MCFID19           │
│                                                                       │
│         - SELECT ONE OPTION (1 TO 5)   ==>                            │
│                                                                       │
│               1 = DISPLAY HISTORY TABLE                               │
│               2 = AUTOMATIC UPGRADE OF THE MICROCODE                  │
│               3 = AUTOMATIC RESTORE OF THE MICROCODE                  │
│               4 = LIST OLD MCF(S)                                     │
│               5 = LIST NEW MCF(S)                                     │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```
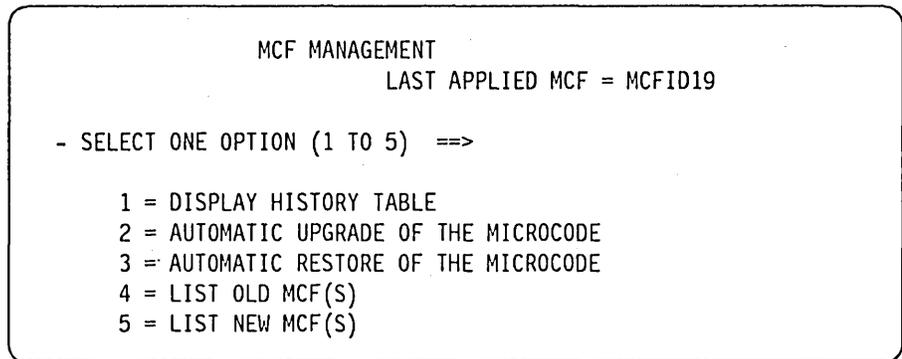
Figure   6-3. MCF Function Selection Panel

Microcode State Concept

The microcode state is identified with the LAST APPLIED MCF.

The MCF file concept is that MCFs are not independent: each MCF file contains all old MCFs, plus the new ones.

The LAST APPLIED MCF displayed corresponds to the identifier of the last MCF applied (either by means of an Engineering Change (EC), or by means of an MCF upgrade).

Warning:

The MCF file is always checked for validity, and if not perfect, the MCF management is forbidden to the customer, and the following message is displayed :
INCORRECT MCF FILE: CONTACT SERVICE REPRESENTATIVE

Displaying the MCF History Table

The MCF history table is a trace of modifications brought to the microcode through upgrade and restore of MCFs.

This table displays the identifier of the last MCF applied by the upgrade or restore function, and the date of execution.

Procedure

1. Type *1* on the **MCF function selection** panel (see Figure 6-3 on page 6-5).
2. Press *SEND*.

An **MCF history table** panel will be displayed (see example in Figure 6-4).

```
                          MCF HISTORY

        MM/DD/YY                              LEVEL

        06/18/84  CODE UPGRADED TO LEVEL      MCFID4
        08/21/84  CODE UPGRADED TO LEVEL      MCFID8
        08/21/84  CODE UPGRADE/RESTORE FAILED
        08/22/84  CODE RESTORED TO LEVEL      MCFID4
        08/28/84  CODE UPGRADED TO LEVEL      MCFID8
        11/03/84  CODE UPGRADED TO LEVEL      MCFID10
        02/13/85  CODE UPGRADED TO LEVEL      MCFID12
        02/13/85  CODE RESTORED TO LEVEL      MCFID10

    PF5:BOTTOM        PF6:QUIT          PF8:FORWARD
```

Figure 6-4. MCF History Table Display (Sample)

Listing Old and New MCFs

Listing Old MCFs

- Type *4* on the **MCF function selection** panel (see Figure 6-3 on page 6-5), then press *SEND*.

An **old MCF list** panel will display the identifiers and the title of the old MCFs (see example in figure below).

```
 IDENTIFIER        OLD MCF(S)                 SCREEN    1/3


 MCFID1  A ==>   AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
 MCFID2  A ==>   BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
 MCFID3  A ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
 MCFID4  A ==>   DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD
 MCFID5  A ==>   EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
 MCFID6  A ==>   FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 MCFID7  A ==>   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
 MCFID8  A ==>   HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
 (A=APPLIED.   OLD MCF(S) ARE ALWAYS APPLIED)
 - TO SCAN AN MCF, ENTER S AGAINST IDENTIFIER


   PF5:BOTTOM        PF6:QUIT              PF8:FORWARD
```

Figure 6-5. Old MCF List Panel (Sample)

Listing New MCFs

- Type *5* on the **MCF function selection** panel, (see Figure 6-3 on page 6-5), then press *SEND*.

A **new MCF list** panel will display the identifiers and the title of the new MCFs (see example in figure below).

```
 IDENTIFIER        NEW MCF(S)                 SCREEN    1/3
 MCFID20  N ==>   TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT
 MCFID21  N ==>   UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU
 MCFID22  N ==>   VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV
 MCFID23  N ==>   WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
 MCFID24  N ==>   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
 MCFID25  N ==>   YYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY
 MCFID26  N ==>   ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
 MCFID27  N ==>   0000000000000000000000000000000000000000
 (A=APPLIED, N=NON-APPLIED)
 - TO SCAN AN MCF, ENTER S AGAINST IDENTIFIER


   PF5:BOTTOM        PF6:QUIT              PF8:FORWARD
```

Figure 6-6. New MCF List Panel (Sample)

MCF Upgrade of Microcode

This function allows you to upgrade the microcode to include all MCFs contained in the MCF set (that is, all MCFs released since the last EC).

Procedure

- Type *2* on the **MCF function selection** panel (see Figure 6-3 on page 6-5), then press *SEND*.

  If it is the first time, you are requested to enter the date.

An **MCF upgrade of microcode** panel will be displayed (see examples in Figure 6-7 and Figure 6-8).

Once requested, the upgrade is done automatically, and the progress of the upgrade is displayed on the panel.

When the upgrade is completed, as shown on the display panel, press *SEND* to terminate the function.

Note: If you want to use the new microcode, you must re-IML. This causes the transfer of the new code from disk to storage.

```
    IDENTIFIER          UPGRADE OF MICROCODE

    MCFID20    APPLIED
    MCFID21    APPLIED
    MCFID22    APPLIED
    MCFID23    APPLIED
    MCFID24    APPLIED
    MCFID25    APPLIED
    MCFID26    APPLIED
    MCFID27    APPLIED


    - UPGRADE IN PROGRESS
```

Figure   6-7. MCF Upgrade of Microcode (Sample 1)

```
    IDENTIFIER          UPGRADE OF MICROCODE

    MCFID28    APPLIED
    MCFID29    APPLIED
    MCFID30    APPLIED


    - UPGRADE COMPLETED, PRESS SEND
```

Figure   6-8. MCF Upgrade of Microcode (Sample 2)

Error During MCF Upgrade

Two types of error could occur during an upgrade.

- Data errors

  If one of the MCFs contained in the set cannot be applied (perhaps due to a conflicting local patch applied), the upgrade function is stopped, and all applied MCFs are restored (*undone*).

  Figure 6-9 and Figure 6-10 show examples of an error followed by an automatic restore.

- Disk error

  When a disk error occurs during an upgrade, the MCF function is canceled, and any future access will recover the upgrade.

  There is no roll-back is this case, since it is not a logical error but a *hardware* error, which must be corrected before anything else.

  Figure 6-11 on page 6-10 shows an example of a disk error during an upgrade.

```
IDENTIFIER          UPGRADE OF MICROCODE          SCREEN  1/2

MCFID20  APPLIED
MCFID21  APPLIED
MCFID22  APPLIED
MCFID23  APPLIED
MCFID24  APPLIED
MCFID25  APPLIED
MCFID26  NOT APPLIED: MCF DATA DOES NOT MATCH 'MODULE DATA'
MCFID27  ==>   000000000000000000000000000000000000000000000000

  - UPGRADE ABORTED, PRESS SEND
```

Figure   6-9. Data Error During MCF Upgrade (Sample 1)

```
    IDENTIFIER          RESTORE OF MICROCODE

MCFID25     RESTORED
MCFID24     RESTORED
MCFID23     RESTORED
MCFID22     RESTORED
MCFID21     RESTORED
MCFID20     RESTORED

  - RESTORE COMPLETED, PRESS SEND
```

Figure   6-10. Data Error During MCF Upgrade (Sample 2)

```
   IDENTIFIER          UPGRADE OF MICROCODE

MCFID20     APPLIED
MCFID21     APPLIED
MCFID22     APPLIED
MCFID23     APPLIED
MCFID24     NOT APPLIED:  DISK ERROR
MCFID25     ==>    YYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY
MCFID26     ==>    ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
MCFID27     ==>    00000000000000000000000000000000000000

   - UPGRADE IN PROGRESS
  DISK(ETTE) ERROR: MCF FUNCTION CANCELED
```

Figure   6-11. Disk Error During MCF Upgrade (Sample)

MCF Restore

This function is used to restore the microcode to what it was before the last MCF upgrade.

This may be required if this upgrade does not suit the 3720.

The restore process is identical to the upgrade process.

Procedure

- Type *3* on the **MCF function selection** panel (see Figure 6-3 on page 6-5), then press *SEND*.

An **MCF restore of microcode** panel will be displayed (see examples in Figure 6-12 and Figure 6-13).

Once requested, the restore is done automatically, and the progress of the restore is displayed on the panel.

When the restore is completed, as shown on the display panel, press *SEND* to terminate the function.

```
 IDENTIFIER        RESTORE OF MICROCODE        SCREEN  1/2

 MCFID20    RESTORED
 MCFID21    RESTORED
 MCFID22    RESTORED
 MCFID23    RESTORED
 MCFID24    RESTORED
 MCFID25    RESTORED
 MCFID26    RESTORED
 MCFID27    RESTORED

  - RESTORE IN PROGRESS
```

Figure   6-12. MCF Restore of Microcode (Sample 1)

```
 IDENTIFIER        RESTORE OF MICROCODE        SCREEN  1/1

 MCFID28    RESTORED
 MCFID29    RESTORED
 MCFID30    RESTORED




  - RESTORE COMPLETED, PRESS SEND
```

Figure   6-13. MCF Restore of Microcode (Sample 2)

Installing Microcode Fixes (MCFs)

There are several ways to get microcode fixes:

- The remote support center transferred the MCFs from a PC to the MOSS disk (see Appendix A, "MOSS File Transfer/Print from PC" on page A-1).

- URSF, through RETAIN, transferred the MCFs onto the MOSS disk (see *3720 RETAIN URSF Guide*, ZZ33-7001).

- You have received EC diskettes that also contain the latest MCFs (those that could not be distributed separately).

Let's assume that **the MCFs to be installed (upgraded) are on the MOSS disk file**. These MCFs, when installed, will modify the 3720 microcode to the latest level; that is, with all microcode fixes issued since the last EC. The microcode changes:

- Correct errors in the microcode.
- Reflect the latest modifications to the 3720 functions.

MCF Installation Procedure

When installing a set of MCFs, the following sequence **MUST** be followed:

1. **The MOSS IML must be made from disk** and the rotary switch must be in *NORMAL* mode.

2. Enter the maintenance password on the **Password** panel (or use the MOSS CE switch 3).

   The **3720 function menu** panel is displayed.

3. Select the MCF function on that panel:

   a. Type *MCF* (for Microcode fix) in the *SIA*, then press *SEND*.

   The **MCF/patch function selection** panel is displayed

4. Apply the MCFs (Upgrade function) that are on the MOSS disk (see "MCF Upgrade of Microcode" on page 6-8).

5. Set the *FUNCTION SELECT* switch to *NORMAL*.

6. IML MOSS from Disk.

   The storage now contains the updated version of the microcode for MOSS. Next scanner IML will use the new scanner microcode (if any).

MCF File Organization

The files for the management of the MCFs are in the SECONDARY diskette space (in order to permit the patch of the Primary diskette in Degraded mode).

- The name of the microcode fix file is CHGMCF.
- The name of the history table file is CHGMCFHT.
- The size of CHGMCF is 53 sectors (to have 92 patches changing up to 52 bytes each.)

Chapter 7. Handling Patches to Microcode

This chapter explains how the service personnel can:

- Create
- List
- Scan (display the contents)
- Modify
- Apply
- Erase
- Restore
- Copy from and to MOSS disk

one or more microcode *PATCHES*.

What Are Microcode Fixes and Patches

The MCF function available with 3720 MOSS is made of **two distinct functions**: the microcode fix, and the microcode patch.

The Microcode Fix (MCF)

This is the code distributed to correct a microcode defect. The 'MCF' chapter of the *3720 Extended Services* manual gives all details concerning the procedures required. Chapter 6 of this manual describes the procedure required by the service personnel.

The Microcode Patch (Patch)

The *Microcode Patch* (referred to as patch) corrects or bypasses a single microcode or hardware logic design defect. A patch:

- Is a response to a high-severity problem.
- Has minimal test requirement.
- Has a very limited distribution.
- Is functionally equivalent to the software *superzap*.

A microcode patch permits also tuning up the microcode. Patch management, as opposed to MCF management, is flexible.

The patch management function is used by **IBM Product Engineering (PE)** to make:

- MOSS microcode,
- TSS microcode,
- CCU picocode, and
- CCU control code

changes to the MOSS disk.

Conditions for Handling Microcode Patches

- MOSS must not be ONLINE.

- The function must have been requested in maintenance mode (maintenance password entered on **Password** panel, or MOSS CE switch 3 On).

Figure 7-1 on page 7-2 shows the function and data flow in patch management.
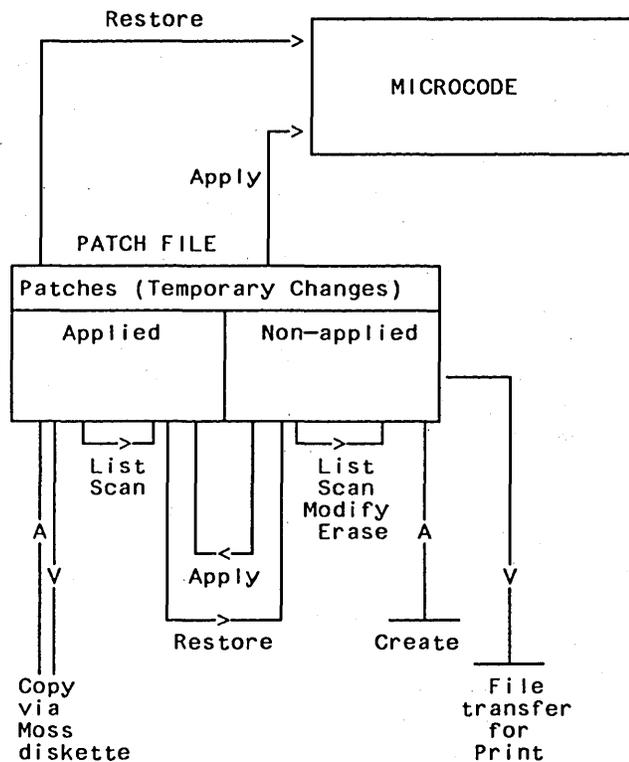
Figure 7-1. Microcode Patch Flow

Patch Files

Patch files are independent of MCF files.

Because of the operations that can be made on patches, there are two types of patches:

- Non-applied patches

  That is, patches that you can:

  — Apply
  — List
  — Scan (display the contents)
  — Modify
  — Erase

- Applied patches

  That is, patches that you can:

  — List
  — Scan (display the contents)
  — Restore, but not erase

New Patches

There are two ways of installing a new patch:

- Create a patch manually (see "Creating a Patch" on page 7-6).

- Copy a patch that has been created for another 3720, using the MOSS diskette as a transfer means from one 3720 to the other (see "Copying Microcode Patches from a Diskette Onto MOSS Disk" on page 7-24).

Patch File Organization

The file for the management of the patches is in the PRIMARY diskette space. (This is to permit the patch of the primary diskette in degraded mode.)

The name of the local patch file is *CHGPATCH*.

The size of CHGPATCH is 25 sectors (to have 64 patches changing 36 bytes each).

Accessing the Patch Management Function

You must first display the **(service) 3720 function menu** panel (first panel displayed after you entered the maintenance password on the **Password** panel, or when you use the MOSS CE switch 3).

- Type *MCF* (for MCF/Patch) in the *SIA*, then press *SEND*.

The **MCF/patch selection** panel will be displayed (see Figure 7-2).

Note: The MCF management function is not available when the IML is made from diskette.

```
-------------------- MAINTENANCE MODE --------------------
FUNCTION ON SCREEN: MICROCODE FIXES

   - SELECT FUNCTION  1 OR 2  ==>

      1 = MCF MANAGEMENT
           (UPGRADE OR RESTORE CODE, LIST, HISTORY TABLE)

      2 = PATCH MANAGEMENT

           EC LEVEL = 1234567
```

Figure 7-2. MCF/Patch Selection Panel

The EC LEVEL is the base MOSS level onto which MCFs and patches are applied.

From the **MCF/patch selection** panel:

- Type *2* (for patch) next to SELECT A FUNCTION, then press *SEND*.

The **patch function selection** panel will be displayed (see Figure 7-3 on page 7-5).

Note: If you are in **diskette mode**, you are immediately presented with the **patch menu**.

From this panel you select to:

- Create a patch; see page 7-6
- Apply patches; see page 7-11
- Scan (display the contents) of a patch; see page 7-16
- Modify the contents of a non-applied patch; see page 7-18
- Erase the contents of a non-applied patch; see page 7-14
- Restore applied patches; see page 7-20
- Copy patches onto MOSS diskette; see page 7-22
- Copy patches from MOSS diskette; see page 7-24

Warning: The patch management is not available in customer mode.

```
- SELECT ONE OPTION (1 TO 5)  ==>

1 = CREATE A PATCH
2 = APPLY, ERASE, MODIFY, OR SCAN NON-APPLIED PATCHES
3 = RESTORE, SCAN APPLIED PATCHES
4 = COPY PATCHES ON MOSS DISKETTE
5 = COPY PATCHES FROM MOSS DISKETTE
```

Figure 7-3. Patch Function Selection Panel

Creating a Patch

A patch is normally created by product engineers (PE); nevertheless a customer engineer (CE) could physically create a patch provided all elements are given to him (manual copy):

- File name
- Module name
- Address
- Verify data
- Replace data
- Checksum

Procedure

- Type *1* on the selection line of the **patch function selection** panel (see Figure 7-3 on page 7-5), then press *SEND*.

The **patch creation header** panel will be displayed (see Figure 7-4).

```
- ENTER PATCH ID (1 TO 8 CHARACTERS) ==> PATCH.ID

- DESCRIBE THE PATCH (60 CHARACTERS MAX)
     ==> THIS IS A TYPICAL PATCH



            PF6=QUIT
  ENTER PATCH IDENTIFICATION
```

Figure 7-4. Patch Creation Header Panel

On the **patch creation header** panel:

- Type the patch identifier.
- Type a short description of the patch.
- Press *SEND*.

The **patch creation record** panel will be displayed (see Figure 7-5).

```
ID:  PATCH.ID                         RECORD: 01
  - FILE NAME    ==> CHGUCMOD
  - MODULE NAME  ==> CHGMOSS

  - ADDRESS      ==> 3C4

  - VERIFY  DATA ==> FFFF FFFF FFFF FFFF FFFF .... .... ....
  - REPLACE DATA ==> 345D 6E7A 223B BC54 A3A3 .... .... ....
      2
              PF6=QUIT   PF7=CHANGE IDENTIFIER
```

Figure 7-5. Patch Creation Record Panel Sample

On the **patch creation record** panel:

- Type the file name.
- Type the module name.

- Type the starting address of the data.
- Type the verify data (that is, the data that currently exists at the address selected).
- Type the replace data (that is, the new data that is going to replace the data currently existing).
- Press *SEND*.

A new **patch creation record** panel will be displayed (see Figure 7-5 on page 7-6), with the record number increased by one.

Checks Performed

A message will be issued if one of the following occurs:

- File name unknown
- No such module in the file
- Address outside module limits
- Verify data different from current data
- Length of verify data and replace data are different

You may also return to the **patch creation header** panel to modify the patch identification or the patch description by pressing *PF7*.

Filing a Patch

When you have entered all records for the patch (record n + 1 is displayed):

1. Press *PF7* to return to previous record (which becomes the LAST RECORD of the patch).

2. Press *PF5* to file the patch.

   Note: You can also at this time modify, delete, or insert patch records.

If you are in PE mode, the patch is filed and the **patch function selection** panel is displayed (see Figure 7-3 on page 7-5). The computed checksum is displayed on this panel in the message line.

If you are *NOT* in PE mode, the **enter checksum** panel will be displayed (see Figure 7-7). You will have to:

1. Type the checksum on that panel, then press **SEND** to file the patch.

2. If you do not have the checksum, file the patch with **INCORRECT CHECKSUM**, pressing PF5.

   You cannot apply this patch, but you may now try to get the correct checksum and then modify the patch.

```
    ID:  PATCH.ID                        LAST RECORD: nn
    - FILE NAME     ==> CHGUCMOD
    - MODULE NAME   ==> CHGMOSS

    - ADDRESS       ==> 3C4

    - VERIFY  DATA ==> FFFF FFFF FFFF FFFF FFFF .... .... ....
    - REPLACE DATA ==> 345D 6E7A 223B BC54 A3A3 .... .... ....

    - AVAILABLE COMMANDS: A=ALTER, D=DELETE, I=INSERT ==>

    PF5=FILE   PF6=QUIT   PF7=PREVIOUS RECORD  PF8=NEXT RECORD
```

Figure   7-6. Patch Creation Last Record Panel

```
        PATCH.ID

    - ENTER CHECKSUM (4 CHARACTERS) ==>


    PF4=CHECK MCF     PF5=FILE WITH "INCORRECT CHECKSUM" STATUS
```

Figure   7-7. Patch Management Checksum Panel

Listing of Patches

Because different commands may be used on them, patches have been split into two groups:

- Non-applied patches
- Applied patches

Listing of Non-applied Patches

1. Type 2 on the selection line of the **patch function selection** panel (see Figure 7-3 on page 7-5).

2. Press *SEND*.

The **non-applied patch list** panel will be displayed (see Figure 7-8).

From this panel, you may:

- Apply patches; see page 7-11
- Scan (display the contents) of a patch; see page 7-16
- Modify a patch; see page 7-18
- Erase a patch; see page 7-14

```
IDENTIFIER              NON-APPLIED PATCHES       SCREEN  1/4
PATCH2   * ==> BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3     ==> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5     ==> EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6   * ==> FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7     ==> GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8     ==> HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11    ==> KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13    ==> MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
(* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)
- ENTER COMMAND FOR ID: A=APPLY, E=ERASE, M=MODIFY, S=SCAN


    PF5=BOTTOM        PF6=QUIT              PF8=FORWARD
```

Figure   7-8. Non-Applied Patch List Panel

Listing of Applied Patches

- Type 3 on the selection line of the **patch function selection** panel (see Figure 7-3 on page 7-5), then press *SEND*.

The **applied patch list** panel will be displayed (see Figure 7-9 on page 7-10).

From this panel, you may:

- Scan (display the contents) of a patch; see page 7-16
- Restore a patch; see page 7-20

```
┌─────────────────────────────────────────────────────────────┐
│  IDENTIFIER              APPLIED PATCHES      SCREEN 1/ 4     │
│                                                             │
│  PATCH2    ==> BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB │
│  PATCH3    ==> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC │
│  PATCH5    ==> EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE │
│  PATCH6    ==> FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF │
│  PATCH7    ==> GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG │
│  PATCH8    ==> HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH │
│  PATCH11   ==> KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK │
│  PATCH13   ==> MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM │
│                                                             │
│  - ENTER A COMMAND AGAINST IDENTIFIER: R=RESTORE, S=SCAN    │
│                                                             │
│      PF5=BOTTOM        PF6=QUIT              PF8=FORWARD     │
└─────────────────────────────────────────────────────────────┘
```

Figure   7-9. Applied Patch List Panel

Applying a Patch

The procedures that are used to apply patches will start by a list of the patches (up to 8 patches per panel), as explained in "Listing of Patches" on page 7-9.

The **non-applied patch list** panel is displayed (see Figure 7-8 on page 7-9),

Procedure

1. Type *A* next to the identifier(s) of the patch(es) you wish to apply (see example in Figure 7-10).
2. Press *SEND*.

After applying all the patches, a **patch apply completed** panel will be displayed (see example in Figure 7-11 on page 7-12).

Press *SEND* to display the **non-applied patch list** panel.

Notes:

1. The apply command could be used for several lines on **one** panel.
2. The patches applied disappear from the panel.
3. The *verify data* is checked again for validity.
4. A patch with a bad checksum **cannot** be applied.
5. A MOSS IML is required to make the patch effective.

```
IDENTIFIER              NON-APPLIED PATCHES      SCREEN 1/ 4

PATCH2    * ==> A BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5      ==> A EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6    * ==> A FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7      ==>   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8      ==> A HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==> A KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==> A MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
(* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)
- ENTER COMMAND FOR ID: A=APPLY, E=ERASE, M=MODIFY, S=SCAN


   PF5=BOTTOM        PF6=QUIT                PF8=FORWARD
```

Figure   7-10. Selection of Patches to Be Applied (Sample)

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│    IDENTIFIER              NON-APPLIED PATCHES      SCREEN 1/ 4        │
│                                                                       │
│    PATCH2 * NOT APPLIED:  INCORRECT CHECKSUM                          │
│    PATCH3   ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC         │
│    PATCH5   APPLIED                                                    │
│    PATCH6 * NOT APPLIED:  INCORRECT CHECKSUM                          │
│    PATCH7   ==>   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG         │
│    PATCH8   APPLIED                                                    │
│    PATCH11  NOT APPLIED: MCF DATA DOES NOT MATCH 'MODULE DATA'        │
│    PATCH13  APPLIED                                                    │
│    (* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)                 │
│                                                                       │
│                                                                       │
│      - APPLY COMPLETED, PRESS SEND                                     │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure   7-11. Patch Apply Completed Panel (Sample)

Disk Error While a Patch Is Being Applied.

If a disk error occurs during an apply, the *Patch management* function is canceled, and the patch in error is marked for later recovery, as shown in Figure 7-12.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│    IDENTIFIER              NON-APPLIED PATCHES      SCREEN 1/ 4        │
│                                                                       │
│    PATCH2  * NOT APPLIED:  INCORRECT CHECKSUM                         │
│    PATCH3    ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC        │
│    PATCH5    NOT APPLIED:  DISK ERROR                                 │
│    PATCH6  * ==>   FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF      │
│    PATCH7    ==> A GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG      │
│    PATCH8    ==> A HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH      │
│    PATCH11   ==>   KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK      │
│    PATCH13   ==> A MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM      │
│    (* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)                 │
│                                                                       │
│       - APPLY IN PROGRESS                                             │
│     DISK(ETTE) ERROR: MCF FUNCTION CANCELED                           │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

Figure   7-12. Patch Apply Disk Error Panel (Sample)

Disk Error Recovery

Once the disk error has been corrected, request the patch management function again:

1. The failing patch will be applied again.
2. The **patch recovery** panel will be displayed for a termination request (see Figure 7-13 on page 7-13).

```
IDENTIFIER          NON-APPLIED PATCHES      SCREEN 1/4

PATCH5              APPLIED


   - APPLY COMPLETED, PRESS SEND
RECOVERY OF A CANCELED APPLY
```

Figure 7-13. Patch Apply Recovery Panel (Sample)

Erasing a Patch

The procedures that are used to erase patches will start by a list of the patches (up to 8 patches per panel), as explained in "Listing of Patches" on page 7-9.

The **non-applied patch list** panel is displayed (see Figure 7-8 on page 7-9).

Procedure

1. Type *E* next to the identifier(s) of the patch(es) you wish to erase (see example in Figure 7-14).
2. Press *SEND*.

A *confirmation* (Y/N) will be requested for each patch you wish to erase (see example in Figure 7-15 on page 7-15).

Notes:

1. The erase command could be used for several lines on **one** panel.
2. The patches to be erased are marked.
3. When you press *SEND*, all patches marked are erased and disappear from the list displayed.

```
IDENTIFIER              NON-APPLIED PATCHES      SCREEN 1/ 4

PATCH2    * ==> E  BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      ==>    CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5      ==> E  EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6    * ==> E  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7      ==>    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8      ==> E  HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==>    KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==> E  MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
(* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)
- ENTER COMMAND FOR ID: A=APPLY, E=ERASE, M=MODIFY, S=SCAN

    PF5=BOTTOM        PF6=QUIT                PF8=FORWARD
```

Figure 7-14. Selection of Patches to Be Erased (Sample)

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│    IDENTIFIER              NON-APPLIED PATCHES    SCREEN 1/ 4      │
│                                                                   │
│  PATCH2    * ERASED                                               │
│  PATCH3      ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC    │
│  PATCH5      ERASED                                               │
│  PATCH6    * NOT ERASED:  NO CONFIRMATION                        │
│  PATCH7      CONFIRM ERASE: (Y/N) ==>                             │
│  PATCH8      ==> E HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH   │
│  PATCH11     ==>   KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK   │
│  PATCH13     ==> E MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM   │
│  (* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)              │
│                                                                   │
│    - ERASE IN PROGRESS                                            │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

Figure   7-15. Patch Erase Confirmation Panel (Sample)

Scanning a Patch

The procedures that are used to scan a patch (display its contents) will start by a list of the patches (up to 8 patches per panel), as explained in "Listing of Patches" on page 7-9.

The **non-applied patch list** panel or the **applied patch list** panel is displayed (see Figure 7-8 on page 7-9 and Figure 7-9 on page 7-10),

Procedure

1. Type S next to the identifier of the patch you wish to scan (see example in Figure 7-16).

   Note: The example shows a *non-applied* patch panel, but the procedure is identical with an *applied* patch panel.

2. Press *SEND*.

A **patch scan** panel will be displayed with a display of the first record of the patch selected (see example in Figure 7-17 on page 7-17)

To display the other records, use the PF keys (*PF8* for next record, and *PF7* for previous record).

Notes:

1. The scan command can be used for **one** patch only.

2. The patch contents **cannot** be modified when using the scan command.

```
IDENTIFIER            NON-APPLIED PATCHES       SCREEN 1/ 4

PATCH2    * ==>    BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      ==>    CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5      ==>    EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6      ==> S  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7      ==>    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8      ==>    HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==>    KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==>    MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
(* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)
- ENTER COMMAND FOR ID: A=APPLY, E=ERASE, M=MODIFY, S=SCAN


      PF5=BOTTOM         PF6=QUIT            PF8=FORWARD
```

Figure 7-16. Selection of the Patch to Be Scanned (Sample)

```
┌─────────────────────────────────────────────────────────────┐
│                                                             │
│  ID:  PATCH5                         RECORD: 01             │
│  - FILE NAME    ==> CHGUCMOD                                │
│  - MODULE NAME  ==> 6PRIM                                   │
│                                                             │
│  - ADDRESS      ==> 234                                     │
│                                                             │
│  - VERIFY  DATA ==> 1111 2222 3333 4444 5555 .... .... .... │
│  - REPLACE DATA ==> 5555 4444 3333 2222 1111 .... .... .... │
│                                                             │
│                                                             │
│              PF6=QUIT                    PF8=NEXT RECORD    │
│                                                             │
└─────────────────────────────────────────────────────────────┘
```

Figure   7-17. Patch Scan Display Panel (Sample)

Modifying a Patch

The procedures that are used to modify a patch will start by a list of the patches (up to 8 patches per panel), as explained in "Listing of Patches" on page 7-9.

The **non-applied patch list** panel is displayed (see Figure 7-8 on page 7-9).

Procedure

1. Type *M* next to the identifier of the patch you wish to modify (see example in Figure 7-18).
2. Press *SEND*.

A **patch modify** panel will be displayed with a display of the first record of the patch selected (see example in Figure 7-19 on page 7-19).

To display the other records, use the PF keys (*PF8* for next record, and *PF7* for previous record).

Notes:

1. The modify command can be used for **one** patch only.
2. Everything may be modified in the patch (identification, description, and record contents).

Modification Procedure

Use the same procedure as when creating a patch. See "Creating a Patch" on page 7-6.

```
IDENTIFIER            NON-APPLIED PATCHES      SCREEN 1/ 4

PATCH2    * ==>     BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      ==>     CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5      ==>     EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6      ==> M   FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7      ==>     GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8      ==>     HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==>     KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==>     MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
(* = PATCH CANNOT BE APPLIED : INCORRECT CHECKSUM)
- ENTER COMMAND FOR ID: A=APPLY, E=ERASE, M=MODIFY, S=SCAN


   PF5=BOTTOM        PF6=QUIT               PF8=FORWARD
```

Figure   7-18. Selection of the Patch to Be Modified (Sample)

```
IDENTIFIER              NON-APPLIED PATCHES      SCREEN 1/ 4

ID:  PATCH6                              RECORD: 01
- FILE NAME    ==> CHGUCMOD
- MODULE NAME  ==> 6PRIM

- ADDRESS      ==> 234

- VERIFY  DATA ==> 1111 2222 3333 4444 5555 .... .... ....
- REPLACE DATA ==> 5555 4444 3333 2222 1111 .... .... ....


- AVAILABLE COMMANDS: A=ALTER, D=DELETE, I=INSERT  ==>

PF5=FILE  PF6=QUIT  PF7=CHANGE IDENTIFIER  PF8=NEXT RECORD
```

Figure 7-19. Patch Modify Execution Panel (Sample)

Restoring Applied Patches

The procedure that is used to restore patches will start by a list of the applied patches (up to 8 patches per panel), as explained in "Listing of Patches" on page 7-9.

The **applied patch list** panel is displayed (see Figure 7-9 on page 7-10).

Restore Patch Function

This function is the opposite to the apply function. It will *undo* the microcode modification requested by the patch applied (that is, restore to the previous code).

Note: At the end of the restore function, you will go directly to the **non-applied patch list** panel, by pressing *SEND*. The patch(es) you just restored will be displayed on that panel, for you to modify, scan, or erase.

Procedure

1. Type *R* next to the identifier(s) of the patch(es) you wish to restore (see example in Figure 7-20).
2. Press *SEND*.

A **patch restore execution** panel will be displayed (see example in Figure 7-21 on page 7-21):

Press *SEND* to switch to non-applied patch management.

Notes:

1. The restore command could be used for several lines on **one** panel.
2. The patches selected are marked *RESTORED*, they are deleted from the applied patch file, and written onto the non-applied patch file.

```
   IDENTIFIER                APPLIED PATCHES      SCREEN 1/ 4


   PATCH2      ==> R  BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
   PATCH3      ==>    CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
   PATCH5      ==> R  EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
   PATCH6      ==> R  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
   PATCH7      ==>    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
   PATCH8      ==> R  HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
   PATCH11     ==>    KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
   PATCH13     ==> R  MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM


  - ENTER COMMAND FOR IDENTIFIER: R=RESTORE, S=SCAN


           PF5=BOTTOM         PF6=QUIT              PF8=FORWARD
```

Figure   7-20. Selection of Patches to be Restored (Sample)

```
┌─────────────────────────────────────────────────────────────────┐
│  IDENTIFIER                    APPLIED PATCHES        SCREEN 1/4   │
│                                                                   │
│  PATCH2      RESTORED                                              │
│  PATCH3      ==>   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC    │
│  PATCH5      RESTORED                                              │
│  PATCH6      RESTORED                                              │
│  PATCH7      ==>   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    │
│  PATCH8      RESTORED                                              │
│  PATCH11     ==>   KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK    │
│  PATCH13     RESTORED                                              │
│  - RESTORE COMPLETED, PRESS SEND FOR NON-APPLIED PATCH MNGMT       │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

Figure 7-21. Patch Restore Execution Panel (Sample)

Copying Microcode Patches Onto MOSS Diskette

This function permits collecting the patches developed on a 3720, and transferring and installing them onto another 3720.

Warning: *TERMINATION* is not allowed during a copy function.

Copy Onto MOSS Diskette Procedure

1. Type *4* on the selection line of the **patch function selection** panel (see Figure 7-3 on page 7-5).
2. Press *SEND*.

A message is displayed that asks you to mount the primary diskette onto which patches are to be copied.

After this diskette has been mounted, and *SEND* pressed, the **patch copy to diskette selection** panel will be displayed (see Figure 7-22 on page 7-23).

This list contains only the patches that are on MOSS disk but not on MOSS diskette.

Procedure

1. Type *C* next to the identifier(s) of the patch(es) you wish to copy onto MOSS diskette (see example in Figure 7-22 on page 7-23).

   Note: At that time the selected patches are copied in the storage area reserved for the destination diskette.

2. Press *SEND* after execution of the copy.

   The next panel with patches to be copied is displayed.

3. Do all previous steps for all panels that contain patches to be copied. Use *PF8* (forward) and *PF7* (backward) to scroll through the list.

4. Press *PF6* (QUIT) to make the copy effective (see example in Figure 7-23 on page 7-23).

   Note: At that time the selected patches are copied from the storage area onto the destination diskette.

After the transfer, the following message is displayed:

```
SELECTED PATCH COPIED ON DISK(ETTE)
```

IML from Diskette

If the IML was done from a diskette, the following panel will be displayed.

```
MOUNT SOURCE PRIMARY DISKETTE, THEN PRESS SEND.

SELECTED PATCHES, IF ANY, COPIED ON DISK(ETTE)
```

Once you press *SEND*, the selected patches are copied from the storage onto the destination diskette.

```
IDENTIFIER          COPY ON MOSS DISKETTE          SCREEN  1/4

PATCH2   * ==>    BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3     ==> C CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5   * ==>    EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6     ==> C FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7     ==> C GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8     ==>    HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11    ==>    KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13    ==>    MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM


 (* = PATCH WITH INCORRECT CHECKSUM)
 - ENTER C TO SELECT PATCHES TO BE COPIED
 - PRESS PF6=QUIT TO MAKE EFFECTIVE THE COPY
         PF5=BOTTOM          PF6=QUIT          PF8=FORWARD
```

Figure 7-22. Patch Copy to MOSS Diskette Selection Panel

```
IDENTIFIER          COPY ON MOSS DISKETTE          SCREEN  1/4

PATCH2   * ==>    BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3     SELECTED TO BE COPIED
PATCH5   * ==>    EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6     SELECTED TO BE COPIED
PATCH7     SELECTED TO BE COPIED
PATCH8     ==>    HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11    ==>    KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13    ==>    MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM


 (* = PATCH WITH INCORRECT CHECKSUM)



 - SELECTION COMPLETED, PRESS SEND
```

Figure 7-23. Patch Copy to MOSS Diskette Execution Panel

Copying Microcode Patches from a Diskette Onto MOSS Disk

This function permits to collecting the patches developed on a another 3720, and installing them onto this 3720.

Warning:

TERMINATION is not allowed during a copy function.

Copy Onto MOSS Disk Procedure.

1. Type 5 on the selection line of the **patch function selection** panel (see Figure 7-3 on page 7-5).

2. Press *SEND*.

A message is displayed that asks you to mount the source diskette from which patches are to be copied.

After this diskette has been mounted, and *SEND* pressed, the **patch copy from diskette selection** panel will be displayed (see Figure 7-24 on page 7-25).

This list contains only the patches that are on the source diskette, but not on MOSS disk.

This function also allows you to scan a patch (display its contents) before copying it. "Scanning a Patch" on page 7-16 explains the procedure used.

Procedure

1. Type *C* (for copy) next to the identifier(s) of the patch(es) you wish to copy onto MOSS disk (see example in Figure 7-24 on page 7-25).

   Note: At that time the selected patches are copied in the storage area reserved for the disk.

2. Press *SEND* after execution of the copy.

   The next panel with patches to be copied is displayed.

3. Do all previous steps for all panels that contain patches to be copied. Use *PF8* (forward) and *PF7* (backward) to scroll through the list.

4. Press *PF6* (QUIT) to make the copy effective (see example in Figure 7-25 on page 7-25).

   Note: At that time the selected patches are copied from the storage area onto the MOSS disk.

After the transfer, the following message is displayed:

SELECTED PATCH COPIED ON DISK(ETTE)

IML from Diskette

If the IML was done from a diskette, the following panel will be displayed.

MOUNT DESTINATION PRIMARY DISKETTE, THEN PRESS SEND.

Once you press *SEND*, the selected patches are copied from the storage to the diskette.

```
IDENTIFIER        COPY FROM MOSS DISKETTE          SCREEN  1/4

PATCH2    * ==>   BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      ==> C CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
PATCH5    * ==>   EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6      ==> C FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PATCH7      ==> C GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
PATCH8      ==>   HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==>   KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==>   MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM

 (* = PATCH WITH INCORRECT CHECKSUM)
 - ENTER C TO SELECT PATCHES TO BE COPIED, OR S TO SCAN
 - PRESS PF6=QUIT TO MAKE EFFECTIVE THE COPY
          PF5=BOTTOM        PF6=QUIT          PF8=FORWARD
```

Figure 7-24. Patch Copy from MOSS Diskette Selection Panel

```
IDENTIFIER        COPY FROM MOSS DISKETTE          SCREEN  1/4

PATCH2    * ==>   BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
PATCH3      SELECTED TO BE COPIED, OR S TO SCAN
PATCH5    * ==>   EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
PATCH6      SELECTED TO BE COPIED, OR S TO SCAN
PATCH7      SELECTED TO BE COPIED, OR S TO SCAN
PATCH8      ==>   HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
PATCH11     ==>   KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK
PATCH13     ==>   MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM

 (* = PATCH WITH INCORRECT CHECKSUM)


 - SELECTION COMPLETED, PRESS SEND
```

Figure 7-25. Patch Copy from MOSS Diskette Execution Panel

Installing a Patch

This section describes the complete sequence of actions that are required when installing a new patch; that is, the complete sequence from the time the patch is available (external diskette, paper information, or data already transmitted onto the MOSS disk) to the moment where the updated microcode is running.

There are several ways to get a patch:

- You have created patch(es) (using the procedure described in "Creating a Patch" on page 7-6).

- You have copied patches from MOSS disk to a MOSS diskette and you have this diskette.

These patches, when applied, will modify temporarily the 3720 microcode to correct an error or bypass a suspected area.

Patch Installation Procedure

When applying patches, the following sequence should be followed:

1. **The IML must be made from disk** and the rotary switch must be in *NORMAL* mode.

2. Enter the maintenance password on the **Password** panel or use MOSS CE switch 3.

   The **3720 function menu** panel is displayed.

3. Select the *patch* function on that panel:

   - Type *MCF* (for Microcode fix) in the *SIA*, then press *SEND*.

   The **MCF/patch function selection** panel will be displayed.

4. Transfer the patches to the MOSS disk, if they are not there already (see "Copying Microcode Patches from a Diskette Onto MOSS Disk" on page 7-24).

5. Apply the patches that are on the MOSS disk (see "Applying a Patch" on page 7-11).

6. Terminate the patch function.

7. Set the *FUNCTION SELECT* switch to *NORMAL*.

8. IML from Disk.

   The storage now contains the updated version of the microcode.

Chapter 8. Configuration Data File (CDF)

This function allows you to create, display, and modify the configuration data file (CDF), located on the disk. The CDF contains the hardware description of the 3720, and is used by the diagnostics and at 3720 initialization time.

The CDF functions and panels are split in two:

- Functions and panels that are available in *customer mode*, that is, the customer password has been entered on the **Password** panel.

  These functions and panels are briefly explained in "Customer CDF" on page 8-16 in this manual, but the *3720 Extended Services* manual gives all details in its 'CDF' chapter.

  Note: The speed of direct-attached lines may be displayed (and modified) using the *customer CDF function*, see page 8-16.

- Functions and panels that are available in *service mode*, that is, the service (maintenance) password has been entered on the **Password** panel, or the *MOSS CE switch 3* was On.

  These functions are explained in detail in this chapter.

CDF Functions in Service Mode

- Type *CDF* (for CONF DATA FILE) in the *SIA* of the **3720 function menu** panel, then press *SEND*.

The **(service) CDF function selection** panel is displayed (see Figure 8-1).

From this panel you may:

1. Create a new CDF by typing *1* and pressing *SEND*.

   A new CDF will be created to reflect the latest hardware modifications of the 3720 (see page 8-3).

2. Upgrade a CDF (that is add elements, such as an MES to an existing configuration) by typing *2* and pressing *SEND* (see page 8-4).

3. Verify a CDF by typing *3* and pressing *SEND*.

   This function checks that the CDF is the exact image of the 3720 (see page 8-5).

4. Display or update a CDF by typing *4* and pressing *SEND* (see page 8-7).

   Note: This function allows you to deactivate an RDV card in the CDF.

The CDF gives information on CCU, MOSS, LAB, channel adapters, scanners, TRSS, and LSSD strings.

An additional panel, referred to as **CDF display help** (see Figure 8-15 on page 8-15) and available in *CDF display* function, explains codes used in CDF panels.

```
   -------------------- MAINTENANCE MODE --------------------
   FUNCTION ON SCREEN: CONF DATA FILE

      - SELECT CDF OPTION (1, 2, 3, 4)    ==>

            1 = CREATE
            2 = UPGRADE
            3 = VERIFY
            4 = DISPLAY/UPDATE

     WARNING: CREATE DESTROYS ALL MANUALLY ENTERED DATA
```

Figure 8-1. Service CDF Function Selection Panel

Creating a CDF

You have typed *1* and pressed *SEND* on the **(service) CDF function selection panel.**

Warning: When you select the CDF create option, all CDF fields are reset.

The **CDF create** panel is displayed (see Figure 8-2).

Fields that reflect the machine configuration (hardware) are reinitialized accordingly. Conversely, the fields that have been manually initialized stay DESTROYED, and have to be manually initialized again.

If necessary, the back-up diskettes, which should be at the same level, might be used to retrieve the lost information.

To create the CDF, **the MOSS must be in** *MOSS ALONE* **state** (field 'c' of the MSA).

The creation of the CDF is automatic.

You are informed of the CDF creation progression by the display on the **CDF create** panel (see Figure 8-2).

```
CDF CREATE STARTED

    CCU INFORMATION FETCHED
    CHANNEL ADAPTER INFORMATION FETCHED
    SCANNER/TRA INFORMATION FETCHED

CDF CREATE COMPLETED
```

Figure   8-2. CDF Create Panel (Sample)

The contents of the panel depend on the current machine configuration, as sensed by the CDF create program. For example, CHANNEL ADAPTER INFORMATION FETCHED will be displayed only if a channel adapter is sensed as installed.

A *CDF Create* does not initialize the channel adapter addresses (ESC Low, ESC High, NSC), but it initializes the line clocking information to the default value (external clock).

To initialize the channel adapter addresses and/or to modify the cable clocking information, the CDF must be updated *manually* using the *(service) CDF display/update function* (see page 8-7).

Upgrading the CDF

This is the function you (or the customer) can use to upgrade the customer's 3720/3721 configuration.

The function is identical to CDF create, **EXCEPT THAT THE DATA ENTERED MANUALLY IS KEPT.**

CDF Upgrade Procedure.

You have entered 2 on the **CDF function selection** panel.

The **(service) CDF upgrade** panel is displayed.

The upgrade of the CDF is automatic.

You are informed of the CDF upgrade progression by the display on the **CDF upgrade** panel as follows:
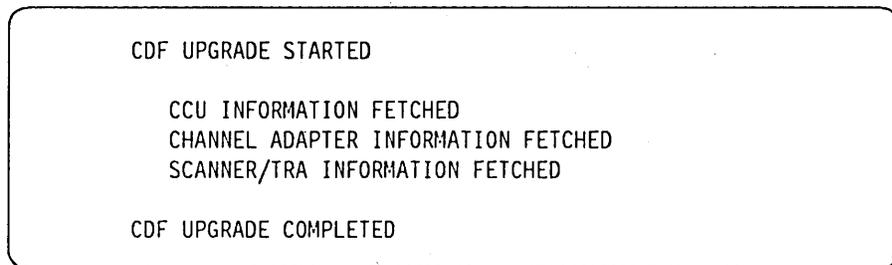
```
    CDF UPGRADE STARTED

        CCU INFORMATION FETCHED
        CHANNEL ADAPTER INFORMATION FETCHED
        SCANNER/TRA INFORMATION FETCHED

    CDF UPGRADE COMPLETED
```

Figure 8-3. CDF Upgrade Panel

The contents of the panel depend on the current machine configuration, as sensed by the CDF create program. For example, CHANNEL ADAPTER INFORMATION FETCHED will be displayed only if a channel adapter is sensed as installed.

A *CDF Upgrade* does not initialize the channel adapter addresses (ESC low, ESC high, NSC), but it initializes the line clocking information to the default value (external clock).

To initialize the channel adapter addresses and/or to modify the cable clocking information, the CDF must be updated *manually* using the *(service) CDF display/update function* (see page 8-7).

Verifying the CDF

Once the 3720 is installed, you should verify that the CDF reflects exactly the hardware configuration of the 3720.

The *verify* option does not handle the cable clocking information nor the channel adapter addresses (ESCL, ESCH, NSC).

You may also verify the CDF at any other time to check whether the CDF corresponds to the actual 3720.

You have typed *3* and pressed *SEND* on **CDF function selection** panel.

The **CDF verify execution** panel is displayed (see Figure 8-4 and Figure 8-5 on page 8-6).

The verification phase is automatic. Once you have selected VERIFY, the first difference, if any, is displayed on the **CDF verification error** panel. You are requested to settle the difference by entering Y or N on the panel (see page 8-5).

Verification Error Display

The **CDF verify execution** panel displays the value that is on the disk and the value that is sensed on the machine (see Figure 8-4).

- To modify the disk to reflect the actual machine configuration, type *Y* and press *SEND.*
- To keep the value on disk, type *N* and press *SEND..*

The next difference, if any, is displayed, and so on.

When you reach the end of the verification phase, the message VERIFY COMPLETED is displayed and the CDF, if updated, is automatically filed on the disk.

```
┌─────────────────────────────────────────────────────────────────────┐
│                    CDF - VERIFY OPTION IN PROGRESS                    │
│                                                                       │
│         SCANNER:                      01                              │
│         LIC POS:                      04                              │
│                                                                       │
│         DIFFERENCE BETWEEN THE MACHINE AND THE DISK:                  │
│                                                                       │
│             VALUE FROM THE MACHINE:    01                             │
│             VALUE FROM THE DISK:       00                             │
│                                                                       │
│                                                                       │
│        - TO UPDATE DISK WITH MACHINE VALUE ENTER Y  ==>               │
│              OTHERWISE ENTER N                                        │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 8-4. CDF Verify Execution Panel (Sample 1)

Field Explanation for CDF Verify Sample Panel

The item displayed varies according to the various frames displayed and the verified information. In the example in Figure 8-4 on page 8-5, there is a difference for the fourth location (out of 7) on scanner number 1.

Note: A machine failure may cause different values in *machine* and *disk* fields. Before updating the disk, make sure that the difference shown by the verify process is valid.

If during the verification phase, cable and/or channel adapters are modified on the disk CDF, the corresponding cable information and channel adapter addresses must be manually updated, using the CDF display/update option.

For the 3721:

- '02' means that the expansion has two scanners
- '00' means that the expansion has one scanner

CDF Error Correction

After the preceding panel (see Figure 8-4 on page 8-5) has been displayed, and if the LIC cables are not updated, the following panel will be displayed line-by-line (see Figure 8-5).

On this panel, the cables on ports 2 and 3 are not present on the disk but exist on the machine. Their code (4) means that they are modem-attached (see "CDF Display/Update Information" on page 8-15 for details).

Note: The LIC position is always referenced by the physical location (1 to 8) on the board, regardless of the base type (basic board, 3721-1 expansion, or 3721-2 expansion).

```
                  CDF - VERIFY OPTION IN PROGRESS

    SCANNER:                01
    LIC POS:                04
    CABLE ID


    DIFFERENCE BETWEEN THE MACHINE AND THE DISK:

        VALUE FROM THE MACHINE:    0440
        VALUE FROM THE DISK:       0000

  - TO UPDATE DISK WITH MACHINE VALUE ENTER Y ==>
        OTHERWISE ENTER N
```

Figure 8-5. CDF Verify Panel (Sample 2)

Service CDF Display/Update

You have typed *4* and pressed *SEND* on the **CDF function selection** panel.

The **CDF display selection** panel is displayed (see Figure 8-6).

From this panel you may:

- Select to display successively all components of the CDF; see page 8-8
- Select to display a single component of the CDF:
  - The CCU; see page 8-8
  - The LAB/CAB; see page 8-8
  - The channel adapters; see page 8-9
  - The scanners or TRA; see page 8-10
  - The LSSD blocks; see page 8-14
- Select to see the CDF information explanation; see 8-15

```
                          CDF - DISPLAY OPTION

    - SELECT ONE DISPLAY OPTION (1 TO 7)   ==>

            1 = ALL (2 TO 6)
            2 = CCU
            3 = LAB/CAB
            4 = SCANNER/TRA
            5 = CHANNEL ADAPTER
            6 = LSSD
            7 = CDF INFORMATION



                        PF6=QUIT
```

Figure 8-6. CDF Display/Update Selection Panel

The contents of the panel depend on the current machine configuration, as sensed by the CDF create program. For example, 5=CHANNEL ADAPTER will be displayed only if a channel adapter is sensed as installed.

When selecting display/update, the default is display mode.

To update the CDF, press *PF4* (UPDATE). This is possible only when PF4 = UPDATE is displayed.

You are informed that you are in update mode by the term UPDATE displayed on the first line of the work area.

The cursor is positioned at the first UPDATABLE character. Use the tab key (--＞) to move from one updatable character to another. When all fields have been updated, press *SEND* to enter the data.

To file the updated CDF on the disk, press *PF8*, when this key is displayed (PF8 = FILE).

If you select the terminate (T) function before filing the updated CDF, the modifications you entered are lost.

Warning: If the CDF has been changed for maintenance, it is possible that bad board swaps may be made while reloading the box after CDF maintenance. That may require changes in the CDF for rectification. Unpredictable results may occur from changes in the CDF if they affect port swapped lines.

Also if a port has been modified to say 'cable not installed' (00), make sure that the cable is unplugged, otherwise diagnostics may give false results.

CDF Display/Update All

You select ALL to display all the CDF: CCU, MOSS, line and channel boards, channel adapters, scanners, and LSSD. To go from one panel to the following one (for example from CCU/MOSS to LAB), press *PF8* (FORWARD).

At the end of the CDF display, if an update has been performed, PF8 = FILE is displayed. It is recommended to perform all the updates before pressing this key.

CDF Display/Update of CCU/MOSS

```
CONTROLLER TYPE= 3720    MODEL: 01 (3720 Model 1)

CCU STORAGE SIZE: 1024 K


PF4=UPDATE  PF6=QUIT
```

Figure 8-7. CDF Display/Update CCU/MOSS Sample Panel

Updatable Fields

The following fields may be updated (if the CCU is not initialized):

- The CCU Storage
- The Model
  - — From a Model 1 to 11
  - — From a Model 2 to 12
  - — From a Model 11 to 1
  - — From a Model 12 to 2

CDF Display/Update LAB/CAB (3720/3721)

```
RDV BOARD  RDV    1ST CA/CS  2ND CA/CS  LIC/LINE INSTALLED
SEQ TYPE   ADDR    # ADDR     # ADDR    L1L2L3L4 L5L6L7L8

* 1  BASB  4000   *CS 01 10  *RA 02 48  Y N h h  h h
* 2  EXB2  4002   *CS 03 11  *CS 04 21  . . . . . . . . .
* 3  CAB   4006   *CA 01 08  *CA 02 08

PF4=UPDATE    PF6=QUIT
```

Figure 8-8. CDF Display/Update LAB/CAB Sample Panel (3720/3721)

Y means TIC present (N if not present)

Fields of CDF Display/Update Panel for LAB/CAB

Highlighting of adapter type field and '*' means: adapter present.

RDV SEQ: Redrive number. If a redrive has been deactivated (top card connector, pin W28 to W29) and is still recorded as present (*), delete the (*).

Note: The RDV will also have to be in disconnected state to prevent failures on some IOC bus IFTs. For more information on redrive states, refer to the *3720 Maintenance Information Reference* manual.

BOARD TYPE: BASB (for 3720), EXB1 (for 3721-1), or EXB2 (for 3721-2)

RDV ADDR: Redrive address.

CA/CS # ADDR: Give the number and the address of the channel adapters (CA), communication scanners (CS), and token-ring adapter (RA).

LIC/LINE INSTALLED: See "CDF Display/Update Information" on page 8-15 for more information.

The codes under this title are interpreted as follows: L1L2L3...L8: LIC position 1 through 8.

```
F(hexadecimal code):
    Port number     1 2 3 4
    Line status     1 1 1 1
    Legend:
        1 means line present
        0 means line absent
8(hexadecimal code):
    Port number     1 2 3 4
    Line status     1 0 0 0
```

Notes:

1. When a LIC is absent, the hexa code is replaced by a point (.).

2. When a TRA is installed (3720 Models 11 and 12), the hexadecimal code under 'L1L2' is replaced by 'Y' for the TIC(s) installed, and by 'N' for the TIC(s) absent.

Press *PF4* (UPDATE), and enter an asterisk at the left of the redrive sequence number to indicate that the redrive is present. No asterisk means not present.

CDF Display/Update of Channel Adapters

```
                        CHANNEL ADAPTER

        CA    RDV    CAB    TPS    NSC ADDRESSES   ESC ADDRESSES
        #     ADDR   TYPE          A     B         LOW    HIGH

      * 1    4006    CAB    Y      00    00         00     00
      * 2    4006    CAB    Y      00    00         00     00


      PF4=UPDATE   PF6=QUIT
```

Figure 8-9. CDF Display/Update Channel Adapters Sample Panel

The * means present

CA #: Channel adapter number. The * indicates that the channel adapter is present. You can update (delete or insert) this character. For example, you can delete the * to temporarily remove a CA during diagnostic tests.

RDV ADDR: Redrive address.

CAB TYPE Board type: CAB

TPS: Two processor switch.

- • Y means present,
- • N means not present
- • - means not applicable

You can update Y and N, but not -.

NSC: Native subchannel address.

ESCL: Emulated subchannel address low (ESC lo)

ESCH: Emulated subchannel address high (ESC hi)

For ESC and NSC address jumpering on cards CADR and CHIN, refer to the 3720 *Maintenance Information Reference* manual. These addresses have to be entered manually.

CDF Display/Update of Scanners or TRA

If you requested a display/update of the scanners or TRA (only), you are requested to enter the scanner/TRA number:

- ENTER SCANNER/TRA NUMBER (0 FOR ALL) ==>

The scanner number is 1, 3, or 4; the TRA number is 2; enter 0 for all scanners.

If you have selected to display or update **ALL**, and if you pressed *PF8* (forward), in the **CDF display/Update LAB/CAB** panel, you are presented with the display of the first scanner (basic board).

Pressing *PF8* will display the other scanner(s) (if a 3721-1 or a 3721-2 is installed), or display the TRA contents (if a 3720-11 or a 3720-12 is installed).

One of the following panels is then displayed:

```
SCANNER:  1 ADDR: 10  ICC-1: 1    LAB: A
      CS:  0 RDV: 4000 ICC-2: 1    FES: 0


LIC POS:     1      2      3      4      5      6      7
LIC TYPE=   01     01     01     01     01     01     01


CLOCK (C) AND CABLE ID INFO (I)
            C I    C I    C I    C I    C I    C I    C I
PORT 1:     2 4    2 4    2 4    2 4    2 4    2 4    2 4
PORT 2:     2 4    2 4    2 4    2 4    2 4    2 4    2 4
PORT 3:     2 4    2 4    2 4    2 4    2 4    2 4    2 4
PORT 4:     2 4    2 4    2 4    2 4    2 4    2 4    2 4

PF4=UPDATE     PF6=QUIT                     <PF8=FORWARD>
```

Figure 8-10. CDF Display/Update Scanner 1 (3720 Model 1 or 2)

```
SCANNER:   1 ADDR: 10   ICC-1: 1    LAB: C
     CS:   0 RDV: 4000 ICC-2: -    FES: 0


LIC POS:    3     4     5     6
LIC TYPE=  01    01    01    01


CLOCK (C) AND CABLE ID INFO (I)
           C I   C I   C I   C I
PORT 1:    2 4   2 4   2 4   2 4
PORT 2:    2 4   2 4   2 4   2 4
PORT 3:    2 4   2 4   2 4   2 4
PORT 4:    2 4   2 4   2 4   2 4

PF4=UPDATE    PF6=QUIT              <PF8=FORWARD>
```

Figure 8-11. CDF Display/Update Scanner 1 (3720 Model 11 and 12)

```
      TRA:   2 ADDR: 48   LAB: C
TRA TYPE: 0 RDV: 4000

TIC POSITION:         1    2
INSTALLED:            *    *

              (* means present, _ means absent)

PF4=UPDATE    PF6=QUIT   <PF7=BACKWARD>    <PF8=FORWARD>
```

Figure 8-12. CDF Display/Update TRA 2 (3720 Model 11 and 12)

```
SCANNER:   3 ADDR: 11    ICC-1: 1    LAB: A
     CS:   0 RDV:  4002 ICC-2: 1    FES: 0

LIC POS:    1     2     3     4     5     6     7     8
LIC TYPE=  01    01    01    01    01    01    01    01

CLOCK (C) AND CABLE ID INFO (I)
         C I   C I   C I   C I   C I   C I  C I  C I
PORT 1: 2 4   2 4   2 4   2 4   2 4   2 4  2 4  2 4
PORT 2: 2 4   2 4   2 4   2 4   2 4   2 4  2 4  2 4
PORT 3: 2 4   2 4   2 4   2 4   2 4   2 4  2 4  2 4
PORT 4: 2 4   2 4   2 4   2 4   2 4   2 4  2 4  2 4

PF4=UPDATE  PF6=QUIT  <PF7=BACKWARD>     <PF8=FORWARD>
```

Figure 8-13. CDF Display/Update Scanners (3721)

Fields in CDF Display/Update Scanners

SCANNER: Gives the scanner number, the scanner address, the board type (A for 3720-1, 3720-2, and 3721-1, B for 3721-2, C for 3720-11 and 3720-12).

```
SCANNER: no.  1   3   4

ADDR:         10  11  21
```

CS: Gives the scanner presence, the redrive address, the FES and ICC presence.

1 indicates present, 0 indicates absent; (any other value indicates a possible error).'

LIC POS: LIC position: 1 to 8.

LIC TYPE: LIC type for each LIC position as follows:

Value	LIC Type
00	(No LIC)
01	1
02	2
03	3
04	4A
0C	4B

PORT n: Gives the clock (C) and cable (I) information for each port of a LIC, as follows:

C   Clock information

                0: Not defined clock
                1: Business machine clock
                2: External clock (default)
                3: Direct attachment

I   Cable information

                0: Cable not installed
                1: LIC type 1, 2, or 4 wrap block
                2: LIC type 3 wrap cable
                4: Modem attachment
                5: Direct attachment
                6: Autocall (See Note 1)

Notes:

1. For autocall units, the clock must be set to 0 (not defined).

2. Place "C" and "I" information in port 1 for the first line attached to a LIC (type 3, direct attachment) even if this line physically connects to another port of the LIC.

Updating the CDF for Scanners

If you delete a scanner or a LIC all the information for that scanner or LIC is suppressed.

The updated data is stored on the disk at the end of the application.

PF Keys

PF7=BACKWARD and PF8=FORWARD.

This PF key information appears on the panel when it is possible to page backward or forward with the PF keys.

Updating the CDF for the TRA

The updated data is stored on the disk at the end of the application.

A TRA takes a scanner adapter position, therefore, when a TRA is detected in lieu of a CSP, a TRA panel is displayed (see Figure 8-12 on page 8-11).

Press *PF4* (UPDATE), and enter an asterisk (*) to indicate that the TIC is present. Blank or (_) means not present.

Note: If you delete a TRA or a TIC, all the information for that TRA or that TIC is suppressed.

Fields in CDF Display/Update TRA

TRA: Gives the TRA number (02)

ADDR: Gives the TRA address (48)

LAB: Gives the pseudo LAB type (C)

TRA Type: Gives the TRA type (0)

RDV: Gives the TRA RDV number (4000)

TIC position: 1   2 Gives the possible TIC positions

INSTALLED: Gives the TIC installed (*) or absent (_)

PF Keys

PF7=BACKWARD and PF8=FORWARD.

This PF key information appears on the panel when it is possible to page backward or forward with the PF keys.

CDF Display of LSSD

The LSSD can only be displayed, **NOT UPDATED**.

For detailed information on level sensitive scan design (LSSD), and trouble-shooting procedures for CCU hardchecks, see the *3720 Maintenance Information Reference* manual. Two sectors of LSSD can be displayed:

1. LSSD skeleton block sector 1: This is the LSSD saved by the MOSS during phase 1b of a controller re-IML when a CCU hardcheck occurs. If several CCU hardchecks occur, the LSSD skeleton kept corresponds to the latest hardcheck.

2. LSSD init block sector 2: This is the actual CCU value for initializing the CCU.

Before displaying LSSD, you are requested to enter the LSSD block number:

- ENTER LSSD BLOCK NUMBER (0 FOR BOTH) = = >
(enter 1 or 2, or 0 for both)

The following panel is then displayed in hexadecimal format (H):

```
         LSSD SKELETON BLOCK     -              CDF SECTOR 1/2
      0        4        8        C        10         14
   00 0002100D 000D000B 00000000 F8280C00 00000063 0FCF3F05
   18 01F82820 00000000 0000FFFF 0001010C 000B0004 00000000
   30 23BE000C 700030F9 C01C3918 E96B8021 00000003 0003010E
   48 00070004 022E3007 64400010 0030B901 00000000 00000000
   60 00000000 00000007 E0000000 00000000 00000000 00050207
   78 0004000E 00000000 00000000 0004010B 002F0002 00000000
   90 00000000 00000000 00000000 00000000 00000000 02FFFFFF
   A8 FFFFFFFF FFFFFFFF FFFF0000 00000018 400C0000 00000000
   C0 10000004 00200003 01000010 20010000 80000000 00000000
   D8 03F00000 00000000 00000000 00000000 00000000 0007010B
   F0 002F0002 FFFFF807 FFFFF2F8 00000140

      PF6=QUIT                  PF8=FORWARD
```

Figure   8-14. CDF Display of an LSSD Sector (Sample)

A sector is made of strings. Each string has a four-element header added that indicates:

- The string number ('0002' in the first string)
- The string Identifier ('100D' in the first string)
- The string length in halwords ('000D' in the first string)
- The number of significant bits in last halfword ('000B' in the first string).

The table below explains to what the string numbers correspond.

Number	Title	Address
0002	MSA	0
0001	PUA	24
0003	UCBA	44
0005	Redrive	74
0004	ALLPUC	84
0007	Picodiag	EC

PF Keys PF7=BACKWARD and PF8=FORWARD.: This PF key information appears on the panel when it is possible to page backward or forward with the PF keys.

CDF Display/Update Information

The following panel, obtained by entering 7 followed by *SEND* in the **CDF display/update selection** panel, is to be used as a HELP for the CDF information:

```
CS/FES/ICC-1/ICC-2  ===>  - = NOT INSTALLED
                          N = INSTALLED AND TYPE NUMBER
LIC TYPES  CLOCK INFO (C)        CABLE INFO(I)
00=NO LIC  1=INT. CLOCK          0=CABLE NOT INSTALLED
01=LIC1    2=EXT. CLOCK          1=LIC1/2/4 WRAP BLOCK
02=LIC2      (DEFAULT)           2=LIC3 WRAP CABLE
03=LIC3    3=DIRECT ATTACHMENT   4=MODEM ATTACHMENT
04=LIC4A                         5=DIRECT ATTACHMENT
0C=LIC4B                         6=AUTOCALL
-LAB/CAB=LIC/LINE POS.GIVES BINARY PORT POSITION INSIDE
        LIC  (A = 1010 LINES ON PORT 1 AND 3)
-DO NOT FORGET TO ENTER NSC & ESC ADDR.  IN CA SCREEN
-UPDATED INFO. IS WRITTEN ONLY AFTER "PF8=FILE" IS KEYED
              PF6=QUIT
```

Figure 8-15. CDF Display/Delete Help Panel

Note: See the *3720 Maintenance Information Reference* manual for register bit details about LIC types, clock, and cable information for specific LIC types.

Customer CDF

You are in *customer mode* (the customer password was used to log onto MOSS).

To select the CDF function:

1. Type *CDF* (for CONF DATA FILE) in the *SIA* of the **3720 function menu** panel.
2. Press *SEND*.

The **(customer) CDF function selection** panel is displayed.

From this panel you may:

- Upgrade a CDF (that is, add elements, such as an MES, to an existing configuration) by typing *1* and pressing *SEND*.
- Display a CDF by typing *2* and pressing *SEND*, that is
  - Display the contents (LICs, TICs, lines, and channel adapters) of the 3720 basic board, and of the 3721 expansion board
  - Display and modify the line speed of some direct-attached lines (only in customer mode)

All CDF information is given the 'CDF' chapter of the *3720 Extended Services* manual.

Display/Update Direct-Attached Line Speed

You have selected to display (and/or update) the speed of one or more direct-attached line(s) by entering *4* on the **(customer) CDF display selection** panel.

The **programmable line speed selection** panel is displayed (only in customer mode).

This CDF function allows the customer to change the speed information of direct-attached lines.

This information is maintained on the MOSS disk, and made available to the corresponding scanner when it is IML'ed (selectively or through a normal CCU IPL).

Speeds on the MOSS disk file have a default value set to 9600 bps.

Procedure

- To **display** the line speed and LIC type assigned to a line,

  1. Type the address corresponding to that line on the **programmable line speed selection** panel.
  2. Press *SEND*.

  The line speed and LIC type is then displayed on the same panel.

  Note: To display the line speed of the next (or previous) sequential line address, press *PF8* (forward) or *PF7* (backward).

- To **update** the line speed assigned to a line, you must:

  1. Display the line speed of that line (see previous paragraph).
  2. Press *PF4* (speed update).
  3. Type the number corresponding to the speed requested (as listed on the panel, for example type *0* for 2400 bps).
  4. Press *SEND*.

The following is checked:

- The existence of the line
- Whether the line is direct-attached
- The LIC type

All Programmable-line-speed information is given in the 'PLS' chapter of the *3720 Extended Services* manual.

Chapter 9. Panel Functions from MOSS Console

This chapter describes how some activities, which would normally require being at the 3720 control panel, could be performed using the MOSS console.

These activities are:

- Show the hexadecimal display, and the position of some control panel switches:
  - The **Function Select** switch
  - The **Power Control** switch (LOCAL or REMOTE)
  - The four **MOSS CE** switches (ON or OFF)

  This information is displayed as soon as you request the **Control Panel Function**; see "Accessing the Panel Function" on page 9-2.

  Note: The **Panel/Console** switch of the control panel NEED NOT BE on **Console**.

- Request a command that would require setting a panel switch to a given position:
  - Request a general IPL
  - Request a MOSS IML with **Reset**
  - Enable or disable the channel adapter(s)

  Note: The *Panel/Console* switch of the control panel MUST BE on **console**

Warning: When setting the *Panel/Console* switch from **Console** to **Panel**, make sure that the channel adapter switches on the control panel correspond to the channel adapter lamps.

User of the 3720 MOSS Panel Functions: This *panel function from MOSS console* function is available to the customer, but some information (such as MOSS CE switch setting) is not displayed if the customer password was used in the **Password** panel.

The *3720 Extended Services* manual describes in more details the procedures required to run this function in customer mode.

Accessing the Panel Function

You must first display the **3720 function menu** panel (first panel displayed after you entered the remote maintenance password on the **Password** panel, or with the MOSS CE switch 3 set ON).

1. Type *PAF* (for Panel Function) in the *SIA*, then press *SEND*.

Depending on the position of the **Panel/Console** switch, two types of panels may be displayed: see following sections.

If the Panel/Console Switch is on Panel

The panel displayed will be similar to the one shown in Figure 9-1.

The following control panel information is displayed:

- The value of the hexadecimal display (if it has a meaning).
- The position of the **Function Select** switch.
- The position of the **Power Control** switch (for the local 3720, Model 1and 11)
- The state of the channel adapters (for the 3720 Models 1 and 11 only):
  - The CAs that are installed.
  - The state of the channel adapter lamps (current state).
  - The state of the channel adapter switches (requested state).
  - The position of MOSS CE switches (only in maintenance mode).

The display is in *refresh* mode; that is, all changes to the control panel are automatically displayed on the console panel. This is the default mode.

To stop the *refresh*, press *BREAK* (ATTN).

To restart the *refresh*, press *PF5*.

```
CUSTOMER ID: .............        3720-1           SERIAL NUMBER: xxxxxxx
-------------------- MAINTENANCE MODE ---------------------------------
FUNCTION ON SCREEN: PANEL FUNCTIONS


SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM


INFORMATION FROM THE CONTROL PANEL


HEX DISPLAY:             FEF         INSTALLED CA:       1 2 3
FUNCTION SELECT SWITCH:  NORMAL      CA STATE:             E D E
POWER CONTROL SWITCH:    LOCAL       REQUESTED CA STATE  E E E
CE SWITCHES:             ON OFF ON   OFF  (E=ENABLED D=DISABLED)


- TO HAVE ACCESS TO THE PANEL FUNCTIONS:
  1. GO TO THE CONTROL PANEL
  2. SET PANEL/CONSOLE SWITCH TO CONSOLE
  OR
- PRESS BREAK TO STOP REFRESH
```

Figure 9-1. Control Panel Display (Switch Set to Panel)

If the Panel/Console Switch is on Console

The panel displayed will be similar to the one shown in Figure 9-2.

The following control panel information is displayed:

- The value of the hexadecimal display (if it has a meaning).
- The position of the **Function Select** switch.
- The position of the **Power Control** switch (for the local 3720, Models 1 and 11).
- The state of the channel adapters (for the 3720 Models 1 and 11 only):
    - The CAs that are installed.
    - The state of the channel adapter lamps (current state).
    - The state of the channel adapter switches (requested state).

    CA numbering:

    CA 1 on screen is: CA 1, interface 1 (1A on control panel).
    CA 2 on screen is: CA 1, interface 2 (1B on control panel).
    CA 3 on screen is: CA 2, interface 1 (2A on control panel).
    CA 4 on screen is: CA 2, interface 2 (2B on control panel).

- The position of MOSS CE switches (only in maintenance mode).

The display is in *refresh* mode; that is, all changes to the control panel are automatically displayed on the console panel. This is the default mode.

To stop the *refresh* and request a panel function such as a change in CA switch state, press *BREAK* (ATTN).

To restart the *refresh*, press *PF5*.

```
FUNCTION ON SCREEN: PANEL FUNCTIONS

SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM


INFORMATION FROM THE CONTROL PANEL

HEX DISPLAY:              FEF          INSTALLED CA:       1 2 3
FUNCTION SELECT SWITCH:   NORMAL       CA STATE:           E D E
POWER CONTROL SWITCH:     LOCAL        REQUESTED CA STATE  E E E
CE SWITCHES:              ON OFF ON  OFF  (E=ENABLED D=DISABLED)


- PRESS BREAK TO SELECT A PANEL FUNCTION AND STOP REFRESH
```

Figure 9-2. Control Panel Display (Switch Set to Console)

Using Control Panel Functions from Console

From the **control panel function selection** panel (see page 9-4), you may select to:

- Request a general IPL or a MOSS IML with RESET, see page 9-5.

- Enable or disable the channel adapter(s), see page 9-4.

```
FUNCTION ON SCREEN: MCF PANEL FUNCTIONS

SYSTEM INPUT AREA (SIA) ===>
T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM


INFORMATION FROM THE CONTROL PANEL

HEX DISPLAY:              FEF            INSTALLED CA:      1 2 3
FUNCTION SELECT SWITCH:   NORMAL         CA STATE:           E D E
POWER CONTROL SWITCH:     LOCAL          REQUESTED CA STATE  E E E
CE SWITCHES:              ON OFF ON  OFF  (E=ENABLED D=DISABLED)


- SELECT A PANEL FUNCTION(IPL, IML, CA) ==>
     IPL = GENERAL IPL
     IML = MOSS IML WITH RESET
     CA  = ENABLE OR DISABLE A CHANNEL ADAPTER

          PF5 = START REFRESH
```

Figure   9-3. Control Panel Function Selection Panel (Sample)

Enabling or Disabling Channel Adapters from Console

CA numbering:

CA 1 on screen is: CA 1, interface 1 (1A on control panel).
CA 2 on screen is: CA 1, interface 2 (1B on control panel).
CA 3 on screen is: CA 2, interface 1 (2A on control panel).
CA 4 on screen is: CA 2, interface 2 (2B on control panel).

Procedure

- Type *CA* on the selection line of **control panel function selection** panel, then press *SEND*.

The **control panel CA state modification** panel is displayed (see page 9-5).

From this panel:

1. Replace the asterisk (*) that is under the selected channel adapter by entering:

   - *D* to disable the corresponding channel adapter.
   - *E* to enable the corresponding channel adapter.

2. Press *SEND*.

The state of the channel adapters will be modified as requested, and messages on the console panel will show the answer to your request (for example,

'YOUR REQUEST TO UPDATE THE CA STATE IS TRANSMITTED'

Note: To display the latest CA state, press **PF5**.

```
INFORMATION FROM THE CONTROL PANEL

HEX DISPLAY:                 FEF          INSTALLED CA:        1 2 3
FUNCTION SELECT SWITCH:      NORMAL       CA STATE:            E D E
POWER CONTROL SWITCH:        LOCAL        REQUESTED CA STATE   E E E
CE SWITCHES:                 ON OFF ON  OFF  (E=ENABLED D=DISABLED)

CHANNEL ADAPTER STATE UPDATE:             INSTALLED CA        1 2 3
                                          CA STATE            E D E

- REPLACE ASTERISK (*) BY E OR D TO UPDATE ==>                D D *

YOUR REQUEST TO UPDATE THE CA STATE IS TRANSMITTED: CA3      ENABLED
                                                    CA1 CA2  DISABLED

        PF5 = START REFRESH
```

Figure   9-4. Control Panel Channel Adapter Modification Panel (Sample)

General IPL or MOSS IML with RESET from Console

Procedure

1. Type *IPL* or *IML* on the selection line of **control panel function selection** panel, then press *SEND*.

2. A confirmation is requested by the following message:

   ```
   CONFIRM YOUR SELECTION (Y=YES, N=NO) ==>

   WARNING: WHEN IML OR IPL IS COMPLETE, MOSS IS DISCONNECTED
   ```

   If you enter 'Y', the IML or IPL takes place (see following steps); otherwise the selection panel of Figure 9-3 on page 9-4 is displayed again.

3. **IPL/IML From Remote Console**.

   If you used the remote maintenance password to log onto MOSS, the **Copyright** panel, then the **Password** panel is displayed, for you to re-enter this remote password, and have the **3720 function menu** panel displayed.

4. **IPL/IML From Local Console**.

   If you used the MOSS CE Switch 3 to log onto MOSS, the **3720 function menu** panel is displayed.

   If the MOSS CE Switch 3 was not in the correct position,

   a. Set the MOSS CE Switch 3 On
   b. Set Console/Panel Switch on Panel
   c. IML MOSS from panel.

   The **3720 function menu** panel is displayed.

Chapter 10. Disk-Diskette Management Functions

This chapter explains how to use the *disk functions* in order to:

- Save the contents of the disk onto diskettes; see page 10-3.
- Restore the contents of diskettes onto the disk; see page 10-7.
- Initialize the disk; see page 10-10.
- Position the disk recording arm back to landing zone; see page 10-12.
- Initialize the diskette; see page 10-13.
- Install an Engineering Change (EC); see page 10-14.
- Check the disk after an I/O error, and replace that disk if required; see page 10-17.

Warning: BEFORE SELECTING THE DISK FUNCTIONS, SET MOSS OFFLINE. Use function *MOF* of the **CCU function menu** panel.

Accessing the Disk Management Functions

You must first display the **3720 function menu** panel (first panel displayed after you entered the maintenance password on the **Password** panel, or if the MOSS CE Switch 3 is ON).

- Type *DF* (for DISK) in the *SIA*, then press *SEND*.

1. If the IML was made from disk, the **(service) disk function selection** panel will be displayed, and the functions available are those listed in Figure 10-1.

   Note: All five options of that menu may be performed in customer mode or in maintenance mode.

2. If the IML was made from diskette, the **(service) disk function selection** panel will be displayed, and the functions available are those listed in Figure 10-2.

   Note: The disk initialization function is **not** available to the customer.

```
        DISK FUNCTION SELECTION

- SELECT ONE OF THE FOLLOWING OPTIONS   ==>

   1 = EC MICROCODE INSTALLATION
   2 = SAVE DISK ONTO DISKETTES
   3 = RESTORE DISK FROM DISKETTES
   4 = DISKETTE INITIALIZATION
   5 = POSITION DISK RECORDING ARM BACK TO LANDING ZONE
```
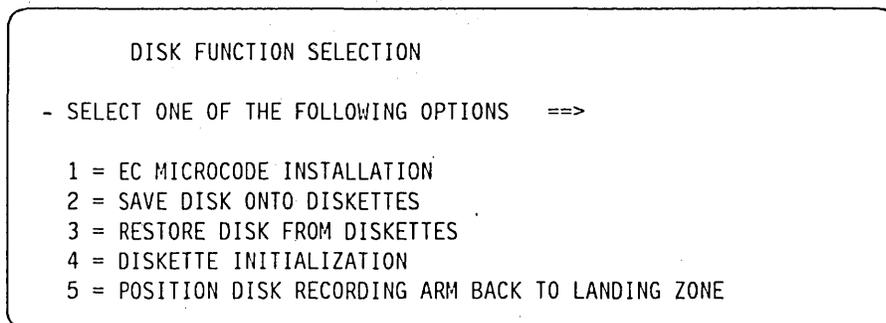
Figure 10-1. Disk Function Selection Panel (IML from Disk)

```
            DISK FUNCTION SELECTION

  - SELECT ONE OF THE FOLLOWING OPTIONS   ==>

   3 = RESTORE DISK FROM DISKETTES
   5 = POSITION DISK RECORDING ARM BACK TO LANDING ZONE
   6 = DISK INITIALIZATION
```
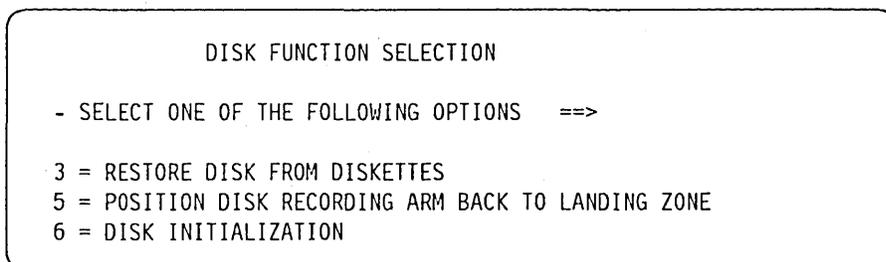
Figure 10-2. Disk Function Selection Panel (IML from Diskette)

How to Save Disk Contents onto Diskettes

This function should be performed by the customer.

3720 Extended Services manual gives the customer detailed information on how to save the disk contents.

This function should be used:

- To create a back-up copy of initial diskettes.
- To copy the MOSS disk files after new MCFs have been installed.
- To copy the disk when:
    - The Configuration data file (CDF)
    - The Line description file (LDF)
    - The IPL port tables
    - The Control program procedures

    have been modified.

- And at regular intervals to keep back-up diskettes at latest disk level.

The reason for that copy is to allow a later restore from the diskettes to the disk, either because the data of the disk is not valid (such as a bad patch applied), or the disk is physically damaged (bad tracks).

Diskettes to Be Used
Disk contents will be saved on two or three diskettes.

Diskette Format

The format of these diskettes must be compatible with the MOSS disk format.

To this end you may **only**:

- Use the spare diskettes corresponding to a back-up copy of the latest installation diskettes (last EC) or diskettes created in a previous MOSS disk save,
- Format PC diskettes using the MOSS **Diskette formatting** application of the Disk function (see 10-13).

    The PC diskettes to be used are *2HC IBM PN 6109660* or equivalent references (double sided and high density).

Diskette Terminology

The word **mount** will be used either on the console panels or in the text that follows to mean:

1. Insert the diskette into the diskette drive.
2. Close the diskette drive (by turning or pulling the door latch).

All original diskettes (either initial installation or new EC) come in two sets ('normal' primary and secondary, and 'back-up' primary and secondary).

When requesting to mount a spare diskette, the prompt will refer to *FIRST*, *SECOND* or *3721* diskette.

When saving the contents of the MOSS disk onto the diskettes the prompt will refer to PRIMARY, SECONDARY or 3721 diskette respectively. **Do not forget to label the diskette and diskette covers accordingly**, so that no ambiguity is left for later restore from diskettes to disk.

Note: The 3721 diskette is **not** used in the disk restore function.

Disk-to-Diskette Procedure

- Type 2 in the SELECTION LINE, then press *SEND*.

The **(service) disk save function** panel will be displayed (see Figure 10-3).

The messages on the panel will ask you which data is to be saved:

- The data corresponding **only** to the 3721.

  This selection is allowed only to service personnel (see Figure 10-3).

- The data corresponding to the 3720 **only** or to the 3720 **and** the 3721 (see Figure 10-4).

```
            SAVE DISK ONTO DISKETTES


DO YOU WANT TO SAVE ONLY 3721 INFORMATION (Y OR N) ==>



            PF6: QUIT
```

Figure 10-3. Disk Save Function (Service Only)

```
            SAVE DISK ONTO DISKETTES

DATE: 20/10/85 (MM/DD/YY)
ENTER SAVE ID (FROM 1 to 8 CHARACTERS)              ==>

DO YOU WANT TO SAVE ALSO 3721 INFORMATION (Y OR N) ==>


            PF6=QUIT
```

Figure 10-4. Save Disk Function Panel (Service and Customer)

Field Explanation for Disk Save Selection Panel

DATE: Date at which you are running the function.

        This information will be entered on the diskette and will allow later checking during disk restore.

SAVE ID: An alphanumeric character string (1 to 8) that identifies the set of saving diskettes.

        This information will be entered on the diskette and will allow later checking during disk restore.

ALSO 3721: If you **also** want to save data concerning the 3721, enter Y.

        The 3721 diskette may be used to perform a new setup (for example, in the case of lost passwords).

Disk Saving Procedure

For each diskette, the sequence is the following:

1. Mount the diskette (see Figure 10-5), then press *SEND*.
2. Information messages or error messages will keep you informed on the progress.
3. The disk-save on a diskette is completed. Remove the diskette, then press *SEND* (see Figure 10-6).

If no error occurred during the process, a panel tells you:

1. That the disk has been correctly saved.
2. To take note of date and identifiers. Write it on the diskette or diskette cover for later identification.
3. To press *SEND*.

See Figure 10-7.

```
                SAVE DISK ONTO DISKETTES


 MOUNT FIRST DISKETTE, THEN PRESS SEND
   or
 MOUNT SECOND DISKETTE, THEN PRESS SEND
   or
 MOUNT A DISKETTE TO SAVE 3721 INFORMATION, PRESS SEND


          PF6: QUIT   (Only for first diskette)
```

Figure 10-5. Save Disk Function Mount Diskette Panel

```
                SAVE DISK ONTO DISKETTES


 DISK SAVED ONTO PRIMARY DISKETTE
 or
 DISK SAVED ONTO SECONDARY DISKETTE
 or
 DISK SAVED ONTO 3721 DISKETTE

 (and) REMOVE DISKETTE, THEN PRESS SEND
```

Figure 10-6. Save Disk Function Diskette Copy End Panel

```
                SAVE DISK ONTO DISKETTES


 DISK CORRECTLY SAVED. TAKE NOTE OF THE FOLLOWING INFO:
      DATE        = 10/20/85  (MM/DD/YY)
      EC          = 123456
      SAVE ID     = YOURTEXT
      INTERNAL ID = 12/45/33


 THEN PRESS SEND
```

Figure 10-7. Save Disk Function End Panel

Disk Save Error Messages

```
DISK ERROR.  SAVE CANCELLED
or
UNABLE TO READ DISK SECTOR 1.  SAVE CANCELLED
```

Action: Press *PF6* or type *T* in the *SIA*.

How to Restore the Disk from Diskettes

This function should be used to restore the disk from back-up diskettes.

The reason for that restore is to get the whole disk to the level of the copied diskettes, either because the data of the disk is no longer valid (such as a bad patch applied), or the disk has just been initialized.

Diskettes to Be Used

Although disk contents have been saved on two or three diskettes (the primary, the secondary, and optionally, the 3721 diskette), **only the primary diskette and the secondary diskette are used during the disk restore function**.

The 3721 diskette is not used during the disk restore function, it is only used for the installation (set-up) of the 3721 after passwords have been lost, or after moving the machine.

The format of these diskettes must be compatible with the MOSS disk format.

To this end you may use **only** those diskettes that you have created in a previous MOSS disk save, or the back-up diskettes (last installation or last EC).

Diskette Naming: When restoring onto MOSS disk the contents of back-up diskettes, the prompts will refer to the PRIMARY, then to the SECONDARY diskette.

These are respectively the first and second diskette you used during the disk saving function.

Diskette-to-Disk Procedure

- Type *3* in the SELECTION LINE, then press *SEND*.

The **restore disk function** panel will be displayed (see Figure 10-8 on page 10-8).

The messages on the panel will prompt you for the actions required (mounting diskettes, checking the data, ..).

Restoring the disk from the diskettes is done in two steps:

- Step 1: checking that both diskettes are the correct ones, and that they belong to the same pair.
- Step 2: copying the diskettes to the disk.

Checking the Diskettes

The sequence is the following:

1. Mount the primary diskette (see Figure 10-8 on page 10-8), then press *SEND*.

2. The primary diskette identification is displayed with date of save, save identifier, and internal identifier (see Figure 10-9 on page 10-8).

3. Type *Y* and press *SEND* if the information displayed corresponds to the diskette you thought.

4. Mount the secondary diskette (see Figure 10-10 on page 10-8), then press *SEND*.

   - If the identifiers of the secondary and primary diskettes **do not match**, the panel displays both identifiers.

Action: Press *SEND* and mount the correct secondary diskette.

- If secondary and primary diskette identifiers **match** you are requested to successively mount the primary diskette, then the secondary diskette.

5. When both diskettes have been checked for validity and copied to the MOSS disk, the following messages are displayed:

```
DISK CORRECTLY RESTORED
PERFORM MOSS IML FROM CONTROL PANEL
(NO OTHER ACTION IS POSSIBLE)
```

Warning: If you enter *T* (Terminate) before that message, you set MOSS down, and the disk contents will not be valid.

Disk Restore Panels and Error Messages

Error message DISK ERROR. FUNCTION CANCELLED

Action Press *PF6* or type *T* in the *SIA*

```
RESTORE DISK FROM DISKETTES

MOUNT PRIMARY DISKETTE, THEN PRESS SEND

                PF6: QUIT
```

Figure 10-8. Restore Disk Function, Mount Primary Diskette Panel

```
RESTORE DISK FROM DISKETTES

MOUNTED PRIMARY DISKETTE IDENTIFICATION:

   CREATED ON  = 10/20/85  (MM/DD/YY)
   SAVE ID     = YOURTEXT
   INTERNAL ID = 12/45/33

- PLEASE CONFIRM (Y/N) ==>
                    PF6: QUIT
```

Figure 10-9. Restore Disk Function, Diskette Identification Panel

```
RESTORE DISK FROM DISKETTES

MOUNT SECONDARY DISKETTE, THEN PRESS SEND

WARNING:
   FROM NOW ON, SELECTING TERMINATE CAUSES MOSS DOWN
   AND DISK DESTROYED
```

Figure 10-10. Restore Disk Function, Mount Secondary Diskette Panel

```
┌─────────────────────────────────────────────────────────────┐
│            RESTORE DISK FROM DISKETTES                       │
│                                                             │
│  DISKETTES DO NOT BELONG TO THE SAME PAIR                    │
│                                                             │
│  PRIMARY CREATED  = 10/20/85 SAVE ID: 1234 INT. ID: 12/33/45│
│  SECONDARY CREATED= 11/21/85 SAVE ID: 2222 INT. ID: 08/22/55│
│                                                             │
│   - PRESS SEND                                              │
│                         PF6: QUIT                           │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-11. Restore Disk Function, Unmatched in Diskette Identification Panel

How to Initialize the Disk

This function should be used in the case of I/O errors on disk (see "Hard Disk Trouble Analysis and Replacement" on page 10-17).

This disk function:

- Formats the disk, so that it is ready to receive a diskette-to-disk transfer or restore.

- Writes on the first sector of the disk the serial number that you will enter when prompted to do so.

Warning:

This function can only be selected if the IML has been done in diskette mode (see "Diskette Mode" on page 12-6).

Passwords are initialized to default values.

Disk Initialization Procedure

- Type 6 in the SELECTION LINE, then press *SEND*.

The **disk initialization** panel will be displayed (see Figure 10-12).

The messages on the panel will prompt you for the actions required.

See Figure 10-12 and Figure 10-13 on page 10-11.

The panel will then display successively the following messages:

DISK FORMATTING IN PROGRESS, then

READ CHECKING IN PROGRESS, then

FORMAT COMPLETED, xx DEFECTIVE TRACK
or NO DEFECTIVE TRACK, ALTERNATE TRACK ASSIGNMENT MAP EMPTY

Note: If defective tracks have been found, the panel will display the alternate assignment map, that is, the way alternate tracks have been assigned to replace tracks found defective (see Figure 10-14 on page 10-11).

```
                    DISK INITIALIZATION


    ENTER MACHINE SERIAL NO (7 NUMERIC CHARACTERS) ==> 1234567




              PF6: QUIT
```

Figure 10-12. Disk Initialization Panel (Sample)

```
┌─────────────────────────────────────────────────────────────┐
│                 DISK INITIALIZATION                          │
│                                                              │
│    MACHINE SERIAL NUMBER  =   1234567                        │
│                                                              │
│  - PLEASE CONFIRM (Y OR N) ==>                               │
│                                                              │
│              PF6: QUIT                                       │
│                                                              │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-13. Disk Initialization, Confirmation Panel (Sample)

```
┌─────────────────────────────────────────────────────────────┐
│          ALTERNATE TRACK ASSIGNMENT MAP                      │
│                                                              │
│  DEFECTIVE      ALTERNATE       DEFECTIVE      ALTERNATE      │
│  TRACK          TRACK           TRACK          TRACK          │
│                                                              │
│  HEAD-CYLINDER  HEAD-CYLINDER   HEAD-CYLINDER  HEAD-CYLINDER  │
│                                                              │
│  ssssssssss       3   003       tttttttttt      0   004      │
│  ssssssssss       1   004       tttttttttt      2   004      │
│  ssssssssss       3   004       tttttttttt      0   0005     │
│  ssssssssss       1   005                                    │
│  ssssssssss       3   005                                    │
│                                                              │
│  FORMAT ERRORS: xx    ID ERRORS: xx    DATA ERRORS: xx        │
│            PF6=QUIT <PF7=BACKWARD   PF8=FORWARD>              │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-14. Disk Initialization, Alternate Track Assignment Panel (Sample)

Position Disk Recording Arm back to Landing Zone

This function should be used before moving the 3720 to another location, or before removing the disk.

This disk function sets the disk arm back to the landing zone, so that:

- The 3720 can be moved to another location without any unwanted moves of the disk arm.

  The procedure is the following:

  1. Type 5 in the SELECTION LINE and press SEND
  2. Power off the 3720
  3. Move the 3720
  4. Power on reset

- The 3720 door can be opened without any unwanted moves of the disk arm.

  The procedure is the following:

  1. Type 5 in the SELECTION LINE and press SEND
  2. Open the 3720 door
  3. Perform whatever tasks are required
  4. Close the 3720 door
  5. Type T (Terminate) to put the disk arm in its working position.

The function will take place immediately, and when complete, the following messages will be displayed:

```
DISK RECORDING ARM IS NOW IN LANDING ZONE
SELECTING TERMINATE RESTARTS DISK ACTIVITY
```

Diskette Formatting

The MOSS disk can only be copied (saved) to diskettes that have been initialized to a specific format required by MOSS.

This function is performed in two phases: formatting and checking.

Diskette Initialization Procedure

- Type *4* in the SELECTION LINE, then press *SEND*.

The **diskette initialization** panel will be displayed.

The panel will then display successively the following messages:

PLEASE CONFIRM YOUR SELECTION (Y OR N)

If Y

```
MOUNT THE DISKETTE YOU WANT TO INITIALIZE, THEN PRESS SEND
DISKETTE FORMATTING IN PROGRESS, then
DISKETTE CHECKING IN PROGRESS, then
DISKETTE INITIALIZATION SUCCESSFULLY COMPLETED
```

Note: If defective tracks have been found, the panel will display the number of tracks found in error while formatting or checking.

DO NOT USE A DISKETTE WITH DEFECTIVE TRACKS

Installing an Engineering Change (EC)

This section describes the complete sequence of actions that are required when installing an EC using the operator console.

The *3720 Extended Services* manual describes how to install an EC from the control panel.

Note: In customer documentation, the EC is referred to as a microcode change.

The complete sequence means from the time the EC is available (external diskettes) to the moment where the updated microcode is running.

You have received four diskettes (two 'normal', primary and secondary, and two 'back-up', primary and secondary). These are two sets of diskettes that contain the Engineering Change (EC) that must be installed on this 3720.

This EC, when installed, will modify the 3720 microcode to the latest level, that is, with all microcode fixes issued since the last EC. The microcode changes:

- Correct errors in the microcode.
- Reflect the latest modifications to the 3720 functions.

EC Installation Sequence

When installing an EC, the following sequence **MUST** be followed:

1. The NCP should not be loaded.

   For integrity reasons, an EC installation should not be made while the NCP is running. If an automatic scanner IML occurs, it may be using incorrect microcode.

2. **The IML must be made from disk** and the rotary switch should be in *MOSS IML* position.

3. Log onto MOSS:

   a. Set the *Console-panel* switch to *Panel*
   b. Set the MOSS CE Switch 3 *On.*
   c. Press the *Function Start* switch.

   The **3720 function menu** panel is displayed.

4. Select the *DISK FUNCTION* from that panel by typing *DF*, then pressing *SEND*.

   The **disk function selection** panel will be displayed (see Figure 10-1 on page 10-2).

5. Select the *EC INSTALLATION* function from that panel by typing *1* in the OPTION SELECTION line, then pressing *SEND*.

   The **EC installation** panels will be displayed (see Figure 10-15 on page 10-16).

   The messages on the panels will prompt you for the actions required (mounting diskettes, checking the data, ..).

   Installing an EC from the diskettes is done in two steps:

   - Step 1: Check that both diskettes belong to the same EC.

   - Step 2: Copy the diskettes to the disk.

   The sequence is the following:

   a. Mount the primary diskette (see Figure 10-15 on page 10-16), then press *SEND*.

b. The primary diskette identification is displayed with EC number and internal identifier (see Figure 10-16 on page 10-16).

c. Type *Y* and press *SEND* if the EC number is correct.

d. Mount the secondary diskette, as requested by prompt (see Figure 10-17 on page 10-16), then press *SEND*.

   • If the EC numbers and identifiers of the secondary and primary diskettes **do not match**, the panel displays both diskette identifiers (see Figure 10-18 on page 10-16).

      Action: Press *SEND* and mount the correct secondary diskette.

   • If the secondary and primary diskette identifiers **match**, you are requested to successively mount the primary diskette, then the secondary diskette.

e. When both diskettes have been checked for validity and copied to the MOSS disk (*diskette image*), the corresponding message is displayed:

```
EC xxxxxxxx CORRECTLY INSTALLED
PERFORM MOSS IML FROM CONTROL PANEL
(NO OTHER ACTION IS POSSIBLE)
```

   Warning: If you enter *T* (Terminate) before these messages, you set MOSS down, and the disk contents will not be valid.

   Note: After correct validation of the diskette pair, the customer files, such as the CDF, are copied from MOSS disk to the primary diskette.

f. Remove the diskette from the diskette drive.

6. IML (or reset) MOSS using the **Function Select** switch in the MOSS IML position (and activation of the *Function Start* switch).

   The **Copyright** panel is displayed, then, when you press *SEND*, the **3720 function menu** panel is displayed.

7. Select the MCF function on that panel by typing *MCF* (for Microcode fix) in the *SIA*, then press *SEND*.

   The **MCF/patch function selection** panel will be displayed.

8. Apply the MCFs that were included in the EC diskettes (see "MCF Upgrade of Microcode" on page 6-8)..

9. Set the **Function Select** switch to **MOSS IML**.

10. IML MOSS.

    The storage now contains the updated version of the microcode.

    Note: Before giving the 3720 back to the customer, DO NOT FORGET to set the 3720 into customer mode (MOSS CE switch 3 off). Follow the "Leaving Procedure after Local Connection" on page 1-19.

11. Ask the customer to save the disk contents, using the procedure described in Chapter 'Disk Functions' of the *3720 Extended Services* manual, SY33-0066.

EC Installation Panels and Error Messages

DISK/DISKETTE ERROR. FUNCTION CANCELLED

Action Press *PF6* or type *T* in the *SIA*.

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                EC MICROCODE INSTALLATION                      │
│                                                               │
│      - MOUNT PRIMARY DISKETTE, THEN PRESS SEND                │
│                                                               │
│                    PF6: QUIT                                  │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-15. EC Installation, Mount Primary Diskette Panel

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                EC MICROCODE INSTALLATION                      │
│                                                               │
│        MOUNTED PRIMARY DISKETTE IDENTIFICATION:               │
│                                                               │
│            EC NUMBER   = xxxxxxx                              │
│            INTERNAL ID = 12/45/33                            │
│                                                               │
│        - PLEASE CONFIRM (Y/N) ==>                            │
│                                    PF6: QUIT                  │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-16. EC Installation, Diskette Identification Panel

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                EC MICROCODE INSTALLATION                      │
│                                                               │
│        MOUNT SECONDARY DISKETTE, THEN PRESS SEND             │
│                                                               │
│      WARNING:                                                 │
│            FROM NOW ON, SELECTING TERMINATE CAUSES MOSS DOWN  │
│            AND DISK DESTROYED                                 │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-17. EC Installation, Mount Secondary Diskette Panel

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                EC MICROCODE INSTALLATION                      │
│                                                               │
│      DISKETTES DO NOT BELONG TO THE SAME PAIR                 │
│                                                               │
│      PRIMARY EC NUMBER    = xxxxxxx  INTERNAL ID: 12/33/45    │
│      SECONDARY EC NUMBER  = yyyyyyy  INTERNAL ID: 08/22/55    │
│                                                               │
│        - PRESS SEND                                           │
│                                    PF6: QUIT                  │
└─────────────────────────────────────────────────────────────┘
```

Figure 10-18. EC Installation, Unmatch in Diskette Identification Panel

Hard Disk Trouble Analysis and Replacement

This section describes the various procedures that should be used when MOSS signals an I/O error on the disk.

Two different procedures may be followed:

1. The backup copies of primary and secondary diskettes are valid and up-to-date.

   - You have saved the MOSS disk recently,
   - You have a valid backup copy of the last EC installed, or
   - You have a valid backup copy of the initial installation

   and the CDF has not been modified since.

   Use the 'backup' diskettes and **follow procedure 1**.

2. The back up copies of primary and secondary diskettes are not valid or not up-to-date, or the installation is not successfully completed.

   - You have not saved the MOSS disk recently,
   - You have an invalid backup copy of the last EC installed,
   - You have an invalid backup copy of the initial installation,
   - The installation is not successfully completed, or
   - The CDF has been modified since last copy has been made.

   Use the 'normal' diskettes and **follow procedure 2**.

Procedure 1

You have a valid and up-to-date set of backup diskettes.

- **STEP 1 -.**

  1. Set the *Console-panel* switch to *Panel*
  2. Set the MOSS CE Switch 3 *On.*
  3. Mount the 'backup' primary diskette,
  4. IML in diskette mode.
  5. Log onto MOSS with the customer's or service personnel console (PT2 or PC).

- **STEP 2 -** Restore the disk from backup diskettes, that is, the primary and secondary diskettes that contain the latest version of the microcode and the current CDF.

  Use the RESTORE DISK function (3) of the 'DF' function that is on the **3720 function menu** panel. See "How to Restore the Disk from Diskettes" on page 10-7.

  If the restore is successful, you have finished.

- **STEP 3 -** Re-initialize the current disk as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

  If disk initialization fails, go to STEP 4.

  After disk initialization, try to restore the disk from the diskettes again (see STEP 2).

  If the restore is successful, you have finished.

  If the restore fails because of an I/O error, go to STEP 4.

- **STEP 4 -** Replace the hard disk file adapter (DFA).

  Exchange the FRUs corresponding to the DFA.

  Chapter 6 of the *Maintenance Information Procedures* manual explains the DFA replacement procedure.

After DFA replacement, try to restore the disk from the diskettes again (see STEP 2).

If the restore is successful, you have finished.

If the restore fails because of an I/O error, go to STEP 5.

- **STEP 5** - Re-initialize the current disk as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

If initialization fails, go to STEP 6.

After disk initialization, try to restore the disk from the diskettes again (see STEP 2).

If the restore is successful, you have finished.

If the restore fails because of an I/O error, go to STEP 6.

- **STEP 6** - Check disk voltages, PS-2, and the MAC card.

If the problem persists, go to STEP 7.

- **STEP 7** - Exchange the disk.

  1. Replace (exchange) the hard disk.

     Chapter 6 of the *Maintenance Information Procedures* manual explains how to exchange the hard disk.

  2. Initialize the new disk, as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

     After disk initialization, try to restore the disk from the diskette again (see STEP 2).

     If the restore is successful, you have finished.

     If the restore fails because of an I/O error, call higher support.

Procedure 2

Your latest set of backup diskettes is either invalid or not up-to-date. You will use the 'normal' primary and secondary diskettes (from the latest set of diskettes: initial installation or latest EC).

- **STEP A.**

  1. Set the *Console-panel* switch to *Panel*
  2. Set the MOSS CE Switch 3 *On*.
  3. Mount the 'normal' primary diskette
  4. IML in diskette mode
  5. Log onto MOSS with the customer's or service personnel console (PT2 or PC).

- **STEP B** - Restore the disk from 'normal' primary and secondary diskettes, that is, the primary and secondary diskettes that contain the latest version of the microcode (initial installation or latest EC).

  Use the RESTORE DISK function (3) of the 'DF' function that is on the **3720 function menu** panel. See "How to Restore the Disk from Diskettes" on page 10-7.

  If the restore is successful, go to STEP G.

  If the restore fails because of an I/O error, go to STEP C.

- **STEP C** - Re-initialize the current disk as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

  If initialization fails, go to STEP D.

  After disk initialization, try to restore the disk from the diskettes again (see STEP B).

  If the restore is successful, you have finished.

If the restore fails because of an I/O error, go to STEP D.

- **STEP D** - Replace the hard disk file adapter (DFA).

  Exchange the FRUs corresponding to the DFA.

  Chapter 6 of the *Maintenance Information Procedures* manual explains the DFA replacement procedure.

  After DFA replacement, try to restore the disk from the diskette again (see STEP B).

  If the restore is successful, go to step H.

  If the restore fails because of an I/O error, go to STEP E.

- **STEP E** - Re-initialize the current disk as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

  If initialization fails, go to STEP F.

  After disk initialization, try to restore the disk from the diskette again (see STEP B).

  If the restore is successful, go to step H.

  If the restore fails because of an I/O error, go to STEP F.

- **STEP F** - Check disk voltages, PS-2, and the MAC card.

  If the problem persists, go to STEP G.

- **STEP G** - Exchange the disk.

  1. Replace (exchange) the hard disk.

     Chapter 6 of the *Maintenance Information Procedures* manual explains how to exchange the hard disk.

  2. Initialize the new disk, as explained in "How to Initialize the Disk" on page 10-10 (You must enter the serial number of the 3720).

     After disk initialization, try to restore the disk from the diskette again (see STEP B).

     If the restore is successful, go to step H.

     If the restore fails because of an I/O error, call higher support.

- **STEP H** - Run a CDF *CREATE*, and have the customer run a CDF update if modifications have been made to the machine and its features.

- **STEP I** - Apply the MCFs that were included in the diskettes (see "MCF Upgrade of Microcode" on page 6-8).

- **STEP J** - Run the diagnostics to check the hardware.

- **STEP K** - Ask the customer to update the programmable line speeds, if required.

- **STEP L** - Ask the customer to save the contents of the MOSS disk, using the DISK SAVE option of the 'DF' function (see "How to Save Disk Contents onto Diskettes" on page 10-3).

  Note: If the backup copies are not valid, the customer must order new diskettes and format them using the 'DISKETTE INITIALIZATION' option of the 'DF' function (see "Diskette Formatting" on page 10-13).

Chapter 11. Token-Ring Subsystem (TRSS) Functions

Token-ring subsystem (TRSS) functions help you debug the token-ring interface of the 3720 Models 11 and 12. In the 3720, the TRSS consists in one token-ring adapter (TRA), which is composed of the token-ring multiplexor card (TRM) and up to two token-ring interface coupler cards (TICs).

In this chapter we will see the panels and procedures for all TRSS functions.

Selecting TRSS Functions

First, display the **(Service) 3720 function menu** panel. This panel is displayed after you entered the maintenance password on the **Password** panel or if you used the MOSS CE switch 3.

- Type *TRS* in the *SIA*, then press *SEND*.

The **TRSS function selection** panel is displayed.

Warning: TRSS functions may disrupt communications on the rings attached to the TRA.

All possible TRSS functions are displayed in the *secondary* menu (left side of the panel):

1. SELECT; see "Select a Token-Ring Adapter (TRA)" on page 11-3.
2. CONNECT/DISC; see "TRA Connection and Disconnection" on page 11-4. May be disruptive.
3. TRM REGS; see "Display/Alter TRM Registers" on page 11-5. The alter function may be disruptive.
4. TIC INTR REG; see "Display/Alter TIC Interrupt Register" on page 11-8. The alter function may be disruptive.
5. DPLY STORAGE; see "Display TIC Storage" on page 11-9. May be disruptive.
6. DUMP; see "Dump TIC Storage" on page 11-11. May be disruptive.
7. DPLY SCB,SSB; see "Display TIC SCB and SSB" on page 11-13.
8. DPLY PARM BLKS; see "Display TIC Parameter Blocks" on page 11-14.
9. TIC ERR STAT; see "Display Token-Ring Status" on page 11-15.

```
+----------------------------------------------------------------------+
|                                                                      |
|                   MSA line 1                                         |
|                   MSA line 2                                         |
|                   MSA line 3                                         |
|       CUSTOMER ID: .............        3720-11        SERIAL NUMBER: xxxxxxx |
|       -------------------- MAINTENANCE MODE ------------------------------- |
|       FUNCTION ON SCREEN: TRSS FUNCTIONS                             |
|       SYSTEM INPUT AREA (SIA) ===>                                   |
|                                                                      |
|                                                                      |
|       T:TERMINATE  OFF: LOGOFF   PF1: MOVE TO SIA   PF2: CCU FNCTN  PF3: ALARM |
|                                                                      |
|       1 SELECT          |                                            |
|       2 CONNECT/DISC    |                                            |
|       3 TRM REGS        |                                            |
|       4 TIC INTR REG    |                                            |
|       5 DPLY STORAGE    |                                            |
|       6 DUMP            |                                            |
|       7 DPLY SCB,SSB    |                                            |
|       8 DPLY PARM BLKS  |                                            |
|       9 TIC ERR STAT    |                                            |
|                                                                      |
+----------------------------------------------------------------------+
```

Figure 11-1. TRSS Function Selection Panel

Messages

Refer to Appendix B, "Messages and Alarms" on page B-1 and to "Machine Status Area" on page 1-20 for the action to be taken for some messages displayed when TRSS functions are run.

Select a Token-Ring Adapter (TRA)

Before you call any TRSS function you must select a token-ring adapter (# '02' on the 3720 Models 11 and 12). To assist you in making a selection, the line addresses associated with the TRA and the token-ring interface couplers (TICs) attached to each TRM are displayed (from hardware CDF).

The mode of the TRA (connected or disconnected) is displayed in line 3 of the machine status area (MSA). If you try to call a TRSS function before selecting the TRA, an error message is displayed.

Note: Although there is is only one TRA on the 3720 Models 11 or 12 (TRA # 02), you must still follow the TRA selection procedure to be consistent with other communication controllers such as the 3725.

Procedure

- Type *1* in the *SIA*, of the **TRSS function selection** panel (see Figure 11-1 on page 11-2), then press *SEND*.

The **TRA selection** panel will be displayed (see Figure 11-2).

1. Type the TRA number (02)
2. Press *SEND* to confirm

The correspondence between line address and TRA number is the following: TRA #02 (3720-11 or 3720-12): Line addresses 016 and 017. The line addresses corresponding to the TIC(s) installed are on the right of the screen.

Note: TRA #01 does not exist.

TRA 02 SELECTED: LOOK IN MSA FOR MODE is displayed.

```
 1 SELECT                        SELECT
 2 CONNECT/DISC    ENTER THE TRA # ==>__    TRA#   LINE ADDRESS   TIC
 3 TRM REGS                               < 02    016    017    1 2>
 4 TIC INTR REG
 5 DPLY STORAGE
 6 DUMP
 7 DPLY SCB,SSB
 8 DPLY PARM BLKS
 9 TIC ERR STAT
                    <PRESS SEND TO CONFIRM>

                    <TRA nn SELECTED: LOOK IN MSA FOR MODE>
```

Figure 11-2. TRA Selection Panel

TRA Connection and Disconnection

Use this function to modify the mode of the TRA.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type 2 in the *SIA*, then press *SEND*.

The **TRA Connection/Disconnection** panel is displayed (see Figure 11-3).

From this panel you may:

- Enter the new mode (*CT* to connect or *DS* to disconnect) next to ==>, then press *SEND*.

Connect (TRA Mode)

The TRA is connected when it runs under the control of the control program. The control program handles all interrupts (except in the case of an MIOH error).

The PIO DISABLE and the DISCONNECT bits in the TRM Level 1 Error Status are off.

Disconnect (TRA Mode)

The TRA is disconnected when it does not run under the control of the control program but under the control of the MOSS microcode. MOSS handles all interrupts and PIOs to/from the TIC.

The PIO DISABLE and the DISCONNECT bits in the TRM Level 1 Error Status are off.

Unknown (TRA Mode)

UNKNOWN means that a non-recoverable error occurred during the connection/disconnection process or that an MIOC/IOC error occurred while getting level 1 error status during TRA selection. Connect/Disconnect may be re-tried.

```
 1 SELECT          TRA CONNECT/DISCONNECT
 2 CONNECT/DISC
 3 TRM REGS
 4 TIC INTR REG    TYPE CT TO CONNECT
 5 DPLY STORAGE         DS TO DISCONNECT   ==>_
 6 DUMP
 7 DPLY SCB,SSB
 8 DPLY PARM BLKS
 9 TIC ERR STAT   |PRESS SEND TO CONFIRM
```

Figure 11-3. TRA Connection/Disconnection Panel

Display/Alter TRM Registers

Warning: Any alter may be disruptive.

Use this function to display the registers of the selected TRA, or modify (alter) the contents of these registers.

Procedure

1. Select the TRA (as explained page 11-3),
2. Type 3 in the *SIA*, then press *SEND*.

The first from the two **Display/alter TRM registers** panels is displayed (see Figure 11-4).

To display the second panel, press *PF8* (see Figure 11-5 on page 11-6).

The register contents are updated on the panel whenever *SEND* is pressed (but not in alter mode).

PF Keys

PF4=ALTER - See "Alter Procedure" on page 11-6.

PF5=REFRESH - Re-displays data every 500ms. This allows you to view data in its most updated state. To stop the refresh, press *BREAK* (ATTN).

PF7=BACKWARD - Displays previous panel.

PF8=FORWARD - Displays next panel.

```
 1 SELECT                 DISPLAY/ALTER TRM REGISTERS   (1)
 2 CONNECT/DISC
 3 TRM REGS         TRM CONTROL:              TIC CONTROL(R/W):  1 2
 4 TIC INTR REG       RESET(R):         _     RESET        ==>  _ _
 5 DPLY STORAGE       HI PRIO(R/W) ==>  _     INH INTR     ==>  _ _
 6 DUMP                                       INH DMA      ==>  _ _
 7 DPLY SCB,SSB                               MOSS CONTROL ==>  _ _
 8 DPLY PARM BLKS   DIAG(R/W): TRM WRAP ==> _  DMA R(1)/W(0)  ==> _
 9 TIC ERR STAT       PIO(1)/DMA(0)     ==> _  ODD(1)/EVEN(0) ==> _
                      TA,TD BAD PARITY  ==> __ BYTE 0,1       ==> _
                      FORCE TIMEOUT     ==> _  DMA COUNTER    ==> _
                      FORCE IDLE ERROR  ==> _  START          ==> _
                      FORCE BAD PTY INT ==> _  CSCW,BUS BAD PTY ==> __

                      PF4: ALTER    PF5: REFRESH    PF8: FORWARD
```

Figure 11-4. Display/Alter TRM Registers (Panel 1 of 2)

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                                                                             │
│   1 SELECT              DISPLAY/ALTER TRM REGISTERS   (2)                    │
│   2 CONNECT/DISC                                                            │
│   3 TRM REGS         LID BASE(R/W) ==> ___                                  │
│   4 TIC INTR REG     DATA REGISTER(R/W) ==> __ ___                          │
│   5 DPLY STORAGE                                                            │
│   6 DUMP             IR/BR(R/W):                                            │
│   7 DPLY SCB,SSB        IR1 ==> _   IR2 ==> _                               │
│   8 DPLY PARM BLKS      BR1 ==> _   BR2 ==> _                               │
│   9 TIC ERR STAT                                                           │
│                      CSCW(R): ___                                          │
│                                                                            │
│                      LEVEL 1 ERROR STATUS(R): ___ ___ ___ ___ BINARY       │
│                      PF4: ALTER    PF5: REFRESH    PF7: BACKWARD           │
└─────────────────────────────────────────────────────────────────────────────┘
```

Figure 11-5. Display/Alter TRM Registers (Panel 2 of 2)

The following table shows the TRM registers which may be displayed or altered:

Register	Read	Write	Detail
TRM State Control	x	W	x
TIC State Control	x	W	x
Level 1 Error Status	x		
LID Base Register	x	W	
IR/BR	x	W	x
Diag Register	x	W	x
Data Buffer Register	x	W	
CSCW	x		

Detail: Contents are shown in bit format with meaning of each bit given in Chapter 5 of the *Maintenance Information Reference (MIR)* manual.

W: Alter function available and preceded with warning.

x: Display function available.

Alter Procedure

To alter the contents of a register, you must press PF4 twice: once to select alter mode and once to confirm. A warning message is displayed after the first PF4. The alterable fields will be highlighted. You may update these fields and press SEND to alter the register contents or press PF6 to ignore the alter (instead of SEND).

After the alter is complete, the contents of the registers are read and displayed again. This allows you to verify that the contents were actually updated.

The register contents are updated on the console panel whenever the SEND key is pressed (but not in alter mode).

A refresh option is available which updates the console panel periodically.

TIC Selection

Most of the TRSS functions that follow require you to first select the TIC (#1 or #2) for which you want the function to be performed.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type the number (4 to 9) corresponding to the TRSS function selected,
3. Press *SEND*.

The **TIC selection** panel will be displayed (see Figure 11-6).

To select a TIC:

1. Type *1* or *2* next to the TIC ID line of the **TIC selection** panel (see Figure 11-6),

2. Press *SEND*.

The panel for the TRSS function selected will be displayed, with the information corresponding to the TIC selected.

```
 1 SELECT
 2 CONNECT/DISC
 3 TRM REGS
 4 TIC INTR REG
 5 DPLY STORAGE
 6 DUMP            ENTER THE TIC ID (1 OR 2) ==> _
 7 DPLY SCB,SSB
 8 DPLY PARM BLKS  VALID CHOICES ARE:  1   <2>
 9 TIC ERR STAT               LINE #  : 016 <017>
```

Figure 11-6. TIC Selection from TRSS Menu

Note: If a TIC has been selected during the current TRSS session, the identifier (1 or 2) of the last TIC selected is displayed in the input field. You may enter a new TIC number or use the previous one.

Display/Alter TIC Interrupt Register

Warning: Any alter may be disruptive.

Use this function to display the interrupt register of the selected TIC, or modify (alter) the contents of this register.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type *4* in the *SIA*, then press *SEND*,
3. Select TIC #1 or #2 (as explained page 11-7).

The **Display/Alter TIC Interrupt Register** panel is then displayed (see Figure 11-7).

```
  1 SELECT                    DISPLAY/ALTER TIC INTERRUPT REGISTER
  2 CONNECT/DISC
  3 TRM REGS        INTERRUPT ==> ___  OR   INTERRUPT ADAPTER   ==> _
  4 TIC INTR REG                  (HEX)     RESET               ==> _
  5 DPLY STORAGE                            SSB CLEAR           ==> _
  6 DUMP                                    EXECUTE             ==> _
  7 DPLY SCB,SSB                            SCB REQUEST         ==> _
  8 DPLY PARM BLKS                          RECEIVE CONTINUE    ==> _
  9 TIC ERR STAT                            RECEIVE VALID       ==> _
                                            XMIT VALID          ==> _
                                            RESET SYSTEM INTR   ==> _
                                            INITIALIZE CODE(R)     __
                                            INTERRUPT CODE(R)      __
                        PF4: ALTER    PF5: REFRESH
```

Figure 11-7. Display/Alter TIC Interrupt Register

Alter Procedure

Warning: The alter function should be used only under the guidance of your support structure.

Register contents are shown in bit format, with the meaning of each bit given in Chapter 5 of the *Maintenance Information Reference (MIR)* manual.

To alter the contents of the TIC interrupt register, you must press PF4 twice: once to select alter mode and once to confirm. A warning message is displayed after the first PF4. The alterable fields will be highlighted. You may update these fields and press SEND to alter the register contents or press PF6 to ignore the alter (instead of SEND).

After the alter is complete, the register contents are read and displayed again. This allows you to verify that the contents were actually updated.

The register contents are updated on the screen whenever the SEND key is pressed (but not in alter mode).

Note: Two fields INITIALIZE CODE(R) and INTERRUPT CODE(R) **cannot** be altered (read only).

A refresh option is available which updates the screen periodically.

Display TIC Storage

Warning: Displaying TIC storage may be disruptive. The TRA must be in DIS-CONNECT mode.

Use this function to display the TIC storage in hexadecimal or EBCDIC format.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type 5 in the *SIA*, then press *SEND*,
3. Select TIC #1 or #2 (as explained page 11-7).

The **display TIC storage** panel is then displayed (see Figure 11-8). To request a display of the TIC storage:

1. Type the starting address (hexadecimal halfword, '0' to 'FFF').

   Must be an **EVEN** address, otherwise it is rounded to the next even address, and a message is displayed.

2. Type the number of halfwords to be displayed (1 to 48).

3. Press *SEND*.

When you press *SEND*, the contents of the selected TIC RAM are displayed (see Figure 11-9 on page 11-10).

The first four characters of each displayed line give the storage addresses. Scrolling is permitted (using PF7 and PF8). Up to 48 halfwords may be displayed at one time.

```
 1 SELECT              |              DISPLAY TIC STORAGE
 2 CONNECT/DISC        |
 3 TRM REGS            | - ENTER ADDRESS OF START OF DISPLAY ==> ___  (HEX)
 4 TIC INTR REG        |     (RAM: 0 TO FFF)
 5 DPLY STORAGE        | - ENTER NBR OF HALFWORDS TO DPLY (UP TO 48) ==> __  (DEC)
 6 DUMP                |
 7 DPLY SCB,SSB        |
 8 DPLY PARM BLKS      |
 9 TIC ERR STAT        |
```

Figure 11-8. Display TIC Storage Panel (Selection)

```
 1 SELECT                            DISPLAY TIC STORAGE
 2 CONNECT/DISC
 3 TRM REGS           - ENTER ADDRESS OF START OF DISPLAY ==> ___  (HEX)
 4 TIC INTR REG            (RAM: 0 TO FFF)
 5 DPLY STORAGE       - ENTER NBR OF HALFWORDS TO DPLY (UP TO 48) ==> __    (DEC)
 6 DUMP
 7 DPLY SCB,SSB       0000 dddddddd dddddddd dddddddd dddddddd cccccccccccccccc
 8 DPLY PARM BLKS     0010
 9 TIC ERR STAT       0020
                            .
                      0050 dddddddd  . . .

                      <PF7: BACKWARD  PF8: FORWARD>
```

Figure 11-9. Display TIC Storage Panel (Sample)

Dump TIC Storage

Use this function to dump the TIC storage in hexadecimal format.

Warning: Dumping TIC storage may be disruptive. The TRA must be in DIS-CONNECT mode.

Procedure

1. Select the TRA (as explained page 11-3),
2. Type 6 in the *SIA*, then press *SEND*,
3. Select TIC #1 or #2 (as explained page 11-7).

The **Dump TIC Storage** panel is then displayed (see Figure 11-10).

To request a dump of the TIC storage for the selected TIC:

1. Type Y next to = = >
2. Press *SEND*.

When you press *SEND*, the following occurs:

1. Message DUMP IN PROGRESS is displayed
2. Message DUMP COMPLETE is displayed
3. The dump is sent onto MOSS disk in CHGTRSS

Note: In case of errors, you are notified by messages.

A TIC dump may be deleted or examined by using the DUMP DISPLAY/DELETE function (DD) (See "Deleting a File from MOSS Disk" on page 5-12).

```
 1 SELECT              |         DUMP TIC STORAGE
 2 CONNECT/DISC        |
 3 TRM REGS            |
 4 TIC INTR REG        |  - ENTER 'Y' TO DUMP TIC RAM ==> _
 5 DPLY STORAGE        |
 6 DUMP                |
 7 DPLY SCB,SSB        |
 8 DPLY PARM BLKS      |
 9 TIC ERR STAT        |
```

Figure 11-10. TIC Dump Request Panel

TIC Dump Area

This function dumps all installed RAM of the selected TIC. The following information is also provided:

- Related TRM registers (LID base, data buffer, TIC state, diagnostics, IR/BR, level 1 error status)
- TIC interrupt register
- Init and Open parameter blocks
- TIC token-ring Status
- TIC adapter check status

Four TIC dumps may be stored on the CHGTRSS dump file on the disk.

The TIC dumps are assigned to a free "slot" in the CHGTRSS dump file in the order they are taken. There is no static allocation of TIC dumps to the CHGTRSS file.

The sector in the CHGTRSS dump file is described below.

```
 1
            ┌──────────────────────────────┐
            │   TRSS  Dump  Header          │
 2          ├──────────────────────────────┤
            │   TIC  Dump  1  —  RAM        │
            │                               │
10          │                               │
            ├──────────────────────────────┤
            │   TIC  Dump  1  —  Header      │
11          ├──────────────────────────────┤
            │   TIC  Dump  2  —  RAM        │
            │                               │
19          │                               │
            ├──────────────────────────────┤
            │   TIC  Dump  2  —  Header      │
20          ├──────────────────────────────┤
            │   TIC  Dump  3  —  RAM        │
            │                               │
28          │                               │
            ├──────────────────────────────┤
            │   TIC  Dump  3  —  Header      │
29          ├──────────────────────────────┤
            │   TIC  Dump  4  —  RAM        │
            │                               │
37          │                               │
(last)      ├──────────────────────────────┤
            │   TIC  Dump  4  —  Header      │
            └──────────────────────────────┘
```

The TRSS dump header is necessary to indicate the presence, time-stamp, and location of a TIC dump within CHGTRSS.

If all TIC dump areas in CHGTRSS are full, the **TIC dump areas full** panel is displayed, and you are given a choice of overwriting the oldest of the four existing TIC dumps or cancelling the dump request (see Figure 11-11).

```
╭───────────────────────────────────────────────────────────────╮
│  1 SELECT            DUMP TIC STORAGE                          │
│  2 CONNECT/DISC                                                │
│  3 TRM REGS          THE TIC DUMP AREA IS FULL.                │
│  4 TIC INTR REG      TYPE C TO OVERWRITE THE OLDEST            │
│  5 DPLY STORAGE      TIC DUMP, OTHERWISE PRESS SEND ==> _      │
│  6 DUMP                                                        │
│  7 DPLY SCB,SSB      OLDEST TIC DUMP IS TRA:02 TIC :1          │
│  8 DPLY PARM BLKS    DATE/TIME: 08:08:87 13:45:33             │
│  9 TIC ERR STAT              <mm dd yy hh mm ss>              │
╰───────────────────────────────────────────────────────────────╯
```

Figure 11-11. TIC Dump Areas Full Panel (Sample)

Display TIC SCB and SSB

This function requires NTRI to be online.

Use this function to display the addresses and contents of the SCB and SSB of the selected TIC.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type 7 in the SIA, then press SEND.
3. Select TIC #1 or #2 (as explained page 11-7).

The **display TIC SCB, SSB (from NTRI)** panel is displayed (see Figure 11-12).

Note: Message NTRI OFFLINE: FUNCTION IGNORED appears if NTRI is not online.

```
1 SELECT              DISPLAY TIC SCB, SSB (FROM NTRI)
2 CONNECT/DISC
3 TRM REGS         SCB ADDRESS:        nnnnnn
4 TIC INTR REG        CONTENTS:        nnnn
5 DPLY STORAGE                         nnnn
6 DUMP                                 nnnn
7 DPLY SCB,SSB
8 DPLY PARM BLKS   SSB ADDRESS:        nnnnnn
9 TIC ERR STAT        CONTENTS:        nnnn
                                       nnnn
                                       nnnn

                    PF5: REFRESH
```

Figure 11-12. Display TIC SCB and SSB

Press ATTN (or BREAK) to stop refresh mode.

Display TIC Parameter Blocks

This function requires NTRI to be online.

Use this function to display the contents of the 'Initialize' and 'Open' parameter blocks of the selected TIC.

Procedure

1. Select the TRA (as explained page 11-3), then press PF1 (move to SIA),
2. Type 8 in the SIA, then press SEND,
3. Select TIC #1 or #2 (as explained page 11-7).

The first of two panels (**Initialize Parameter Block**) is displayed (see Figure 11-13).

Note: Message NTRI OFFLINE: FUNCTION IGNORED appears if NTRI is not online.

Press PF8 (forward) to display the second panel (**Open Parameter Block**) (see Figure 11-14).

```
1 SELECT                              DISPLAY TIC
2 CONNECT/DISC            INITIALIZE PARAMETER BLOCK (FROM NTRI)
3 TRM REGS
4 TIC INTR REG      OPTIONS:         nnnn     DMA ABORT THRESH:  nnnn
5 DPLY STORAGE      INTR VECT CMD:   nn       SCB ADDRESS:     nnnnnnnn
6 DUMP              INTR VECT XMIT:  nn       SSB ADDRESS:     nnnnnnnn
7 DPLY SCB,SSB      INTR VECT RCV:   nn
8 DPLY PARM BLKS    INTR VECT RING:  nn
9 TIC ERR STAT      INTR VECT SCB:   nn
                    INTR VECT ADPT:  nn
                    RCV BURST SIZE:  nnnn
                    XMIT BURST SIZE: nnnn

                    PF8: FORWARD
```

Figure 11-13. TIC Initialize Parameter Block Display

```
1 SELECT                              DISPLAY TIC
2 CONNECT/DISC              OPEN PARAMETER BLOCK (FROM NTRI)
3 TRM REGS
4 TIC INTR REG      OPEN OPTIONS:  nnnn           BUFFER SIZE:     nnnn
5 DPLY STORAGE      NODE ADDRESS:  nnnnnnnnnnnn EXT RAM START:   nnnn
6 DUMP              GROUP ADDRESS: nnnnnnnn       EXT RAM END:     nnnn
7 DPLY SCB,SSB      FUNCT ADDRESS: nnnnnnnn       XMIT BUF COUNT: nnnn
8 DPLY PARM BLKS    RCV LIST SIZE: nnnn           PROD ID ADDR:  nnnnnnnn
9 TIC ERR STAT      XMIT LIST SIZE: nnnn

                    XMIT LIST CHAIN ADDR: nnnnnn
                    RCV LIST CHAIN ADDR:  nnnnnn

                    PF7: BACKWARD
```

Figure 11-14. TIC Open Parameter Block Display

Display Token-Ring Status

This function requires NTRI to be online.

Use this function to display the token-ring status of the selected TIC.

Procedure

1. Select the TRA (as explained page 11-3),
2. Type 9 in the *SIA*, then press *SEND*,
3. Select TIC #1 or #2 (as explained page 11-7).

The **token-ring status (from NTRI)** panel is displayed (see Figure 11-15).

Note: Message NTRI OFFLINE: FUNCTION IGNORED appears if NTRI is not online.

```
 1 SELECT                    TOKEN RING STATUS (FROM NTRI)
 2 CONNECT/DISC
 3 TRM REGS          SIGNAL LOSS:           n
 4 TIC INTR REG      HARD ERROR:            n
 5 DPLY STORAGE      SOFT ERROR:            n
 6 DUMP              TRANSMIT BEACON:       n
 7 DPLY SCB,SSB      LOBE WIRE FAULT:       n
 8 DPLY PARM BLKS    AUTO-REMOVAL ERROR 1:  n
 9 TIC ERR STAT      REMOVE RECEIVED:       n
                     COUNTER OVERFLOW:      n
                     SINGLE STATION:        n
                     RING RECOVERY:         n

                     PF5: REFRESH
```

Figure 11-15. Token-Ring Status Panel

TRSS Modes (TRA modes and TIC Modes)

TRSS functions are based on the concept of modes.

The TRA must be in one of three modes: DISCONNECT, CONNECT, or UNKNOWN. (These modes are explained in "TRA Connection and Disconnection" on page 11-4 and in "Machine Status Area" on page 1-20).

TIC Modes

Each of the two possible TICs must be in one of seven modes (as reported by NTRI):

IDLE: The TIC has not yet been reset by NTRI.

RESET: The TIC has been reset by NTRI but not yet initialized.

INITIALIZED: The TIC has been initialized but not yet OPEN or DISABLED. Initialization parameters have been passed to the TIC by NTRI.

OPEN: The TIC has been inserted into the token-ring and is in normal operation. Open parameters have been passed and receive and transmit operations have been started.

CLOSED: The TIC has been opened since initialization, but has since been closed (by the host).

FROZEN: An error was detected and the following actions were taken by NTRI:

- Interrupts from this TIC are disabled.
- DMA from this TIC is disabled.
- The TIC is reset.

DISABLED: The associated TRA has been disconnected by MOSS. NTRI will send no PIO to this TIC.

(blank): There is no TIC mode if NTRI is not online.

The TIC mode is derived from the NTRI MAC layer status obtained from NTRI. The following table gives the correspondence.

Medium Access Control (MAC) Status	TIC Mode
Idle	Idle
TIC resetting hard	Idle
TIC resetting soft	Idle
Initialization list transfer	Reset
Initialized	Initialized
Open started	Initialized
Receive initialization	Initialized
Transmit initialization	Initialized
Started	Open
Transmit in progress	Open
Close in progress	Open
Closed	Closed
Frozen	Frozen
Disconnected	Disabled

Figure 11-16. NTRI MAC Status and Corresponding TIC Mode.

Chapter 12. Additional Functions

In this chapter we will see the panels and procedures for the following functions:

- IPL the 3720 and IML a scanner; see page 12-2
- Display Machine Level Table (MLT); see page 12-5
- Using the diskette mode; see page 12-6
- Running the Stand-alone Link Tests (SALT); see page 12-7
- Taking dumps (MOSS, scanner,TIC); see page 12-9
- Managing the passwords; see page 12-13
- The file transfer to host (and print); see page 12-14
- The wrap tests; see page 12-16

3720 IPL and One-Scanner IML

3720 IPL

Use the IPL functions to IPL the CCU and scanners of the 3720.

Options are available to the CE only:

- Normal IPL
- Step-by-step
- Bypass phase 1

To perform any of the IPL functions, the MOSS must be running (MOSS-ALONE status).

Requesting the 3720 IPL

You must first display the **3720 function menu** panel (first panel displayed after you entered the maintenance password on the **Password** panel, or if you used the MOSS CE switch 3).

- Type *IPL* (for 3720 IPL) in the *SIA*, then press *SEND*.

The **IPL 3720** panel will be displayed (see Figure 12-1).

```
- ENTER 1, 2, or 3           ==>

    1 = NORMAL
    2 = STEP BY STEP
    3 = BYPASS PHASE 1
```
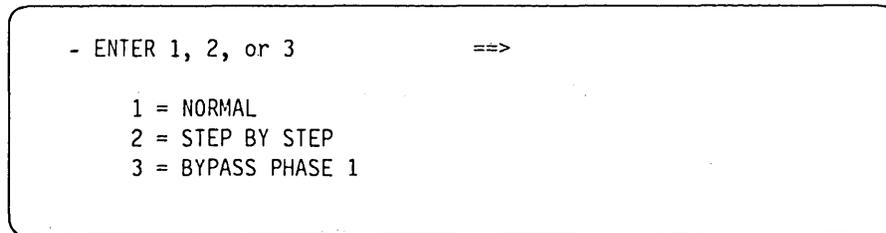
Figure 12-1. 3720 IPL Function Selection Panel

Selecting the Options for 3720 IPL

Note: The options are available only if a maintenance password is entered (or the MOSS CE switch 3 was ON).

- Enter 1, 2, or 3 at the cursor location to select the corresponding IPL option, then press *SEND*.

Notes:

1. The only functions that can be performed while IPLing the CCU are the CCU functions.
2. No CCU function can be selected before IPL phase 2 (hex display = FF2).
3. If a previous IPL or IML request is running, you must:

    - Wait until the IPL or IML is completed, then terminate by using *T*, or
    - Cancel the IPL using *T*

    before selecting another IPL or IML.

4. The IPL/IML is canceled if one of the following occurs before the IPL/IML is complete.

    - Terminate (T) is entered in *SIA*.
    - The operator console is switched from normal mode to test mode.

- The other operator console is selected.
- The operator console is powered off.

IPL Phases

During 3720 IPL, with any options selected, the IPL phases are indicated on:

- The third line of the MSA (fields r to x)
- The hex display on the control panel

(See the *3720 Extended Services* manual, for details.)

To stop the IPL during a phase, press *PF4*. To resume, press *PF5*.

To terminate the IPL function, when the *IPL COMPLETE* message is displayed in the MSA, use Terminate (T).

Normal IPL (Option 1)

Use this option to normally IPL the CCU and IML the scanners. When you select *1* in the 3720 IPL menu, the IPL starts immediately.

The following message is displayed while the IPL is in progress:

CCU AND SCANNER IPL

Step-by-Step IPL (Option 2)

Use this option to IPL the 3720 in step-by-step mode. When you select *2* in the 3720 IPL menu, the IPL stops automatically at the start of each phase, so that you may take appropriate action, such as executing a CCU function.

To continue, press *PF5*.

The following message is displayed while the IPL is in progress:

STEP-BY-STEP IPL

Bypass Phase 1 (Option 3)

Use this option to IPL the CCU without CCU test and initialization, and IML the scanners. When you select *3* in the 3720 IPL menu, the IPL bypasses phase 1 and stops automatically at the beginning of the following phases.

The following message is displayed while the IPL is in progress:

BYPASS PHASE 1 IPL

One-Scanner IML

Use this function to IML only one scanner.

Warning: Before IMLing a scanner, stop all the lines on that scanner, using the NCP facilities.

To perform scanner IML functions, the MOSS must be running (MOSS-ALONE status).

Requesting One Scanner IML

You must first display the **3720 function menu** panel. This panel is displayed after you have entered the maintenance password on the **Password** panel, or after you use the MOSS CE Switch 3.

- Type *IS* (for IML one SCANNER) in the *SIA*, then press *SEND*.

The **IML One Scanner** panel will be displayed (see Figure 12-2).

```
- ENTER:

    THE SCANNER NUMBER PRECEDED BY S (S1 TO S4)
       OR                                             ==>
    THE LINE ADDRESS (0 to 63)
```

Figure 12-2. IML One Scanner Function Selection Panel

Selecting the Scanner for One Scanner IML

1. Enter S followed by the scanner number (1 to 4):

    For the 3720, the scanner number is 1
    For the 3721-1, the scanner number is 3
    For the 3721-2, the scanner number is 3 or 4

2. Press *SEND*.

IML Termination

When the IML is complete, the following message is displayed:

IML FOR SCANNER XX COMPLETED - SCANNER IS CONNECTED

Type *T* in the *SIA* to terminate the One-Scanner IML function when the IML COMPLETE message is displayed in the MSA.

Machine Level Table (MLT) Display

The *MLT display* function allows displaying IBM-provided information related to the microcode and control program, namely:

- The identifier of the control program version (NCP, EP, ...) loaded into the CCU
- The Engineering Change (EC) level of the microcode
- The identifier of the last applied microcode fix (MCF) and the date at which it was applied.

Note: The machine serial number, the machine type, and the model type are permanently displayed on all MOSS panels (they also appear on the files printed at the host, or on the remote PC printer).

Origin of MLT Information

The MLT application reads in sector 1 of the MOSS disk the information concerning:

- The level of the microcode (EC level and associated wording).

- The identification and date of last MCF applied.

- The control program loaded in the CCU, that is, if the status in the MSA is MOSS ONLINE (as a result of an IPL that has been completed).

  Note: If there is no control program loaded in the CCU, (status in the MSA is MOSS ALONE), the following message is displayed:
  NO CONTROL PROGRAM LOADED.

Displaying the MLT

- Type *MLT* in the *SIA* of the **3720 function menu** panel, then press *SEND*.

The **Machine Level Table** panel is displayed (see Figure 12-3).

Note: To list the microcode fixes that have been applied, use the **MCF** function, see Chapter 6.

```
                    MSA  lines 1-3
    CUSTOMER ID: .............       3720-1          SERIAL NUMBER: xxxxxxx
    FUNCTION ON SCREEN: MACHINE LEVEL TABLE


    CONTROL PROGRAM ID:  EP          VMSPAR14  VERSION4

    EC LEVEL : 123456E

    LAST APPLIED MCF : M180A011  ON 09/11/85
```

Figure 12-3. Machine Level Table Display Panel (Sample)

The Machine Level Table can only be displayed, **NOT UPDATED**.

Diskette Mode

This mode is a temporary recovery facility offered to the customer in case of hard disk unavailability. Its usage lasts only the time needed by the service personnel to repair the fault.

If you press the **Function Start** switch while the **Function Select** switch is in the *Diskette Mode* rotary position, a full IPL of the machine occurs (MOSS IML, CCU IPL, and scanner IML) using the PRIMARY diskette exclusively.

At the end of CCU IPL, the MOSS state is the following:

- No LOGON is required, no machine status area, no menu displayed on screen, no functions are available to the operator (keyboard locked). Only a warning is displayed: DISKETTE MODE: NO FUNCTION AVAILABLE.

- Diskette files are *read-only* (except DUMP files for CCU local store registers, and CCU Roll-in/Roll-out areas for auto-IPLs). This allows keeping the disk as the only reference.

  At the end of IML, MOSS is in MOSS OFFLINE state (or MOSS ALONE).

- No BER logging takes place.

- No dump (MOSS, scanner, or TIC) is possible (manual or automatic), and no file transfer to host (dumps are on disk).

- Using this rotary position with CE switch 3 set performs a MOSS IML ONLY, with the IBM panel available. This may be necessary for some service actions such as hard disk repair and re-initialization.

  Note: Do not forget that not all functions are on the PRIMARY diskette, and that most data files are not meaningful.

  The LOGON process is bypassed in diskette mode.

Stand-Alone Link Tests (SALT)

The stand-alone link tests, also called "link tests", are used to test:

- The link between two communication controllers
- The link between a 3720 and an SDLC terminal

The link tests consist of two programs:

- The link test requester (REQ), for use in the requester 3720, and
- The link test responder (RESP), for use in the responder 3720.

Both programs are recorded on the controller disk. They destroy the control program when they are loaded and run in stand-alone mode instead of control program mode.

The link tests are particularly useful for link-attached controllers when the control program cannot be loaded over the normal IPL link.

The link tests are loaded from the 3720 console using the *LK* (LINK TEST) function of the **3720 function menu** panel. The detailed procedures are described in the *3720 Extended Services* manual.

Testing an INN Link

The link tests can be used to check an intermediate network node (INN) link between two communications controllers such as the IBM 3720, IBM 3725, and IBM 3705. The INN link is an SDLC non-switched or manually switched line.

The link to be tested must be defined as an IPL port in the IPL port table of the requester controller, and also in the responder controller (if the link tests are to be used as responder).

See details in *3720 Extended Services* manual.

SDLC Terminals Exerciser Without CP Loaded

Test Purpose

The link tests can also be used to exercise SDLC terminals provided that they:

- Reply correctly to SDLC test frames (see *3720 Extended Services* manual for SDLC test frame description)
- Do not require the following options:
  - Transmit two flags before frame
  - Transmit flags between frames
  - Transmit with new SYNC
- Do not use the 3720 internal clock

The lines to be exercised must be defined as IPL ports in the IPL PORT table. They should be removed from the IPL PORT table at end of test. Also, if customer-defined IPL ports have been overridden, they must be redefined.

Procedure

1. Start as follows:

   a. Use the *CDF* functions to create (if not already done) and update the CDF, and check the clocking, as required.

b. Record the customer IPL ports manually, or via the printer, if installed, to be able to re-establish them after the test.

2. Define the lines to be tested as IPL ports in the link IPL PORT table according to the terminal and line characteristics (see *3720 Extended Services*).

   Notes:

   a. Up to eight lines can be defined in the IPL PORT table. If more than eight lines have to be tested, define the first eight in the IPL PORT table and test them as described below. Then, define new lines by updating the IPL PORT table and restart the procedure at step 3.

   b. If you override an existing customer IPL port, do not forget to re-establish it after the test.

3. Proceed as follows:

   a. Load the link test program requester in the CCU (see the *3720 Extended Services* manual).

      Warning: The link tests destroy the control program that may be running in the CCU. In such a case, before loading the link tests, ask the customer to vary off-line the lines and channels connected to the controller.

   b. Disable all the channel ports at the control panel.

   c. Request the LINK TEST REQUESTER (function *LOQ* of the **3720 function menu** panel).

   d. Request the LINK TEST function (function *LT* of the **3720 function menu** panel).

4. Be sure that the terminal to be tested is powered on.

   Also, in case of a programmable terminal, be sure that the terminal is initialized (refer to appropriate terminal documentation) and that its host communication link is active.

5. Perform the test by providing the required information (see the *3720 Extended Services* manual) considering the following notes:

   Notes:

   a. The responder address is the address of the terminal.

   b. The data pattern to be used for the test should not be longer than the size of the terminal buffer, as the terminal will reflect back only the data it is able to receive. Thus, for terminals with a buffer size less than 128 bytes, the use of the personal pattern option is recommended.

   c. The personal pattern option allows defining an empty pattern (containing no data). This facility must be considered for terminals that are not able to reflect back the received data (or that send back their own data).

6. When the test is completed for a given line, return to step 4 to perform the test on another line, or to step 2 if new IPL ports must be defined.

   Warning: Never forget to reload the link test program each time the IPL PORT table is updated.

Error Reporting

When running in investigation mode, the test stops on the first error encountered and error information is displayed.

Status codes (SCF, LCS, SES) may also be displayed along with messages (see the *3720 Extended Services* manual).

Taking a Dump

You may dump a scanner, a TIC, or MOSS itself on the MOSS disk.

An automatic NCP dump may occur.

NCP Dump

The NCP dump is the contents of the CCU storage transferred to the 3720 MOSS disk buffer area in a file named CHGDMP1.

With the use of System Support Program (SSP) facilities the dump buffer area of the MOSS disk may be transferred to the host for printing.

This dump **can be deleted only from the host**.

Field *n* of the machine status area (MSA) on the MOSS panel will display DUMP while an NCP dump is in progress.

An NCP dump may only be started automatically.

Automatic NCP Dump

The automatic NCP dump occurs when:

- A CCU hardcheck is detected

  1. An automatic IPL is started.
  2. The NCP dump is taken
  3. An alert or an alarm is sent at the end of the IPL
     - Alarm A31 3720 REIPL SUCCESSFUL - DUMP AVAILABLE ON DISK
     - Alarm A34 and A35 3720 REIPL FAILED - DUMP (NOT) AVAILABLE ON DISK (dump available A34, or no dump A35)
     - Alert A31 or A7 HARDWARE ERROR: COMMUNICATION CONTROLLER RE-IPLED (dump taken A31, no dump A7)

- An ABEND is issued (except 703)

  1. An automatic IPL is started.
  2. The NCP dump is taken
  3. An alert or an alarm is sent at the end of the IPL
     - Alarm A31 3720 REIPL SUCCESSFUL - DUMP AVAILABLE ON DISK
     - Alarm A34 or A35 3720 REIPL FAILED - DUMP (NOT) AVAILABLE ON DISK (dump available A34, or no dump A35)
     - Alert A32 and A8 SOFTWARE ERROR: COMMUNICATION CONTROLLER RE-IPLED (dump taken A31, or no dump A8)

MOSS Dump

A MOSS dump is the contents of MOSS microcode storage (see MOSS storage layout in the *Maintenance Information Reference* manual) transferred to the disk buffer area in a file named CHGDMP.

With the use of System Support Program (SSP) facilities, the dump buffer area of the MOSS disk may be transferred to the host for printing.

Using a PC, the dump buffer area can be transmitted to a support center for analysis (see Appendix A, "MOSS File Transfer/Print from PC" on page A-1).

A MOSS dump may be started automatically or manually.

Automatic MOSS Dump

The automatic MOSS dump is started when MOSS abends taking a MOSS level 0 interrupt. A MOSS re-IML occurs after this dump. An A1 or A2 alert is then sent to the host. An A1 alert is sent by the NCP to the host if the MOSS cannot successfully re-IML before a re-IML retry threshold is reached. An A2 alert is sent by the MOSS to the host if the MOSS is successfully IMLed. If another MOSS automatic dump is attempted before a previous dump is either transferred or manually deleted, the previous dump remains protected and the following one is lost. This previous dump may have been taken manually or automatically.

Manual MOSS Dump

The MOSS must be set OFF-LINE. Failure to do so results in a 3720 system abend.

The manual MOSS dump is started by placing the **Function Select** switch in the **MOSS DUMP** position and pressing the **Function Start** switch on the control panel. Successful completion of the manual dump is indicated by the hex display D00. MOSS should then be manually re-IMLed using the control panel function MOSS IML.

The manual MOSS dump always overlays any previous dump on the MOSS disk.

You can perform this procedure while the NCP is loaded and active without affecting NCP operation.

Performing a MOSS dump automatically places MOSS OFF-LINE.

To bring MOSS ONLINE after the dump is completed, use the CCU function *MON*, on the **CCU Function Menu** panel.

Scanner Dump

A scanner dump is the contents of one scanner microcode storage transferred to the disk buffer area in a file named CHHDMP.

With the use of System Support Program (SSP) facilities the dump buffer area of the MOSS disk may be transferred to the host for printing.

Field *n* of the machine status area (MSA) on the MOSS panel will display DUMP while a scanner dump is in progress.

Using a PC, the scanner dump can be transmitted to a support center for analysis.

A scanner dump may be started automatically or manually.

Automatic Scanner Dump

The automatic scanner dump is started whenever a condition exists that generates a SCANNER xx ERROR alarm.

If the auto re-IML fails, the scanner must be manually re-IMLed; the *3720 Extended Services* manual gives the procedure for scanner alarms. If another scanner dump is attempted by this automatic method before a previous dump is either transferred to the host or manually deleted, the previous dump remains protected and the following one is lost. This previous dump may have been taken manually or automatically.

Automatic scanner dump can also be started at NCP request by a specific command (F2). (Contact your Programming Service Representative.)

Manual Scanner Dump

A scanner dump is disruptive to the scanner and its link.

"Dump a Scanner" on page 4-5 explains how to request a dump for a selected scanner.

The scanner must be re-IMLed using a MOSS function, such as *ONE-SCANNER IML* (see "One-Scanner IML" on page 12-3).

If a scanner dump is attempted by the manual method before a previous dump is either transferred to the host or manually cleared (deleted), a message is displayed that the scanner dump file is not empty. If you respond with a C to this message, the previous dump is cleared and the following dump is taken.

The previous scanner dump may also be manually deleted (cleared) using the DUMP DISPLAY/DELETE (DD) function of the **3720 Function Menu** panel. For details, see "Deleting a File from MOSS Disk" on page 5-12.

TIC Dump

A TIC dump is the contents of one TIC microcode storage transferred to the disk buffer area in a file named CHGTRSS.

Up to 4 TIC dumps may reside on the CHGTRSS file. The last TIC dump takes the space of the first free area (0 to 3), or the area of the last TIC dump deleted.

With the use of System Support Program (SSP) facilities the CHGTRSS dump file may be transferred to the host for printing.

Transferring the CHGTRSS dump to the host automatically deletes the whole CHGTRSS file.

Using a PC, the TIC dump can be transmitted to a support center for analysis.

A TIC dump may be started automatically or manually.

Automatic TIC Dump

The automatic TIC dump is started whenever a condition exists that generates alarm 29.

If the CHGTRSS dump file is full, the dump is lost. To avoid this, transfer and/or delete the TIC dump file from time to time.

Manual TIC Dump

Since a TRA must be disconnected before a manual dump request, a TIC dump is disruptive to the TRA and its links.

"Dump TIC Storage" on page 11-11 explains how to request a dump for a selected TIC.

If all TIC dump areas in CHGTRSS are full, the **TIC dump areas full** panel is displayed, and you are given a choice of overwriting the oldest of the four existing TIC dumps or cancelling the dump request (see Figure 11-11 on page 11-12).

The previous TIC dumps may also be manually deleted (cleared) using the DUMP DISPLAY/DELETE (DD) function of the **3720 Function Menu** panel. For details, see "Deleting a File from MOSS Disk" on page 5-12.

Password and Customer Identification Management

This function, which is normally performed by the customer, is explained in detail in the *3720 Extended Services* manual.

Procedure

You must first display the **3720 function menu** panel (first panel displayed after you entered the **customer** password on the **Password** panel).

- Type *P* (for PASSWORD) in the *SIA*, then press *SEND*.

The **password management logon** panel will be displayed.

To access the password functions, you must from this panel:

1. Type the *management* password.

   Note: When using this function for the first time, type the *default* customer password given to you by IBM.

2. Press *SEND*.

The **password management selection** panel will be displayed.

From this panel the user who knows the management password will be able to:

- Activate, deactivate, update, and display all 3720 passwords.

  These passwords are:

  - The management password
  - The customer user's password
  - The maintenance (service) password

- Display and reset the logon attempt counters.

  The logon attempt counters will record how many unsuccessful or unauthorized attempts have been made to log onto MOSS using the various passwords.

- Create or modify the customer identification.

  This identification is recorded in the MLT and displayed on all MOSS panels.

File Transfer and Print at Host Location

The 3720 files that can be transferred are:

- NCP dump
- MOSS dump
- Scanner dump
- TRSS dump
- Configuration data file (CDF)
- Microcode fixes (MCF or patches)
- Machine load table (MLT)
- Line description file (LDF)
- BER file (described in the *Maintenance Information Reference* manual, in the 'BER' chapter)
- Cataloged control program procedures

To print the 3720 files listed above, you must:

- Transfer them to the host, or

- Transfer them to the support function, using the remote application (see Appendix A, MOSS File Transfer/Print from PC).

  Note: The NCP dump cannot be transferred using the remote appplication.

Transfer to the Host

The dump transfer to the host can be done only from the host, using dump host facilities.

Functions at the host are used to transfer the dump files from the MOSS disk to the host and also to print them. These host functions are described in *Advanced Communication Functions for Network Control Program and System Support Programs for the 3720 Diagnosis Guide*, SC30-3181.

When a dump is transferred to the host, it is deleted automatically from the dump buffer of the disk (except for the NCP dump, the deletion of which requires an additional VTAM command). The disk is then ready to receive another dump if necessary.

Transfer to the Support Function

You may have to transmit a dump file to the support function using the remote application running on an IBM-PC. Appendix A, MOSS File Transfer/Print from PC explains in detail how to use this application for file transfer.

When a dump is transferred to the support function, it has to be deleted manually from the dump buffer of the MOSS disk. To manually delete a dump from the MOSS disk, use the MOSS utility program function *DD* (Dump Display/Delete). See "Deleting a File from MOSS Disk" on page 5-12 for the complete procedure required to delete a file.

This manual deletion procedure may be used at any time and deletes whichever file is entered, regardless of any other factors. Be careful not to delete a file that may be needed and has not been saved.

Receiving Files from Support Function

You may have to receive a patch or an MCF file. Appendix A, MOSS File Transfer/Print from PC explains in detail how to use this application to send a file from IBM-PC to MOSS disk.

Printing MOSS Files at the Host Location

When files are transmitted to the host, they are formatted so as to be printed by the host utility programs

These host programs are described in *Advanced Communication Functions for Network Control Program and System Support Programs for the 3720 Diagnosis Guide*, SC30-3181.

The printing format depends on the file being processed:

The *3720 Maintenance Information Reference* manual gives file printout samples and, if necessary, the layout of some records, as well as a detailed description of the various fields.

Wrap Tests Controlled from the MOSS

The *3720 Maintenance Information Reference* manual shows the different wrap test possibilities controlled from the host, on the communication link, with the progression of testing procedures from the TSS to the terminal.

Wrap tests performed during diagnostics are explained on pages 3-4 and 3-4.

The following wrap tests may be controlled from MOSS:

- Wrap tests at tailgate (also referred to as *Wrap Block/Wrap Cable*)
- Wrap tests at modem level
- Wrap tests at NTT cable level
- Internal LIC wrap

These wrap tests are part of the line functions and are described in the *3720 Extended Services* manual.
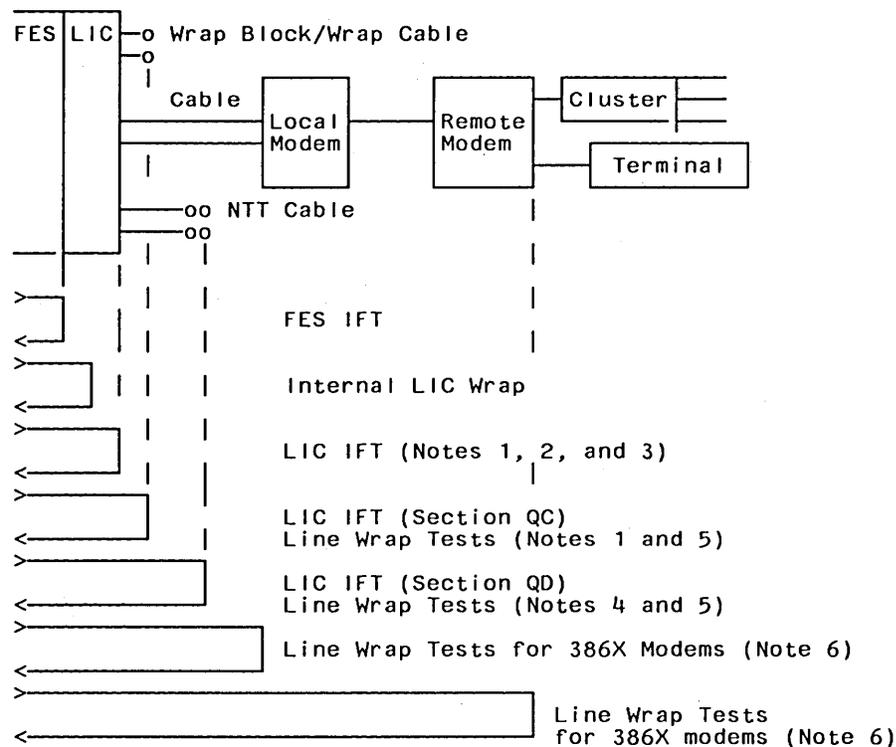
Figure 12-4. Wrap Tests Controlled from the MOSS

Notes:

1. A line position can be plugged with a line cable, or be without a line cable, or can be plugged with a wrap block (LIC type 1, 2, 4A, or 4B), or with a wrap cable (LIC type 3). The CDF for each line must be updated accordingly when running the diagnostics.

   When the TSS IFTs are run, the hardware for a selected line is:

   a. Tested up to the LIC drivers if the line cable is present.

   b. Tested up to the LIC and ICC card level for a line without cable.

   c. Fully tested if a wrap block or a wrap cable is present on the selected line. Plugging a wrap block or wrap cable and updating the CDF automatically selects the manual intervention section QC when diagnostics are running

2. During LIC wrap mode operation, the transmit data line and the control lines are not deactivated at the modem interface.

3. Although there is no user-activated test, an "echo-check" mechanism (inline) checks the transmitted data in wrap mode.

4. For selection of the NTT manual intervention routine QD, refer to "Wrap Test during Diagnostics for Japan Only" on page 3-4.

5. In these wrap modes, the clocking is taken from the 480-Hz clock. Therefore, an error such as an overrun, detected at operational speed, might not occur at the above testing speed.

6. If the cable is NTT with the connector switch set to "operate", the test indicator (TI) signal is not forwarded to the connected modem, so that the received pattern differs from the expected one.

Token-Ring Wrap Tests

There are two types of *pseudo* wrap test performed for the token-ring:

- The NCP/Token-ring Interface (NTRI) wrap test: the internal lobe media test.

  Under NCP/TRI, a wrap test is performed at each TIC open command processing, as the first step before inserting itself into the ring. The TIC internal lobe media test, tests the ring up to and including the local IBM 8228 Multistation access unit or equivalent (the 8228 is a wiring concentrator).

  It also tests the ring up to the point where it is unplugged before the 8228 (such as the tailgate or the wall connector).

  The lobe media test is only invoked at the open command (not at the reset or initialization command).

  Note that a disconnected cable during a lobe media test will show a lobe wire fault in the *TRSS* function (token-ring status) and in the *TRI* function.

  When a lobe wire fault is detected, the TIC will be frozen and the status will remain unchanged until the next open is issued.

- The TRSS diagnostic test: TIC lobe test (TG01).

  The *3720 Diagnostic Descriptions* manual, SY33-2042, explains all TRSS diagnostic routines.

  During the TG01 diagnostic routine, a wrap test is performed up to and including the 8228 or up to the point where it is unplugged before the 8228 (such as the tailgate or the wall connector).

  Note: The open command issued by TG01 runs only the lobe test, not the entire OPEN process; a lobe wire fault is not detected.
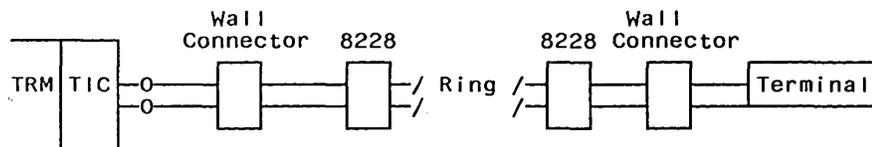
Appendix A. MOSS File Transfer/Print from PC

Table Of Contents

General Overview

This application can be used by the remote maintenance only if:

- **URSF/RETAIN is not available for the 3720.**

- **The function requested is not yet in URSF/RETAIN (such as file transfer from MOSS to remote terminal).**

Terminology: For brevity, the IBM Personal Computer will be referred to as the PC.

This appendix explains how to transfer data between a 3720 and a PC connected to it as a console.

See "Accessing the File Transfer Selection Panel" on page A-10 for details on how to use the remote file transfer application.

"How to Select a File Transfer/Print Function" on page A-6 explains how to start the application.

"File Printing Application" on page A-25 gives more explanations on how to request a print of the transferred files.

"Transferring MCFs from VM to 3720 EC diskette via a PC/AT" on page A-4 explains how to transfer MCFs from VM to the PC located at the HCS.

Remote Assistance Concept

The remote file transfer and print applications are part of the **3720 Remote Assistance** concept. This concept is built-up around an IBM Personal Computer connected to a 3720 through a switched line.

Running the 3101 emulation package, the PC is used as a normal 3720 console and allows an operator to perform all the MOSS functions. This facility is available to IBM only (remote support center).

Running built-in applications, the PC can receive and transmit data from/to the 3720 to which it is connected. Thus, most MOSS data become available at the central site:

- Configurations
- Technical Levels
- Microcode patches
- Error Logs
- ...

A file containing microcode fixes (MCF) can be sent from the PC to the MOSS disk.

All these files can be printed at the PC printer.

"Transferring MCFs from VM to PC then to MOSS" on page A-5 explains how to transfer MCFs from VM to a PC located at the HCS.

Hardware Requirements

The following minimum configuration is required to run the *File Transfer Application*:

- One IBM Personal Computer 5150, 5160, or 5170.
- 128 kbytes of memory.

- One 320-kbyte diskette drive and associated diskette adapter. Reference: 1503810.

  A hard disk is required for receiving MCFs from VM.

- One IBM Personal Computer Asynchronous Communication Adapter Reference: 1502074. This adapter is selectable from 50 bps up to 9600 bps.

- One modem for remote connection (see "Modem (DCE) Requirements for the Remote Console" on page 1-9 for details)

- A cable for modem connection.

To run the *file print application*, an additional feature is requested:

- One graphic printer, IBM 5152.

Software Requirements

- IBM Personal Computer Disk Operating System (DOS) at the current level. Reference: 6936836.

- IBM Personal Computer 3101 Emulation Control Program. Reference: 6024042.

For the transfer of MCFs, the application requires: a sub-directory named REMOTASS.DIR. This sub-directory will be used by the application (VM) that transfers MCFs to the PC. The MCF files on that sub-directory have the following names: xxxxx.MCF.

If there is no PC sub-directory whose name is REMOTASS.DIR, create one on the disk/diskette (a: in our example):
MKDIR   a: REMOTASS.DIR

Notes:

1. A hard disk is recommended as a reception unit.

2. Contact your local VM administrator for the implementation of programs associated with PCs when transferring files from/to VM.

Transferring MCFs from VM to 3720 EC Diskette via a PC/AT

This section describes how to transfer an MCF file from the Host to a the 3720 EC 'secondary' diskette using *RAXDSK*.

VM to 3720 EC Diskette Transfer Procedure (via PC/AT)

1. Logon to Host-VM.

2. Transfer the MCF file(s) (CHGMCF COP) from the Host to the PC hard disk:

   - If the PC is a PC/AT, use command E78 or HCOPY (under PC DOS):

     ```
     E78copy h:CHGMCF COP f c:CHGMCF.COP /B
     or hcopy h:CHGMCF COP f c:CHGMCF.COP /B
     (h=Host, c=PC hard disk, f=file mode)
     ```

   - If the PC is a 3270/AT, use command RECEIVE:

     ```
     receive c:CHGMCF.COP h:CHGMCF COP f
     (h=Host, c=PC hard disk, f=file mode)
     ```

3. Load the RAXDSK program from hard disk or HCS diskette.

4. Select option 2 (data set restore)

5. When 'enter data set name to be restored' appears: insert the 3720 EC 'secondary' diskette.

6. Type: CHGMCF and press *SEND*.

When the operation is successfully completed, the 3720 EC 'secondary' diskette is ready to be mailed, together with the associated EC 'primary' diskette to the Branch Office or to the Customer.

Note: You can check the last MCF level in the 'CHGMCF COP' file of the host-VM using edit or browse. The last MCF level appears on the first line of that file.

Transferring MCFs from VM to PC then to MOSS

This section describes how to receive an MCF file from the Host for a later transfer to MOSS via the *RAXFER* program.

VM-to-PC Transfer Procedure

All files to be transferred must first be stored in a PC-DOS sub-directory called REMOTASS.DIR.

For instance, if you received a CDF file whose name is 'C585515', you will find it on the PC disk(ette) in the sub-directory REMOTASS.DIR with the complete name: C585515.CDF (filename.filetype).

For MCF files, the same rule applies. If you receive a file from a Host, you must store it in the sub-directory REMOTASS.DIR with the filetype .MCF.

To receive an MCF file from a HOST to a PC disk(ette):

- Step 1. Logon to Host-VM.
- Step 2. Logon to PC DOS.
- Is there a PC sub-directory whose name is REMOTASS.DIR ?

  If yes, go to step 4.
- Step 3. Create the REMOTASS.DIR sub-directory on the disk/diskette (a: in our example).

  Note: A hard disk is recommended as a reception unit.

  MKDIR a: REMOTASS.DIR
- Step 4. Receive the file from the Host:
  - If the PC is a PC/AT, use E78 or HCOPY:

    HCOPY h: hostfname hostftype a: REMOTASS.DIR\pcfilename.MCF /b
    or
    E78COPY h: hostfname hostftype a: REMOTASS.DIR\pcfilename.MCF /b
  - If the PC is a 3270/AT, use command receive:

    RECEIVE a: REMOTASS.DIR\pcfilename.MCF r:hostfname hostftype a1

    (h: host, a: disk/diskette drive)
- Step 5. Logoff from Host-VM

From now on you can transfer this file to a 3720 MOSS using RAXFER.

Note: It is assumed that the whole MCF file is an EBCDIC-coded file (even for the EC-number).

Application Environment

Note: Make sure that you have a directory called REMOTASS.DIR on your disk/diskette.

The PC runs the 3101 emulation under the DOS package.

The 3720 and the PC must be connected to run the *file transfer application*.

The file printing application is developed within the PC, and does not require a connection to MOSS.

The two PC applications (file transfer and file print) are on a single PC diskette.

Figure A-1 on page A-8 gives a general overview of the different applications.

How to Select a File Transfer/Print Function

This function requires:

- The customer to agree to the remote connection.

- All other possible users of the MOSS to be *logged off*.

- The customer to give you the modem telephone number and the MOSS maintenance password.

Remote Application Starting Procedure

1. Logon to MOSS as explained in "Remote Connection Procedure" on page 1-10.

   From this time, your terminal has the same capabilities as the local 3101-like terminal.

   Note: The file transfer application can only be called from the *3720 function menu* panel, and no MOSS function should be active or pending.

2. Press ALT and PF10 simultaneously, then, when the emulator command line is displayed, type *Q* (for QUIT) to enter DOS mode.

   Note: When in DOS, you are disconnected from the MOSS application.

3. Insert the diskette that contains the file transfer/print programs into the PC drive that is available.

4. Type the name of the function requested:

   - d:RAXFER for file transfer
   - d:RAXPRT for file print.

     Where *d* is the identifier of the disk/diskette drive that contains the programs.

   Notes:

   a. IPL should not be in progress while using the file transfer application.

   b. Although it may be possible to load and run the print file function while connected to the 3720, it is recommended to run the print function offline. (If online, the line remains connected during the print.)

The *remote assistance initialization* panel is displayed. and FILE TRANSFER INITIALIZATION IN PROGRESS is blinking.

If there is no error, the **file transfer selection** panel (RAXFER command) or the **file print selection** panel (RAXPRT command) is displayed.

Note: If an error occurs, PF9=End is displayed so that you may return to DOS by pressing PF9 (MOSS is not connected to the PC).

File Naming

All the files transferred from the 3720 to the PC may be written on the diskette/disk attached to the PC. The operator will be asked for file names. The operator may enter a file name or let the system choose one.

- If entered by the operator, this name is a string of up to 8 characters.

  In case of a name already defined, the operator is prompted to confirm or to change the entered name. (if confirmed, the new file overwrites the previous one.)

- If the operator does not want to enter a name, this file name is created by the system using the following rule:

- First character is a code that defines the file to be transferred:
  - 'C' for CDF
  - 'P' for PCH
  - 'Z' for MCF
  - 'B' for BER
  - 'L' for MLT
  - 'M' for MOSS Dump
  - 'S' for Scanner Dump
  - 'T' for TIC Dump
- The last 7 characters are the serial number of the current 3720 (displayed at the top right corner of the panel).

```
                    | Load 3101 Emulator
              ┌────V──────────────┐
              │ 3101 Emulation    │
              │ Environment       │
              └───────────────────┘
                    │
                    │   Request Connection to 3720
              ┌────V──────────────┐
              │ Connection is     │
              │   completed       │
              │ Receive 1st panel │
              │   from 3720       │
              └───────────────────┘
                    │
              ┌────V──────────────┐
              │ Enter 3720        │
              │ maintenance       │
              │ password          │
              └───────────────────┘
                    │
              ┌────V──────────────┐
              │ Normal 3720 MOSS  │
              │ terminal activity │
              └───────────────────┘
                    │
                    │   ALT + PF10 + QUIT
              ┌────V──────────────┐
              │ PC                │
              │ DOS Environment   │
              └───────────────────┘
                    │
                    RAXFER
              ┌────V──────────────┐
              │ Load File Transfer│
              │ Application       │
              └───────────────────┘
                    │          ┌──────────┐
              ┌────V──V────────┐          │
              │ File Transfer  │          │
              │ or File Print  │          │
              │   selection    │          │
              │     menu       │          │
         PF6  └────────────────┘     PF6
              ENTER               
              ┌────V──────────────┐
         ┌──> │ Execute file      │───────┐
         │    │ transfer/Print    │       │
         │    ├────────┬──────────┤  <──  │
         │    │ Files  │  Dump    │       │
         │    └────────┴──────────┘       │
         │                                │
         │       │           No space     │
         └ PF5 ──┘          on disk       │
          (cancel)     │                  │
              Link down │                  
              + PF9
         ┌────V──────────┐  ┌────V──────┐
         │ Return to DOS │  │           │
         │ Disconnect MOSS│ │           │
         └───────────────┘  └───────────┘
```

Figure   A-1. General Overview
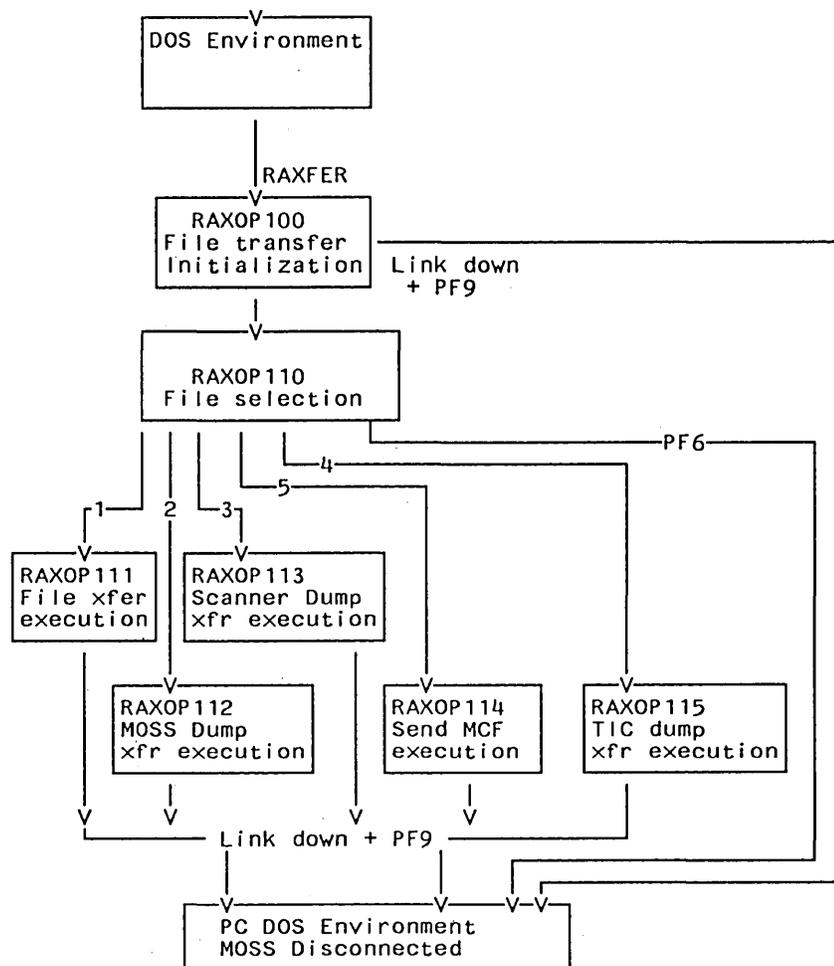
Figure   A-2. Online Process Detailed Flow

Accessing the File Transfer Selection Panel

When in 3720 console mode, press ALT and PF10 simultaneously, then, when the emulator command line is displayed, type Q (for QUIT) to enter DOS mode.

Note: When in DOS, you are disconnected from the MOSS application.

"How to Select a File Transfer/Print Function" on page A-6 gives more details concerning the activation of the data transfer application.

- Load the File transfer application by typing d:RAXFER (where d is the PC disk/diskette address on which the file transfer programs are located).

When the initialization ends successfully, the **file transfer selection** panel (see Figure A-3 on page A-12) is displayed.

Error Processing

If for any reason (link down, MOSS unable to load file transfer application ...) this phase fails, one of the following error messages will be displayed

- `008 Link with 3720 down`
- `024 Unable to load file transfer`

`FILE TRANSFER INITIALIZATION IN PROGRESS` will stop blinking.

Note: If an error occurs, PF9=End is displayed so that you may return to DOS by pressing *PF9* (MOSS is not connected to the PC).

File Transfer PF Keys

- *PF5* (CANCEL.

  Used only to cancel a file transfer request, and to erase the file (or part of file) that has been transferred.

- *PF6* (QUIT).

  With *PF6*, you return to DOS, you are disconnected from MOSS, but **you can reconnect to MOSS**.

  The reconnection sequence is the following:

  1. Load the 3101 emulation program
  2. Press *PF1* twice (for refresh)
  3. Wait until you are in 3720 console mode

- *PF7* (FORWARD) and *PF8* (BACKWARD) (used only in case of multipanel display).

- *PF9* (END).

  Pressing *PF9* returns you to DOS, and disconnects you from MOSS.

  PF9=END appears on the panel only in exceptional cases where the only possible action is an exit:

  - MOSS does not answer, or there is an error on the line (message 035)
  - The link with 3720x is down (message 008)

Warning: When you return to DOS, you are disconnected from the MOSS application.

Selecting the File to Be Transferred

The **file transfer selection** panel (see Figure A-3 on page A-12) is displayed as soon as the initialization phase with the 3720 is completed.

The serial number of the 3720 currently connected is displayed at the top right corner of the panel,

To select the type of file you want to transfer:

- Enter 1 to **receive** from the 3720 one or more of the following files:

  - CDF (configuration data file)
  - BER (box event records)
  - MLT (machine level table)
  - PCH (patches)

  If no error occurs, the **file transfer execution** panel (see Figure A-4 on page A-14) is displayed. What to do next is explained in "Receiving a File from MOSS" on page A-12.

- Enter 2 to **receive** the MOSS dump from the 3720.

  The **receive MOSS dump transfer** panel (see Figure A-6 on page A-17) is displayed.

  What to do next is explained in "Receiving a MOSS Dump" on page A-16.

- Enter 3 to **receive** the scanner dump from the 3720.

  The **receive scanner dump transfer** panel (see Figure A-8 on page A-20) is displayed.

  What to do next is explained in "Receiving a Scanner Dump" on page A-19.

- Enter 4 to **receive** the TRSS dump file from the 3720.

  The **send MCF** panel (see Figure A-9 on page A-22) is displayed.

  What to do next is explained in "Receiving TRSS Dumps" on page A-21.

- Enter 5 to **send** the MCF file to the 3720 (from PC to MOSS).

  The **send MCF** panel (see Figure A-10 on page A-24) is displayed.

  What to do next is explained in "Sending an MCF File from PC to 3720" on page A-23.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
 rap110                    ┌─────────────────────────────────┐  Serial
                          │        3720 REMOTE ASSISTANCE   │  Number=xxxxxxx
                          │        FILE TRANSFER   Version 1.0│
                          └─────────────────────────────────┘

              •••••••   ••••••••••••   ••••••      ••••••
              •••••••   •••••••••••••••  •••••••     •••••••
                •••       •••   ••••     ••••••   ••••••
                •••       •••••••••••••   ••••••• •••••••
                •••       ••••••••••••   ••• ••••••• •••
                •••       •••   ••••     ••• ••••• •••
              •••••••   ••••••••••••••   •••••  •••   ••••••
              •••••••   •••••••••••••••   •••••   •    ••••••
                     Microcode (c) Copyright IBM Corp. 1986

          - Select a file transfer option (1 to 5) and press ENTER key ==> 1

                   1 = Receive Files (CDF/BER/MLT/PCH)
                   2 = Receive MOSS Dump
                   3 = Receive Scanner dump
                   4 = Receive TRSS dumps
                   5 = Send MCF


                   PF6:Quit
```
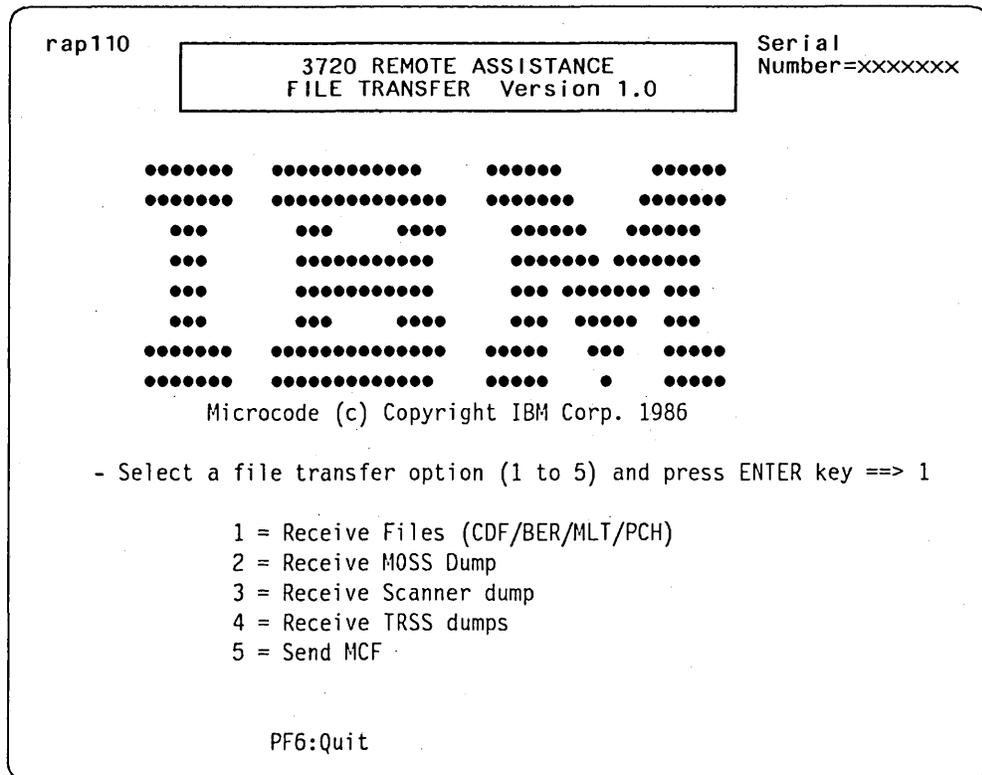
Figure   A-3. File Transfer Selection Panel (RAP110)

Receiving a File from MOSS

You have entered *1* on the **file transfer selection** panel (see Figure A-3).

The **file transfer execution** panel (see Figure A-4 on page A-14) is displayed
and the fields are filled with their default values:

• The file name fields are filled as specified in "File Naming" on page A-6.

• The PC disk/diskette address is filled with *A*.

• The status field (rightmost field for all files listed) is set to blanks.

• The serial number of the 3720 currently connected is displayed at the top
  right corner of the panel.

Selecting the File you Want to Receive

You select the file by:

1. Entering Y in front of the listed files you want (default is N).

2. Changing, if necessary, the names of the files to be transferred.

   If there is already a file with the same name on your PC disk/diskette, the
   corresponding status field (rightmost field in the lines) will display EXIST.

   You may then do one of the following:

   a. Change the entered name.

      The status field is blanked and the name checked for validity.

   b. Leave the entered name as is.

The current file is erased on the PC disk/diskette and is replaced by the file received.

3. Changing the diskette or disk drive (A, B, C or D) on which you want to receive the files (default is A).

File Transfer Status

If the input is correct, the transfer starts, the part in process blinks, and the status displays the following:

IN PROGRESS: You have selected this part, and the transfer is in progress. The file name is blinking.

TRANSFERRED: The transfer is successfully completed for this selected part. It is now available on the selected PC disk/diskette.

CANCELED:

1. You have canceled the transfer by pressing the *PF5* key. The file that was being transferred is erased from the PC disk/diskette.

2. The cancel is due to a transmission error

EMPTY: The requested file is empty. No transfer takes place.

NOT TRANSF: The specified file is not transferred due to your cancel request during another file transfer.

Canceling File Transfer

To cancel a file transfer, press *PF5*. The process will be stopped, the file in transfer is erased on the PC disk/diskette, its status field is set to CANCELED, and the status fields for all other files to be transferred are set to NOT TRANSF.

An example of the panel after pressing *PF5* during a transfer is shown in "File Transfer Execution Sample" on page A-15.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

File Transfer Speed

The *average* time for each file transfer is:

CDF file: .3 min (1Kb)
MCF files: 5-6 min (27Kb)
BER file: 15 min (39Kb)
SCANNER dump: up to 40-45 min (up to 64 Kb)
MOSS dump: up to 200 min (up to 512Kb)
TRSS dump: 2-10 min (up to 17Kb)

```
 rap111                                              Serial
              ┌─────────────────────────────────┐    Number=xxxxxxx
              │        3720  REMOTE  ASSISTANCE  │
              │     FILE TRANSFER   Version 1.0  │
              └─────────────────────────────────┘

   - Select the file to be received (Y/N)
   - Modify file name and disk/diskette address, if necessary
   - Press ENTER

                                    Y/N     File name   Disk
                                                        addr

      Configuration Data File (CDF) ==> N    Cxxxxxxx    A

      Box Error Record File (BER)   ==> N    Bxxxxxxx    A

      Machine Level Table (MLT)     ==> N    Lxxxxxxx    A

      Microcode Patches  (PCH)      ==> N    Zxxxxxxx    A


        PF5:Cancel      PF6:Quit                      <PF9:End>
```

Figure   A-4. File Transfer Execution Panel

File Transfer Execution Sample

The **file transfer execution** sample panel (see Figure A-5) display resumes the following actions:

- You have selected function *1* on the **file transfer selection** panel (Figure A-3 on page A-12).

- The 3720 serial number is: 3417903

- The default parameters for the file name and the PC disk/diskette address are not changed.

- The files to be transferred are:
  - CDF
  - BER
  - PCH

- You pressed *PF5* during BER file transfer.

```
rap111                                                         Serial
                    ┌─────────────────────────────────────┐   Number=xxxxxxx
                    │         3720 REMOTE ASSISTANCE       │
                    │         FILE TRANSFER  Version 1.0   │
                    └─────────────────────────────────────┘

      - Select the file to be received (Y/N)
      - Modify file name and disk/diskette address, if necessary
      - Press ENTER

                                       Y/N     File name   Disk
                                                           addr

      Configuration Data File (CDF) ==> Y     C3417903     A   TRANSFERRED

      Box Error Record File (BER)   ==> Y     B3417903     A   CANCELED

      Machine Level Table (MLT)     ==> N     L3417903     A

      Microcode Patch    (PCH)      ==> Y     Z3417903     A   NOT TRANSF


         PF5:Cancel      PF6:Quit                              <PF9:End>
```

Figure   A-5. File Transfer, Execution Sample

Receiving a MOSS Dump

You have selected function *2* on the **file transfer selection** panel (Figure A-3 on page A-12).

The **receive MOSS dump transfer** panel (see Figure A-6 on page A-17) is displayed and the fields are filled with their default values:

- The serial number of the 3720 currently connected is displayed at the top right corner of the panel.
- The PC disk/diskette address is set to *A*.
- The dump file name field is set to the name specified in "File Naming" on page A-6.
- The erase dump indicator is set to *N*.

  Set this indicator to *Y* to erase the MOSS dump on the MOSS disk after a successful transfer.

- The status field (rightmost field for all files listed) is set to blanks.

Selecting the Parts of the MOSS Dump you Want to Receive

You select the parts by:

1. Changing the PC disk/diskette address to B, C, or D (default is A).
2. Changing, if necessary, the name of the MOSS dump file.

   If there already is a file with the same name on your PC disk/diskette, the corresponding status field (rightmost field in the lines), will display an error message.

3. Entering the 'from' address and 'to' address of each part of the dump you want to receive. The addresses must be in hexadecimal notation.

   All the selected parts (1-8) must be separated. If an overlay area is found within the selected parts, an error message is displayed.

   The 'from' and 'to' addresses are automatically justified on MOSS disk sector boundaries.

   Note: MOSS dump valid address boundaries are 00400/7FFFF.

When multiple parts are requested, they must be entered in address sequence, and parts must be contiguous (for example: part 1, then part 2).

During the dump transfer, the operator is informed every time half a kbyte of dump data is transferred.

File Transfer Status.

If the input is correct, the transfer starts, the part in progress blinks, and the status displays the following:

IN PROGRESS: You have selected this part, and the transfer is in progress.

TRANSFERRED: The transfer is successfully completed for this selected part. It is now available on the selected PC disk/diskette.

CANCELED: You have canceled the transfer by pressing the *PF5* key. The file that was being transferred is erased from the PC disk/diskette.

NOT TRANSF: The specified file is not transferred due to a line error, a MOSS error, or a link down (see *PF9*).

Canceling File Transfer

To cancel the file transfer, press *PF5*. The process will be stopped, the status of each selected part is set to CANCELED, and the file being transferred is erased on the PC disk/diskette,

The parts fully transferred are not kept on the PC disk/diskette.

The part being transferred is erased from the PC disk/diskette.

The whole file is erased from the PC disk/diskette.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
 rap112                                               Serial
                 ┌────────────────────────────┐      Number=xxxxxxx
                 │       3720 REMOTE ASSISTANCE│
                 │    FILE TRANSFER  Version 1.0│
                 └────────────────────────────┘

       - Enter disk/diskette address (A, B, C, or D)      ==> A

       - Enter dump file name                             ==> Mxxxxxxx

       - Enter Y to erase the dump in MOSS after transfer ==> N

       - Enter dump part address and press ENTER

             Part 1    fffff to  ==> ttttt    sssssssssss
             Part 2    fffff to  ==> ttttt    sssssssssss
             Part 3    fffff to  ==> ttttt    sssssssssss
             Part 4    fffff to  ==> ttttt    sssssssssss
             Part 5    fffff to  ==> ttttt    sssssssssss
             Part 6    fffff to  ==> ttttt    sssssssssss
             Part 7    fffff to  ==> ttttt    sssssssssss
             Part 8    fffff to  ==> ttttt    sssssssssss

       PF5:Cancel     PF6:Quit                            <PF9:End>
```

Figure A-6. Receive MOSS Dump

Receive MOSS Dump Transfer, Execution Sample

The **receive MOSS dump transfer** execution sample panel (see Figure A-7 on page A-18) presumes the following actions:

- You selected function 2 on the *file transfer selection* panel (see Figure A-3 on page A-12).
- The 3720 serial number is: 3417903
- You do not change the default parameter for the file name
- You selected the second diskette address (B).
- You intend to transfer a MOSS dump (3 parts).
- During Part 2 transfer, you pressed *PF5*.

```
rap112                                                    Serial
              ┌─────────────────────────────────────┐    Number=xxxxxxx
              │         3720 REMOTE ASSISTANCE       │
              │       FILE TRANSFER   Version 1.0    │
              └─────────────────────────────────────┘

       - Enter disk/diskette address (A, B, C, or D)      ==> B

       - Enter dump file name                             ==> M3417903

       - Enter Y to erase the dump in MOSS after transfer ==> N

       - Enter dump part address and press ENTER

            Part 1  ==> 01000 to  ==> 014BF    CANCELED
            Part 2  ==> 02000 to  ==> 1A000    CANCELED
            Part 3  ==> 1CBF0 to  ==> 1F00F    CANCELED
            Part 4  ==>        to  ==>
            Part 5  ==>        to  ==>
            Part 6  ==>        to. ==>
            Part 7  ==>        to  ==>
            Part 8  ==>        to  ==>

            PF5:Cancel     PF6:Quit                    <PF9:End>
```

Figure   A-7. Receive MOSS Dump Transfer, Execution Sample

Receiving a Scanner Dump

You have selected function *3* on the **file transfer selection** panel (Figure A-3 on page A-12). The **receive scanner dump transfer execution** panel (see Figure A-8 on page A-20) is displayed and the fields are filled with their default values:

- The serial number of the 3720 currently connected is displayed at the top right corner of the panel.

- The PC disk/diskette address is set to *A*.

- The dump file name field is set to the name specified in "File Naming" on page A-6

- The erase dump indicator is set to *N*.

- The status field (rightmost field for all files listed) is set to blanks.

Selecting the Parts of the Scanner Dump you Want to Receive

You select the parts by:

1. Changing the PC disk/diskette address to B, C, or D (default is A).

2. Changing, if necessary, the name of the scanner dump file.

   If there is already a file with the same name on your PC disk/diskette, the corresponding status field (rightmost field on the lines) will display EXIST.

3. Entering the 'from' address and 'to' address of each part of the dump you want to receive. The addresses must be in hexadecimal format.

   The dump part limits must fit within the scanner dump limits (boundary), as displayed below *Enter dump part address* on the panel.

   Note: Scanner dump valid address boundaries are 00000/1FFFF.

   All the selected parts (1-8) must be separated. If an overlay area is found within the selected parts, an error message is displayed.

   The 'from' and 'to' addresses are automatically justified on MOSS disk sector boundaries.

   When multiple parts are requested, they must be entered in sequence (for example: part 1, then part 2).

During the dump transfer, the operator is informed every time half a kbyte of dump data is transferred.

File Transfer Status

If the input is correct, the transfer starts, the part in progress blinks, and the status displays the following:

IN PROGRESS: You have selected this part, and the transfer is in progress.

TRANSFERRED: The transfer is successfully completed for this selected part. It is now available on the selected PC disk/diskette.

CANCELED: You have canceled the transfer by pressing the *PF5* key. The file that was being transferred is erased from the PC disk/diskette.

NOT TRANSF: The specified file is not transferred due to a line error, a MOSS error, or a link down (see PF9).

Canceling File Transfer

To cancel the file transfer, press *PF5*. The process will be stopped, the status of each selected part is set to CANCELED, and the file being transferred is erased on PC disk/diskette.

The parts fully transferred are not kept on the PC disk/diskette.

The part being transferred is erased from the PC disk/diskette.

The whole file is erased from the PC disk/diskette. An example of the panel after pressing *PF5* during a transfer is shown in Figure A-8.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
 rap113                                                        Serial
                  ┌─────────────────────────────────┐         Number=xxxxxxx
                  │        3720 REMOTE ASSISTANCE    │
                  │     FILE TRANSFER   Version 1.0  │
                  └─────────────────────────────────┘


          - Enter disk/diskette address (A, B, C, or D)      ==> A

          - Enter dump file name                             ==> Sxxxxxxx

          - Enter Y to erase the dump in MOSS after transfer ==> N

          - Enter dump part address and press ENTER
                 (scanner dump boundaries are 11111 and hhhhh)
                 Part 1 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 2 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 3 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 4 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 5 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 6 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 7 address from  ==> fffff to  ==> ttttt    ssssssssss
                 Part 8 address from  ==> fffff to  ==> ttttt    ssssssssss

          PF5:Cancel      PF6:Quit                            <PF9:End>
```

Figure   A-8. Receive Scanner Dump Transfer, Execution Panel

Receiving TRSS Dumps

You have selected function *4* on the **file transfer selection** panel (Figure A-3 on page A-12). The **receive TRSS dumps transfer** panel (see Figure A-9 on page A-22) is displayed and the fields are filled with their default values:

- The serial number of the 3720 currently connected is displayed at the top right corner of the panel.

- The PC disk/diskette address is set to *A*.

- The dump file name field is set to the name specified in "File Naming" on page A-6

- The erase dump indicator is set to *N*.

- The status field (to the right of the disk/diskette address) is set to blanks.

Specifying the transfer

You specify the transfer by:

1. Changing the PC disk/diskette address to B, C, or D (default is A).

2. Changing, if necessary, the name of the TRSS dump file.

   If there is already a file with the same name on your PC disk/diskette, the corresponding status field (rightmost field on the lines) will display EXIST.

3. Changing the erase option to Y This will cause the MOSS to erase the TRSS dump file (CHGTRSS) from the MOSS disk after successful completion of the transfer.

   During the dump transfer, the operator is informed every time half a kbyte of dump data is transferred.

File Transfer Status

If the input is correct, the transfer starts, and the status displays the following:

IN PROGRESS: The transfer is in progress.

TRANSFERRED: The transfer is successfully completed. It is now available on the selected PC disk/diskette.

If requested (erase option = Y), the CHGTRSS dump file is deleted from MOSS disk.

CANCELED: You have canceled the transfer by pressing the *PF5* key. The file that was being transferred is erased from the PC disk/diskette.

NOT TRANSF: The file is not transferred due to a line error, a MOSS error, or a link down (see PF9).

Canceling File Transfer

To cancel the file transfer, press *PF5*. The process will be stopped, the status is set to CANCELED, and the file being transferred is erased on PC disk/diskette.

The whole file is erased from the PC disk/diskette. An example of the panel after pressing *PF5* during a transfer is shown in Figure A-9 on page A-22.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
 rap115                                              Serial
              ┌─────────────────────────────┐       Number=0030009
              │      3720 REMOTE ASSISTANCE  │
              │    FILE TRANSFER   Version 1.0 │
              └─────────────────────────────┘

       - Enter disk/diskette address (A, B, C, or D)    ==> A  CANCELED

       - ENTER DUMP FILE NAME ==>                            T0030009

       - Enter Y to erase the dump in MOSS after transfer ==> N




         PF5:Cancel      PF6:Quit                         <PF9:End>
```

Figure   A-9. Receive TRSS Dumps Transfer Panel (Sample of Transfer Canceled)

Sending an MCF File from PC to 3720

MCFs must first be sent to a PC disk/diskette, see "Transferring MCFs from VM to PC then to MOSS" on page A-5.

You have selected function *5* on the **file transfer selection** panel (Figure A-3 on page A-12).

The **send MCF** panel (see Figure A-10 on page A-24) is displayed in two steps:

1. First the serial number of the 3720 currently connected is displayed at the top right corner of the panel, and the PC disk/diskette address is set to *A*.

   Enter the letter corresponding to the PC disk/diskette drive that contains the MCF files to be transferred to MOSS.

2. Then the remainder of the panel is set to all the MCF file names found on the PC disk/diskette specified.

   The status field (rightmost field for all files listed) is set to blanks.

Selecting the MCF File you Want to Transfer to MOSS

You select the file by:

1. Changing the PC disk/diskette address to B, C, or D (default is A).

2. Entering *Y* next to the MCF file name you want to send to MOSS.

   Only **one** MCF file can be selected on a panel.

If all MCF files cannot be displayed on one panel, use *PF7* (Forward) and *PF8* (backward) to scroll back and forth.

If you change the PC disk/diskette address, the MCF files displayed will be those of the new PC disk/diskette address specified.

File Transfer Status

If the input is correct, the transfer starts, the file name in progress blinks and the status displays the following:

IN PROGRESS: You have selected this file, and the transfer is in progress. The file name is blinking.

TRANSFERRED: The transfer is successfully completed for this selected file.

CANCELED: You have canceled the transfer by pressing the *PF5* key, or the cancel is due to a line error or a MOSS error (see PF9).

The file that was being transferred still remains on the PC disk/diskette.

Canceling File Transfer

To cancel the file transfer, press *PF5*. The process will be stopped, the status of the file is set to CANCELED, and the file being transferred still remains on the PC disk/diskette,

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
 ┌─────────────────────────────────────────────────────────────┐
 │  rap114                                          Serial       │
 │              ┌──────────────────────────────┐   Number=xxxxxxx│
 │              │     3720 REMOTE ASSISTANCE   │                 │
 │              │   FILE TRANSFER   Version 1.0│                 │
 │              └──────────────────────────────┘                 │
 │                                                               │
 │   - Enter disk/diskette address (A, B, C, or D) ==> A         │
 │                                                               │
 │   - Select the file to be sent (Y/N)'and press ENTER          │
 │                                                               │
 │       ffffffff ===> N  ssssssssss      ffffffff ===> N  ssssssssss│
 │                                                               │
 │       ffffffff ===> N  ssssssssss      ffffffff ===> N  ssssssssss│
 │                                                               │
 │       ffffffff ===> N  ssssssssss      ffffffff ===> N  ssssssssss│
 │                                                               │
 │       ffffffff ===> N  sssssssssss     ffffffff ===> N  ssssssssss│
 │                                                               │
 │       ffffffff ===> N  ssssssssss      ffffffff ===> N  ssssssssss│
 │                                                               │
 │       ffffffff ===> N  ssssssssss      ffffffff ===> N  ssssssssss│
 │                                                               │
 │      PF5:Cancel    PF6:Quit    PF7:Forward    PF8:Backward   <PF9:End>│
 └─────────────────────────────────────────────────────────────┘
```

Figure   A-10. Send MCF Execution

File Printing Application

Application Description

This application addresses only printer number one.

The files to be formatted and printed are the following:

- Dump files:
  - MOSS Dump
  - Scanner Dump
  - TRSS Dumps
- CDF file
- PCH file
- BER file
- MLT file

This function can (**and should**) be activated *offline*; it means that the PC need not be connected to the 3720. The operator has to load the proper disk/diskette file and to select the Printing Function.

Printing can be canceled using the CANCEL key (*PF5*).

The printing format depends on the files to be printed. The maximum number of characters per line is 132.

Printing Time

The time required to print 1 kbyte of data is between 60 and 100 seconds.

File Printing Procedure

To Print MOSS files (CDF, MLT, BER), MCF files, or MOSS, scanner, and TRSS dumps, you must:

1. Be in DOS mode.

2. Load the *file printing* application by typing d:RAXPRT. (where *d* is the PC disk/diskette address on which the file printing programs are located).

   The **file printing selection** panel (see Figure A-11 on page A-26) is displayed. (The PC disk/diskette address is set to *A*.)

Selecting the File you Want to Print

To select the file:

1. Change the PC disk/diskette address to B, C, or D (default is A).

2. Enter the number (1 to 7) corresponding to the file name you want to print.

If the file requested exists on the selected PC disk/diskette, the **file printing execution** panel (see Figure A-12 on page A-27) is displayed.

What to do next is explained in "Printing a File" on page A-26.

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
  rap002
                 ┌────────────────────────────────────┐
                 │        3720 REMOTE ASSISTANCE       │
                 │     FILE-PRINT     Version 1.0      │
                 └────────────────────────────────────┘


          •••••••    ••••••••••••••   ••••••      ••••••
          ••••••••   ••••••••••••••   •••••••     •••••••
            •••        •••     ••••   ••••••    ••••••
            •••        •••••••••••••   ••••••• •••••••
            •••        •••••••••••••   ••• ••••••• •••
            •••        •••     ••••   ••• ••••• •••
          ••••••••   ••••••••••••••   •••••   •••   •••••
          •••••••    ••••••••••••••   •••••    •    •••••
                 Microcode (c) Copyright IBM Corp. 1986

      - SELECT THE FILE TO PRINT (1 to 7) ==>
              1 - CDF    3 - MLT    5 - MOSS DUMP   7 - TIC DUMPS
              2 - BER    4 - PCH    6 - SCAN DUMP

      - Enter disk/diskette address (A,B,C or D) ==> A

      - Press ENTER

                          PF6:Quit
```
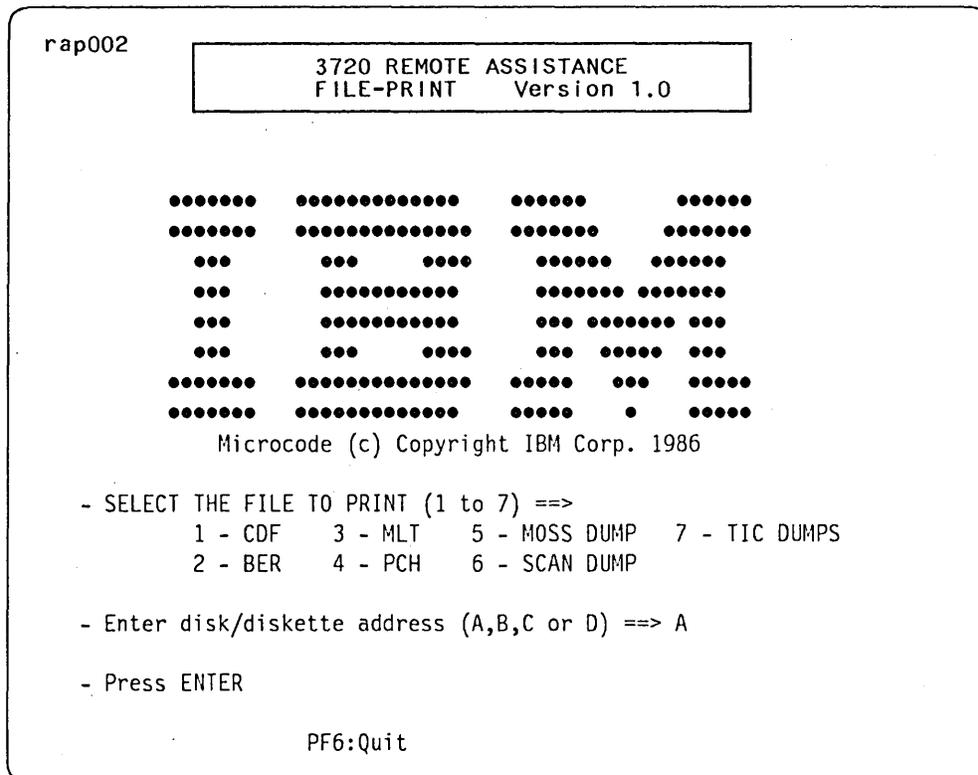
Figure A-11. File Printing Selection

Printing a File

You have entered (1 to 6) on the previous **file printing selection** panel (see
Figure A-11).

The **file printing execution** panel (see Figure A-12 on page A-27) is displayed
and the fields are filled with their default values:

- The file type and the disk address are set to what you entered in previous
  panel.

- The panel displays all the files of the selected PC disk/diskette that have
  the required file type (with printing request N).

Start to Print the File

1. Type Y (instead of N) next to the file name(s) of the file(s) you want to print.

2. Press ENTER.

File Printing Status.

When the input is successfully checked by the application, printing starts, and
the status fields are updated as follows:

IN PROGRESS: You have selected this file, and printing is in progress on the IBM
             5152 printer.

PRINTED: Printing is successfully completed for this selected file.

CANCELED: You have canceled the transfer by pressing the PF5 key, or there is
             a disk/diskette error.

NOT PRINTED: The specified file is not printed due to your cancel request during
             the printing of another file.

Canceling File Printing

To cancel file printing, press *PF5*. The process will be stopped, the status of the file being printed is set to CANCELED, the status of the files remaining to be printed is set to NOT PRINTED,

An example of the panel after pressing *PF5* during a transfer is shown in "File Printing Execution Sample".

PF keys are explained on page A-10.

"Remote Assistance Application Messages" on page A-34 gives the explanation and user response for the messages that may be displayed.

```
rap021              ┌──────────────────────────────────────┐
                    │          3720 REMOTE ASSISTANCE      │
                    │          nnn   PRINT from disk: d     │
                    └──────────────────────────────────────┘


   - Select the files to print (Y/N) and press ENTER

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss

          ffffffff ===> N  sssssssssssss        ffffffff ===> N  sssssssssssss


                    PF6:Quit      PF7:Forward      PF8:Backward
```
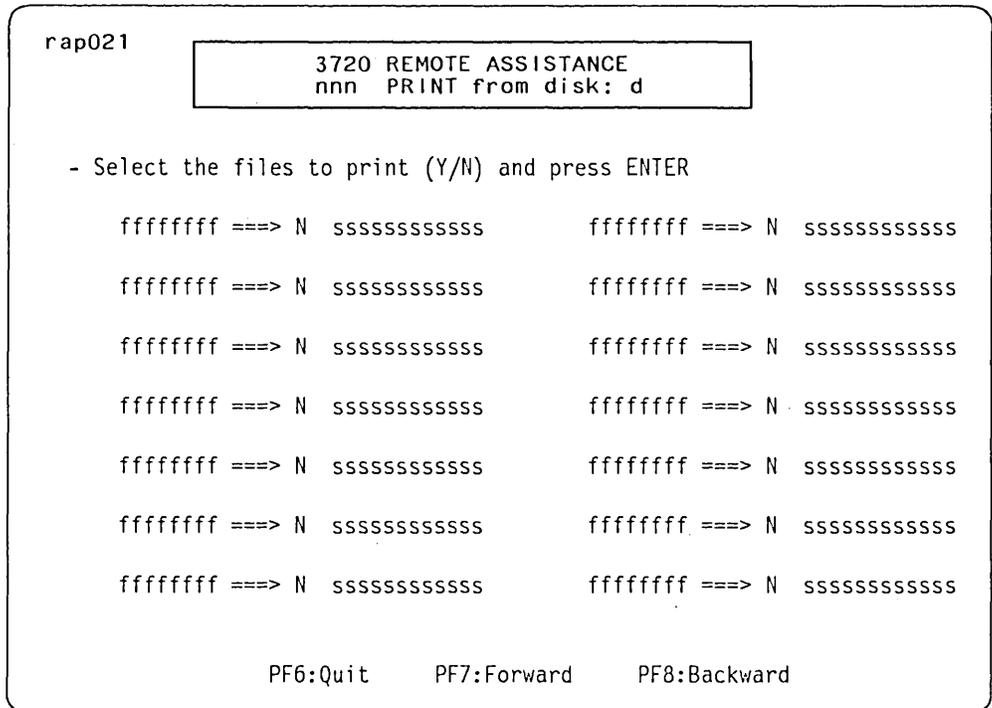
Figure A-12. File Printing Execution Panel

File Printing Execution Sample

The *file printing execution* sample panel (see Figure A-13 on page A-28) presumes the following actions:

- You have selected function *1* (CDF) on the **file printing selection** panel (see Figure A-11 on page A-26).
- You used the default PC disk/diskette address (A).
- Eight CDF files are available on the selected disk/diskette.
- You intend to print five of them.
- During the printing of C0981217, you pressed *PF5* (cancel).

```
  rap021
                      ┌──────────────────────────────────────────────┐
                      │            3720 REMOTE ASSISTANCE            │
                      │         nnn  PRINT from disk: d              │
                      └──────────────────────────────────────────────┘


  - Select the files to print (Y/N) and press ENTER

          C1234567 ===> Y  PRINTED              C2333323 ===> N

          C3454912 ===> Y  PRINTED

          C1254912 ===> N

          C0981217 ===> Y  CANCELED

          C1234123 ===> Y  NOT PRINTED

          C3456780 ===> N

          C3444480 ===> Y  NOT PRINTED


     PF5:Cancel      PF6:Quit
```
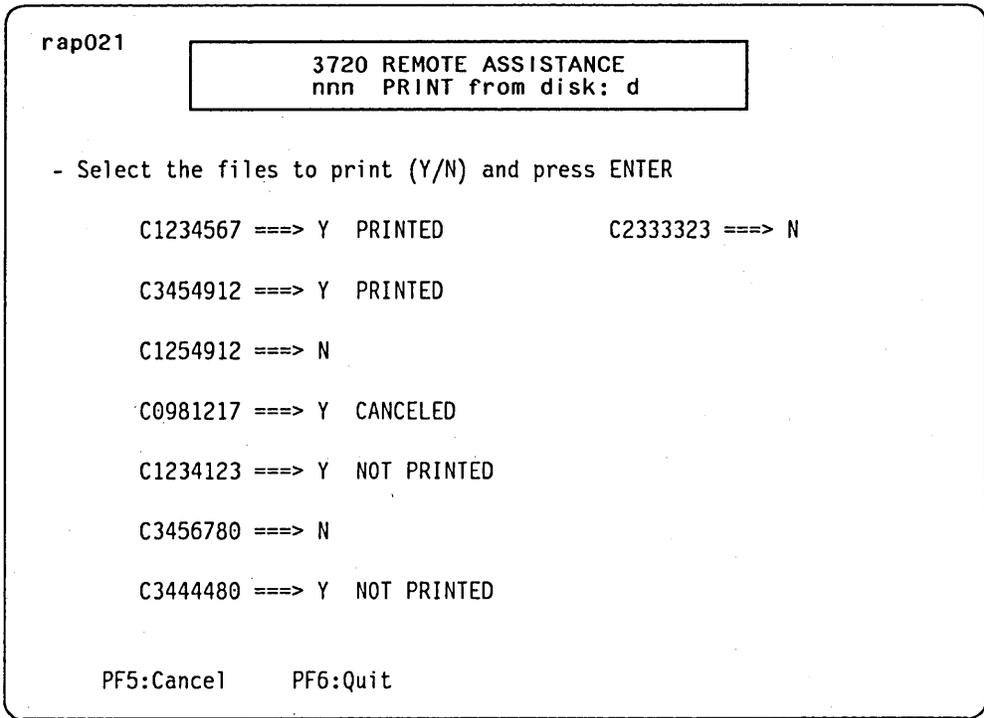
Figure A-13. Sample Panel for File Printing Execution

Printing TRSS Dumps

1. You have selected function 7 (TIC) on the **file printing selection** panel (see Figure A-11 on page A-26).

   The *TRSS Dump Selection* panel is displayed (see Figure A-14 on page A-29) with a list of all TRSS dump files transferred from MOSS.

2. You select from that panel, the TRSS dump file that you want, by entering Y next to the TRSS dump file name.

   The *TIC Dump Selection* panel is displayed (see Figure A-15 on page A-29) with a list of all TIC dumps (up to 4) that the TRSS dump file contains.

3. You select from that panel, the TIC dump that you want to print:

   • Change the N to Y. for the TIC dump to be printed.

```
 rap021
                    ┌─────────────────────────────────────┐
                    │        3720 REMOTE ASSISTANCE       │
                    │        TDP   PRINT from disk: d      │
                    └─────────────────────────────────────┘


  - SELECT THE FILES TO PRINT (Y/N) AND PRESS ENTER

            T1234567 ===> Y                    C2333323 ===> N

            T3454912 ===> N

            T1254912 ===> N

            T0981217 ===> N

            T1234123 ===> N

            T3456780 ===> N

            T3444480 ===> N


        PF5:Cancel      PF6:Quit
```

Figure   A-14. Sample Panel for TRSS Dumps Printing Selection


```
 rap021
                    ┌─────────────────────────────────────┐
                    │        3720 REMOTE ASSISTANCE       │
                    │        TRSS PRINT from disk: d       │
                    └─────────────────────────────────────┘

  - SELECT THE DESIRED TIC DUMP TO PRINT (Y/N) FROM T1234567 AND PRESS ENTER

            TRA:02 TIC:1 DATE/TIME:00/00/00 00:04:25  ===> Y

            TRA:02 TIC:2 DATE/TIME:00/00/00 00:08:29  ===> N

            TRA:02 TIC:2 DATE/TIME:00/00/00 00:10:39  ===> N




        PF5:Cancel      PF6:Quit
```

Figure   A-15. Sample Panel for TIC Dump Printing Execution

Remote Application Description

The file transfer is made up of one application in the MOSS and one application in the PC.

Once file transfer applications are ready on both sides, they communicate using their own message formats. This protocol has been implemented in this application to improve transfer reliability and data integrity.

Being the master in the file transfer function, the PC application requests from the operator all the information it needs. All the operator inputs are checked for validity (such as duplicate or invalid file names).

MOSS File Transfer Application

The MOSS application is transient; it is invoked as an ordinary MOSS function by the *operator control task* when it receives a file transfer request from the IBM PC.

The MOSS application receives from the PC all information (file ID, Logical Record Number, direction of transfer) about the files that it must send or receive.

MOSS File Transfer Activation

The file transfer application is activated as soon as it has been loaded by the operator control.

Once activated the application sets the MOSS to *file transfer* mode. This mode, which enables the application to transmit and receive data from the PC without any operator control interference, is reset only by a TERMINATE message received from the MOSS or by the file transfer application error recovery after an unrecoverable error.

MOSS File Transfer Termination

When the MOSS application recognizes the TERMINATE FILE TRANSFER message coming from the PC, it closes all the opened files, resets the *file transfer* mode, and returns control to the *operator control task*, which has to wait for the next operator entry.

PC File Transfer Application

In the PC, the file transfer application runs under the control of the PC Disk Operating System (DOS), using its facilities to send and receive data to/from the MOSS over the Asynchronous Communication adapter.

PC File Transfer Activation

The PC file transfer application can be activated only if the PC is connected to the 3720. Running the 3101 Emulation Program, the operator can press ALT + PF10, then select the QUIT option to return to DOS. When in DOS, the operator loads the File Transfer application using the normal DOS command d:RAXFER.

Note: *d* is the address of PC disk/diskette drive at which the file transfer programs are located.

First, the application checks if the link with the 3720 is correct, then it tells the 3720 to load its own file transfer application, and the PC file transfer application waits for the 3720 Extended Status. After receiving it, the **file transfer selection** panel is displayed. Then the PC application waits for a file transfer specification from the operator.

PC File Transfer Termination

When the operator presses *PF6* to quit the file transfer mode, the PC application sends a TERMINATE FILE TRANSFER message to the MOSS. When the PC receives the Terminate Acknowledgment from the MOSS, it returns to DOS.

Data Transfer

To send data to the PC the MOSS file transfer application proceeds in the same way as it would to display the same information on the MOSS console. This path implies that all the transferred data is, before being sent over the line, translated into 7-bit ASCII characters by the Console Control Code. This operation will double the data length.

All the data messages received by the PC are coded in 7-bit ASCII notation. In order to save space on the PC diskette, the IBM-PC file transfer application translates all this data into its initial 8 bits/byte form.

Error Recovery

There are two error recovery levels:

1. All the hardware or communication interface errors detected by the DOS Communication Support routines are normally recovered by the DOS recovery routines.

2. Logical errors (protocol errors) are treated by the File Transfer application routines in the following manner:

   Each time a message or a protocol character is sent over the line, a 3-second response time-out is started. If this time-out comes up, the last operation is restarted nine times if necessary.

   If a checksum or a message numbering error is detected by the receiver, a NAK is returned to the transmitter and the transmitter must again send the last message transmitted. This operation can be restarted up to nine times.

   In all cases, if after nine retries the in-process operation still fails, the transfer attempt stops on both sides and the operator is informed through an error message. The application then waits for an operator action.

Data Transparency

All the data messages transferred over the line are in a displayed format. ASCII notation used to transfer the data allows using some not-displayed ASCII characters for protocol sequences.

This notation allows transmissions without interference between data files and protocol sequences.

Data Integrity

Data integrity will be preserved by the transfer protocol which is much more efficient than the normal data validity checking based only on both side parity checking.

The base unit for a data file transfer is a MOSS/PC diskette sector length (512 bytes). All data transfers must be justified on this length unit.

To prevent line problems on very large data transfer and to improve retry flexibility and efficiency, the data message length is fixed at 64 data bytes plus the control characters.

A transferred block length being 512 bytes, there will be eight data messages for a block transfer.

MOSS/PC Interface

General Information About the Protocol

Data is transferred over the line by blocks of 512 bytes; a whole data block is transferred using eight data messages of 64 bytes each.

The receiver is always informed of a complete data block transfer by receiving a special control character (EOB or EOT if the block is the last one of the file).

A status message response instead of an ACK looks like an EOT for the current transfer. This means that there will be no more data message exchange for the file in error.

After an EOB, an EOT, or a status message, whichever the receiver or transmitter, the PC application must always wait for a 'NACK' coming from the MOSS to signal that it is again ready to receive a request from the PC.

All the NACKs between a request file transfer specification and an 'EOB', 'EOT', or a status message must be acknowledged.

All the messages and protocol characters sent over the line are always acknowledged by the receiver, either by a control character or by a message (data or status). This rule has four exceptions:

- The NACK sent by the MOSS, at the beginning of a session or after an EOB, an EOT or a status message, to indicate it is ready to receive, may normally stay without answer.

- The NACK sent by the MOSS, every 30 seconds to keep the line.

- The ACK sent to acknowledge an EOB, an EOT or a status message received from the PC.

- The ACK sent to acknowledge a 'hard stop' status message.

Each time the PC sends a message or a control character over the line, a three-second response time-out counter is started (except for the *ACKs* described above). When the time-out elapses, the PC application retries up to nine times to send the error control character or message.

Protocol Characters

The file transfer protocol uses the following special characters to control the transfer sequences.

SOH Start of header (ASCII 01). This control character begins all transferred messages.

ACK Positive acknowledge (ASCII 06). This control character is used to tell the transmitter that the transmitted information has been received and can be considered as valid (but only from the transfer point of view). It is not a data validity acknowledge.

NACK Negative acknowledge (ASCII 21). Means that the transmitted information has been received but is not valid after a checksum compare. Also used by the receiver to indicate it is ready to receive.

EOB End of block (ASCII 23). Used to tell the receiver that there are no more messages to transmit for this block.

EOT End of transmission (ASCII 04). Used to tell the receiver that there are no more messages or blocks to transmit for this file.

ESCAPE Message control character (ASCII 27). Used to communicate with the operator control.

PC Diskette File Sizing

All the files being transferred are justified on sector boundaries. 3720 disk sectors and PC diskette sectors are each 512 bytes long. One PC diskette of 320K bytes has 640 sectors each 512 bytes long. The space required on the PC diskette is:

- 3 sectors for the CDF
- 1 sectors for the MLT
- 28 sectors for the PCH
- 54 sectors for the MCF
- 26 sectors for the BER
- 128 sectors maximum for the SCANNER dump
- 516 sectors maximum for the MOSS dump

Note: For MOSS and Scanner Dump, only the necessary number of sectors corresponding to the dump size are allocated.

File Management

A Remote Assistance dedicated sub-directory entry will be created in the root-directory of the PC disk/diskette on which remote assistance files are to be filed.

The *File Transfer* application will check if the *Free Space* available on the PC disk/diskette is sufficient to contain all the files to be saved on it. It will also control the file name validity and will prompt the operator for each duplicated name. In the case of duplicate names, the operator can:

- Change the name of the file being transferred.

- Replace the file on the PC disk/diskette with the file being received.

Remote Assistance Application Messages

This section lists all information, warning, and error messages that can be displayed by the Remote Assistance applications.

001 - File transfer canceled on 3720 request

002 - Inactive for 15 minutes: link released

003 - Invalid file transfer option

004 - Invalid input: Enter Y or N

005 - Invalid file name
Explanation: File name does not respect DOS 2.0 file naming conventions.

006 - Invalid disk/diskette address
Explanation: A PC disk/diskette address other than A, B, C, or D has been specified.

007 - PC disk/diskette Error: The open command failed

008 - Link with 3720 down
Explanation: The link with the 3720 is down: The link was never established or has dropped.
User Response: Press PF9 to return to DOS and load 3101 emulator to reinitiate the link.

009 - Invalid file selection: Enter 1 to 6

010 - Address must be hexadecimal

011 - Address must be within boundaries
Explanation: For MOSS dump, valid address boundaries are 00400/7FFFF. For SCANNER dump, valid address boundaries are 00000/1FFFF.

012 - End address must be Greater than start address

013 - Address must not overlap
Explanation: Dump parts must be specified in ascending order. Dump parts must not overlap. User Response: Re-enter dump part boundaries in order to have dump parts in ascending order, or re-enter dump part boundaries in order to suppress part overlap.

014 - Undefined PF key

015 - Internal program error
Explanation: A non-recoverable error occurred during the process. User Response: Return to DOS and restart the procedure. If the error persists, contact the appropriate service representative.

016 - No such file on selected disk/diskette
Explanation: The file type specified is not found on this PC disk/diskette. User Response: Verify your "FILE TYPE" or PC disk/diskette "ADDRESS" or change your diskette.

017 - File name already exists: Press ENTER to confirm
Explanation: File name already exist on the specified PC disk/diskette. User Response: To confirm this file name press ENTER; in this case the previous file will be canceled; or change the file name.

018 - Disk/diskette error: close command failed,
current file is deleted

019 - XXX.X kbytes of data already transferred

020 - Printer not ready: start it and press ENTER

021 - Out of paper: load paper and press ENTER

022 - Disk drive x Read error

023 - Disk drive x Write error
User Response: call the PC service representative.

024 - Unable to load file transfer
        User Response: Check the 3101 emulator or terminate any active MOSS function.

025 - MOSS dump file empty
        User Response: Enter a new selection or return to 3101 emulator.

026 - Scanner dump file empty
        User Response: Enter a new selection or return to 3101 emulator.

027 - 3720 disk error
        User Response: For CE: return to 3101 for investigation.

028 - No MCF file found on the selected disk/diskette
        User Response: Change the selected PC disk/diskette address and re-start the command.

029 - Dump part selection must be sequential

030 - Disk drive x not ready

031 - No more space available on x disk/diskette

032 - Selected disk/diskette not configured
        Explanation: C or D address has been specified. It does not exist in the current configuration.

033 - Printer I/O error, press PF5 to cancel.

034 - EC level found on MCF file does not match the machine EC level
        User Response: Check the list of MCF files available on the PC disk/diskette.

035 - Permanent data error, leave current session.

050 - TRSS dump file empty
        User Response: Enter a new selection or return to 3101 emulator.

Appendix B. Messages and Alarms

Messages

This section describes the messages displayed on the operator console. **Only messages that require more explanation or a specific user action will be listed in this appendix.**

Messages which are displayed when running customer-oriented functions such as *Control Program procedures* or *programmable line speed*, are fully documented in the *3720 Communication Controller, Problem Determination*, SY33-0086 (PD) or in the *3720 Communication Controller, Extended Services*, SY33-0066 (ES).

The messages in the table below are listed in **alphabetical order**

Action: Retry and perform all necessary actions, such as re-IML or DUMP request, before calling the software or hardware support.

ALTERNATE TRACK ASSIGNMENT MAP FULL, CHANGE DISK (Function: DF)
> User Response: See SG Chapter 10 and MIR

CABLE DOES NOT EXIST (Function: common)
> Explanation: Line not installed/not configured

CCU/MOSS ERROR: AUTO SELECT NOT DISABLED (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: AUTO SELECT NOT ENABLED (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: BT BUFFER NOT ACCESSIBLE (Function: BT)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: BT BUFFER NOT UPDATED (Function: BT)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: CA CANNOT BE SELECTED (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: CA REGISTER X'E' NOT ACCESSIBLE (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: CA REGISTERS NOT ACCESSIBLE (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: CA STATE NOT ACCESSIBLE (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: DISK FUNCTION CANNOT BE PERFORMED (Function: DF)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: FUNCTION NOT PERFORMED (Function: Common)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: INPUT X'71', X'72' REG NOT ACCES. (Function: Data exchange)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: INITIAL CA CANNOT BE RESELECTED (Function: CA)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: STEP NOT EXECUTED (Function: Control program)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: WORK REGISTERS CANNOT BE ALTERED (Function: Display/Alter)
> Explanation: Hardware error on MOSS-to-CCU interface. BER Type 01-02 is created.

CCU/MOSS ERROR: RESET CCU FUNCTION CANCELED (Function: CCU/LSSD)
> Explanation: Physical error. BER Type 01-02 is created.

CCU/MOSS ERROR: WRAP FUNCTION CANCELED (Function: Wrap)
> Explanation: Physical error. BER Type 01-02 is created.

CCU NORMAL MODE IMMEDIATE FUNCTION FAILED
> Explanation: Physical error. BER Type 01-02 is created.

CDF NOT CREATED: WRAP FUNCTION CANCELED (Function: Wrap)
> Explanation: 3720 CDF not tested.

CONTROLLER DATA UNAVAILABLE: FUNCTION CANCELED
> Explanation: Physical error during diskette access

DISK DIRECTORY CAPACITY EXCEEDED: MOSS DOWN (Function: DF)
Explanation: Too many customer files.
DISK-DISKETTE ADAPTER DOWN (Function: DF)
User Response: See SG Chapter 10 and MIR
DISK ERROR - SPEED CANNOT BE UPDATED (Function: PLS)
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK ERROR: FUNCTION CANCELED (Function: DF)
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK ERROR: MOSS DOWN (Function: DF)
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK ERROR: SAVE CANCELED (Function: DF)
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK ERROR: UNABLE TO LOAD FUNCTION MODULE
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK OR DISKETTE UNUSABLE
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISK UNUSABLE: EC NOT INITIALIZED
User Response: Disk hardware error. See SG Chapter 10 and MIR
DISKETTE ERROR: FUNCTION CANCELED: PRESS SEND (Function: DF)
User Response: See SG Chapter 10 and MIR
DISKETTE ERROR: IML CANCELED (Function: One scanner IML.)
Explanation: Scanner microcode down. User Response: See SG Chapter 10 and MIR
DISKETTE ERROR: MOSS DOWN (Function: DF)
User Response: See SG Chapter 10 and MIR
DISKETTE ERROR: SAVE CANCELED (Function: DF)
Explanation: Error during save on second diskette User Response: Restart from first diskette
DISKETTE UNUSABLE
Explanation: Diskette adapter problem User Response: IML MOSS. Call support.
DISPLAY ADDRESS MODIFIED TO xxxx (Function: TRS)
Explanation: An odd display TIC storage address was entered; the odd address is rounded down to the nearest even address.
ERROR DURING ERROR RECOVERY (Function: LID)
Explanation: Scanner cannot process MOSS command. Scanner hardware error BER type 01-05 is created. User Response: Re-IML Scanner. Call support.
ERROR IN FRONT END SCANNER PROCESSOR (Function: LID)
Explanation: Scanner cannot process MOSS command. Scanner hardware error BER type 01-05 is created. User Response: Re-IML Scanner. Call support.
ERROR IN SCANNER DURING COMMAND PROCESSING (Function: Common)
Explanation: Scanner cannot process MOSS command. Scanner hardware error BER type 01-05 is created. User Response: Re-IML Scanner. Call support.
ERROR IN SCANNER: ICC/LIC FAILED OR NOT PRESENT (Function: LID)
Explanation: Scanner cannot process MOSS command. Scanner hardware error BER type 01-05 is created. User Response: Re-IML Scanner. Call support.
EXEC CANCELED: OUTPUT X'71' REG NOT ACCESSIBLE (Function: Ctrl pgm)
Explanation: Hardware error on the CCU-to-MOSS boundary BER type 01-02 is created.
FILE CHGxxxxx NOT FOUND ON xxxx: FUNCTION CANCELED (Function: DF)
Explanation: File not on new EC diskette or not on disk
FILE CHGxxx SMALLER ON DISKETTE: FUNCTION CANCELED (Function: DF)
Explanation: Not enough space for CHGxxxxx on EC diskette
INCORRECT PASSWORD - TERMINAL DISCONNECTED (Function: Logon)
User Response: Get password and reconnect.
INVALID LCD: WRAP FUNCTION CANCELED (Function: Wrap)
Explanation: Invalid LCD transmitted by CP
IOC ERROR DURING ERROR RECOVERY (Function: Common)
Explanation: The scanner cannot process MOSS command BER type 01-05 is created.
IOC/SCANNER ERROR: FUNCTION NOT PERFORMED (Function: Common)
Explanation: Hardware error in scanner/IOC bus BER type 01-05 is created.
IOC/TRA ERROR: FUNCTION NOT PERFORMED (Function: Common)
Explanation: Hardware error in TRA/IOC bus BER type 01-07 is created. Call support.
MICROCODE DETECTED ERROR DURING COMMAND PROCESS. (Function: LID)
Explanation: Scanner microcode detected error BER type 01-05 is created. User Response: Re-IML scanner.

NO ANSWER FROM CCU CTRL PGM: WRAP FUNCT. CANCELED (Function: Wrap)
>Explanation: Check if MOSS-ONLINE and Wrap tests in Ctrl pgm BER type 01-02 is created.

NO ANSWER TO ERROR STATUS REQ DURING ERROR RECOV. (Function: LID)
>Explanation: Scanner cannot process MOSS command BER type 01-05 is created.
>User Response: Re-IPL the 3270. Call support.

PF2 REFUSED (Function: Common)
>Explanation: CCU functions selected before MOSS IML phase 2 User Response: Self-explanatory

RESET CCU FAILED
>Explanation: CCU cannot be reset because of a hardware error BER type 01-02 is created. User Response: Re-IPL the CCU. Call support.

SCANNER CONNECTION REJECTED BY CCU CTRL PGM (Function: One-scanner IML)
>Explanation: IMLed scanner not recognized by CCU control program BER type 01-05 is created.

SCANNER CYCLE STEAL TO/FROM CCU FAILED (Function: LID)
>Explanation: Incorrect cycle steal parameters BER type 01-05 is created. User Response: Re-IML scanner, re-IPL the 3270. Call support.

SCANNER HARDSTOP DURING COMMAND PROCESSING (Function: LID)
>Explanation: A scanner hardstop error is detected BER type 01-05 is created.

SELECTED TIC NOT AVAILABLE: REQUEST REJECTED (Function: TRI)
>User Response: Check CDF and control program SYSGEN.

START CCU FAILED
>Explanation: CCU cannot be started due to hardware error. BER type 01-02 is created.
>User Response: Re-IPL the CCU. Call support.

STOP CCU FAILED
>Explanation: CCU cannot be stopped due to a hardware error BER type 01-02 is created. User Response: Check CDF. Call support.

TRA SELECTED IS NOT INSTALLED (Function: TRI)
>User Response: Check CDF.

UNAUTHORIZED ACCESS - TERMINAL DISCONNECTED (Function: Logon)
>Explanation: Password deactivated User Response: Contact password management personnel.

UNABLE TO SET TIC STORAGE BOUNDARY
>Explanation: The TIC did not correctly set the requested TIC 2Kb storage boundary. BER 01-07 is created.

Alarms

Alarms provide an automatic first level of problem determination. Most alarms are given a **reference code**, which appears at the rightmost position of the alarm. This reference code is meant to help service personnel identify the problem.

For most alarms, related messages are sent to the NetView/NPDA console or to the host console.

How to Display an Alarm

Once generated, the alarm is automatically displayed and an audible signal is heard if the console is logged on.

When an alarm is already displayed, you are informed that another one is waiting for display by the blinking of the word ALARM. Press PF3 to display it. Up to five alarms may be waiting for display. If a sixth one is generated, it is stacked but the oldest one is erased.

Pressing PF3 when no alarms are waiting clears the Alarm area from the screen.

Warning: Before pressing PF3 to display the next alarm or to clear the displayed alarm, note the reference code. If you forget to do so, select the Event Log function to display all the alarms (see Chapter 2, "Analyzing BERs (Box Event Records)" on page 2-1).

No	Description	Action

A0	MOSS IML EXCEPTION xxx yyy zzz
	xxx=FE4: CDF not initialized on disk
	    =FE5: CDF not accessible on disk
	    =FE6: Unidentified IPL or MOSS IML request
	    =FE7: MOSS-to-Control program communication time out
	yyy=FEB: Bad Function Select switch position
	    =FED: MOSS IML complete with non-fatal errors
	if zzz=FEC: Serial number not initialized
		Refcode
		Refcode
		Refcode
		Refcode
		Self-explanatory
		None

A2	MOSS RECOVERABLE ERROR: MOSS	Dump MOSS
A3	MOSS DISKETTE DOWN	Hex code
A4	MOSS DISKETTE ERROR: DISKETTE IS DEFECTIVE	Hex code
A6	MOSS OFFLINE: MAINTENANCE MODE (information)	None
A7	HARDWARE ERROR: 3720 RE-IPL IN PROGRESS	If problem persists, use Refcode
A8	SOFTWARE ERROR: 3720 RE-IPL IN PROGRESS	
A9	HARDWARE ERROR: CHANNEL ADAPTER x DOWN	
A10	GENERAL IPL CHECK (hardware)	See MSA field w Retry: hex code, then Refcode
A15	LINE ADAPTER xxx DOWN (hardware) Refcode=B1B1xxxx or B1A2xxxx Refcode is notB1B1xxxx or B1A2xxxx	Reactivate line, Line problem Refcode
A16	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML IN PROGRESS (hardware error)	None
A17	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML IN PROGRESS (software error)	None
A18	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML SUCCESSFUL (hardware error)	None
A19	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML SUCCESSFUL (software error)	Dump scanner
A20	SCANNER xx ERROR (LINES xxx-yyy) (hardware error)	Refcode
A21	SCANNER xx ERROR (LINES xxx-yyy) (software error)	If problem persists, use Refcode
A22	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML FAILED (hardware error)	Refcode
A23	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML FAILED (software error)	Refcode
A24	SCANNER xx ERROR (LINES xxx-yyy) - RE-IML FAILED (scanner and MOSS error)	Refcode
A25	REMOTE CONSOLE ERROR: LINE/MODEMS/CONSOLE/MOSS	Logon again
A26	MOSS REMOTE CONSOLE ERROR: CONSOLE	Logon again
A28	TRM 02 DOWN (TIC 1-2) (TRM or control program error)	Refcode
A29	TIC x DOWN ON TRM 02 (TIC, TRM or control program error)	Refcode
A30	MOSS DISK DOWN IPL/DUMP NOT POSSIBLE FROM/ON DISK	Refcode
A31	3720 RE-IPL SUCCESSFUL - DUMP AVAILABLE ON DISK (NCP)	Refcode
A34	3720 RE-IPL FAILED - DUMP AVAILABLE ON DISK (control program)	Refcode
A35	3720 RE-IPL FAILED - DUMP NOT AVAILABLE ON DISK (control program)	Refcode

Figure B-1. Alarms

List of Abbreviations

Abend	Abnormal end (acronym)
ac	Alternating Current
AC	1. Address Control. 2. Address Compare
ACF	Advanced Communication Function (ACF/VTAM, ACF/TCAM, ACF/NCP)
AIO	Adapter Initiated Operation, Working in cycle steal mode. Contrast with PIO
ASCII	American National Standard Code for Information Interchange
BASB	Basic board
BCC	Block Check Character. Usually it designates the LRC or the CRC character
BCCW	Bit Clock Control Word
BER	Box Event Record
bps	bits per second
BSC	Binary Synchronous Communication
CA	Channel Adapter
CAB	Channel Adapter Base
CADR	Channel Adapter Driver Receiver
CCITT	Comite Consultatif International Telegraphe et Telephone
CCU	Central Control Unit
CDF	Configuration Data File
CE	Customer Engineering (WTC Term for FE)
CHIN	Channel Interface
CLDP	Controller Loader and Dump Program
CP	1. Communication Processor. 2. Control program
CRC	Cyclic Redundancy Check Character
CS	1. Communication Scanner. 2. Cycle Steal architecture.
CSP	Communication scanner storage
CSS	1. Control Subsystem . 2. Control Store Select
CSU	Customer set up
CTS	Clear To Send
DCE	Data Circuit - Terminating Equipment (modem, for example)
DCF	Diagnostic control facility
DCM	Diagnostic control monitor
DF	Disk Function (MSS command)
DFA	Disk File Adapter
Diag	Diagnostic or diagnostic guide (manual)
DLC	Data Link Control (SNA)
DLE	Data Link Escape Character (BSC)
DOS	Disk Operating System (PC)
DTE	Data Terminal Equipment
EBCDIC	Extended Binary Coded decimal Interchange Code
EC	Engineering change
ECC	Error Checking and Correction (Code or card)
EIA	1. Electronic Industries Association. 2. Interface card
Enbl	Enable (on the control panel)
ENQ	Enquiry Character (BSC)
EOB	End of Block, Circle D in Start-Stop protocol
EOT	End of transmission (BSC), (End of transmission in Start-Stop is denoted by Circle C)
EP	Emulation Program program.

ES	Extended Services (customer manual)
ESC	1.Emulation Sub Channel. 2. Escape Character
ETB	End of transmission block character (BSC)
ETX	End of Text Character (BSC)
EXB	Extension Board
FDX	Duplex
FE	Field Engineering
FES	Front End Scanner
FRU	Field Replaceable Unit
HDX	Half Duplex
HCS	Hardware Central Services
IAR	Instruction Address Register
ICC	Internal Clock Control
ID	Identifier
IFT	Internal Function Test
IML	Initial Microprogram Load
IOC	Input Output Control
IOH	Adapter Input Output (instruction)
IOHI	Adapter Input Output Immediate (instruction)
IPL	Initial Program Load
ITB	Intermediate Text Block (BSC)
LAB	Line Attachment Base (Use BASB or EXB)
LDF	Line Description File (MOSS function)
LED	Light Emitting Diode
LIC	Line Interface Coupler (Card)
LICn	Line Interface Coupler (Card) type 1, 2, 3, 4A, or 4B
LID	1. Line Interface Display (MOSS function) 2. Line IDentifier
LKP	Link IPL Port (MOSS function)
LOQ	Link Test Requestor (MOSS function)
LOS	Link Test Responder (MOSS function)
LS	Local Store
LSAR	Local Store Address Register
LSSD	Level Scan Sensitive Design
LT	Link Test (MOSS function)
LTH	Line Threshold (MOSS function)
MAC	MOSS adapter card
MAP	Maintenance Analysis Procedure
MCF	Microcode Fix
MES	Miscellaneous Equipment Specification
MIOC	Moss Input Output Control
MIP	Maintenance Information Procedures (manual)
MIR	Maintenance Information Reference (manual)
MIT	MOSS Interface Table (also called MPT)
MLC	Machine Level Control
MLT	Machine Level Table
MOSS	Maintenance and Operator Subsystem
MS	Main Storage
MSA	Machine Status Area
MSD	Machine Status Display
NCP	Network Control Program
NPDA	Network Problem Determination Application (CNM)
NPO	Network Power Off

NSC	Native Sub Channel (Use Local Sub Channel)
NTRI	NCP Token-ring Interconnect
NTT	Nippon Telephone and Telegraph Public Corporation in Japan
OEM	Original Equipment Manufacturer
OLTS	Online Test System
OPG	Operator Guide3 (manual)
PAF	Panel Access Function (MOSS Function)
PC	Personal Computer
PCA	Programmed Communication Adapter
PD	Problem Determination (customer manual)
PE	Product Engineer
PEP	Partitioned Emulation Programming
PF	Program function (keys)
PGM	Programs (acronym)
PIO	1. Programmed Input Output (instruction). 2. Program Initiated Operation (contrast with AIO)
PS	1. Port Swap (MOSS function). 2. Power Supply
PST CE	Product trained support CE
PTT	Post Telegraph and Telephone agency
PTCE	Product trained CE
PUC	Processor Unit Card
RAC	Repair Action Code
RAM	Random Access Memory < D >. Use Main Storage
RAS	The name given to a function that defines the following aspects of a product: Reliability, Availability, and Serviceability
RBAM	Register/Block Access Method
RCV	Receive
RDV	Redrive
ROS	Read Only Storage

RSF	Remote Support Facility (RETAIN)
RTS	Request to send
SALT	Stand Alone Link Tests
SAR	Storage Address Register
SCB	System Control Block
SDLC	Synchronous Data Link Control
SG	Service Guide (this manual)
SIA	System Input Area (Screen area)
SIT	Scanner Interface Trace
SNA	System Network Architecture
SS	1. Start-Stop
SSB	System Status Block
STX	The start of text character. (BSC)
SU	Set up (manual). See CSU
SYN	Synchronous idle character (BSC)
TCAM	Telecommunications access method
TPS	Two Processor Switch
TRI	Token-ring interconnect
TRM	Token-ring multiplexor
TRSS	Token-ring Subsystem
TSS	Transmission Subsystem
U	
URSF	Universal Remote Support Facility (RETAIN)
V.24/25/35	CCITT Recommendation on transmission interfaces
VM	Virtual Machine
VTAM	Virtual Telecommunication Access Method
XREG	eXternal REGister
X.21	CCITT Recommendation on transmission interface

Glossary

A

adapter-initiated operation (AIO). A transfer of up to 256 bytes between an adapter (channel or scanner) and the CCU storage. The transfer is initiated by an IOH/IOHI instruction, and is performed in cycle stealing via the IOC bus.

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.

B

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 error record (BER). Information about an error detected by the controller. It is recorded on the disk and can be displayed on the operator console for error analysis.

C

central control unit (CCU). 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 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.

communication controller. A communication control unit that is controlled by a program stored and executed in the unit.

Communication Network Management (CNM). An IBM product program that assists the user in identifying network problems from a control point. It is stored in the host processor and comprises the network problem determination application (NPDA) and the network communication control facility (NCCF).

communication scanner. See 'scanner'.

communication scanner processor (CSP). The processor of a scanner.

configuration data file (CDF). A file of the diskette that contains a description of all the hardware features (presence, type, address, and characteristics).

control panel. Contains switches and indicators for the use of the customer's operator and service personnel.

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). An individual who provides field services for IBM products.

D

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 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. In the 3720/3721, the DTE function is achieved by the FES with the associated LIC.

direct attachment. The attachment of a DTE to the controller without a DCE.

duplex transmission. Data transmission in both directions at the same time. Contrast with 'half duplex.'

E

emulation program (EP). The function of a network control program to perform activities equivalent to those 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 statistics of machine malfunctions.

F

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.

H

half-duplex. Data transmission in either direction, one direction at a time. Contrast with 'duplex.'

Note: The functional unit using the data circuit determines the choice of direction.

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'

I

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 3720 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 circuit (ICC). An optional circuit that provides, through the LICs, the clock control to the DCEs or DTEs that need it.

internal function test (IFT). A set of diagnostic programs designed and organized to detect and isolate a malfunction.

L

LID. Line IDentifier. Value returned to NCP as the result of a Get Line ID command. Identifies the TRM sending a Level 1 interrupt.

line. See 'transmission line'.

line interface coupler (LIC). A circuit that attaches up to four transmission cables to the controller.

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.

longitudinal redundancy check (LRC). A system of error checking performed at the receiving station after a block check character has been accumulated.

M

maintenance and operator subsystem (MOSS). The part of the controller that provides operating and servicing facilities to the customer's operator and customer engineer.

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.

MIT. MOSS Interface Table. A block of pointer data giving CCU addresses of NCP blocks of a particular TIC. (Also called MPT - Moss Pointer Table.)

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.

multiplexing. The division of a transmission facility into two or more channels by allotting the common channel to several different channels, one at a time.

multipoint connection. A connection established among more than two data stations for data transmission. The connection may include switching facilities.

N

network. See 'user application network'.

Network Control Program (NCP). A program, generated by the user from a library of IBM-supplied modules, that controls the operation of a communication controller.

nonswitched line. A permanent dedicated transmission line that connects two or more DTEs. The connection can be point-to-point or multipoint. The line can be leased or private. Contrast with 'switched line.'

O

NTRI. NCP Token-Ring Interconnect.

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).

operator console. Used to operate and service the 3720 through the MOSS.

P

partitioned emulation programming (PEP). A feature of NCP that permits some lines to operate in network control mode while simultaneously operating others in emulation mode.

point-to-point connection. A connection established between two data stations for data transmission. The connection may include switching facilities.

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 the Post Office Corporation in the United Kingdom, the Deutsche Bundespost in Germany, and the 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.

R

RBAM. Register/Block Access Method. A group of subroutines which permit simplified access to and display of TIC or TRM registers and Isthmus Blocks.

redrive card. A card that repowers the IOC bus signals at board entry. It also has logical and checking functions.

reliability. The ability of a functional unit to perform its intended function under stated conditions, for a stated period of time.

S

SCB. System Contol Block. With System Status Block (SSB). Two control blocks located in CCU Storage used for communication between NTRI and a TIC. There is one set for each TIC.

scanner. A device that scans and controls the transmission lines. It is composed of one communication scanner processor (CSP) and one front-end scanner (FES).

SSB. System Status Block, With System Control Block (SCB). Two control blocks located in CCU Storage used for communication between NTRI and a TIC. There is one set for each TIC.

start-stop. A data transmission system in which each character is preceded by a start signal and is followed by a stop signal.

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 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.

T

TIC. Token-ring Interface Coupler (card). The circuit that attaches a token-ring cable to the controller.

timeout. The time interval allotted for certain operations to occur.

Token-Ring. IBM Local Area Network.

Token-Ring. An information transport system that provides very high speed connection between users within a single building complex through implementation of common:

- Cabling system (called the ring)
- Communication adapter
- Access protocol

TRA Number (ID). Number identifying a TRA by its physical position in the ISOLA. The only possible value for ISOLA is 2.

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 a 'line.'

transmission subsystem (TSS). The part of the controller that controls the data transfers over the transmission interface.

TRI. Token-Ring Interconnect. A TRSS Function which is available under the Line Function option of the Customer Menu of MOSS.

TRM. Token-Ring Multiplexer card. The processor of a token-ring subsystem.

TRSS. Token-Ring Subsystem. That part of the controller that controls the data transfer over the token-ring interface. The token-ring adapter of the 3720.

two-processor switch (TPS). A feature of the channel adapter that connects a second channel to the same adapter.

V

vertical redundancy check (VRC). An odd parity check performed on each character of a block as the block is received.

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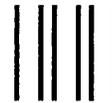
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