Critical Release Notice

Publication number: 297-1001-590
Publication release: Standard 04.14

The content of this customer NTP supports the SN06 (DMS) and ISN06 (TDM) software releases.

Bookmarks used in this NTP highlight the changes between the baseline NTP and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the baseline NTP remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to new or modified content for the baseline NTP that is valid through the current release.

Red: Applies to new or modified content for NA017/ISN04 (TDM) that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS)/ISN05 (TDM) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS)/ISN06 (TDM) that is valid through the current release.

Attention!
Adobe® Acrobat® Reader™ 5.0 is required to view bookmarks in color.

Publication History

March 2004

Standard release 04.14 for software release SN06 (DMS) and ISN06 (TDM).

Change of phone number from 1-800-684-2273 to 1-877-662-5669, Option 4 + 1.

297-1001-590

DMS-100 Family

Input/Output Devices

Maintenance Guide

BASE07 Standard 04.13 August 1999

NORTEL

NORTHERN TELECOM

DMS-100 Family

Input/Output Devices

Maintenance Guide

Publication number: 297-1001-590
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Date: August 1999

Publication history

August 1999

BASE13 Standard 04.13

- information added to Chapter 1 about IOM controller card options
- table added in Chapter 1 that lists the supported I/O devices for the IOM

May 1999

BASE07 Standard 04.12

- corrected disk drive unit information in Maintenance Overview chapter

April 1999

BASE07 Standard 04.11

- note added to the Responses for the REBOOTIOM table in Chapter 6
- replaced term ”MPCDEBUG” with term ”MONMPC” in Chapter 3

April 1999

BASE07 Standard 04.10

- added feedback from NTT to Chapter 5 and 6.

November 1998

BASE07 Standard 04.09

- corrected outdated references to NTPs in Chapter 1

August 1998

BASE07 Standard 04.08

- revisions to figures 1-5, 1-5, and 5-4
- revision of IOM information in Chapter 1

February 1998

BASE07 Standard 04.07

- updated NT2X70 card description
- changed the schedule for reformatting IOC-based disk drives in Table 2-1
- removed the TRNSL command from the IOC nonmenu commands in Chapter 6

August 1997

BASE07 Standard 04.06

Editing changes

May 1997

BASE07 Standard 04.05

Chapters 6 and 9 revised to include IOM commands, syntax, and responses.

March 1997

BASE07 Standard 04.04

Editing changes

November 1996

BASE07 Standard 04.03

Editing and Software Design review changes.

August 1996

BASE07 Standard 04.02

- editing changes
- added description of MPC908 log to chapter about logs

August 1996

BASE07 Standard 04.01

- editing changes
- added input/output module (IOM) description, logs, interface commands, and procedures to isolate and correct trouble.

November 1995

BASE06 Standard 03.01

- added description and associated commands of the MONMPC tool
- revised Maintenance overview chapter

May 1995

BASE05 Standard 02.01

- added IOC DDU information
- added information on CKEr alarm
- revised references to match current NTP numbering and titles

- revised affected chapters to incorporate PRS solutions

March 1993

BCS35 Standard 01.01 First release of this document

Contents

About this document

When to use this document

This maintenance guide describes the maintenance of the input/output devices (IOD) at the input/output controller (IOC) level of the MAP terminal. Engineering and maintenance personnel will use this guide.

How to check the version and issue of this document

Numbers (for example 01.01) indicate the version and issue of the document.

The first two digits indicate the version. When an update of the document occurs to support a new software release, the version number increases. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. When a revision and release of the document occurs in the *same* software release cycle, the issue number increases. For example, the second release of a document in the same software release cycle is 01.02.

Check the release information in *Product Documentation Directory,* 297-8991-001, to determine the version of this document that applies to the software in your office. Check the release information to determine the arrangement of documentation for your product.

References in this document

The following documents are referred to in this document:

- *Alarm and Performance Monitoring Procedures*
- *Card Replacement Procedures*
- *DMS-100 Family Commands Reference Manual,* 297-1001-822
- *DMS SuperNode and DMS SuperNode SE Computing Module Maintenance Guide*, 297-5001-548
- *Feature Description Reference Manual*
- *Hardware Description Manual Reference Manual*

- *Log Report Reference Manual*
- *Magnetic Tape Reference Manual*, 297-1001-118
- *Operational Measurements Reference Manual*
- *Recovery Procedures*
- *Routine Maintenance Procedures*
- *Translations Guide*
- *Trouble Locating and Clearing Procedures*

What precautionary messages mean

The types of precautionary messages used in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION Information needed to perform a task

ATTENTION

If you do not deprovision the inactive DS-3 ports before you install a DS-1/VT Mapper, you will affect the DS-1 traffic. DS–1 traffic will not travel through the DS-1/VT Mapper.

DANGER Possibility of injury

DANGER
Risk of electrocution
Do not open the front panel of the inverter unless you already removed fuses F1, F2, and F3. The inverter contains high-voltage lines. The high-voltage lines are active until you remove the fuses. You risk electrocution while the high-voltage lines are active.

WARNING Possibility of equipment damage

WARNING
Damage to the backplane connector pins
To avoid bending the backplane connector pins, align the card before you seat the card. Use light thumb pressure to align the card with the connectors. Use the levers on the card to seat the card into the connectors.

CAUTION Possibility of service interruption or degradation

CAUTION
Possible loss of service
Make sure that you remove the card from the inactive unit of the peripheral module before you continue. If you remove a card from the active unit, loss of subscriber service occurs.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following standards.

Input prompt (>)

An input prompt (>) indicates that the following information is a command:

```
>BSY
```

Commands and fixed parameters

Commands and fixed parameters that you enter at a MAP terminal appear in uppercase letters:

```
>BSY CTRL
```

Variables

Variables appear in lowercase letters:

>BSY CTRL ctrl_no

You must enter the letters or numbers that the variable represents. A list that follows the command string explains each variable.

Responses

Responses correspond to the MAP display. Responses appear in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.
FP 3 Busy CTRL 0: Command passed.
```

The following sample from a procedure shows the command syntax used in this document:

1 To manually busy the CTRL on the inactive plane, type

>BSY CTRL ctrl_no
and press the Enter key.

where

ctrl_no is the number of the CTRL (0 or 1)

Example of a MAP response:

```
FP 3 Busy CTRL 0: Command request has been submitted.
FP 3 Busy CTRL 0: Command passed.
```

Maintenance overview

To monitor, maintain, operate, and administer the input/output device (IOD) subsystem, operating company personnel use the IOD level and the associated sublevels at the MAP terminal.

The input/output controller (IOC) and input/output module (IOM) are the main components of the IOD subsystem. Both these components have a MAP sublevel that is accessed from the IOD level. This chapter provides an overview of IOC and IOM maintenance.

Table 1-1 shows where to find information about IOD MAP sublevels other than IOC and IOM.

Table 1-1
Information on IOD MAP sublevels

IOD sublevel	Location of information	NTP Number
Device Independent Recording Package (DIRP)	*Magnetic Tape Reference Manual*	297-1001-118
	Feature Description Manual	297-8xxx-801
	Hardware Description Manual	297-8xxx-805
	Alarm and Performance Monitoring Procedures	297-8xxx-543
	Trouble Locating and Clearing Procedures	297-8xxx-544
	Recovery Procedures	297-8xxx-545
	Routine Maintenance Procedures	297-8xxx-546
	DMS-100 Family Commands Reference Manual	297-1001-822

—continued—

Table 1-1
Information on IOD MAP sublevels (continued)

IOD sublevel	Location of information	NTP Number
Distributed Processing Peripheral (DPP)	*Distributed Processing Peripheral Recovery and Routine Maintenance Procedures*	297-1001-537
	Distributed Processing Peripheral Card Replacement Guide	297-1001-536
	Alarm and Performance Monitoring Procedures	297-8xxx-543
	DMS-100 Family Commands Reference Manual	297-1001-822
—end—		

IOC Functional description

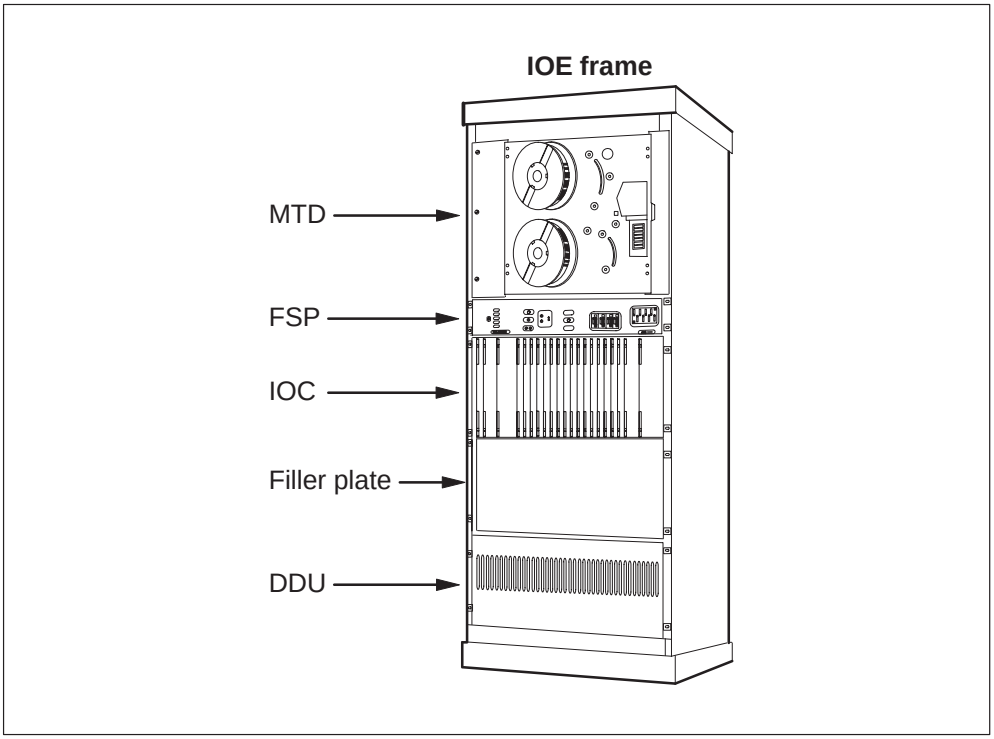
The IOC user interface provides access to commands that allow operating company personnel to use IODs to enter machine controls, perform tests, and request information.

Maintenance and administrative IODs are in an input/output equipment (IOE) frame or a cabinetized input/output equipment frame (CIOE). The following sections describe IOE frame and the IODs.

IOE frame

The IOE frame is a standard DMS frame. The frame contains a magnetic tape drive (MTD) and a frame supervisory panel (FSP). The frame also contains an IOC, and a maximum of two disk drive units (DDU). The FSP provides power, control, and alarm circuits for the frame hardware. Figure 1-1 shows the locations of I/O equipment in an IOE frame.

Figure 1-1
Input/output equipment frame



IOC

The IOC is an equipment shelf in the IOE frame (see Figure 1-1). The IOC provides an interface to the SuperNode or SuperNode SE message switch (MS) for a maximum of 36 IODs. The IOC also provides an interface to the central message controller (CMC) in an NT40 switch. The IOC shelf is part of the maintenance and administration area. For enhanced reliability, each maintenance and administration area must have at least two IOC shelves. The DMS switch can have a maximum of 12 IOCs. When you configure the switch to have a maximum of 12 IOCs, network capacity decreases as a result of hardware limits.

The device controller cards provide the interface between the IOC and the IODs. There are 26 slots in an IOC shelf. A maximum of nine of the slots can contain device controller cards. One of the slots contains the power converter for the shelf. Eleven of the slots contain filler faceplates. Two of the slots contain the IOC processor cards.

The following sections describe some of the more common maintenance and administration IODs.

Disk drive unit

A disk drive unit (DDU) is a device used to store and retrieve DMS information and data. The following are examples of DMS information and data:

- office image data
- automatic message accounting (AMA) data
- journal file (JF) data
- operational measurements (OM) data

You can transfer data to or from a tape or any other medium to the DDU that stores the data. A DMS office requires a minimum of two DDUs (DDU 0 and DDU 1).

SCSI DDU

The small computer systems interface (SCSI) DDU (NT1X55FA) is a disk drive mounted directly on an IOC card. The SCSI DDU (NT1X55FA) is also known as an IOC DDU. The SCSI DDU is based on the industry standard SCSI. The SCSI DDU provides a migration path to the Fault-Tolerant File System (FTFS) for all DDU applications.

The SCSI DDU occupies a single slot on the IOC shelf. The SCSI DDU replaces the disk drive controller card (NT1X55DA) and associated DDU in the DDU shelf.

Magnetic tape drive (MTD)

An MTD is a device that allows transfer of DMS information to a permanent memory tape. The permanent memory tape can be external to the switch. You can transport the permanent memory tape. You can use the MTD to store and retrieve the same type of information as the DDU. The MTD allows transportation of data with the magnetic tape. The MTD also serves as the backup for the DDU. A DMS office requires a minimum of one MTD.

Modem

A modem is an external device that allows computers to send and retrieve information over telephone lines.

Printer

A printer provides paper copies of reports that the system generates.

Visual display unit (VDU)

VDU is a terminal that serves as the main entry point for maintenance and administration commands made by operating company personnel.

IOC processor cards

The IOC processor cards are the main component of the IOC. IOC processor cards are also called as common control cards because they are always provisioned. The IOC processor cards consist of the I/O message processor card (NT1X62) and the I/O terminator card (NT0X67). The following sections describe the IOC processor cards.

I/O message processor card (NT1X62)

The I/O message processor card (NT1X62) contains a microprocessor that can connect serial message links to the message switch. The card can connect a parallel data bus to the separate device controller cards. The NT1X62 card controls the complete operation of the IOC.

I/O terminator card (NT0X67)

The I/O terminator card (NT0X67) contains terminating resistors for the parallel data bus of the IOC.

Power converter card (NT2X70)

The power converter card NT2X70xx supplies the voltage required by the cards in the IOC shelf. This card does not provide power redundancy. If the power converter card fails, power to the complete IOC shelf fails.

The NT2X70AF power converter is the current and preferred selection. Existing IOC shelves equipped with SCSI DDU may be equipped with power converter NT2X70AE cards, this is acceptable.

If an IOC shelf is equipped with at least one SCSI DDU (NT1X55FA), power converter cards NT2X70AA, NT2X70AB, NT2X70AC, or NT2X70AD must not be used to power the shelf.

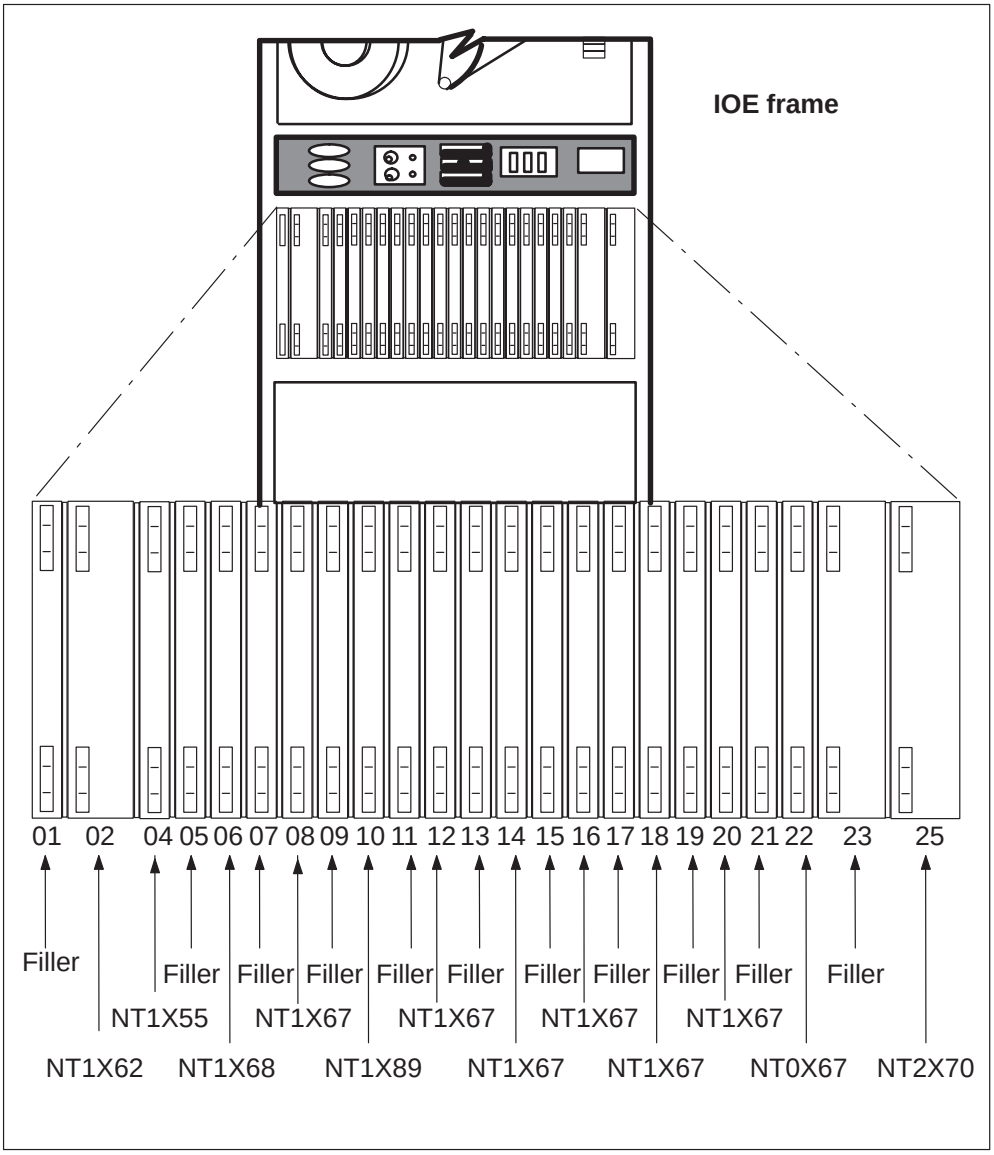
IOC device controller cards

The IOC contains device controller (DC) cards that control the activity of each IOD. The DC cards allow IODs to communicate with the rest of the DMS-100 switch. You can place device controller cards in any of the even-numbered IOC shelf slots from 4 to 20. An IOC shelf can contain a maximum of nine DC cards. Every DC card has four ports. The ports are numbered 0, 1, 2, and 3.

Device controller cards allow IODs to communicate with the DMS-100 switch. Device controller cards use the Electronic Industries Association (EIA) standard RS-232 interface or the Current Loop (CL) interface.

Figure 1-2 shows the locations of the DC cards in the IOC shelf.

Figure 1-2
Device controller cards in the IOC shelf



The following sections describe the DC cards that provide an interface with the main types of IODs:

Disk drive controller card (NT1X55)

A disk drive controller card (NT1X55) provides an interface for one DDU. The DDU must be on port 0 at the MAP display. The NT1X55 card uses ports 2 and 3 to connect two control cables. Ports 0 and 1 are not equipped. A DMS office requires two or more NT1X55s because the office requires two or more DDUs. The disk drive controller cards are in slot 4 of the

shelves in IOE frame 0 and in IOE frame 1. The NT1X55 can pass message data to and from an I/O message processor card (NT1X62). See Figure 1-3.

Magnetic tape controller card (NT1X68)

A magnetic tape controller card (NT1X68) provides an interface for one MTD. The MTD must be on port 0 at the MAP display. The NT1X68 card connects a read cable, a write cable, and a control cable. The card connects the cables with ports 1, 2 and 3 (in the order given). Port 0 is not equipped. Port 0 can pass message data to and from an I/O message processor card (NT1X62). See Figure 1-3.

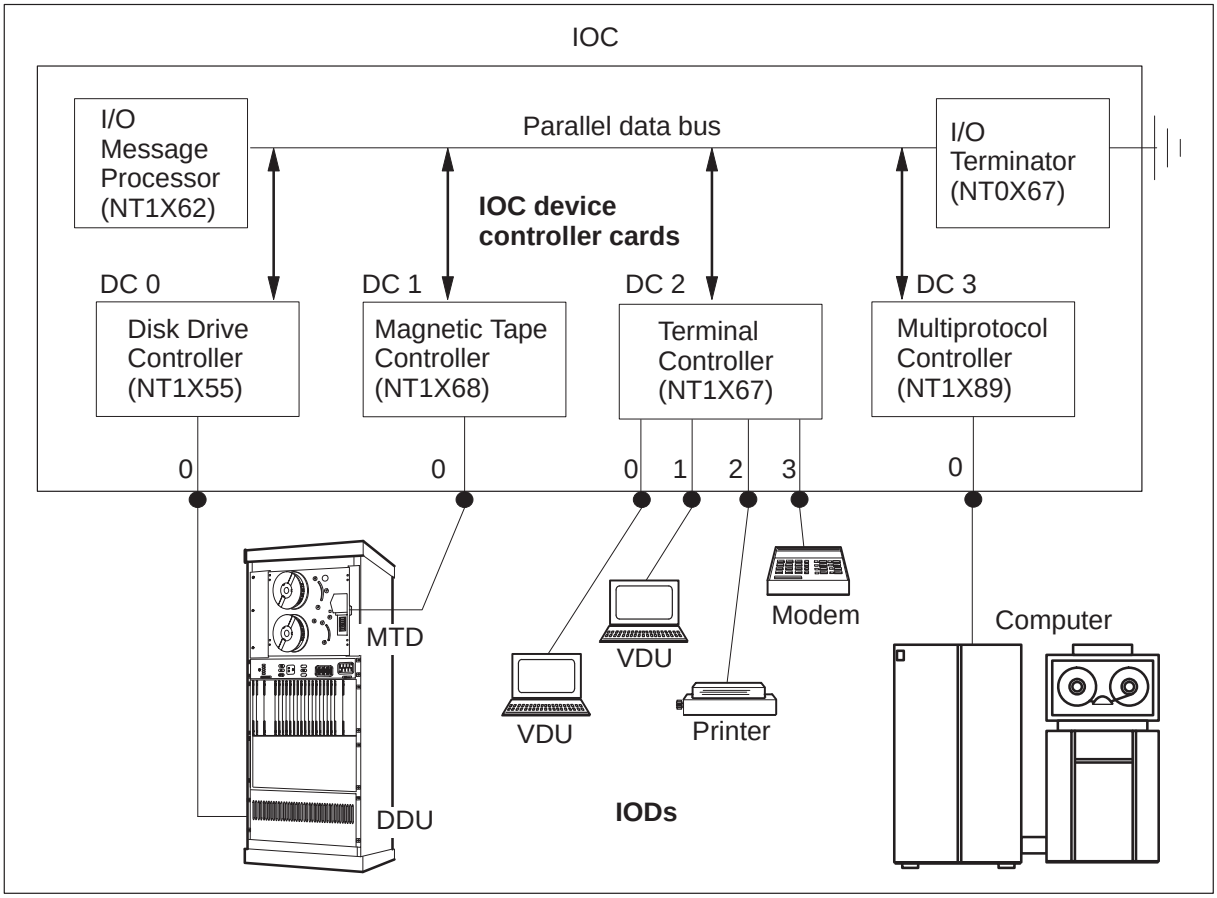
Multiprotocol controller card (NT1X89)

A multiprotocol controller (MPC) card (NT1X89) allows data communications between a DMS-100 switch and an external computer. For example, a central office (CO) billing computer can have data communications with a DMS-100 switch. The system downloads the NT1X89 protocol software from the DMS-100 CPU. The NT1X89 protocol software supports software routines for Data Packet Network (DPN) communications. See Figure 1-3.

Terminal controller card (NT1X67)

A terminal controller card (NT1X67) provides an interface for a group of four devices. One of the devices can be a VDU. The NT1X67 card also provides an interface for any group of four printers (read-only or keyboard send-receive), or modems. The number of NT1X67 cards required depends on the number of console devices equipped in the DMS switch. The NT1X67 card can pass message data to and from an I/O message processor card (NT1X62). See Figure 1-3.

Figure 1-3
IODs attached to the device controller cards



IOM Functional description

The IOM user interface provides access to commands that allow operating company personnel to use IODs to enter machine controls, perform tests, and request information.

Maintenance and administrative IODs are in the integrated services module (ISM) shelf. The following sections describe the IOM and the associated IODs. The following sections also describe the ISM shelf, integrated services module (ISME) frame, and integrated services module (CISM) cabinet.

ISM shelf

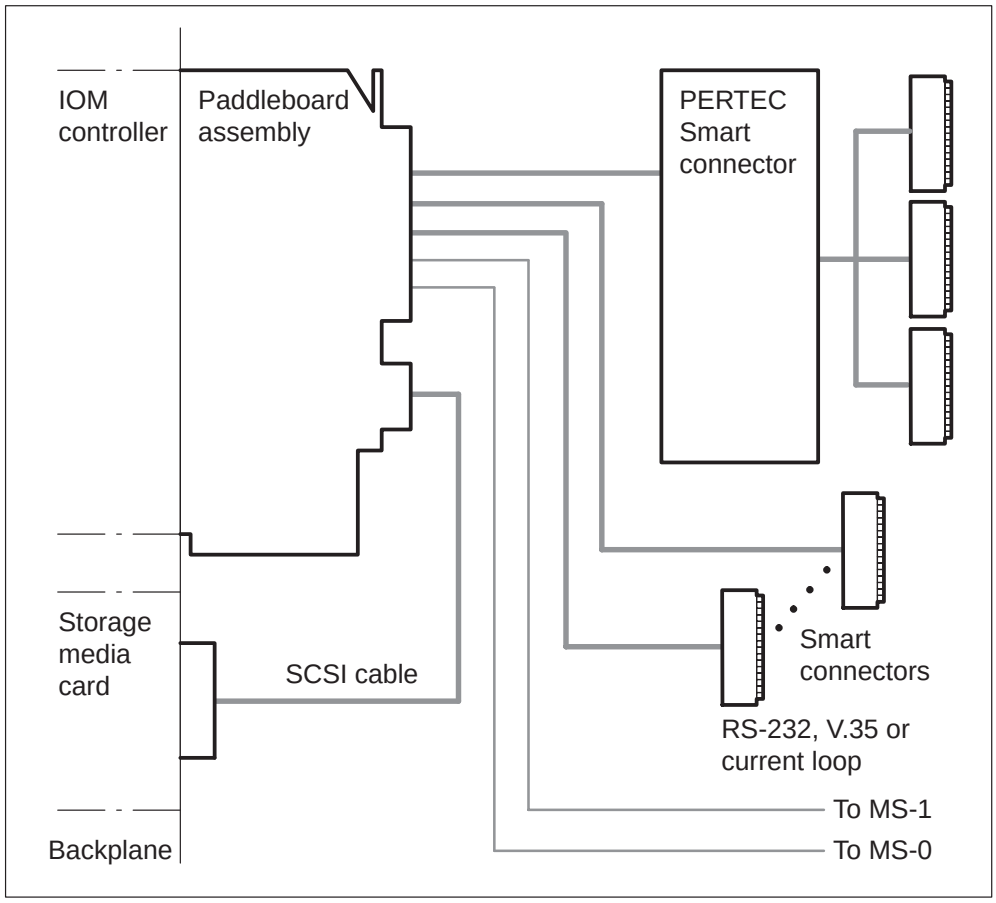
The ISM is a single shelf unit that replaces the current trunk module (TM) shelf or the maintenance trunk module (MTM) shelf. The ISM shelf is on the cabinetized metallic ISM (CISM), the frame ISM (FISM), or cabinetized metallic test access (CMTA). The CISM, FISM and CMTA contain a

maximum of four ISM shelves. The ISM shelf has the same functionality as current TM/MTM shelves. See *Hardware Description Manual*, 297–8xxx–805 for a complete description of the ISM shelf.

ISME frame

The ISME frame is a standard DMS frame that supports a maximum of four ISM shelves. The modular supervisory panel (MSP) provides power, and control for the frame hardware. Figure 1-4 contains a schematic diagram of the IOM in an ISM positioned in an ISME frame.

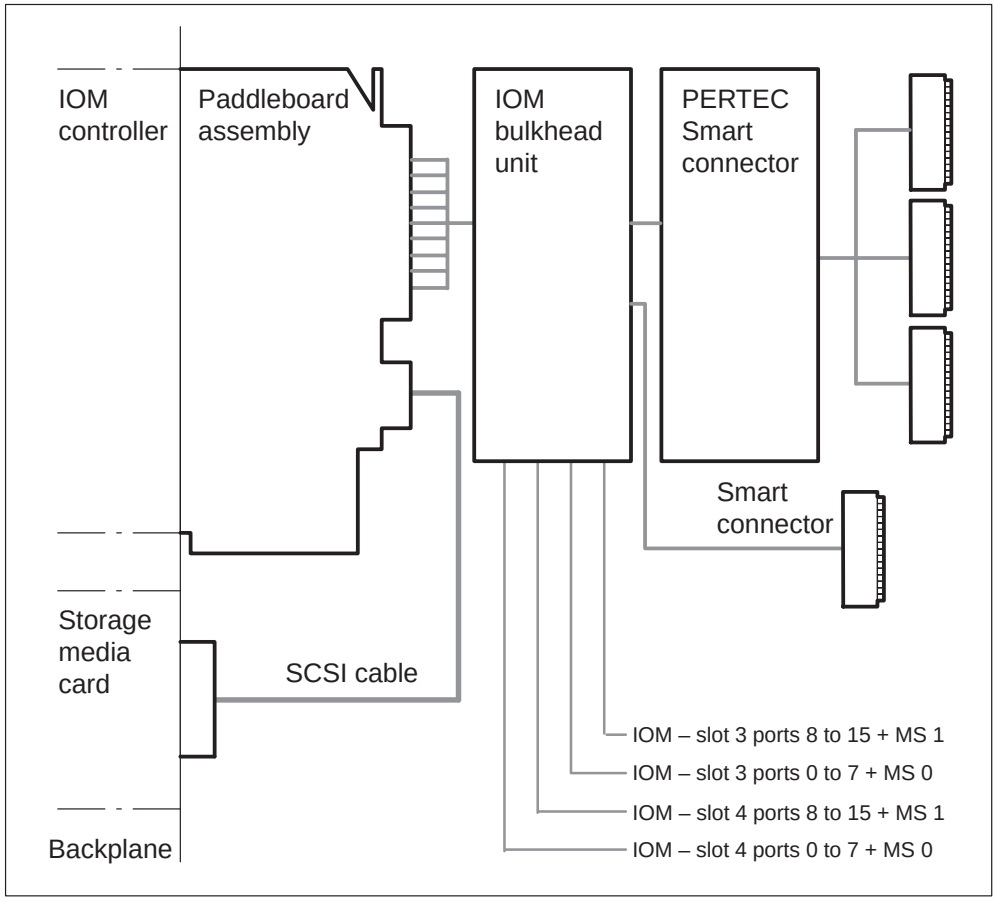
Figure 1-4
IOM equipment in the ISM (ISME frame)



CISM cabinet

The CISM cabinet is a standard DMS cabinet that supports a maximum of four ISM shelves and a cooling unit shelf. The modular supervisory panel (MSP) provides power and control for the frame hardware. Figure 1-5 shows a schematic diagram of the IOM in an ISM positioned in a CISM cabinet.

Figure 1-5
IOM equipment in the ISM (CISM cabinet)



IOM

The input/output module (IOM) is a direct replacement for the IOC shelf. The IOM provides all the functionality of the current IOC cards, with the exception of the NT6X91. The IOM with a digital audio tape (DAT) and a disk drive unit (DDU) replace the IOC and magnetic tape drive (MTD). The IOM occupies three shelf slots. If a DAT is not required, the IOM controller cards provide 9-track MTD support.

The IOM supports all peripheral equipment that a completely provisioned IOC shelf supports.

The main IOM controller card (NTFX30) is in slots 3 or 4 of the integrated services module (ISM). This card has all the communication ports and controller circuits for the storage media card. Together, the controller card and the storage media card provide all the communications and storage functions of a completely provisioned IOC shelf.

The storage media card (NTFX32AA) occupies slot 4 of the ISM shelf. The card has plug-in DAT (NTFX32CA) and DDU (NTFX32BA) units. The plug-in design gives maximum flexibility. The plug-in design does not require card replacement for upgrades and repairs. The NTFX31AA paddle board mounted on the rear of the backplane supplies power to the IOM smart connectors. The backplane supplies power to the NTFX32AA card directly.

The main controller card provides the interface between the IOM and the IODs. The card has 20 DS-30 communication ports. Sixteen ports are general purpose input/output ports. The ports provide RS-232C, V.35, current loop or PERTEC interfaces with a smart connector at the end of the cable for the protocol conversion. Communication with the message switch (MS) requires two DS-30 ports. The remaining ports are not used.

Smart connectors have a 6-pin teledapt connector on the IOM side and a 25-pin connector on the user side. The PERTEC interface connects to the IOM through a 6-pin D-type connector on the IOM side. The interface also connects to the IOM through a 50-pin connector on the user side. The PERTEC conversion box is on the MTD in a vertical position. The cables from the box connect to the MTD or DPP.

The IOM controller card (NTFX34AA) has the option of setting the clock to internal or external. The option is only available when NTFX34AA is used as an MPC RS232 port. For other synchronous configurations, the smart connector expects clock from the modem or external devices.

In external clocking modes with NTFX34AA, NTFX35AA or NTFX35BA, the smart connector expects the external device to provide the receive clock and the transmit clock to be from the same source. The receive clock and the transmit lock should also be with the same frequency and locked in phase. The same frequency and locked in phase forces the user to set the same baud rate for both transmission and reception and disallows the use of modems that have limited clocking features with IOM. This is not in alignment with the IOC operation, and the solution is to replace the modem with another modem.

The following table lists supported I/O devices for IOM and the type of its connectors.

Make/Model		CPC	Connector
Printers	DEC LA75/424 (MD)		6 pin MMJ
	DEC LA30 (Narrow Carriage)	A0660002	6 pin MMJ
	DEC LA400 (Wide Carriage)	A0660949	6 pin MMJ
Terminals/VDUs	DEC VT320/340/420 (MD)		DB25M, 6 pin MMJ
	DEC VT520	A0661478	DB25F, DB25M, 6 pin MMJ
	DEC VT525	A0385880	DB25F, DB25M, 6 pin MMJ
Modems/Data Sets			

GDC Modems	GDC, DS–6/R–1 Modem Shelf	A0602127	DB25F
	DC 202S/T	A0328522	DB25F
	DC 9600 RPA	A0378922	DB25F
	DC 596	A0351816	DB25F
	DC 596X.25	A0378945	DB25F
	DT VFAST (RS232) 28.8K	A0620530	DB25F
	DC 500G/UXR	A0632487	DB25F
	DC 500F/AXR	A0614226	DB25F, V.35
	DT 500A	A0386041	DB25F
	NMS 510/IFP	A0605210	DB25F
	NMS 510	A0640834	DB25F
	DT VFAST 28.8K V.35	A0620540	DB25F
UDS/MOTOROLA Modems	UDS RM16M Modem Shelf	A0344310	DB25F
	DC 202S/T	A0336496	DB25F
	2440	A0360824	DB25F
	DDS/MRS ADPT	A0609600	DB25F
	DDS/MR1 RS530	A0600483	DB25F
	V.3229	A0600471	DB25F
	DU 170 RS232	A0633604	DB25F
	DU 170 RS530	A0636941	DB25F

RIXON/CASE/OSI-COM	RM4200 Modem Shelf	A035525	DB25F
	DCM4202	A0355257	DB25F
	DCM4212	A0355260	DB25F
	DCM4229	A0355256	DB25F
	DCM4222	A0351638	DB25F
	DCM4232	A0352027	DB25F
	DCM4296	A0351641	DB25F
	DCM4256	A0385841	DB25F

The following sections describe the maintenance and administration IODs that correspond to the IOM.

IOM subsystem components

The IOM controller card (NTFX30AA) and the associated paddle board (NTFX31AA) are the main components of the IOM. The following sections describe the IOM cards.

IOM controller card (NTFX30)

The IOM controller card (NTFX30) contains hardware and firmware to support 16 general purpose ports. The ports include the RS-232C, V.35, current loop and PERTEC. The hardware and firmware also support two DS-30 links to the message switch (MS) and two optional external SCSI devices on the storage media card. The NTFX30 controls the emtire operation of the IOM.

IOM paddle board (NTFX31)

The IOM paddle board (NTFX31) contains the power feed circuits. The paddle board contains a maximum of 16 smart connectors and circuits. The paddle board implements a local loopback for diagnostic purposes. The paddle board is at the rear of the backplane at the slot 3 position. The paddle board has 20 connectors. Sixteen connectors supply power and the signal to the smart connector at the end of the cable. The four connectors that remain do not have power. Two of the connectors have connections to the MS and the last two are not used

IOM storage media card (NTFX32)

The IOM storage media card (NTFX32) is an optional unit for the IOM. The media card holds the 3.5 in. DDU (NTFX32BA) and/or DAT

(NTFX32CA) units. With these units installed, the media card is functionally equivalent to the IOC DDU and/or nine-track MTD. You can use the media card in all applications that require a DDU and/or nine-track MTD.

Disk drive unit (DDU)

The IOM 3.5-in. DDU (NTFX32BA) has a capacity of 2-GByte. The DDU performs the same function as the current IOC SCSI DDU. The disk drive unit is on the IOM storage media card. The DDU is based on the industry standard small computer systems interface (SCSI).

Digital audio tape unit (DAT)

The DAT unit (NTFX32CA) has a capacity of 1.3-GBytes (not compressed). The DAT unit performs the same function as the IOC MTD. The DAT unit is on the IOM storage media card.

Bulkhead splitter unit (NTFX39)

The bulkhead splitter unit (NTFX39) is a one-to-nine cable splitter unit for the cabinetized ISM.

Fault conditions (IOC and IOM)

Fault conditions in the IOC or IOM are caused by product design, product defects, or product failures during operation.

The IOM uses the same alarm indications as the IOC. The alarm clearing procedures for the IOM are different than the procedures for the IOC. The following sections explain the IOC and IOM level fault conditions.

Babbling device

The babbling device fault occurs when a device sends an excessive quantity of input/output (I/O) interrupt messages to the message switch (MS). This condition is referred to as *babbling*. The MS detects the babbling device when the quantity of I/O interrupt messages exceeds the threshold. When babbling starts, the babbling remains until maintenance actions correct it. The babbling device thresholds are set at low, medium, and critical. Removal of the IOD from service occurs for medium or critical levels. Refer to Chapter 6 for additional information on babbling device thresholds.

CKEr

A circuit error (CKEr) fault occurs when one or more I/O or IOM devices disconnects at the IOC end of the link to the IOC or IOM.

CkOS

For IOC, the CkOS (circuit out-of-service) fault occurs when there is a problem with the terminal controller card (NT1X67). When the CkOS fault

condition occursThere is no service to devices connected to the NT1X67 card .

For IOM, the CkOS fault occurs when a controller port is out of service. When a controller port is out of service, there is no service to devices connected to the NT1X67 card .

DDUOS

For IOC, the DDUOS (disk drive unit out-of-service) fault occurs when there is a problem in the disk drive controller card (NT1X55).

For IOM, the DDUOS fault occurs when one or more of the DDUs are out of service.

If the DDUOS fault occurs, you cannot record or download files to or from tape or the DDU.

IOCOS

For IOC, a problem in one of the IOC processor cards causes the IOCOS (input/output controller out-of-service) fault condition. The IOC processor cards are the I/O message processor card (NT1X62) or I/O terminator card (NT0X67).

For IOM, a problem in the IOM controller card (NTFX30) causes the IOCOS fault condition.

When the IOCOS fault condition occurs, all devices associated with the out-of-service IOC lose communication with the DMS-100 switch.

MPCOS

For IOC, the multiprotocol controller out-of-service (MPCOS) fault occurs when there is a problem in one or more multiprotocol controller cards (NT1X89). Remote terminals lose access to the DMS–100 switch for any affected cards.

For IOM, the MPCOS fault occurs when there is a problem with one or more multiprotocol ports. Remote terminals lose access to the DMS-100 switch for any affected ports.

MTDOS

For IOC, the MTDOS (magnetic tape drive out-of-service) fault condition occurs when there is a problem in the magnetic controller card (NT9X68). If the Device Independent Recording Package (DIRP) utility uses the MTD to record billing data, loss of billing data occurs. If the DIRP utility does not use the MTD, you cannot download or record files to or from tape.

For IOM, the MTDOS or DATOS (digital audio tape out-of-service) fault condition occurs when there is a problem in one or more magnetic tape drives or digital audio tapes. If the DIRP utility uses the MTD or DAT to record billing data, loss of billing data occurs. If the DIRP utility does not use MTD or DAT, you cannot download or record files to or from tape.

Automatic maintenance

The system performs self-diagnostics. The system isolates and tests an IOD component that has faults. The system attempts to return the component that has faults to service.

Manual maintenance

When the system cannot clear an alarm, perform manual actions to clear the alarm. Perform manual maintenance on a periodic schedule according to local operating company policy.

Preventive maintenance strategy

This chapter contains the procedures for maintaining an input/output device (IOD). The routine maintenance contained in these procedures allows the operating company to correct problems before the problems affect service. To ensure that IODs remain free of problems, perform routine procedures according to a schedule. For detailed information on routine maintenance of IODs, refer to *Routine Maintenance Procedures*.

Description of routine maintenance procedures

The following procedures are not all IOD maintenance procedures, but the procedures affect the operation of the IODs.

Allocating test volumes on 14-in. DDUs

CAUTION
Risk of service interruption
Contact your local technical and maintenance support group before you start this procedure.

Use this procedure to perform volume allocation tests on an installed new 14-in. disk drive unit (DDU).

Procedure: Determine which DDU is to be tested; busy the disk; allocate the test volumes; add the test volumes to the root directory; update the disk; and return the disk to service.

Allocating test volumes on 8-in., 5.25-in., or 3.5-in. DDUs

CAUTION
Risk of service interruption
Contact your local technical and maintenance support group before you start this procedure.

Use this procedure to perform volume allocation tests on a installed new 8-in., 5.25-in., or 3.5-in. disk drive unit (DDU).

Procedure: Identify the DDU that you must test. Busy the disk. Allocate the test volumes. Add the test volumes to the root directory. Update the disk. Return the disk to service.

Cleaning the magnetic tape drive

WARNING
Potential damage to the tape drive
To avoid damage to the read heads, do not spray the glass cleaner on the tape drive.

Use this procedure to clean a magnetic tape drive.

Procedure: Obtain the following cleaning materials: a clean brush with soft bristles, glass cleaner, and lint-free rags. Obtain the following cleaning fluids: isopropyl alcohol, head cleaner, Gensolve D, and Freon TF. Take the MTD out of service. Clean the tape drive. Return the MTD to service.

Cleaning the digital audio tape (DAT) drive

WARNING
Possible loss of data
Only force eject a cartridge as a last resort to recover a cartridge. Never use this method as a quick way to eject the cartridge. Use of the quick method to eject the cartridge can result in the loss of data. Use of the quick method to eject the cartridge can result in the incorrect format of the tape.

Procedure: Use a cleaning cartridge to clean the DAT drive.

Cleaning the optical sensors in a 14-in. DDU

WARNING
Risk of static damage to electronic equipment
Wear a wrist strap that connects to the wrist-strap grounding point on the frame supervisory panel to handle the DDU. The wrist strap protects the DDU against static electricity damage.

CAUTION
Loss of service
Make sure you remove the correct fuse. Removal of the wrong fuse causes a loss of service and a loss of power of MAP terminals and printers. Removal of the wrong fuses also can cause a loss of recording space for billing information.

DANGER
Risk of injury
If you touch the parts that rotate under the DDU, injury can occur.

WARNING
Damage to DDU
Make sure that the rotation of the disk stops before you attempt to lock the carriage and heads. If the disk rotation has not stopped, damage can occur to the locking mechanism.

WARNING

Recording media and all information in the disk can be destroyed

Lock the heads and the carriage. Do not pull the DDU with the heads and the carriage unlocked. If you pull the DDU with the heads and the carriage unlocked, you can destroy the recording media and all the information in the disk.

DANGER

Risk of personal injury

If you use compressed air, make sure that the pressure is not greater than 15 psi. Wear safety glasses to avoid eye injury from flying particles. Use of a low pressure also helps to prevent a fatal embolism if the nozzle presses against the skin.

WARNING

Damage to optical sensors

Do not touch the optical sensors with your hands or with a cloth. Deposits on the cloth or the acids on your fingers can damage the sensors.

CAUTION

Loss of data

If you do not correctly route the ribbon cable, signal interference can cause a loss of data.

Procedure: Obtain a flat blade screwdriver with a blade that is 1/4-in. wide. Obtain a container of oil-free compressed air or an aerosol can of Freon. Busy the DDU controller card. Turn off the motor. Make sure that the rotation of the disk drive stops. You require two persons to pull the DDU from the frame. Blow dust off the sensors. You require two persons to push the DDU back into the frame. Return the DDU to service.

Performing DDU interference and file transfer tests

Use this procedure to check the noise resistance of an installed new DDU. Use this procedure to check the ability of the DDU to send and receive files. Contact a technical and maintenance support group before you start this procedure.

Procedure: Clear the fault count registers. After 1 h, obtain the fault counts for the DDU. Busy the disk. Add the test volumes. Update the disk. Return the disk to service. Create a new file. Copy the file to the DDU. Format a blank tape. Copy the new file to the tape. Busy the disk. Update the disk. Return the disk to service.

Reformatting IOC-based disk drives

CAUTION
Loss of service
Disk reformatting is difficult. Avoid the possibilities of dangerous error. Contact the technical support group before you attempt this procedure.

CAUTION
Loss of billing data
The reformatting process erases all files. Failure to start a different device and copy files results in a loss of billing data.

CAUTION
Loss of billing data
Do not allow total billing to exceed 28 000 blocks, the maximum volume of the 9-track 9600 foot tape. Loss of billing data occurs when the blocks exceed 28 000.

CAUTION
System degradation
Use only the FORMAT command with the DISKDBG feature. Use of any other command can degrade the system.

Use this procedure to format IOC or IOM disk drives again. Perform routine reformatting to increase the reliability and life of IOC-based or IOM-based disks. This procedure does not apply to any other disk drives.

Procedure: Identify the DDU to format. Assign any parallel volumes on the drive that you will reformat (see *Routine Maintenance Procedures*). Mount a blank tape and list the files on the disk. Copy any DIRP subsystem files. Close the subsystem.

Demount the volumes on the disk. Copy the files that remain. Busy the DDU. Access the disk debug feature. Format the disk. Add the volumes to

the disk. Update the disk. Return the DDU to service. Copy the files back to the disk. Mount the volumes. Format any parallel volumes again. Update table DIRPSSYS.

Returning a card or assembly to Northern Telecom

Use this procedure to return a circuit card or an assembly to Northern Telecom for repair or replacement. An example of an assembly is a power converter. The procedure is the same for Canada and the United States. The exception between Canada and the United States is the support telephone number and address on the package.

Procedure: Complete a return label for each item. Attach a duplicate of each label to each item. Pack the items carefully. Return the items to the correct Nortel facility.

Scheduling magnetic tape drive maintenance

Set up a routine maintenance schedule according to the information in the manuals supplied with the Hewlett Packard or Cooke magnetic tape drive. Perform the 1000-h maintenance routine, described in the Hewlett Packard manual. Perform the routine every 3 months for the MTDs you used to record automatic message accounting (AMA) or call detail recording (CDR) data.

Scheduling digital audio tape (DAT) drive

Set up a routine maintenance schedule according to the number of digital data storage (DDS) cartridges used each day.

Testing the wrist strap grounding cords

DANGER
Risk of electrocution
Do not use a grounding cord that has a resistance less than 800 kΩ. A lower resistance exposes you to the risk of electrocution, if the equipment short-circuits while you wear the wrist strap.

WARNING
Risk of static damage to electronic equipment
Do not use a grounding cord that has a resistance greater than 1200 kΩ. The cord cannot conduct enough static charges to ground. The cord does not protect sensitive electronic equipment against build-ups of electrostatic discharges that can cause damage.

Use this procedure to test the resistance of wrist-strap grounding cords. The resistance must be low enough to allow static electricity to discharge from the person. If the equipment develops a short-circuit while you wear the wrist strap, the resistance must be high enough to prevent electrocution.

Procedure: Measure the resistance of the grounding cord. If the resistance is not between 800–1200 kΩ, replace the grounding cord. If the resistance is between the values, connect the wrist strap again to the grounding cord.

Routine maintenance schedules

Table 2-1 provides the schedules for the IOD routine maintenance tasks listed in the previous section.

Table 2-1
IOD routine maintenance schedules

Procedure	Interval
Allocating test volumes on 14-in. DDUs	Every time operating company personnel installs a new 14-in. DDU
Allocating test volumes on 8-in., 5.25-in., or 3.5-in. DDUs	Every time operating company personnel installs a new 8-in., 5.25-in. or 3.5-in. DDU

Table 2-1
IOD routine maintenance schedules (continued)

Procedure	Interval
Cleaning an MTD	Daily
Cleaning the optical sensors on a 14-in. DDU	Every 6 months
Cleaning a digital audio tape (DAT) drive	<1 cartridge per day – clean weekly
	2 to 3 cartridges per day – clean twice a week
	>4 cartridges per day – clean daily
Performing DDU interference and file transfer tests	Every time operating company personnel installs a new DDU
Reformatting IOC-based disk drives	Every 3 months for NT1X55DA or earlier units Every 12 months for NT1X55FA units
Returning a circuit card to Northern Telecom	As required
Scheduling magnetic tape drive maintenance	Every 6 months
	Every 3 months for Hewlett Packard MTD used to record AMA or CDR data
Testing the wrist-strap grounding cords	Every month

IOD-related logs

Logs are one of the primary resources used to monitor input/output controller (IOC) components in the input/output device (IOD) subsystem. Some logs help to isolate a problem to a single component. Other logs help to detect link problems. In addition to IOD logs, this document addresses the following logs that associate with the IOC and input/output module (IOM) subsystems:

- disk drive unit (DDU)
- multiprotocol converter (MPC)
- magnetic tape drive (MTD)

The tables in this chapter describe IOD-related logs. For details, refer to the *Log Report Reference Manual* for details. For alarm and fault clearing procedures included in the tables, refer to the following IOD documents:

- *Alarm and Performance Monitoring Procedures*
- *Trouble Locating and Clearing Procedures*
- *Routine Maintenance Procedures*
- *Card Replacement Procedures*

IOD logs

Table 3-1 lists the reasons that the IOD subsystem generates IOD logs. Table 3-1 also lists the recommended responses to the IOD logs.

Table 3-1
IOD related logs—IOD

Log name	Causes	Response
IOD101	Issue of a manual request to unequip an offline IOC.	There is no response.
IOD102	The IOD unequipped IOC taken offline.	There is no response
IOD103	You manually busied an IOC.	Return the IOC to service when maintenance is complete.
IOD104	The system busied an IOC.	Return the IOC to service when the system busy alarm clears. The system resets and returns the IOM to service in an attempt to recover the IOM.
IOD105	You or the system attempted to return an IOC to service.	If the return to service (RTS) attempt fails, perform corrective maintenance and RTS the IOC. If the RTS attempt passes, action is not required.
IOD106	Issue of a manual request to unequip an offline IOC port.	There is no response.
IOD107	Issue of a manual request to offline a manual busy IOC.	There is no response.
IOD108	You manually busied an IOC port.	Return the port to service when maintenance is complete.
IOD109	The system busied an IOC port.	Clear the alarm and return the port to service.
IOD110	You or the system made an attempt to return an IOC port to service.	If the RTS attempt fails, perform corrective maintenance and RTS the port. If the RTS attempt passes, action is not required.

—continued—

Table 3-1
IOD related logs—IOD (continued)

Log name	Causes	Response
IOD111	You manually offlined an IOC port.	There is no response.
IOD112	You manually busied an IOC port.	Return the port to service when corrective maintenance is complete.
IOD113	The system busied an IOC port.	Clear the alarm and return the port to service.
IOD114	You or the system attempted to return an IOC port to service.	If the RTS attempt fails, perform corrective maintenance and RTS the port. If the RTS attempt passes, action is not required.
IOD115	A different IOC error (for example, a problem with software is present).	If IOD115 persists, contact maintenance support.
IOD116	A different IOC error (for example, a problem with software is present).	If IOD116 persists, contact maintenance support.
IOD117	A fault occurred during a message transfer sequence between an IOC and a message switch (MS) or between an IOC and a central message controller (CMC).	Contact maintenance support.
IOD118	A fault occurred during a message transfer sequence between a device controller and an IOC, an IOC and an MS, or an IOC and a CMC.	Contact maintenance support.
IOD119	A fault occurred during a message transfer sequence between a console and an IOC, an IOC and an MS, or an IOC and a CMC.	Contact maintenance support.
IOD120	A discrepancy is present between a maximum device number (MDN) and an expected value. If the system can update the MDN, the system generates `UPDATED`. If the system cannot update the MDN, the system generates `MISMATCH`.	If the update is not successful, a mismatch occurs. Clear the fault. If the update is successful, action is not required.

—continued—

Table 3-1
IOD related logs—IOD (continued)

Log name	Causes	Response
IOD121	The input/output audit updated the route enable, MS port enable, or CMC port enable bits to agree with the MC link status.	Clear the fault.
IOD122	An IOC port test passed.	There is no response.
IOD123	An MDN test on an IOC failed.	Clear the fault.
IOD124	An IOC memory sequence test failed.	Clear the fault.
IOD125	An IOC memory pattern test failed.	Clear the fault.
IOD126	A register test for the IOC clock status failed.	Clear the fault.
IOD127	An IOC status register test failed.	Clear the fault.
IOD128	An IOC port test passed.	There is no response.
IOD129	An IOC port test failed.	Clear the fault.
IOD130	You or the system performs an in-service/out-of-service diagnostic test for the IOM. The test fails on the input/output controller.	Check the accuracy of the IOM load and download the IOM again. If the problem persists, replace the IOM hardware.
IOD201	A manual request results in an unequipped offline MTD.	There is no response.
IOD202	A manual request results in an offline manual busy MTD.	There is no response.
IOD203	You manually busied an MTD.	Clear the fault and return the MTD to service.
IOD204	The system busied an MTD.	Clear the alarm and return the MTD to service.

—continued—

Table 3-1
IOD related logs—IOD (continued)

Log name	Causes	Response
IOD205	You or the system attempted to return an MTD to service.	If the RTS attempt fails, perform corrective maintenance and RTS the MTD. If the RTS attempt passes, action is not required.
IOD206	A different MTD error (for example, a problem with software) is present.	If IOD206 persists, contact maintenance support. For IOM, repeat the same action. If the log continues to occur, you can busy and return the IOM to service, or load the IOM again. Another option is that you can change the IOM hardware.
IOD207	A message-related MTD error is present.	If IOD207 persists, contact maintenance support.
IOD208	An MTD sanity timeout error is present.	If IOD208 persists, or the tape is not in use, the sanity timer on the NT1X28 card is defective. You must replace the card. If the tape is in use, action is not required as a result of a false alarm.
IOD209	Detection of a transient fault during an MTD read, write or self-test operation.	Clear the fault and return the MTD to service.
IOD210	Detection of a fault during an MTD read, write or self-test operation.	Clear the fault and return the MTD to service.
IOD211	An MTD test passed.	There is no response.
IOD212	The file system detected an MTD error.	Contact maintenance support.
IOD213	An MTD test failed.	Clear the fault.
IOD214	Between two consecutive tape marks are 7.62 m (25 ft) of blank tape. The marks indicate a defective tape drive or a defective tape.	Check the tape drive for defective read/write capabilities and clear any faults.

—continued—

Table 3-1
IOD related logs—IOD (continued)

Log name	Causes	Response
IOD215	The block size of the tape or user buffer exceeded the maximum block size during a read/write operation on a 9-track tape.	Check the tape drive for read/write capabilities that have faults, and clear the fault.
IOD301	An offline terminal is unequipped as a result of a manual request.	There is no response.
IOD302	An unequipped terminal is offlined as a result of a manual request.	There is no response.
IOD303	You manually busied a terminal.	Clear the alarm and return the console to service.
IOD304	You system busied a terminal.	Clear the alarm and return the console to service.
IOD305	You or the system attempted to return a terminal to service.	If the RTS attempt fails, perform corrective maintenance and RTS the terminal. If the RTS attempt passes, action is not required.
IOD306	Different terminal errors are present.	If IOD306 persists, contact maintenance support. For IOM, perform the action again that caused the log. If the action fails, load the IOM again or change the IOM hardware.
IOD307	A terminal failed a loop test.	Determine if the loop is open or if the component is defective. Perform corrective maintenance. For IOM, perform the action again that caused the log. If the log occurs again, change the IOM hardware.
IOD308	A terminal controller detected a terminal fault.	Clear the fault. Return the console to service.
IOD309	A console passed a loop test.	There is no response.

—continued—

Table 3-1
IOD related logs—IOD (continued)

Log name	Causes	Response
IOD310	The file system detected an error on a terminal.	Contact maintenance support.
IOD311	A message-related terminal error is present.	If IOD311 persists, contact maintenance support.
IOD312	An active log device becomes peripheral-side (P-side) busy. This log can occur when you lift the printer cover and cause an interruption to the power supply to a printer. The log also can occur, if you manually busied a device.	Determine the P-side busy reason and correct the fault. Determine if the device resumes printing of log reports.
IOD313	A P-side busy log device returned to service.	There is no response.
IOD315	A previous fault condition does not affect a console.	There is no response.
IOD610	A record of the load attempts to a specified IOC and IOM and if attempts are successful.	There is no response.
	—end—	

Disk drive unit logs

Table 3-2 lists the reasons that the DDU subsystem generates DDU logs. Table 3-2 also lists the recommended responses to the DDU logs.

Table 3-2
IOD related logs—DDU

Log name	Causes	Response
DDU100	An initialization is complete, or software errors prevented an initialization.	Record occurrences of this log because the log supplies additional information in occurrences where the DDU did not perform correctly. Contact the next level of maintenance support when the DDU fails to function correctly.
DDU101	Input/output errors are present.	Record occurrences of this log because the log supplies additional information in occurrences where the DDU did not perform correctly. Contact the next level of maintenance support when the DDU fails to function correctly.
DDU201	The status of the DDU changed from unequipped to offline. This status change occurs when you delete the entry for the DDU from table DDU.	There is no response.
DDU202	You made a manual request to offline a DDU.	If the offline attempt fails, repeat the manual offline request. If the offline attempt fails again, contact the next level of maintenance support. If the offline passes, action is not required.
DDU203	You made a request to manually busy a DDU.	If the manual busy attempt fails, repeat the manual busy request. If the manual busy attempt fails again, contact the next level of maintenance support. If the manual busy request passes, action is not required.

—continued—

Table 3-2
IOD related logs—DDU (continued)

Log name	Causes	Response
DDU204	A DDU becomes system busy.	Monitor the specified DDU from the MAP screen. The record of volumes on this DDU controlled by the Device Independent Recording Package (DIRP) can close as a result of this action. The system attempts to return the unit to service after the log reports the action. The DDU205 log reports the attempt.
DDU205	You made a request to return the DDU to service.	If the RTS attempt fails, repeat the RTS. If the RTS attempt fails again, perform appropriate maintenance. Repeat the RTS attempt until the RTS attempt passes. If the RTS attempt passes, action is not required.
DDU208	The IOD subsystem reported a DDU sanity timeout.	There is no response.
DDU209	A DDU is central-side (C-side) busy.	Check the state of the IOC that connects to the DDU. If the IOC is online, contact the next level of maintenance support.
DDU210	The the central control input/output subsystem detected a minor incoming message overload (ICMO) condition.	Corrective action is automatic. If the ICMO condition persists, or the number of incoming messages increases, the DDU becomes system busy. Manually clear the minor ICMO. Manually busy the unit and return the unit to service. Note that recording volumes on the DDU controlled by DIRP can close as a result of this action.

—continued—

Table 3-2
IOD related logs—DDU (continued)

Log name	Causes	Response
DDU211	A major ICMO overload condition caused the DDU to become system busy.	Monitor DDU activities from the MAP screen. Note that recording volumes on the DDU controlled by DIRP can close as a result of this action. An automatic RTS of the DDU does *not* follow this log report.
DDU212	A DDU failed a diagnostic test that you or the system requested.	If this report occurred for the first time, repeat the diagnostic test. If the report occurred more than one time, perform appropriate maintenance to correct the fault. The *reason* field indicates the appropriate maintenance that you must perform.
DDU213	An ICMO condition does not affect the DDU any longer, or an input/output error occurred on a file.	There is no response
	—end—	

MPC logs

Table 3-3 lists the reasons that the MPC subsystem generate MPC logs. Table 3-3 also lists the recommended responses to the MPC logs.

Table 3-3
IOD related logs—MPC

Log name	Causes	Response
MPC101	A software condition in the MPC subsystem is present. The software condition can prevent normal MPC operations.	The MPC subsystem generates MPC101 for many reasons. Refer to the *Log Report Reference Manual* to determine the action you must take for each reason. Save all MPC101 reports with a return code for operating company or Nortel software support personnel.
MPC102	A controller condition in the software subsystem MPCSUB or X25SUB that can prevent normal operation of X25 protocol support. This condition can interfere with a download file, MPCSUB, X25SUB, MS, or CMC software interface.	The MPC subsystem generated MPC102 for many reasons. Refer to the *Log Report Reference Manual* to determine the action you must take for each reason. Save all MPC102 reports with a return code for operating company or Nortel software support personnel.
MPC103	A trap occurred in MPC software.	Save this and all other MPC log reports generated during the previous hour. Contact the next level of maintenance support.
MPC104	An audit detected trouble that can prevent normal MPC operation.	The MPC susbsystem generated MPC104 for several reasons. Refer to the *Log Report Reference Manual* to determine the action you must take for each reason.

—continued—

Table 3-3
IOD related logs—MPC (continued)

Log name	Causes	Response
MPC105	A configuration change occurred because the system issued the SETPARM command. The SETPARM command is only available when the nonresident software package MONMPC is loaded in the DMS switch.	There is no response.
MPC106	The MPCGDADY subsystem has problems in the creation of a requested child process. After the system issues the REVIVE command, this event can occur during any DMS restart (cold, warm, or reload). This event can occur when a process trap is present.	The MPC subsystem generated MPC106 for many reasons. Refer to the *Log Report Reference Manual* to determine the action you must take for each reason. If the MPC106 logs have attendant MPC101 logs that document related system return codes, save all these logs. Save these logs in the event that Northern Telecom support personnel need to analyze them.
MPC201	An MLC consists of one MPC, one link, and one channel. An MLC is used for a FAST utility application. The log appears each time you enter or remove an MLC. The MPC logs that relate to BX.25 or MPC hardware precede the MLC.	Monitor this log for repeated `MARKED DOWN` (resource loss) messages.
MPC299	An error occurred during operation of an application entered in table MPCFASTA. This error can involve application input/output, allocation of resources for the application, or system problems.	Errors that involve application input/output or allocation of resources for the application can correct automatically. The MPC subsystem generates MPC299 for many reasons. Refer to the *Log Report Reference Manual* to determine the action you must take for each reason. Save all MPC299 reports with a return code for operating company or Nortel software support personnel.

—continued—

Table 3-3
IOD related logs—MPC (continued)

Log name	Causes	Response
MPC901	Removal of a tuple that defines an MPC in customer data table MPC occurred. The MPC is now unequipped.	There is no response.
MPC902	You added a tuple that defines a specified MPC to table MPC for the issued manual busy (MBSY) command. The MPC is offline.	There is no response.
MPC903	You issued the MBSY command. The MPC is manual busy.	There is no response.
MPC904	A serious MPC fault is present. The MPC is system busy.	Attempt to return the MPC to service manually. If the RTS attempt fails, perform diagnostic and corrective maintenance. If the MPC does not RTS after these correction procedures, record the frequency and type of logs the system generated. Contact the next level of maintenance support.
MPC905	You issued an RTS command, or the system returned the MPC to service and to an OK state.	If the MPC was system busy and returns to service, review the MPC log reports. Perform diagnostics and corrective maintenance. If diagnostic and maintenance attempts fail, record the frequency and type of logs that the system generated. Contact the next level of maintenance.
MPC906	The MS or CMC input/output system detected a minor incoming message overload (ICMO) on a link.	If the system generates MPC906 log often, take the MPC out of service.

—continued—

Table 3-3
IOD related logs—MPC (continued)

Log name	Causes	Response
MPC908	The system generates this log when the state of an MPC link changes as a result of one of the following: • regular entries or maintenance actions • protocol or support detected fault conditions	The MPC subsystem generated the MPC908 log for many reasons. To determine the action you must take for each reason, refer to *Log Report Reference Manual*.
MPCS101	The system generates the log when one of the following occurs: • An invalid call attempt was detected. • An acceptable MPC MAP login call was accepted or screened. • A call cleared. This log is a secret log that the system generates for security. Only users with the ability to use a secret command see the log. Administrators use the MPCS101 log to monitor the use of the MPC MAP system. The log allows the administrator to track login and logout times for each authorized system user.	There is no response.
	—end—	

MTD logs

Table 3-4 lists the reasons that the MTD subsystem generates MTD logs. Table 3-4 also lists the recommended responses to the MTD logs.

Table 3-4
IOD related SYNC logs—MTD

Log name	Causes	Response
MTD101	A minor incoming message overload condition is present on a link.	If the incoming message overload continues, take the MTD out of service.
MTD102	A minor incoming message overload condition does not continue to affect an MTD.	There is no response.
MTD103	The number of messages sent by the tape drive exceeded the threshold set up for the major incoming message overload condition. The MTD is system busy.	Monitor activities on this link from the MAP screen. Perform necessary manual maintenance.

IOD-related operational measurements

Operational measurements (OM) provide information on the performance of the DMS switch and the peripheral components of the DMS switch. The OM system controls collection, display, and generation of OM data for the operating company. The OM groups that associate with the input/output device (IOD) subsystem are IOC, IOSYS, and IOSYSERR.

The OM system does not create OM data. The OM system acquires OM data from DMS hardware and software sources. The system provides performance indicators for each part of the DMS switch. The OM group IOC monitors IOC and IOM performance and maintenance.

Each IOC provides an interface in one of the following areas:

- between an IOD and the message switch (MS) of a DMS SuperNode
- between an IOD and the central message controller (CMC) of an NT40 switch

OM group IOC

The OM group IOC supplies data to monitor IOD, IOC and IOM performance. Peg registers in this OM group count the following:

- IOC and IOM errors and faults
- device errors on peripheral-side (P-side) links
- system busy and manual busy links
- system busy and manual busy IOCs and IOMs

Table 4-1 describes the registers in OM group IOC.

Table 4-1
OM group IOC registers

Register name	Peg reason
IOCERR	**Description:** IOC errors. This register counts errors for in-service IOCs. The errors include transient errors and errors that cause an IOC to become system busy. **Associated Logs:** • IOD104 (system busy IOC) • IOD115 (different IOC errors) • IOD118 (fault during messaging between an IOC and a device controller, or between an IOC and an MS) • IOD119 (fault during messaging between and IOC and a console device, or between an IOC and an MS) • IOD120 (discrepancy between current value of a maximum device number and expected value of a maximum device number) • IOD123 (IOC fails maximum device number test) • IOD124 (IOC fails memory sequence test) • IOD125 (IOC fails memory pattern test) • IOD126 (IOC fails clock status register test) • IOD127 (IOC fails status register test)

—continued—

Table 4-1
OM group IOC registers (continued)

Register name	Peg reason
IOCFLT	**Description:** IOC faults. This register counts faults that cause the IOC to become system busy. Faults counted by IOCFLT cause an IOC to remain system busy. This continues until you or the system corrects the faults or returns the IOC to service. **Associated Logs:** • IOD104 (system busy IOC) • IOD109 (system busy IOC port) • IOD113 (system busy IOC port) • IOD116 (different IOC errors) • IOD118 (fault during messaging between an IOC and a device controller, or between an IOC and an MS) • IOD119 (fault during messaging between an IOC and a console device, or between an IOC and an MS) • IOD124 (IOC fails memory sequence test) • IOD125 (IOC fails memory pattern test) • IOD126 (IOC fails clock status register test) • IOD127 (IOC fails status register test) • IOD129 (IOC port fails a test)
IOCLKERR	**Description:** IOC link errors. This register counts device errors on P-side IOC links. Errors include checksums, bus overruns, and device-not-ready errors. **Associated Logs:** • IOD117 (faults during messaging between an IOC and an MS or a CMC) • IOD129 (IOC port fails a test)

—continued—

Table 4-1
OM group IOC registers (continued)

Register name	Peg reason
IOCLKMBU	**Description:** IOC link manual busy use. This register records if P-side IOC links are manual busy. **Associated Logs:** • IOD108 (manual busy IOC port) • IOD112 (manual busy IOC port)
IOCLKSBU	**Description:** IOC link system busy use. This register records if P-side IOC links are system busy. **Associated Logs:** • IOD109 (system busy IOC port) • IOD113 (system busy IOC port)
IOCMBU	**Description:** IOC manual busy use. This register records if IOCs are manual busy. Associated Logs: IOD103 (manual busy IOC)
IOCSBU	**Description:** IOC system busy use. This register records if IOCs are system busy. **Associated Logs:** IOD104 (system busy IOC)
	—end—

OM group IOSYS

The OM group IOSYS monitors incoming and outgoing messages. The IOSYS supplies data to monitor the performance of the input/output system. Examples of fault conditions include errors or rebounded message interrupts that originate in the MS or the CMC.

If additional diagnostics determine errors counted by IOSYS that originate in one of the following areas:

- the MS or the CMC (central message controller)
- a network message controller (NMC)

Groups MS, CMC or NMC also count errors.

For additional information on groups MS, CMC, and NMC, refer to *Operational Measurements Reference Manual*.

The OM group IOSYS has one register, IOSYSERR. This register measures the input and output system errors. The IOSYS counts errors that the input/output system detects on incoming or outgoing messages. Examples of problem conditions include errors or rebounded message interrupts that originate in the MS or the CMC. Logs do not associate with the IOSYSERR register.

OM group DDU

The OM group DDU provides information on disk drive units to monitor DDU performance. Peg registers count DDU errors and faults. The registers detect if a DDU is manual busy or system busy. Table 4-2 describes the registers in OM group DDU.

Table 4-2
OM group DDU registers

Register name	Peg reason
DDUERROR	**Description:** DDU errors. This register counts input/output errors that cause a DDU to become system busy. These errors include the following: • transient errors that cause a DDU to become system busy for a limited time • faults that cause the DDU to remain system busy until maintenance corrects the fault **Associated Logs:** • DDU100 (DDU initialization completed, or DDU initialization prevented as a result of software errors) • DDU101 (DDU input/output errors) • DDU204 (system busy DDU) • DDU205 (DDU RTS attempt)
DDUFAULT	**Description:** DDU fault. This register increments when the following actions occur: • The system makes a failed attempt to RTS a system busy DDU. • A DDU becomes system busy four times within a single audit cycle and remains system busy. **Associated Logs:** • DDU204 (system busy DDU) • DDU205 (DDU RTS attempt) • DDU208 (sanity time-out) • DDU209 (central-side [C-side] busy DDU: a C-side node changed state) • DDU212 (DDU fails diagnostic)

—continued—

Table 4-2
OM group DDU registers (continued)

Register name	Peg reason
DDUMBUSY	**Description:** DDU manual busy use. This register records if a DDU is manual busy. **Associated Logs:** DDU203 (manual busy DDU)
DDUSBUSY	**Description:** DDU system busy use. This register records if a DDU is system busy. **Associated Logs:** DDU204 (system busy DDU)
	—end—

OM group MPCBASE

The OM group MPCBASE collects data in multiprotocol controller (MPC) central control (CC) software. Data include use and availability of MPC cards, nodes, and data transfer through an MPC. Registers for MPCBASE measure the following:

- incoming and outgoing messages and successful conversations handled by an MPC
- maintenance problems
- MPC provisioning

Table 4-3 describes the registers in OM group MPCBASE.

Table 4-3
OM group MPCBASE registers

Register name	Peg reason
BDAPPERR	**Description:** MPC board application error. This register increments when an MPC board cannot process application data—a condition known as a peripheral trap. A peripheral trap indicates problems with an MPC board, an IOC, or peripheral software. **Associated Logs:** MPC103 (a trap in MPC software)
CONVERR	**Description:** Conversation error. This register increments when a conversation reset occurs on MPC links 2 or 3. Protocol problems cause conversation resets. Protocol problems do not affect other conversations on the links. **Associated Logs:** MPC102 (controller condition in SPCSUB or X25SUB subsystem can prevent normal X.25 protocol support functions)
CONVESTB	**Description:** Conversation established. This register increments when a conversation establishes between a DMS switch and a remote. This register includes counts for links 2 and 3 and link resets. **Associated Logs:** There are no associated logs.

—continued—

Table 4-3
OM group MPCBASE registers (continued)

Register name	Peg reason
CONVIREF	**Description:** Incoming conversation refused. This register increments when the DMS switch refuses an incoming data call from the network. A count of zero or very low is better than a high count. A high count indicates one of the following conditions: • entry for the link in table X25LINK is not compatible with remote switch parameters • not enough facilities or entries to handle number of calls • unauthorized attempt to establish a conversation with the DMS switch **Associated Logs:** MPC101 (software condition in MPCSUB subsystem can prevent normal MPC functions)
FCTRLDEL	**Description:** Flow control delay. This register increments when flow control delays a message to the MPC. Flow control delay occurs when not enough buffer space is available. **Associated Logs:** There are no associated logs.
L2UDSIN	**Description:** Link 2 user data segment in. This register counts incoming data messages from a remote user that arrive on link 2 of an MPC. **Associated Logs:** There are no associated logs.
L2UDSOUT	**Description:** Link 2 user data segment out. This register counts outgoing user data segments on MPC link 2. The count depends on the volume of messages sent by a local user of link 2. **Associated Logs:** There are no associated logs.
L3UDSIN	**Description:** Link 3 user data segment in. This register counts incoming data messages from a remote user that arrive on MPC link 3. **Associated Logs:** There are no associated logs.
L3UDSOUT	**Description:** Link 3 user data segment out. This register counts outgoing user data segments MPC link 3. The count depends on the volume of messages output by a local user of link 3. **Associated Logs:** There are no associated logs.

—continued—

Table 4-3
OM group MPCBASE registers (continued)

Register name	Peg reason
LISTMSGS	**Description:** Lost messages. This register counts data messages that cannot arrive to the intended application after a conversation was established. A high count indicates that a process stopped reading incoming data. **Associated Logs:** MPC102 (reports the number of and reason for failures to deliver a message)
MPCNSMBU	**Description:** MPC node status manual busy. This register increments when the MPC node status changes to manual busy. **Associated Logs:** MPC903 (manual busy MPC)
MPCNSOK	**Description:** MPC node status OK. This register records if an MPC node is available. The MPCNSOK does not record if MPC node status is manual busy, system busy, or offline. **Associated Logs:** MPC905 (RTS command issued from MPC MAP level, or MPC returns to service and is in OK state)
MPCNSSBU	**Description:** MPC node status system busy. This register increments when an MPC node status changes to system busy. A problem in the hardware or in the peripheral software can cause a count other than zero. **Associated Logs**: MPC904 (MPC has an important defect)

—continued—

Table 4-3
OM group MPCBASE registers (continued)

Register name	Peg reason
RESETL2	**Description:** Reset on link 2. This register increments when the protocol software resets link 2. When the protocol software resets a link, all conversations in progress on the link are disabled and communications are initiated again. The software resets links when the MPC becomes manual busy for maintenance or system busy as a result of link problems. **Associated Logs:** MPC102 (problem at the link protocol level)
RESETL3	**Description:** Reset on link 3. This register increments when the protocol software resets link 3. When the protocol software resets a link, all conversations in progress on the link are disabled and communications are initiated again. The software resets links when the MPC becomes manual busy for maintenance or system busy as a result of link problems. **Associated Logs:** MPC102 (problem at the link protocol level)
—end—	

OM group MPCFASTA

The OM group MPCFASTA monitors outgoing traffic and exception conditions for MPC multilink management. Registers count the following:

- traffic generated by an application
- availability and stability of data links
- adequacy of internal resources

Table 4-4 describes the registers in OM group MPCFASTA.

Table 4-4
OM group MPCFASTA registers

Register name	Peg reason
FAMSGOUT	**Description:** FAST application message output. This register counts outgoing messages that the application sends over data links. **Associated Logs:** There are no associated logs.
FAOUTFLD	**Description:** FAST application output operation failed. This register increments when an application output attempt fails as a result of not enough internal queueing resources. FAOUTFLD does not count application output failures caused by invalid application identification, invalid message size or links that are not available. **Associated Logs:** There are no associated logs.
LLNKAVBL	**Description:** Logical link availability. This register increments when a logical link is available for an MPC FAST application. **Associated Logs:** MPC201 (MPC used for FAST utility application)
LLNKXFRD	**Description:** Logical link data transferred. This register increments when data are sent to an alternate logical link because the originally targeted logical link is not available. A logical link becomes not available when one of the following actions occur; • an output attempt fails • software resets the link • the system does not detect a response **Associated Logs:** MPC201 (MPC used for FAST utility application)

OM group MPCLINK2

The OM group MPCLINK2 provides information on traffic and faults that occur in the physical, link and network levels. The levels are part of the open system connection (OSI) model for link 2 on an MPC. Data is collected at the MPC card level in the peripheral processor software. This register counts the following:

- frames aborted as a result of line, modem, or card problems
- link synchronization errors
- attempts by the peripheral module processor to enable the physical layer of a link
- hardware errors
- link starts again and disconnects
- out-of-service links
- acknowledge timeouts
- retransmissions
- invalid messages
- messages transmitted and received
- incoming messages lost
- data received and transmitted

Table 4-5 describes the registers in OM group MPCLINK2.

Table 4-5
OM group MPCLINK2 registers

Register name	Peg reason
L2LACKTO	**Description:** Link 2 acknowledgement timeout. This register increments when the remote does not receive acknowledgement for a message within a specified time. If the count in L2LACKTO is high, the link goes out of service and L2LDOWN increments, or a link restart initiates and L2LSETUP increments. If the count in L2LACKTO is high, one of the following actions occurs: • the link goes out of service and L2LDOWN increments • a link restart initiates and L2SETUP increments **Associated Logs:** There are no associated logs.
L2LDISC	**Description:** Link 2 link disconnect. This register increments when either end of the link sends a link disconnect. A link disconnect terminates communication on a link. A link restart is necessary to prepare the link again for active communication. **Associated Logs:** There are no associated logs
L2LDOWN	**Description:** Link 2 link down. This register increments every second that a link 2 is out of service. The register increments at that specified interval as a result of not enough response from the remote level two software. The link must start again. **Associated Logs:** There are no associated logs.
L2LLVIO	**Description:** Link 2 link local violations. This register counts messages from the MPC that a remote considers to be invalid. **Associated Logs:** There are no associated logs.
L2LRCV	**Description:** Link 2 messages received. This register increments when an incoming message arrives on a link. **Associated Logs:** There are no associated logs.
	—continued—

Table 4-5
OM group MPCLINK2 registers (continued)

Register name	Peg reason
L2LRVIO	**Description:** Link 2 link remote violations. This register counts invalid messages from the remote received at an MPC. **Associated Logs:** There are no associated logs.
L2LRXMIT	**Description:** Link 2 link retransmission. This register counts messages transmitted again as a result of one of the following: • a remote made a request • the message was not acknowledged **Associated Logs:** There are no associated logs.
L2LSETUP	**Description:** Link 2 link set up. This register increments when a link restart sequence occurs. A local MPC or a remote can initiate a link restart to make sure that communication is possible over a link. During a restart, loss of MPC output data and loss of data in transit occur. A high count indicates a problem in the line, modem, or card. Protocol incompatibility can cause a high count. **Associated Logs:** There are no associated logs
L2LXMIT	**Description:** Link 2 messages sent. This register increments when a message is sent on a link. Messages can be related to data or protocol. **Associated Logs:** There are no associated logs.
L2MSGLST	**Description:** Link 2 messages lost. This register counts incoming messages lost on link 2 of an MPC. This register is acceptable only for asynchronous protocol implementation of the MPC subsystem. **Associated Logs:** There are no associated logs.
L2NURCV	**Description:** Link 2 user data received. This register increments when the MPC on the link receives 1 kB of user data. **Associated Logs:** There are no associated logs.

—continued—

Table 4-5
OM group MPCLINK2 registers (continued)

Register name	Peg reason
L2NUXMIT	**Description:** Layer 2 link user data transmitted. This register increments when 1 kB of user data is transmitted on the link from the MPC. **Associated Logs:** There are no associated logs.
L2PABORT	**Description:** Physical abort on link 2. This register counts outgoing frames on link 2 aborted as a result of one of the following: • line, modem, or cad problems • frames are sent with an abort indication at the logical level A count in this register can indicate line noise. Link noise is a common cause of link and network exceptions. **Associated Logs:** There are no associated logs
L2PDOWN	**Description:** Link 2 physical time down. This register increments every second the peripheral processor attempts to enable the physical layer of link 2. **Associated Logs:** There are no associated logs.
L2PHWERR	**Description:** Link 2 hardware errors. This register increments when the system detects hardware errors during hardware maintenance operations on link 2. Hardware errors include errors that affect directory memory access and incoming byte and frame overruns. A high count can indicate the requirement to replace an MPC card. **Associated Logs:** There are no associated logs.
L2PSYNC	**Description:** Link 2 synchronization error. This register increments when the system detects a loss of carrier or a clear-to-send signal. This detection indicates a line, cable, or modem failure. A high corresponding count in L2HWERR can indicate a card that has faults. **Associated Logs:** There are no associated logs.
—end—	

OM group MPCLINK3

The OM group MPCLINK3 provides information about traffic and faults that occur in the physical, link and network levels. The levels are part of the OSI model for link 3 on an MPC. Data is collected at the MPC card level in peripheral processor software. MPCLINK3 counts the same type of physical-, link-, and network-level occurrences as OM group MPCLINK2. Page 4–10 lists these occurrences.

Table 4-6 describes the registers in OM group MPCLINK3.

Table 4-6
OM group MPCLINK3 registers

Register name	Peg reason
L3LACKTO	**Description:** Link 3 acknowledgement timeout. This register increments when the remote does not receive acknowledgement for a message sent within a specified time. If the count in L3LACKTO is high, one of the following occurs: • the link goes out of service and register L3DOWN increments • a link restart is initiated and L3LSETUP increments **Associated Logs:** There are no associated logs.
L3LDISC	**Description:** Link 3 link disconnect. This register increments when either end of a link sends a link disconnect. A link disconnect terminates communication on a link. A link restart is necessary to prepare the link again for active communication. **Associated Logs:** There are no associated logs.
L3LDOWN	**Description:** Link 3 link down. This register increments every second that a link 3 is not in service as a result of a lack of response from the remote level 2 software. **Associated Logs:** There are no associated logs.
L3LLVIO	**Description:** Link 3 link local violations. This register counts messages from the MPC that a remote considers to be invalid. **Associated Logs:** There are no associated logs.

—continued—

Table 4-6
OM group MPCLINK3 registers (continued)

Register name	Peg reason
L3LRCV	**Description:** Link 3 messages received. This register increments when an incoming message arrives on a link. **Associated Logs:** There are no associated logs.
L3LRVIO	**Description:** Link 3 link remote violations. This register counts invalid messages received from the remote at the MPC. **Associated Logs:** There are no associated logs.
L3LRXMIT	**Description:** Link 3 link retransmission. This register counts messages transmitted again as a result of one of the following: • a remote made a request • the message was not acknowledged **Associated Logs:** There are no associated logs.
L3LSETUP	**Description:** Link 3 link setup. This register increments when a link restart sequence occurs. A local MPC or a remote can initiate a link restart to make sure that communication is possible over a link. During a restart, loss of any MPC output data and loss of data in transit occur. A high count indicates a problem in the line, modem, or card. A high count also can be as a result of protocol incompatibility. **Associated Logs:** There are no associated logs.
L3LXMIT	**Description:** Link 3 messages sent. This register increments when a message is sent on the link. Messages can be related to data or protocol. **Associated Logs:** There are no associated logs.
L3MSGLST	**Description:** Link 3 messages lost. This register counts incoming messages lost on link 3 of the MPC. This register is acceptable only for the asynchronous protocol implementation of the MPC subsystem. **Associated Logs:** There are no associated logs.

—continued—

Table 4-6
OM group MPCLINK3 registers (continued)

Register name	Peg reason
L3NURCV	**Description:** Link 3 user data received. This register increments when the MPC on a link recieves 1 kbyte of user data. **Associated Logs:** There are no associated logs.
L3NUXMIT	**Description:** Link 3 user data transmitted. This register increments when an MPC on the link transmits 1 kB of user data. **Associated Logs:** There are no associated logs.
L3PABORT	**Description:** Physical abort on link 3. This register counts outgoing frames on link 3 that are aborted as a result of one of the following: • line, modem, or cad problems • frames are sent with an abort indication at the logical level **Associated Logs:** There are no associated logs.
L3PDOWN	**Description:** Link 3 physical time down. This register increments every second that the peripheral processor attempts to enable the physical layer of link 3. **Associated Logs:** There are no associated logs.

—continued—

Table 4-6
OM group MPCLINK3 registers (continued)

Register name	Peg reason
L3PHWERR	**Description:** Link 3 physical hardware errors. This register increments when the system detects hardware errors during hardware maintenance operations on link 3. Hardware errors include errors that affect direct memory access and incoming byte and frame overruns. A high count can indicate the need to replace an MPC card. **Associated Logs:** There are no assoicated logs.
L3PSYNC	**Description:** Link 3 synchronization error. This register increments when the system detects a loss-of-carrier or a clear-to-send signal. L3PSYNC indicates a line, cable, or modem failure. A high corresponding count in L3PHWERR also can indicate a card that has faults. **Associated Logs:** There are no associated logs.
—end—	

For additional information on IOD related OMs, refer to the *Operational Measurements Reference Manual*. For additional information on logs, refer to the *Log Report Reference Manual*.

IOD-related data schema

Data schema tables

IOD-related data schema tables contain IOD hardware and software data. Table editor ommands (at the CI MAP level) provide access to these tables and the capability to enter or change data in the tables. For example, to access table IOC, enter the TABLE IOC command from the CI prompt. This command accesses table IOC. To display all table data (tuples), enter the LIST ALL command. To display a specified number of tuples, enter the LIST *n* command, where *n* is the number of tuples you want to display.

The following sections contain example data displays for the LIST command on the following IOD-related data schema tables:

- IOC
- MTD
- CONS
- TERMDEV

CAUTION
MAP responses vary
The design of a switch determines the MAP response. The MAP responses in this document are *example* responses only. The purpose of the responses is only for explanatory purposes only.

Table IOC

Table IOC contains the assignment data and location for each IOC in a DMS switch.

Figure 5-1 shows an example MAP response for the LIST 3 command on table IOC.

Figure 5-1
Table IOC tuple display example

```
>table ioc
TABLE: IOC
>list 3
TOP
IOCNO FRTYPE
            FRNO SHPOS FLOOR ROW FRPOS MSCARD MSPORT  EQPEC
-------------------------------------------------------------
  0   IOE
             0    32   1    A    5    23    0    1X61AB
  1   IOE
             1    65   1     A    3    22    0     1X61AB

  2    IOD
             2     4     1   A     3   21    0     1X61AB
```

Figure 5-2 shows an example MAP response for the LIST 3 command on table IOC for a switch with an IOM (See second tuple).

Figure 5-2
Table IOC tuple display example

```
>table ioc
TABLE: IOC
>list 3
TOP
IOCNO FRTYPE
            FRNO SHPOS FLOOR ROW FRPOS MSCARD MSPORT  EQPEC
-------------------------------------------------------------
  0   IOE
             0    32   1    A    5    23    0    1X61AB
  1  ISME
             1  32    1   A    5    22     0 FX30AA MTM 5 3
                                             IOMRAA01
                                            D000PMLOADS
  2    IOD
             2     4     1   A     3     21      0 1X61AB
```

Table MTD

Table MTD contains the assignment data for each MTD in an DMS switch. To access table MTD, enter the TABLE MTD command from the CI prompt. Figure 5-3 shows an example MAP response to the LIST 2 command on table MTD.

Figure 5-3
Table MTD tuple display example

```
>table mtd
TABLE: MTD
>list 2
TOP
MTDNO IOCNO IOCCKTNO  EQPEC
--------------------------
    0     0        0 1X68AA
    1     1        0 1X68AC
```

Figure 5-4 shows an example MAP response for the LIST 2 command on table TABLE MTD for a switch with an IOM (See second tuple).

Figure 5-4
Table MTD tuple display example

```
>table mtd
TABLE: MTD
>list 2
TOP
MTDNO IOCNO IOCCKTNO  EQPEC
--------------------------
    0     0        0 1X68AA
    1     1       10 FX30AA
```

Table DDU

Table DDU contains the assignment data for each DDU in a DMS switch. To access table DDU, enter the TABLE DDU command from the CI prompt. Figure 5-5 shows an example MAP response to the LIST 2 command on table DDU.

Figure 5-5
Table DDU tuple display example

```
>table ddu
TABLE: DDU
>list 2
TOP
DDUNO IOCNO IOCCKTNO  EQPEC
--------------------------
    0     0        4 1X55AB
    1     1        4 1X55AB
```

Figure 5-6 shows an example MAP response to the LIST 2 command on table DDU for a switch with an IOM (See second tuple).

Figure 5-6
Table DDU tuple display example

```
>table ddu
TABLE: DDU
>list 2
TOP
DDUNO IOCNO IOCCKTNO  EQPEC
--------------------------
    0     0        4 1X55AB
    1     1       17 FX30AA
```

Table TERMDEV

Table TERMDEV assigns console terminal controller hardware in a DMS switch. To access table TERMDEV, enter the TABLE TERMDEV command from the CI prompt. Figure 5-7 shows an example MAP response to the LIST 5 command on table TERMDEV.

To disable the CKEr alarm for an I/O device, change the entries for the device in field CKERDISC to N. For additional information, refer to the description of table TERMDEV in the Data Schema section of *Translations Guide*.

Figure 5-7
Table TERMDEV tuple display example

```
> table termdev
TABLE: TERMDEV
> list 5
TOP
 TERMDES IOCNO CKTNO TERMTYPE  BAUDRT INTYP  EQPEC PRTY GUAR MODEM
                                                              COMCLASS
                                                    CKERDISC
-----------------------------------------------------------------------
    MAP     0     8    VT100   B2400    CL 1X67BC NONE    N  NONE
                                                              ALL
      B     0     9    VT100   B2400    CL 1X67BC NONE    N  NONE
                                                              ALL
    PRT     0    10      KSR   B1200   EIA 1X67BC NONE    N  NONE
                                                              ALL
  PORT0     0    11    VT100   B2400    CL 1X67BC NONE    N  NONE
                                                              ALL
  RTPB3     0    12    VT100   B2400   EIA 1X67BC NONE    N  NONE
                                                              ALL
```

Figure 5-8 shows an example MAP response to the LIST 5 command on table TERMDEV for a switch with an IOM (See fourth tuple).

Figure 5-8
Table TERMDEV tuple display example

```
> table termdev
TABLE: TERMDEV
> list 5
TOP
 TERMDES IOCNO CKTNO TERMTYPE  BAUDRT INTYP  EQPEC PRTY GUAR MODEM
                                                              COMCLASS
                                                        CKERDISC
-------------------------------------------------------------------------
      MAP     0     8    VT100   B2400    CL 1X67BC NONE    N  NONE
                                                              ALL
        B     0     9    VT100   B2400    CL 1X67BC NONE    N  NONE
                                                              ALL
      PRT     0    10      KSR   B1200   EIA 1X67BC NONE    N  NONE
                                                              ALL
    PORT0     0    11    VT100   B2400    CL FX30AA NONE    N  NONE
                                                              ALL
    RTPB3     0    12    VT100   B2400   EIA 1X67BC NONE    N  NONE
                                                              ALL
```

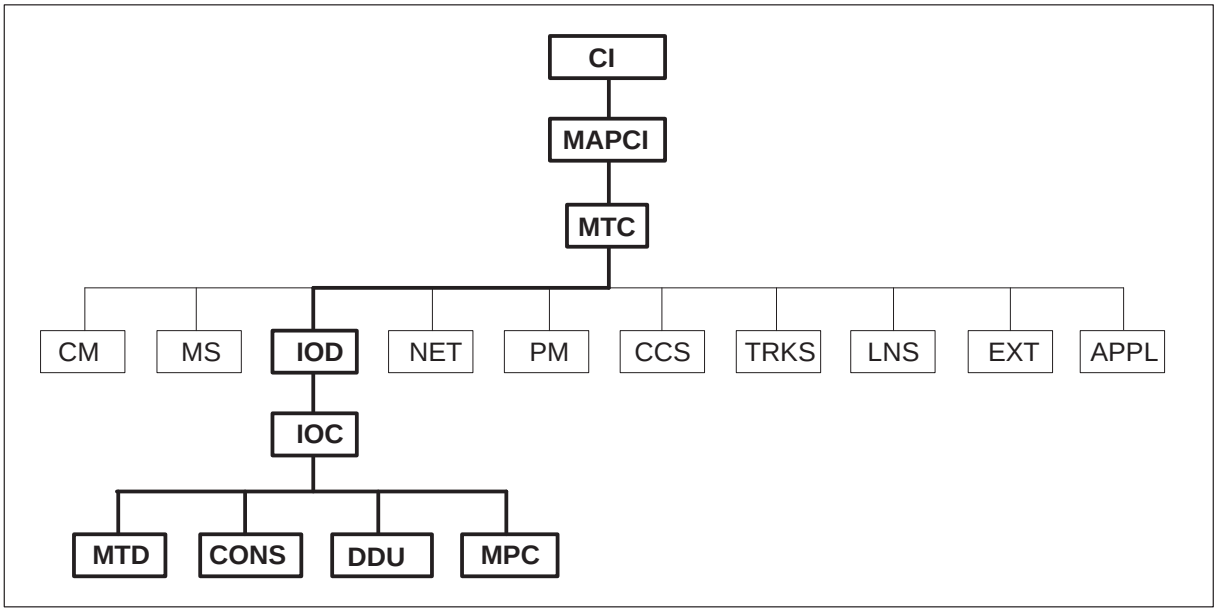
For additional information about IOD data tables, refer to *Translations Guide*.

IOD-related user interface commands

The user interface for the input/output device (IOD) subsystem is the IOD level and the associated sublevels at the MAP terminal. The input/output controller (IOC) and input/output module (IOM) are the main components of the IOD subsystem. Both these components have a MAP sublevel that is accessed from the IOD level.

This chapter describes menu and non-menu commands for the input/output devices (IOD) subsystem. The IOD subsystem provides maintenance for the input/output controller (IOC) and input/output module (IOM) cards. IOD maintenance is performed at the MAP terminal in DMS-100 offices. Figure 6-1 shows the MAP levels of the IOD subsystem.

Figure 6-1
IOD MAP menu levels



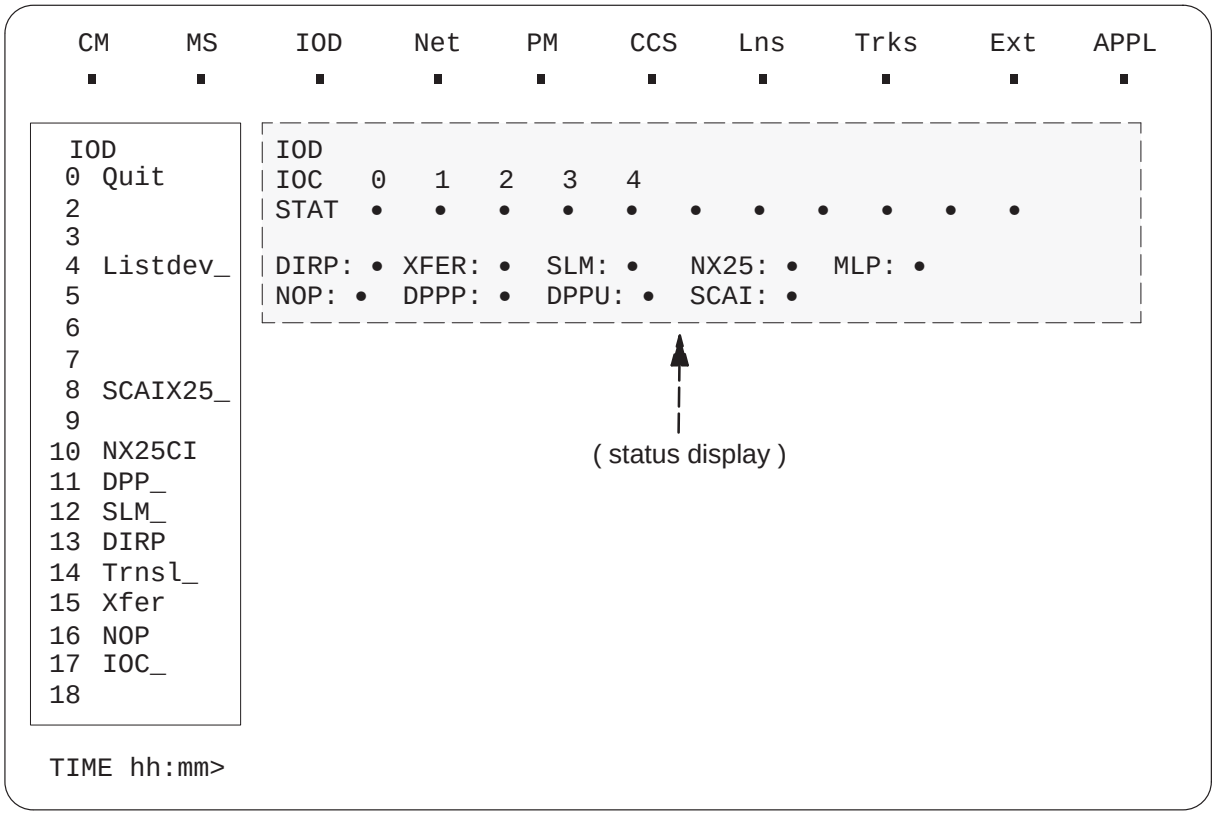
User interface

The following sections describe the IOD, IOC and IOM MAP displays.

IOD level MAP display

The IOD MAP level provides access to IOD commands, IOD sublevels, and IOD status information. The IOD MAP display identifies IOD subsystems and indicates IOD subsystem states. Figure 6-2 is an example of an IOD level MAP display.

Figure 6-2
IOD level MAP display



The status display (highlighted in Figure 6-2) identifies problems in the IOD subsystem. Status displays for each IOD maintenance level are added to the MAP display each time you access an IOD sublevel. When you access another IOD sublevel, previously displayed IOD sublevel status indicators remain. Operating company personnel can determine if a maintenance action at an IOD level affects the system as a whole.

The header `IOC` identifies up to 12 IOC cards numbered from 0 to 11. The header `STAT` identifies the state of the IOC cards. To display the state of the devices that connects to the IOC, enter the LISTDEV command. A description of the LISTDEV command is on page 6–13.

For IOM, the header `IOC` identifies 16 DS-30 ports for IO devices and two (optional) small computer systems interface (SCSI) devices. The devices use a maximum of 18 ports. The header `STAT` identifies the state of each port. To display the state of the devices that connect to the IOM, enter the LISTDEV command. A description of the LISTDEV command is on page 6-13.

IOC level MAP display

The IOC status display at the IOD level also appears at the IOC level. The IOC display includes the state of the following:

- four ports (numbered 0 to 3) on each of 12 device controller (DC) cards (numbered 0 to 11)
- the type of each card on the IOC shelf

Refer to Figure 6-4 on page 6-15 for an example of an IOC level MAP display.

IOM level MAP display

If an IOM is provisioned, the IOC status display at the IOD level changes to an IOM status display. The display for IOM includes the state of the following:

- each port (numbered from 0 to 17) on each IOC device
- the type of each device on the IOM controller in the integrated services module (ISM) shelf

IOC and IOM maintenance states

Refer to Figure 6-10 on page 6-36 for an example of an IOM level MAP display.

One of the following activities can cause each IOC or IOM to have an assigned maintenance state:

- the system automatically assigns a maintenance state to each IOC or IOM
- you manually assign a maintenance state to each IOC or IOM from the MAP terminal

Each IOC or IOM state has a code that appears in the IOC or IOM status display. Table 6–1 describes IOC and IOM states, and mnemonic codes for each state.

Table 6-1
IOC and IOM status codes

Code	Description
•	The IOC or IOM is in service, and has no defects.
–	The IOC or IOM is unequipped.
C	All CM ports that connect to the IOC or IOM are out of service. The IOC or IOM is central-side (C-side) busy.
L	A minimum of one IOD link that connects to the IOC or IOM is out of service. These links include the following: • terminals or consoles (CONS)—*n*CkOS • magnetic tape drives (MTD) or digital audio units (DAT) —*n*MTDOS • disk drive units (DDU)—*n*DDUOS
M	The complete IOC or IOM is manual busy.
O	The complete IOC or IOM is offline.
S	The complete IOC or IOM is system busy.
N	Only base load runs on IOM.
Ld	Downloading or reprogramming is in progress.

Port status codes

Table 6–2 describes the codes used to display the port status of an IOC card or IOM port.

Table 6-2
Port status codes

Code	Description
•	The port is OK, in service, and has no defects.

—continued—

Table 6-2
Port status codes (continued)

Code	Description
–	The port is unequipped.
C	All ports are C-side busy. C-side busy means communication is not present with one of the following: • the central controller (CC) for an NT40 configuration • the message switch (MS) for a SuperNode configuration
M	The port is manual busy.
P	The port is peripheral-side (P-side busy). P-side busy means one of the following: • a fault is in the device attached to the controller of the device • a fault is in the connecting circuit of the device • the device is manual busy
O	The port is offline.
S	The port is system busy.
	—end—

DDU controller system status codes

Table 6-3 describes DDU controller system status codes.

Table 6-3
DDU controller system status codes

Code	Description
Ready	A DDU is available.
	—continued—

Table 6-3
DDU controller system status codes (continued)

Code	Description
Not Ready	A DDU is not available for one of the following reasons: • After the drive returns to service (RTS), the drive does not rotate at the correct speed. • the system cannot read specified control data blocks from the drive.
MBsy	A DDU is manual busy.
SBsy	A DDU is system busy.
Offl	A DDU is offline.
Uneq	A DDU is unequipped. An unequipped DDU indicates that the corresponding data entry for the unit was deleted.
- - -	An error occurred during a system restart. To clear this state, you can manually busy the unit and return the unit to service.
	—end—

DDU drive state codes

Table 6-4 describes DDU drive state codes.

Table 6-4
DDU drive state codes

Code	Description
`being_allocated`	Volume allocation updates through disk allocation (DSKALLOC).
disconnected	A drive does not have power, or the drive is cabled wrong to the controller of the drive.
drive_faults	A drive has power. The drive does not respond to commands from the controller of the drive.
on_line	A drive rotates, was allocated, and is in service.
	—continued—

Table 6-4
DDU drive state codes (continued)

Code	Description
spinning	A drive rotates at the correct speed. Volume allocation did not complete or is not known.
spinning_up	A drive increases to full speed.
spun_down	A drive has power. The drive does not rotate.
unknown	A drive state is not known as a result of a failure in the controller or the message system.
–	A drive is offline or unequipped.
	—end—

MPC status codes

The multiprotocol converter (MPC) status display includes information under the following headers:

- SYSTEM (system state)
- BOARD (card state). The card state is a special internal state that MPC software uses.
- LINK0, LINK1, LINK2, and LINK3 (communication states of each port on a card).

Table 6–5 describes MPC card states.

Table 6-5
MPC card states

State	Description
APPLIP	An MPC was notified to begin the download of software. The application is in progress.
COMACT	The MPC communication is active.
	—continued—

Table 6-5
MPC card states (continued)

State	Description
COMIDL	Communication is idle because the download is in progress.
DNLDED	An MPC is downloaded. The MPC does not execute downloaded software.
DNLDIP	The download process is in progress.
ENBLIP	An MPC was notified to enable communication. Enabling is in progress.
MANB	An MPC is manual busy.
NOLOAD	An MPC requires downloading.
OFFL	An MPC is offline.
OK	An RTS is complete. The tests passed.
RTS	An MPC returned to service automatically or manually. When the tests pass, the status display changes from RTS to OK.
UNEQ	An MPC is not equipped. The entry in table MPC was deleted. Refer to *Customer Data Schema* for additional information on table entries.
UNKNWN	An MPC download is not known.
—end—	

MPC link states

Table 6–6 describes MPC link states.

Table 6-6
MPC link states

State	Description
DABLIP	The system disables a link because the link has a fault.
—continued—	

Table 6-6
MPC link states (continued)

State	Description
DISBLD	The system disabled a link because the link had a fault.
ENABLD	The system enables a link. The MPC communication is active (COMACT).
ENBLIP	The system enables a link. The MPC communication is active (COMACT).
OFFL	A link is offline.
UNEQ	A link is not equipped. The link does not have an entry in the correct table for the link. An example is table BX25LINK for links on an MPC with the BX.25 protocol.
UNKNWN	The state of a link is not known. This condition indicates a software error.
N/A	A link is not available.
	—end—

Device status codes

Device status codes appear if you enter the LISTDEV command at IOD, IOC, IOM, and Card MAP levels. A list of acceptable devices can appear if you enter the Q LISTDEV command. Table 6-7 describes status codes for devices that connect to an IOC or IOM.

Note: Chapter 6 describes the LISTDEV command and other IOD commands.

Table 6-7
Device status codes

Status	Description
•	A device does not have faults.
–	A device is not equipped.
	—continued—

Table 6-7
Device status codes (continued)

Status	Description
Babbling	A device sent an excessive quantity of input/output interrupt messages to an MS or a CMC.
CS Bsy	A device is C-side busy.
Disc	The link to a device in another office disconnects for a limited period of time. The line state of the DC is `disconnect`.
Idle	An MTD or DAT does not have a loaded tape.
Man Bsy	A device is manual busy.
Mt @	An MTD or DAT is with tape volume number @ loaded on the MTD or the IOM media card. The MTD or DAT is where @ is a collection of one to six alphanumeric characters.
Offl	A device is offline.
Not Ready	A DDU is not available as a result of one of the following reasons: • The drive does not rotate at the correct speed after the drive returned to service. • The system cannot read certain volume control data blocks from the drive. An MPC is not available.
Ready	A device is ready.
SBsy	A device (DDU, MPC) is system busy.
Sys Bsy	A device (CONS, MTD or DAT) is system busy.
Uneq	A device is not equipped. This status indicates that the unit in data tables DDU or DLCDEV do not have corresponding entries.

—continued—

Table 6-7
Device status codes (continued)

Status	Description
---	A DDU error occurred during a system restart.
	—end—

Babbling device thresholds

The MS or the CMC detects a babbling device when the quantity of input/output interrupt messages exceeds a threshold. All IODs except consoles have only one threshold. The threshold is critical. Consoles have three thresholds. These thresholds are low, medium, and critical. Table 6-8 describes the thresholds.

Table 6-8
Babbling device thresholds

Threshold	Description
Low	The quantity of input/output interrupt messages exceeds the minimum threshold at 400 messages for each time frame. The terminal controllers remain in service. The system flags the terminal controllers that have faults. The status of the DC card or IOM port appears as in service (•) in the IOC status display. The status also appears as `Babbling` in the card status display. The fault clears when the message count is lower than the threshold.
Medium	The quantity of input/output interrupt messages exceeds the medium threshold at 500 messages for each time frame. Removal of terminal controllers or the IOM ports from service occurs. The status of the DC card or IOM port appears as system busy (S). The status also appears as `Babbling` in the card status display.
Critical	The quanitity of input/output interrupt messages exceeds the critical threshold at 600 messages for a terminal controller. The quantity of input/output interrupt messages exceeds the critical threshold at 2500 messages for each time frame for all other IOC devices. A medium threshold babbler is present.

When the quantity of input/output interrupt messages reaches a critical threshold, the following events occur:

- The MS or CMC stops the scans of ports.
- The IOD is removed from service.
- The system generates the appropriate logs.
- The IOD alarm appears with a severity code `*C*`.
- The state of the DC card or IOM port appears as system busy (`S`) in the IOC MAP display. The state also appears as `Babbling` in the card status display.

The DC card or IOM port is tested and returned to service while the card or port continues to be system busy. The system busy status is `S` for the separate IOC and `Sys`, `Bsy`, or `SBsy` for the device.

IOD, IOC and IOM commands

The following subsections describe commands and MAP displays for the IOD, IOC, and IOM levels. To display command information such as syntax, enter the HELP followed by the command name. For example, to display TST command information, enter

>HELP TST or

>H TST

For detailed information on IOD-, IOC-, and IOM-level commands, refer to *DMS-100 Family Commands Reference Manual.*

CAUTION
MAP responses can vary
The configuration of a switch determines the MAP response. The MAP display responses in this document are *example* responses only. This document includes the MAP display responses for explanatory purposes only.

IOD level commands

The IOD level menu appears when you enter the following command from the command interpreter (CI) MAP level:

>MAPCI;MTC;IOD

IOD level commands query and change the state of a specified IOD. Figure 6-3 is an example of an IOD level MAP display.

Figure 6-3
IOD level MAP display

```
   CM      MS      IOD     Net     PM      CCS     Lns     Trks     Ext    APPL
    .       .     NO AMA    .       .       .       .       .       .       .
                   *C*

  IOD           IOD                                                 1   1
  0 Quit        IOC   0   1   2   3   4   5   6   7   8   9   0   1
  2             STAT  •   •   •   •   •   •   •   •   •   •   •
  3
  4 ListDev_    CDR: •  DIRP: NO AMA   XFER: •  CDRS: •  DPPP: • DPPU: •
  5             NOP: •  SLM:  •
  6
  7
  8 SCAIX25_
  9
 10 NX25CI_
 11 DPP_
 12 SLM_
 13 DIRP
 14 Trnsl_
 15 Xfer
 16 NOP
 17 IOC_
 18

TIME 09:30  >
```

Menu commands

The following sections describe IOD level menu commands. This document presents commands in the order that the commands appear on the menu. For more information on the IOD commands included in this section, refer to *DMS-100 Family Commands Reference Manual*.

ListDev_

The LISTDEV command displays a list of IOC devices. The parameter *ioc* limits the display to the devices attached to the specified IOC. To obtain a list of valid device types, enter the Q LISTDEV command. When more than one device connects to the same card, the LISTDEV command displays the information for the device on port 0. The valid device types are MTD (magnetic tape drive), CONS (console), DDU (disk drive unit), and MPC (multiprotocol controller).

SCAIX25

The SCAIX25 command displays the switch computer application interface for the X25CI link MAP level.

NX25CI

The NX25CI command displays a list of valid NX25 commands. These commands are:

- L2 – access to level 2 commands
- L3 – access to level 3 commands
- MLP – access to the multi-link procedure
- NCS – access to the NSC PVC level 3 commands
- NCSAP – access to the NCS applications level commands
- CAC – access to the calling card applications commands
- DCP – access to the DMS to DCP application level commands

DPP_

The DPP command accesses the DPP level for the specified distributed processing peripheral (DPP).

SLM_

The SLM command accessess the SLM level for the specified system load module (SLM). If the you do not specify an SLM number, you access the SLM level for the primary SLM. If neither SLM is primary, you access the SLM level for SLM 0.

DIRP

The DIRP command accesses the DIRP (Device Independent Recording Package) level.

Trnsl_

The TRNSL command translates the console name (CONS) into IOC, console DC card, and circuit numbers.

Xfer

The XFER command accesses the Remote-Data Polling System (XFER) level if the office has this feature.

NOP

The NOP command accesses the NOP (network operations protocol) level.

IOC_

The IOC command accesses the IOC level for the specified IOC. To obtain correct IOC device types, enter the Q LISTDEV command at the IOD level

or IOC sublevel. “IOC level commands” on page 6-14 describes the IOC level commands in more detail.

The IOC command creates a different IOC MAP display if the IOD contains an IOM.

Non-menu commands

There are no IOD-level non-menu commands.

IOC level commands

The IOC level menu appears when you enter the IOC command from the IOD level. Commands that you enter at the IOC level test or change the state of specified DC cards. Figure 6-4 is an example of an IOC level MAP display.

Figure 6-4
IOC level MAP display

```
   CM      MS      IOD     Net     PM      CCS     Lns     Trks     Ext    APPL
    ▪       ▪     NO AMA   ▪       ▪       ▪       ▪       ▪       ▪       ▪
                   *C*

 IOC           IOD                                                  1   1
 0 Quit        IOC   0   1   2   3   4   5   6   7   8   9        0   1
 2             STAT  •   •   L   •   M   -   •   M   •   S        C
 3
 4 ListDev_    CDR: •    DIRP: NO AMA  XFER: •     CDRS: •   DPP: •  DPPU: •
 5             NOP: •    SLM:•
 6 Tst_
 7 Bsy_        IOC Card  0     1     2     3     4    5     6     7     8
 8 RTS_         1  Port 0123  0123  0123  0123  0123 0123  0123  0123  0123
 9 Offl_           Stat P---  ----  ----  ----  •--- ••••   ----  ----
10 _IOC            TYPE MTD                     MTD  CONS
11 _Port_     IOC:
12
13
14 Trnsl
15
16
17
18 Card_

TIME 09:30  >
```

Menu commands

The following sections describe IOC level menu commands.

ListDev_

The LISTDEV command displays the state of a device that connects to an IOC. The state of a maximum of 12 IOC cards (numbered 0 to 11) can be displayed. One IOC shelf can contain a maximum of nine IOC cards (numbered 0 to 8). The IOC status display can show a maximum of nine cards. Displays appear only up to the highest equipped MTD number. An IOC card can have up to four consoles (CONS) connected to it.

Tst_

The TST command tests the IOC and DC cards. The IOC must be manual busy or system busy before can you enter the TST command. A port must be manual busy before you can enter the TST command. To busy a port, access the card level and busy the card. Quit the card level and busy the port.

Bsy_

The BSY command manually busies the IOC or the link to the DC card or port. You can busy the IOC cards and the link to the DC cards or ports, when the specified circuit is in the in service state (dot). All devices attached to the specified circuit must be manual busy.

RTS_

The RTS command returns the specified DC card to service. An IOC or port must be manual busy before you can enter the RTS command.

Offl_

The OFFL command changes the state of the specified IOC or IOC circuit to offline. An IOC or port must be manual busy before you can enter the command. When one port on an IOC is offline, all ports on that IOC are offline.

_IOC

The IOC command designates the IOC controller card affected by the BSY, OFFL, RTS, and TST commands.

Port

The PORT command designates a port on a DC card affected by the BSY, OFFL, RTS, and TST commands.

Trnsl

The TRNSL command identifies the port that connects to an IOC. The port can be the MS port of a DMS SuperNode switch or the CMC port of an NT40 switch.

Card_

The CARD command displays a card menu for the device that connects to the card. Contents of the display depend on the type of card selected. Figure 6–5 on page 6–18 shows an example of a card MAP display.

Non-menu commands

The following sections describe IOC level non-menu commands. All non-menu level commands appear in alphabetical order. For more information on the commands included in this section, refer to *DMS-100 Family Commands Reference Manual*.

Devtype

The DEVTYPE command displays the device node type, class, and number for a specified card and port.

MDN

The MDN command displays the maximum device number equipped for a IOC or port.

Query

The QUERY command queries the IOC or the device on the port side of an MS or a CMC.

Queryproc

The QUERYPROC command tests to make sure that the IOC maintenance process operates.

Reset

The RESET command reinitializes the IOC (all cards) or a port on an IOC card. Use this command only when directed to do so by the maintenance support group. This command takes the specified IODs out of service. If you cannot busy an IOC as a result of a DC error, the RESET command busies the IOC card. The RESET command also returns the card to service.

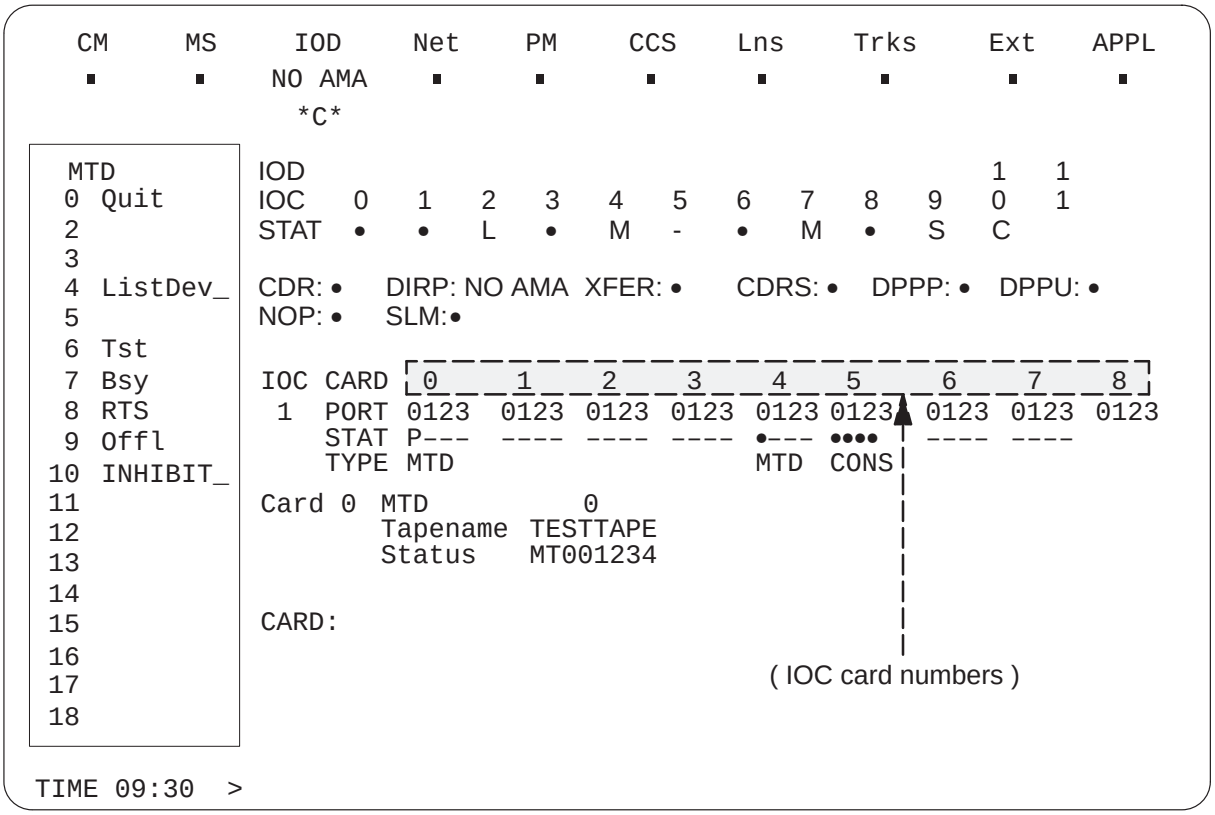
Status

The STATUS command queries the IOC or the device on the port side of the MS or CMC.

IOC CARD level commands

You access the CARD level when you enter the CARD *n* command from the IOC level. At the IOC level, *n* is the card number for given IOD. The content of the menu and display vary depending on the type of device that connects to a card. Figure 6-5 shows an example of an IOC card level display.

Figure 6-5
Example IOC card level display

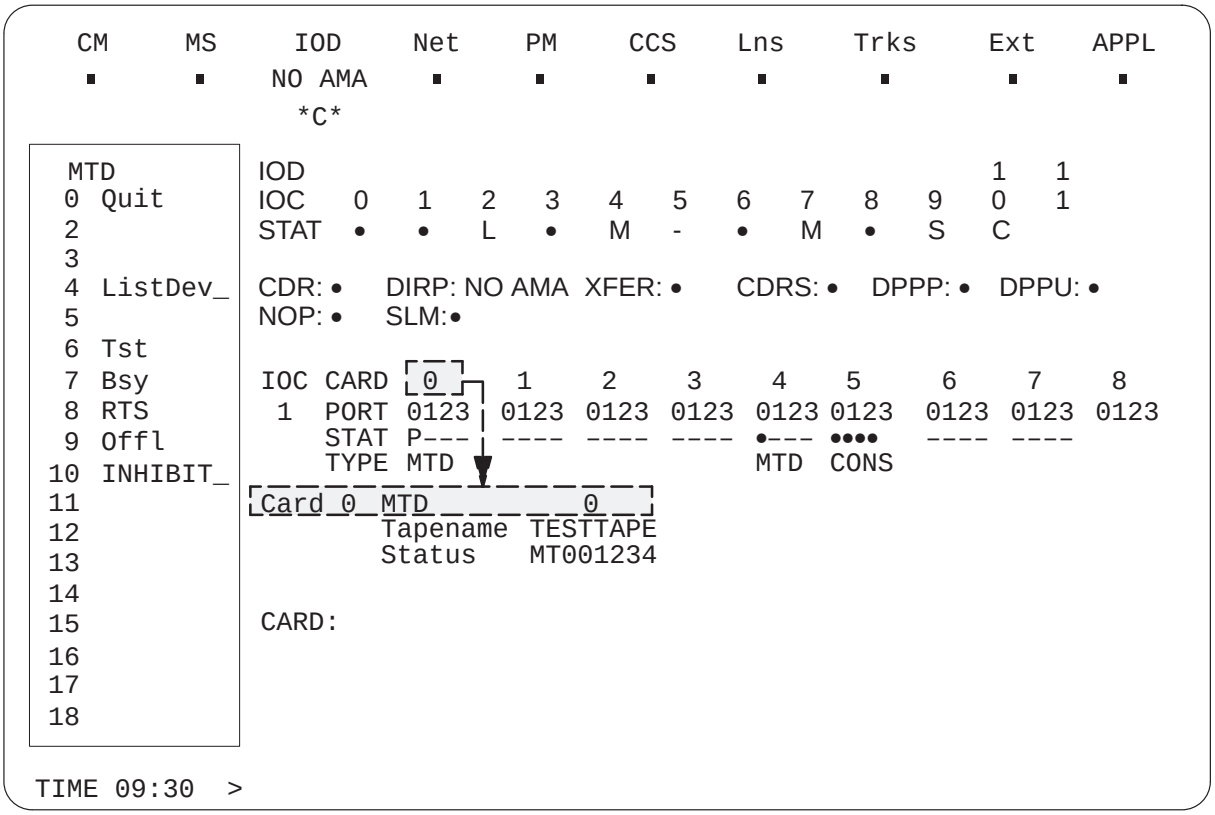


From any IOD sublevel, you can use the CARD command to post and query the status of a DC card. DC cards can be posted individually for maintenance. When a card state changes, the status display is updated.

MTD card level menu commands

You access MTD level when you enter the CARD *n* command from the IOC level. At the IOC level, *n* is the number of the IOC that connects to the MTD. Commands at the MTD card level can test or change the state of a specified MTD. Figure 6-6 is an example of an MTD Card level MAP display. In the display, MTDs connect to cards *0* and *4*. The example contains the display for card *0*.

Figure 6–6
Example MTD card level display



The following sections describe MTD card level commands.

ListDev_

The LISTDEV command displays the state of a device, such as an MTD, that connects to an IOC. The state of a maximum of 12 IOC devices (numbered 0 to 11) can be displayed. One IOC shelf can contain a maximum of nine IOC cards (numbered 0 to 8). As a result, the IOC status display can show up a maximum of nine cards. Displays appear only up to the highest equipped MTD number. An IOC card can have up to four consoles (CONS) connected to it.

Tst

The TST command tests an MTD and the DC card that connects to the MD. An MTD must be manual busy or system busy before you can test the MTD. You must load a scratch tape on an MTD before you can test the MTD. If you do not load a scratch tape, you can test only the MTD controller.

Note: The MOUNT command identifies the mounted tape to the software before the command assigns the tape a scratch tape. The DEMOUNT command cancels the tape mount. For more information on the MOUNT and DEMOUNT commands, refer to *DMS-100 Family Commands Reference Manual*.

Bsy

The BSY command manually busies the MTD DC card.

RTS

The RTS command returns an MTD card to service. An MTD must be manual busy or system busy before the command can return the MTD to service.

Offl

The OFFL command changes the state of an MTD DC card to offline. An MTD must be manually busy before the MTD can be offlined. When one port of a card goes offline, the whole card goes offline.

INHIBIT_

The INHIBIT command enables and disables all front-panel switches on the MTD. You must thread the MTD tape correctly on to the MTD, before you can use the INHIBIT command. A mounted and demounted tape affected by the MOUNT and DEMOUNT commands can be the same tape. You do not always need to remove a tape from the MTD.

Note: For more information on the MOUNT and DEMOUNT commands, refer to *DMS-100 Family Commands Reference Manual*.

MTD level non-menu commands

The following sections describe utility MTD tape commands. A utility MTD is an MTD used for any purpose other than for operational measurements (OM), automatic message accounting (AMA), or journal files (JF).

Mount

The MOUNT command places an MTD in service. The command loads the tape. The command also displays the volume name and the name of the first file.

List

The LIST command lists the files on an in-service MTD. The command also links the files to a directory.

Send

The SEND command directs a terminal response to another device, for example, a printer.

Print

The PRINT command prints the contents of a file.

Copy

The COPY command copies a file from an MTD to or from another device (MTD, DDU, or SFDEV).

Demount

The DEMOUNT command removes an MTD from service.

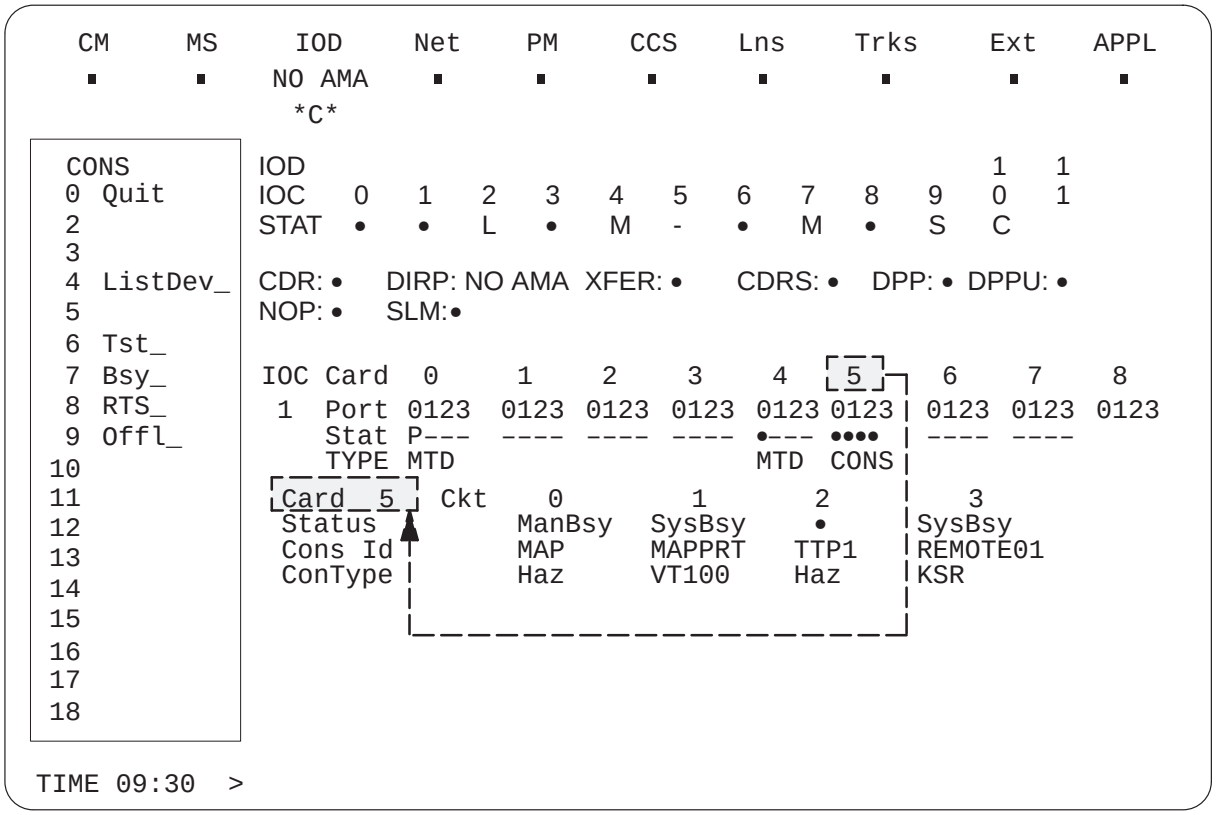
CONS card level menu commands

You access the CONS level when you enter CARD *n* from the IOC level of the MAP. At the IOC MAP level, *n* is the discrimination number of the IOC that connects to the DDU. The display for a console card contains the following:

- state of each of the four circuits that connect to the DC
- console names that identify the attached consoles
- type of consoles attached to a DC

Figure 6-7 is an example of a CONS level MAP display. In the display, the console connects to card *5*.

Figure 6-7
Example CONS level MAP display



The following sections describe CONS card level commands.

ListDev_

The LISTDEV command displays the status of a console. An IOC card can have a maximum of four consoles connected to it. For a complete description of the LISTDEV command, refer to “ListDev” on page 6–15.

Tst_

The TST command tests a given console DC card. A console card must be manual busy or system busy before you can test the card.

Bsy_

The BSY command manually busies the specified console DC card or port. The circuit status of a console DC must be in service (•), offline, or disconnected.

RTS_

The RTS command returns the console DC to service. An offline console card must be manual busy before you can return the card to service.

Offl_

The OFFL command takes a console DC card offline. Before the command takes a console card offline, the card must be manual busy or system busy. When the command takes one port of a console card offline, the command takes the whole card offline.

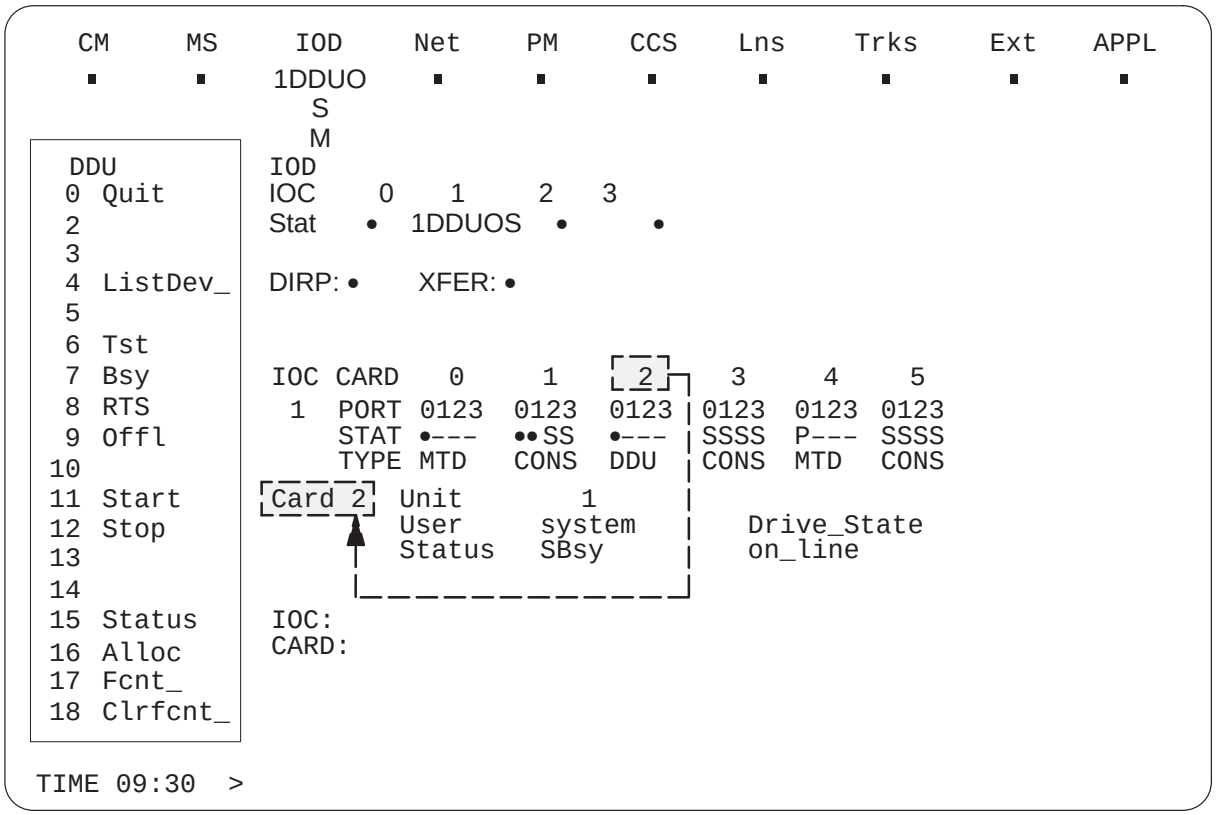
CONS card level non-menu commands

There are no CONS card level non-menu commands.

DDU card level menu commands

You access the DDU MAP level when you enter CARD *n* from the IOC MAP level. At the IOC MAP level, *n* is the discrimination number of the IOC that connects to the DDU. Figure 6-8 is an example of a DDU MAP level display in which the DDU connects to card *2*.

Figure 6–8
DDU level MAP display



The following sections describe DDU card level commands.

ListDev_

The LISTDEV command displays the status of a DDU. For a description of the LISTDEV command, refer to “ListDev” on page 6–15.

Tst

The TST command tests a disk controller and the associated disk drive. The DDU can be in or out of service before the command tests the DDU. If the DDU is in service, the command tests the reset controller sequence, loopback messaging, and drive status. `Ready` under the controller status indicates that the DDU is in service. If the DDU is out of service (system or manual busy), the command tests all elements of the in-service test plus. The DDU spins the drive up to speed, if the status is `Stopped`. The TST command also tests read-only and write-only capabilities. You must have

Bsy

The BSY command manually busies a disk controller, if files are not open. The controller must be in service (•), system busy, C-side busy, or offline before you can manually busy the controller.

RTS

The RTS command tests a disk controller. The command also returns the controller to service. A disk must be system busy or manual busy before the command can return the controller to service.

Offl

The OFFL command takes a disk controller offline. A controller must be manual busy and the rotation of the disk drive must stop, before the command takes the DDU offline.

Start

The START command begins to spin the disk drive. The command also monitors the status of the disk drive. The DDU must be manual busy before the command can start the disk drive.

Stop

The STOP command stops the rotation of a disk drive. The DDU must be manual busy before the command can stop the disk drive.

Status

The STATUS command displays information about a controller and disk drives. The status display does not continuously update, if changes occur. The status display reflects the status at the time that you issue the STATUS command. When you issue the STATUS command again, the most recent status appears.

Alloc

The ALLOC command displays information about the allocation of recording volumes on a disk drive. The disk drive cannot identify volumes marked *unallocated*.

Fcnt_

The FCNT command displays the current values of a disk controller firmware counters. This command isolates problems in the disk system during debug procedures. Do not use the command during maintenance tasks.

Clrfcnt_

The CLRFCNT command resets the values of the firmware counters of a disk controller firmware to zero. Use this command to isolate problems in the disk system during debug procedures. Do not use the command during maintenance activities.

DDU card level non-menu commands

The following sections describe DDU level non-menu commands.

Clrbuff

The CLRBUFF command corrects a software error condition. Use this command in response to the following system message:

```
Failed to claim mtce buffer
```

> ***Note:*** Use the CLRBUFF command when the DDU is out of service. Use the command only under the direction of the operating company technical support group.

Disk utility commands

Disk utility (DSKUT) commands do the following:

- list, erase, or rename files in a volume
- assign or remove current image file status
- display information about files and volumes

You can enter the DSKUT set of commands at any MAP level. These commands do not have menu displays. After you enter the commands, responses to these commands appear on the MAP. You must enter the DSKUT command before you enter any of the other commands in the set. The following sections describe the DSKUT commands.

Clearboot

The CLEARBOOT command removes the boot flag indication from the file with a current image file status. The image file status is on the volume specified by LISTVOL. The SETBOOT command assigned the boot flag indication earlier. This command makes sure that the system does not load a specified image file, if a bootstrap load is required. The system considers the specified image files as the current image file on a DDU.

DSKUT

The DSKUT command provides access to disk utility commands. After you enter the DSKUT command, the response `DSKUT` appears on the MAP screen. The response indicates that disk utility commands are ready for use.

Erasefile

The ERASEFILE command erases a specified file from a disk volume. You must access the command through the LISTVOL procedure before the command can erase a file. The next paragraph describes the LISTVOL command.

Listvol

The LISTVOL command allows you to access disk volume files. If parameters are not specified, the system identifies the user who issued the LISTVOL command. The system accesses only the files of that user.

Renamefl

The RENAMEFL command changes the name of a current file to a new name. To make sure the command renames the file, use the SHOWFL command with the new filename as the filename parameter. The following sections describe the SHOWFL command.

Setboot

The SETBOOT command assigns current image file status to a file on the volume specified by the LISTVOL command. The command assigns the status through the boot flag. You must use the LISTVOL command to list the volume before the volume can be set.

Showboot

The SHOWBOOT command displays information about the current image file on a specified volume.

Showfl

The SHOWFL command displays information about a specified file name. The complete display appears when you use the ALL parameter. When you use the SHOWFL command without the ALL parameter, the command

displays only the length of filename (`Number of records`). The command also displays the date and time of the last modification (`Last modified`).

Showvol

The SHOWVOL command displays information about a specified volume name. The complete display of volume information appears when you use the ALL parameter. When you use the SHOWVOL command without the ALL parameter, the command displays information about free space (number of new blocks). The command also displays number of files, volume identification, and the disk unit number of the specified volume.

Disk allocation utility commands

Disk allocation (DSKALLOC) commands distribute disk storage space to different disk volumes. The distribution is necessary before you can put a DDU into service. You can enter the DSKALLOC set of commands at any MAP level. These commands do not have menu displays. After you enter the commands, responses to these commands appear on the MAP. You must enter the DSKALLOC command before you enter any of the other commands in the set. The following sections describe the DSKALLOC commands.

> ***Note:*** After you manually busy the DDU from the DDU level menu, you can perform the allocation process on a DDU.

Add

The ADD command includes a volume of a given size on the list of space that the command allocates on a disk.

> ***Note:*** This command does not create volumes. This command does not update an allocation list that appears on the MAP screen. After the completion of the allocation process and the ADD command identifies all volumes, the UPDATE command creates all volumes. Updated lists appear when you use the DISPLAY command.

Delete

The DELETE command removes a specified volume from the list of space allocated on a disk. When the command deletes a volume and you enter the UPDATE command, any files contained in the deleted volume automatically erase.

This command does not immediately remove a volume from a disk. After you enter the UPDATE command at the end of an allocation process, all creations and deletions of volumes occur.

After the command deletes a volume, the DISPLAY command shows an updated list of pending DDU space allocation. Storage blocks assigned

earlier to a volume to be deleted are marked as unallocated (`Unallocd`). Unallocated volumes next to the storage blocks join into one volume. The number of volumes that appear on the allocation display for the specified DDU reduce.

Diradd

The DIRADD command allows you to access a specified volume on a DDU. After you create new volumes during the disk allocation procedure, you can add the names of new volumes to the root directory (ROOTDIR). To add the names, use the ROOTDIR command one time for each volume. This command allows operating company personnel to access volumes directly from the CI MAP level. The system can only access volumes that will be in use by the system. The system can access the volumes even if the ROOTDIR includes the volumes.

When you use the DIRADD command with the UPDATE command, the updated volume automatically reinstates to the ROOTDIR. The procedure occurs during restart and RTS procedures.

Dirdel

The DIRDEL command removes a specified volume name from an internal system list of accessible volumes.

Display

The DISPLAY command shows current or pending allocation of space on a DDU. When you use the DISPLAY command during a series of allocations and deletions, the chart on the MAP screen reflects the pending allocation. The chart shows the allocation that results after you issue the UPDATE command. If you decide to not update the DDU allocation, you can use the QUIT command. When you enter the DSKALLOC utility again and you issue the DISPLAY command again, the current space allocation appears.

DSKALLOC

The DSKALLOC command accesses disk allocation commands. The command also specifies the DDU to which you apply the DSKALLOC commands.

Quit

The QUIT command ends a disk allocation session. The command also returns the MAP menu to the previous level. If you decide not to update a DDU to implement changes made on the space allocation list, use the QUIT command. Use the QUIT command instead of the UPDATE command. If you use the QUIT command in error before DDU updates, you must repeat the disk allocation process from the start. Enter the DSKALLOC, ADD, and DELETE commands (in that order) to prepare the list of pending changes.

Reinit

CAUTION
All volumes can erase
All files on the volume erase when you reinitialize a volume.

The REINIT command sets a field that indicates a specified disk volume that you will initialize again. Use this command instead of the ERASEFL command when you reassign a disk volume. You can initialize a volume again to return a volume to operation when too many errors occurred on the volume. Loss of data occurs for data recorded on the volume before starting again. Operating company personnel are responsible for backup and restoration of any readable data contained on the volume.

Update

CAUTION
Static data mismatch
Do not break stop from DSKALLOC. If you made an error and entered the UPDATE command, allow the update to finish before you make any corrections. If you break stop from DSKALLOC after you enter an UPDATE command, the volume that updates can reflect a mismatch status. If a volume is in mismatch status, contact your regional maintenance support group for help.

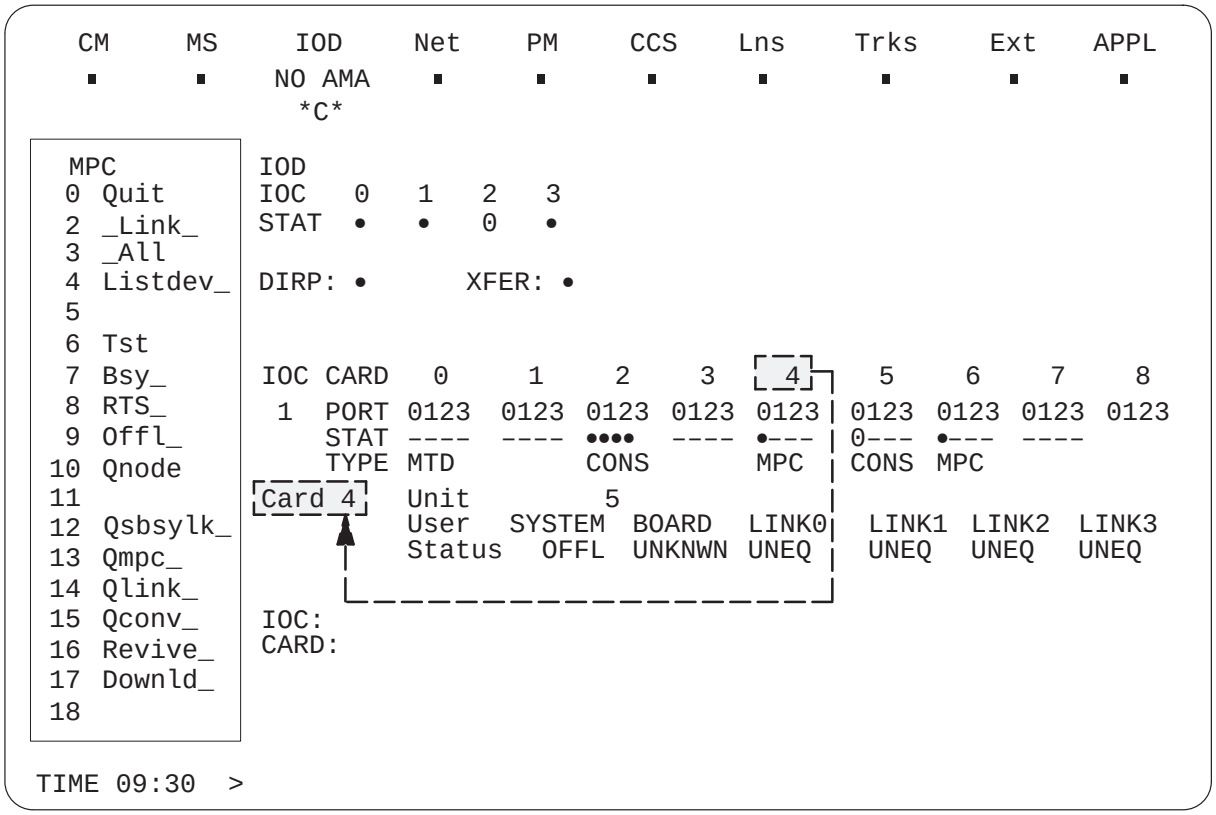
The UPDATE command implements changes made to the list of space allocation on a DDU. This process can require a maximum of 10 min to complete. If an error message indicates that a volume fails to initialize during an update procedure, contact your regional maintenance support group.

MPC card level menu commands

The MPC level menu appears when you enter the MPC *n* or CARD *n* commands. The *n* is the discrimination number of the IOC that connects to an MPC. The MPC commands test and query the card and link status of MPC cards (NT1X89). Figure 6-9 is an example of an MPC MAP level display in which the MPCs connect to cards *4* and *6*. The example reflects the display for card 4.

Note: Note that the term `BOARD` in the display is equal with `CARD`.

Figure 6-9
MPC level MAP display



The following sections describe MPC card level commands.

Link

Use the LINK command with the BSY, OFFL, and RTS commands to manually busy, offline or RTS a designated MPC link . The MPC link is numbered 0 to 3.

_All

Use the ALL command with other commands as follows:

- the BSY, OFFL, or RTS commands, to designate that all links on an MPC are manually busy, go offline, or return to service.
- the QMPC command, to display the status for all MPCs entered in table MPC for an office.
- the REVIVE command, to designate that all MPC subsystem software processes are to be reinstated. The ALL command is the default.

Listdev_

The LISTDEV command displays a list of all MPCs. For a description of the LISTDEV command, see “ListDev” on page 6–15.

Tst

The TST command tests an MPC to make sure that the card communicates correctly. The TST command also checks if the MPC is downloaded. If the MPC is downloaded, the command checks the sanity of the software.

Bsy_

The BSY command manually busies the MPC card. The BSY command options include separate links of the MPC card and the MPC card. An MPC card and links must be offline, system busy or in service before you can busy the card and links. A MPC card that is busy does not handle conversations.

RTS_

The RTS command returns the MPC card to service. Options for this command allow maintenance for separate links of and for an MPC card. The RTS command returns to service separate links, all links, the MPC card and all links, or the MPC card.

Only one of the following returns to service:

- separate links
- all links
- the MPC card and all links
- the MPC card

An MPC card and links must be manual busy before the card and links can return to service.

During testing, the status of the MPC card appears as `RTS`. If the test fails, the MPC card does not return to service. If the test passes, the state of the MPC card is `OK`. If the test determines that the card is not downloaded, the following steps occur:

1 The MPC card has a label that indicates the card needs a download.

2 The card goes in service.

3 The card has the label `NOT READY` on the MPC display.

4 A download initiates.

Offl_

The OFFL command takes an MPC and the links of an MPC offline. Options are present for the OFFL command mantenance for separate links of and for an MPC card.

You can take only one of the following offline:

- separate links
- all links
- the MPC card and all links
- the MPC card

You must busy an MPC card and links before you can take the card and links offline.

Qnode

The QNODE command queries and displays data about the node that connects to an MPC.

Qsbsylk

The QSBSYLK command displays all MPC links in the system busy state (SBSY).

Qmpc_

The QMPC command displays the current status of the following:

- an MPC card
- an MPC download file
- each of the four links on the MPC card
- the OM tuple that associates with the MPC

  Note: The MPC number used to specify an MPC is not always the same OM tuple number used to record data on that MPC. When you request a display of OMs for a given MPC, use the QMPC command to identify the tuple that associates with the MPC.

Qlink_

The QLINK command queries system configuration parameters for a specified MPC.

Qconv_

The QCONV command queries the following information about an MPC conversation:

- number
- link number
- logical channel number
- conversation status
- conversation number
- conversation security number
- parameter device or directory entry
- input indicator
- number of files opened on a conversation
- application owner of a conversation

Revive_

CAUTION
Service interruption—Use only for processor errors
Use the REVIVE command under special conditions only. Logs MPC101 and MPC106 indicate process error conditions. Use the command under the process error conditions.

The REVIVE command revives a minimum of one MPC application process. The applications are based on parameters that specify complete applications or separate software processes.

Downld_

Use the DOWNLD command to manually download software to a selected MPC card. The entry specifies the software that you download.

MPC card level non-menu commands

The following sections describe MPC level non-menu commands.

Mpccopy

The MPCCOPY command translates download files for an MPC. Download files are in ASCII format. Translate and download ASCII characters into the MPC. The command creates a new binary-coded download file.

MPC tools

The MONMPC tool allows the collection and display of messages in the MPC links. An internal buffer stores these messages. The internal buffer is overwritten when the buffer becomes full. This command allows the recording of SMDI messages in ASYNC from MPC links on to the DDU/MTD devices. Only one session of MONMPC can start in the DMS. The MONMPC is a single user tool.

The MONMPC tool consists of the following commands:

Mpcstart

The MPCSTART command starts to record MPC messages on to a DDU or an MTD. The file called RECFILE contains a record of the messages. After you enter the command, the command overwrites any current information in RECFILE.

Mpcstop

The MPCSTOP command stops the recording of all MPC messages on to a DDU or MTD.

Mpcprint

The MPCPRINT command allows you to display the contents of the recorded file in a format that you can read.

Startmsgs

The STARTMSGS command starts to monitor messages for a specified MPC. When the MPCSTART command is active, the MPCSTART command disables the STARTMSGS command.

Stopmsgs

The STOPMSGS command stops the monitoring of messages for an MPC. When the MPCSTART command is active, the MPCSTART command disables the STOPMSGS command.

Capture

The CAPTURE command initiates the capture of MPC messages from any STARTED MPC. When the MPCSTART command is active, the MPCSTART command disables the CAPTURE command.

Display

The DISPLAY command shows captured MPC messages. When the MPCSTART command is active, the MPCSTART command disables the DISPLAY command.

Zapdata

The ZAPDATA command clears the MPC message table. When the MPCSTART command is active, the MPCSTART command disables the ZAPDATA command.

Format

The FORMAT command determines the display of the captured MONMPCCI data. The current value appears when a parameter is not available. The formats are HEX, VERBOSE or BOTH. For Async, HEX is the only option. For X.25, you can use all three formats. The default format is HEX.

Dealloc

The DEALLOC command stops the capture of MONMPCCI messages. The command also deallocates the memory for the MONMPCCI message table. When the MPCSTART command is active, the MPCSTART command disables the DEALLOC command.

Quit

The QUIT command exits the MONMPC tool. The command does not terminate the MPCSTART commands. The MPCSTART commands continue to run in the background until you enter the MPCSTOP command.

Query

The QUERY command displays current MONMPCCI status information.

This command displays the following:

- the current index
- the message table wrap
- the message size
- the message table size
- the number of MSGs captured
- the currently capturing mode
- the started MPCs
- the active MPCSTART (MPCRECRD process id)
- the recording device

IOC level commands for IOM

The IOC level menu for IOM appears when you enter the IOC *n* command from the IOD level menu. If IOM is configured, a new IOM MAP display is under the IOD level. Commands at the IOC for IOM level can test or change the state of specified IOM ports. Figure 6-10 is an example of an IOM level MAP display.

Figure 6–10
IOM level MAP display

```
  CM    MS   IOD    Net    PM    CCS    Lns    Trks    Ext    APPL
CM Flt  .   SMDR B   .    1RCC    .      .    *** CC  2 Maj     .
  M          *C*           *C*                 *C*      M
IOC          IOD
 0 Quit      IOC  0 1 2 3
 2           STAT . . . .
 3
 4 ListDev_ DIRP: SMDR B   XFER:  .  SLM :  .  NOP :  .  NX25:  .
 5           MLP :   .      DPPP:  .  DPPU:  .  SCAI:  .
 6 Tst_
 7 Bsy_      IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
 8 RTS_      (IOM)STAT . . . - . . - - - .  -  -  -  -  -  -  .  .
 9 Offl_      0   TYPE C C C   C M        M                   S  S
10 _IOC                O O O   O T        P                   C  C
11                     N N N   N D        C                   S  S
12
13
14 Trnsl
15
16 QIOM
17 Downld_
18 Port_
  ASIU
Time 12:58   >
```

Menu commands

The following sections describe IOM level menu commands.

ListDev_

The LISTDEV command displays the status of a specified device that connects to an IOC. A maximum of 18 IOC devices (numbered 0 to 17) can appear. The limit of the maximum number of ports for each IOM is 16.

Tst_

The TST command tests the IOC and IOM ports. The IOC must be manual or system busy before you can enter the TST command. A port must be manual busy before you can enter the TST command.

Bsy_

The BSY command manually busies the IOC or IOM ports. You can busy the IOC only when the specified circuit is in the dot (•) state. All devices attached to that circuit must be manual busy.

RTS_

The RTS command returns a specified IOM port to service. An IOC or port must be manual busy before you can enter the RTS command.

Offl_

The OFFL command changes the status of a specified IOC or IOC circuit to offline. An IOC or port must be manual busy before you can enter the command. When one port on an IOC changes to offline, all ports on that IOC become offline.

_IOC

The IOC command designates the IOM controller card that the BSY, OFFL, RTS, and TST commands affect.

Trnsl

The TRNSL command identifies the port that connects to an IOC. The port can be the MS port of a DMS SuperNode switch or the CMC port of an NT40 switch.

Port_

The PORT command displays a port menu for the device that connects to the port. The contents of the menu display depends on the type of port and device selected.

QIOM

The QIOM command displays the IOM controller status, state and downloaded file. The onboard diagnostics mark any hardware failure.

Non-menu commands

The following sections describe IOC level non-menu commands for IOM. All non-menu level commands in this guide appear in alphabetical order. For more information on the commands included in this section, refer to the *DMS-100 Family Commands Reference Manual.*

Trnsl_

The TRNSL command translates the console name into IOC, console DC card, and circuit numbers. Each input/output terminals has an assigned console name. A console name has a maximum of eight characters.

Devtype

The DEVTYPE command displays device node type, class, and number for a specified port.

MDN

The MDN command displays the maximum device number equipped for a port.

Query

The QUERY command queries the IOC or the device on the port side of an MS or a CMC.

Queryproc

The QUERYPROC command tests that the IOC maintenance process operates.

Reset

The RESET command initializes the IOM or any of the IOM ports on an IOM controller card again. Use this command under the direction of the maintenance support group. The command makes specified IODs temporarily not available. If you cannot busy an IOM as a result of a controller error, the RESET command busies the IOC controller card. The command returns the controller card to service.

Status

The STATUS command queries the IOC or the device on the port side of the MS or CMC.

QIOMALL

The QIOMALL command displays the information on the data entry of IOM ports.

REBOOTIOM

The REBOOTIOM command requests the IOM to perform a firmware reboot restart from the base load that is in RAM. If you use the optional FORCE parameter, the IOM forces a firmware reboot restart from the base load. The base load is in flash ROM memory.

IOM sublevel commands

The MAP displays on the current IOC and the new IOM are different. If IOM is configured, a new IOM MAP is under the IOD level. The IOM level menu appears as another IOC. The IOM level menu displays when you enter the IOC *n* command from the IOM level menu. At the IOM level menu, *n* is the IOM number that associates with a specified IOD. Menu and display content vary according to the device type that connects to the port.

IOM MTD or DAT sublevel

The MTD level appears when you enter the PORT *n* command from the IOM level. At the IOM level, *n* is the discrimination number of the port that connects to the MTD. Commands at the MTD port level can test or change the status of a specified MTD. The commands add a field DevType. The commands also display DAT, if DAT is a DAT device. The commands do not display any information, if DAT is not a DAT device. Figure 6–11 is an example of an MTD or DAT port level display.

Figure 6–11
Example MTD or DAT level display

```
  CM    MS   IOD    Net    PM    CCS    Lns    Trks    Ext    APPL
CM Flt  .   SMDR B   .    1RCC    .      .    *** CC  2 Maj     .
  M          *C*           *C*                 *C*      M
IOC         IOD
 0 Quit     IOC  0 1 2 3
 2          STAT . . . S
 3
 4 ListDev_ DIRP: SMDR B   XFER:  .  SLM :  .  NOP :  .  NX25:  .
 5          MLP :   .      DPPP:  .  DPPU:  .  SCAI:  .
 6 Tst_
 7 Bsy_     IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
 8 RTS_     (IOM)STAT . . . - . . - - - .  -  -  -  -  -  -  .  .
 9 Offl_     0   TYPE C C C   C M        M                   S  S
10 INHIBIT           O O O   O T        P                   C  C
11                   N N N   N D        C                   S  S
12           Port 17  MTD    0          DevType     DAT
13           (SCSI)   TapeName          User
14                    Status    Idle
15
16
17
18
  ASIU
Time 12:58   >
```

The following sections describe the MTD or DAT level commands.

ListDev_

The LISTDEV command displays the status of a specified device that connects to an IOM (for example, an MTD or DAT). The IOM ports are general purpose input/output. The ports can be configured to provide any IOC devices. You can use a maximum of 18 IOC devices with the port numbers (0 to 17) displayed. You can use DAT and DDU devices with ports 16 and 17.

Tst_

The TST command tests an MTD or DAT and the controller ports that connect to the MTD and DAT. An MTD or DAT must be manual busy or system busy before the command can test the ports. You must load a scratch tape on to an MTD before the command can test the port. If you do not load a scratch tape, the command tests only the MTD controller port.

> ***Note:*** The MOUNT command identifies the physically mounted tape to the software before the command assigns the tape as a scratch tape. The DEMOUNT command cancels the MOUNT command. For more information on the MOUNT and DEMOUNT commands, refer to the *DMS-100 Family Commands Reference Manual.*

Bsy_

The BSY command manually busies the MTD or DAT controller port.

RTS_

The RTS command returns an MTD or DAT port to service. An MTD or DAT port must be manual busy or system busy before the port can return to service.

Offl_

The OFFL command changes the status of an MTD or DAT port to offline. An MTD or DAT must be manual busy before the command can take the port offline.

INHIBIT

The INHIBIT command enables and disables all front-panel switches on the MTD. You must correctly thread the MTD tape on to the MTD before you can use the INHIBIT command. A mounted and demounted tape affected by the MOUNT and DEMOUNT commands can be the same tape. You do not always need to remove a tape from the MTD.

> ***Note:*** For more information on the MOUNT and DEMOUNT commands, refer to the *DMS-100 Family Commands Reference Manual.*

MTD or DAT port level non-menu commands

The following sections describe MTD or DAT utility tape commands. A utility MTD or DAT is an MTD or DAT used for any purpose other than for operational measurements (OM), automatic message accounting (AMA), or journal files (JF).

Mount

The MOUNT command places an MTD or DAT in service. The command loads the tape. The command also displays the volume name and name of the first file.

List

The LIST command lists the files on an in-service MTD or DAT and links the files to a directory.

Send

The SEND command redirects terminal response to another device, like a printer.

Print

The PRINT command prints the contents of a file.

Copy

The COPY command copies a file from an MTD or DAT to or from another device (MTD, DDU, or SFDEV).

Demount

The DEMOUNT command removes an MTD or DAT from service.

IOM CONS sublevel

The CONS level menu appears when you enter PORT *n* from the IOM MAP level. At the IOM MAP level, *n* is the discrimination number of the IOM that connects to the CONS. The display for a console card shows the following:

- status of the port that connects to the controller
- console names that identify the attached consoles within the DMS
- type of consoles attached to a controller port

Note: You can use CONS or CON to indicate consoles.

Figure 6-12 is an example of an MTD or DAT port level display.

Figure 6-12
Example IOM CONS level display

```
  CM    MS   IOD    Net    PM    CCS    Lns    Trks    Ext    APPL
CM Flt  .   SMDR B   .    1RCC    .      .    *** CC  2 Maj     .
  M          *C*           *C*                 *C*      M
IOC         IOD
 0 Quit     IOC  0 1 2 3
 2          STAT . . . .
 3
 4 ListDev_ DIRP: SMDR B   XFER:  .  SLM :  .  NOP :  .  NX25:  .
 5          MLP :   .      DPPP:  .  DPPU:  .  SCAI:  .
 6 Tst_
 7 Bsy_     IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
 8 RTS_     (IOM)STAT . . . - . . - - - .  -  -  -  -  -  -  .  .
 9 Offl_     0   TYPE C C C   C M       M                   S  S
10 _IOC              O O O   O T       P                   C  C
11                   N N N   N D       C                   S  S
12          Port 2   Status     .
13                   Cons Id    MAP
14                   ConsType   CYB
15
16
17
18
  ASIU
Time 12:58   >
```

The following sections describe the CONS level commands.

ListDev_

The LISTDEV command displays the status of a console. A port has one CONS that connects to the port. For a complete description of the LISTDEV command, refer to “ListDev” earlier in this chapter.

Tst_

The TST command tests a specified console controller port. The port must be manual busy or system busy before the command can test the port.

Bsy_

The BSY command manually busies a specified console controller port. The circuit status of a port must be in service (•) or offline. This command does not require a parameter.

RTS_

The RTS command returns the console port to service. The port taken offline must be manual busy before the port can be return to service. This command accepts an optional force parameter.

Offl_

The OFFL command takes a console port offline. The port must be manual busy or system busy before the command can take the port offline. This command does not require a parameter.

CONS card level non-menu commands

There are no CONS card level non-menu commands.

IOM DDU sublevel

The DDU level appears when you enter the PORT *n* command from the IOM level. At the IOM level, *n* is the discrimination number of the port that connects to the DDU. Commands at the DDU port level can test or change the status of a DDU. Figure 6-13 is an example of an DDU port level display.

Figure 6-13
Example IOM DDU level display

```
  CM    MS   IOD    Net    PM    CCS    Lns    Trks    Ext    APPL
CM Flt  .   SMDR B   .    1RCC    .      .    *** CC  2 Maj     .
  M          *C*           *C*                 *C*      M
IOC         IOD
 0 Quit     IOC  0 1 2 3
 2          STAT . . . S
 3
 4 ListDev_ DIRP: SMDR B   XFER:  .  SLM :  .  NOP :  .  NX25:  .
 5          MLP :   .      DPPP:  .  DPPU:  .  SCAI:  .
 6 Tst_
 7 Bsy_     IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
 8 RTS_     (IOM)STAT . . . - . . - - - .  -  -  -  -  -  -  .  .
 9 Offl_     0   TYPE C C C   C M       M                   S  S
10                   O O O   O T       P                   C  C
11 Start             N N N   N D       C                   S  S
12 Stop     Port 16  Unit     0
13          (SCSI)   User   System      Drive_State
14                   Status     Ready   On_line
15 Status
16 Alloc
17 Fcnt_
18 Clrfcnt_
  ASIU
Time 12:58   >
```

The following sections describe the DDU level commands.

ListDev_

The LISTDEV command displays the status of a DDU. For a complete description of the LISTDEV command, refer to “ListDev” earlier in this chapter.

Tst_

The TST command tests a disk controller port and the associated disk drive of the port. The DDU can be in service or out of service before the command tests the port. When the DDU is in service, the controller status displays `Ready`. If the DDU is in service, the command tests the reset controller sequence, loopback messaging, and drive status. The DDU is out of service when the DDU is system busy or manual busy. If the DDU is out of service, the command tests all the elements of the in-service test plus. The command spins the drive up to speed if the status displays `Stopped`. The TST command tests read-only and write-only capabilities.

Bsy_

The BSY command manually busies a disk controller port if all files are not open. The controller must be in service (•), system busy, C-side busy, or offline before you can manually busy the controller.

RTS_

The RTS command tests a disk controller port. The command returns the controller to service. A disk must be system busy or manual busy before the disk can return to service.

Offl_

The OFFL command takes a disk controller port offline. A controller port must be manual busy and the rotation of the disk drive must stop before the DDU can go offline.

Start

The START command begins to spin the disk drive. The command monitors the status of the disk drive. You must manually busy the DDU before the command can start the disk drive.

Stop

The STOP command stops the rotation of a disk drive. The DDU must be manual busy before the rotation of the disk drive can stop.

Status

The STATUS command displays information about a controller and disk drives. The status display reflects the status at the time that you issue the STATUS command. If changes occur, the status display does not continuously update. When you issue the STATUS command again, the most recent status appears .

Alloc

The ALLOC command displays information about the allocation of recording volumes on a disk drive. The disk drive cannot identify volumes marked as *unallocated*.

Fcnt_

The FCNT command displays the current values of firmware counters of a specified disk controller. This command isolates problems in the disk system during debug procedures. Use of the command is not routine during maintenance activities.

Clrfcnt_

The CLRFCNT command resets the values of firmware counters of a specified disk controller to zero. This command isolates problems in the

disk system during debug procedures. Use of the command is not routine during maintenance activities.

DDU card level non-menu commands

The following sections describe DDU level non-menu commands.

Clrbuff

The CLRBUFF command corrects a software error condition. Use this command in response to the following system message:

```
Failed to claim mtce buffer
```

Note: Use the CLRBUFF command only when the DDU is out of service. Use the command under the direction of the operating company technical support group.

Disk utility commands

The DSKUT commands do the following:

- list, erase, or name files again in a volume
- assign or remove current image file status
- display information about files and volumes

You can enter the DSKUT set of commands at any MAP level. These commands do not have a menu display. After you enter the commands, responses to these commands appear on the MAP. Enter the DSKUT command before you enter any of the other commands in the set. The following sections describe the DSKUT commands.

Clearboot

The CLEARBOOT command removes the boot flag indication from the file with the current image file status. The current image file status is on the volume specified by LISTVOL. The SETBOOT command assigned the boot flag indication to the file earlier. Use this command to make sure that the system does not load a given image file, if a bootstrap load is required. The given image file was considered as the current image file on a specified DDU.

DSKUT

The DSKUT command provides access to disk utility commands. After you enter the DSKUT command, the response `DSKUT` appears on the MAP screen. The response indicates that the disk utility commands are ready for use.

Erasefile

The ERASEFILE command erases a specified file from a disk volume. You must access the file through the LISTVOL procedure before the command can erase the file. Page 6-26 describes the LISTVOL command.

Listvol

The LISTVOL command allows you to access disk volume files. If you do not specify parameters, the system determines that you issued the LISTVOL command. The system accesses only your files.

Renamefl

The RENAMEFL command changes the name of a present file to a new name. To make sure the command renames the file, use the SHOWFL command with the new filename as the filename parameter. Page 6-26 describes the SHOWFL command.

Setboot

The SETBOOT command assigns current image file status to a file on the volume specified by the LISTVOL command. The SETBOOT command assigns the status through the boot flag. The LISTVOL command specifies the volume. You must use the LISTVOL command to list the volume of files, before the volume can be set.

Showboot

The SHOWBOOT command displays information about the current image file on a specified volume.

Showfl

The SHOWFL command displays information about a specified file name. The complete display appears when you use the ALL parameter. When you use the SHOWFL command without the ALL parameter, the command displays only the length of filename `(Number of recordS)`. The command also displays the date and time of the last modification `(Last modified)`.

Showvol

The SHOWVOL command displays information about a specified volume name. The complete display of volume information appears when you use the ALL parameter. When you use the SHOWVOL command without the ALL parameter, the command displays information about free space (number of unused blocks). The command also displays information about the number of files, volume identification, and the disk unit number of the specified volume.

Disk allocation utility commands

Disk allocation (DSKALLOC) commands distribute disk storage space to different disk volumes. This distribution is necessary before you can put a DDU into service. You can enter the DSKALLOC set of commands at any MAP level. These commands do not have menu displays. After you enter the commands, responses to these commands appear on the MAP. You must enter the DSKALLOC command before you enter any of the other commands in the set. The following sections describe the DSKALLOC commands.

> ***Note:*** After you manually busy the DDU from the DDU level, you can perform an allocation process on a DDU.

Add

The ADD command includes a volume of a given size on the list of space the command allocates on a disk.

> ***Note:*** This command does not create volumes. This command does not update an allocation list that appears on the MAP screen. After the completion of the allocation process and the ADD command identifies all volumes, the UPDATE command creates all volumes. Updated lists appear when you use the DISPLAY command.

Delete

The DELETE command removes a specified volume from the list of space allocated on a disk. When the command deletes a volume and you enter the UPDATE command, any files contained in the deleted volume automatically erase.

This command does not immediately remove a volume from a disk. After you the UPDATE command at the end of an allocation process, all creations and deletions of volumes occur.

After the command deletes a volume, the DISPLAY command shows an updated list of pending DDU space allocation. Storage blocks assigned earlier to a volume to be deleted are marked as unallocated (`Unallocd`). Unallocated volumes next to the storage blocks join into one volume. The number of volumes that appear on the allocation display for the specified DDU reduce.

Diradd

The DIRADD command allows you to access a specified volume on a DDU. After you create new volumes during the disk allocation procedure, you can add the names of new volumes to the root directory (ROOTDIR). To add the names, use the ROOTDIR command one time for each volume. This command allows operating company personnel to access volumes directly

from the CI MAP level. The system only can access volumes that will be in use by the system. The system can access the volumes even when the ROOTDIR does not include the volumes.

When you use the DIRADD command for a volume, and you use the UPDATE command, the updated volume automatically reinstates to the ROOTDIR. The procedure occurs during restart and RTS procedures.

Dirdel

The DIRDEL command removes a specified volume name from an internal system list of accessible volumes.

Display

The DISPLAY command shows current or pending allocation of space on a DDU. When you use the DISPLAY command during a series of allocations and deletions, the chart on the MAP screen reflects the pending allocation. The chart shows the allocation that results after you issue the UPDATE command. If you decide not to update the DDU allocation, you can use the QUIT command. When you enter the DKSALLOC utility and you issue the DISPLAY command again, the current space allocation appears.

DSKALLOC

The DSKALLOC command accesses disk allocation commands. The command also specifies the DDU to which you apply the DSKALLOC commands.

Quit

The QUIT command ends a disk allocation session. The command also returns the MAP menu to a previous level. If you decide not to update a DDU to implement changes made on a space allocation list, use the QUIT command instead of the UPDATE command. If you use the QUIT command in error before DDU updates, you must repeat the disk allocation process from the start. Enter the DKSALLOC, ADD, and DELETE commands (in that order) to prepare the list of pending changes.

Reinit

CAUTION
All volumes can erase
All files on the volume erase when you reinitialize a volume again.

The REINIT command sets a field that indicates a specified disk volume that you will initialize again. Use this command instead of the ERASEFL

command when you assign a disk volume again. You can initialize a volume again to return a volume to operation when too many errors occurred on the volume. Loss of data occurs for data recorded on the volume before you reinitialize the volume again. Operating company personnel are responsible for backup and restoration of any readable data contained on the volume.

Update

CAUTION

Static data mismatch

Do not break stop from DSKALLOC. If you made an error and entered the UPDATE command, allow the update to finish before you make any corrections. If you break stop from DSKALLOC after you enter an UPDATE command, the volume that updates can reflect a mismatch status. If a volume is in mismatch status, contact your regional maintenance support group for help.

The UPDATE command implements changes made to the list of space allocation on a DDU. This process can require a maximum of 10 min to complete. If an error message indicates that a volume fails to initialize during an update procedure, contact your regional maintenance support group.

IOM MPC sublevel

The MPC level appears when you enter the PORT *n* command from the IOM level. At the IOM level, *n* is the discrimination number of the port that connects to the MPC. Commands at the MPC port level can test or change the status of a specified MPC. Figure 6-14 is an example of an IOM MPC port level display.

Figure 6-14
Example IOM MPC level display

```
  CM    MS   IOD    Net    PM    CCS    Lns    Trks    Ext    APPL
CM Flt  .   SMDR B   .    1RCC    .      .    *** CC  2 Maj     .
  M          *C*           *C*                *C*      M
IOC         IOD
 0 Quit     IOC  0 1 2 3
 2          STAT . . . S
 3
 4 ListDev_ DIRP: SMDR B   XFER:  .  SLM :  .  NOP :  .  NX25:  .
 5          MLP :   .      DPPP:  .  DPPU:  .  SCAI:  .
 6 Tst_
 7 Bsy_     IOC  PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
 8 RTS_     (IOM)STAT . . . - . . - - - .  -  -  -  -  -  -  .  .
 9 Offl_     0   TYPE C C C   C M       M                   S  S
10 Qnode             O O O   O T       P                   C  C
11                   N N N   N D       C                   S  S
12 Qsbsylk  Port  9  Unit     0
13 Qmpc_            User   SYSTEM  PROTOCOL     LINK
14 Qlink           Status   Ready   X2584    COMACT ENABLED
15 Qconv
16 Revive
17
18
  ASIU
Time 12:58   >
```

The following sections describe the IOM MPC level commands.

_All

Use the ALL command with other commands as follows:

- the QMPC command, to display the status for all MPCs entered in table MPC for an office.
- the REVIVE command, to designate all MPC subsystem software processes are to be reinstated. The ALL command is the default.

Listdev_

The LISTDEV command displays a list of all MPCs. For a description of the LISTDEV command, see “ListDev” on page 6-36.

Tst

The TST command tests an MPC to make sure that the port communicates correctly.

Bsy_

The BSY command manually busies the MPC port. The BSY command options allow maintenance for an MPC port. An MPC port must be offline, system busy or in service before you can busy the port. An MPC port that is manual busy does not handle conversations.

RTS_

The RTS command returns the MPC port to service. Options allow maintenance for an MPC port. An MPC port must be manual busy before the port can be return to service.

Offl_

The OFFL command takes an MPC port offline. An MPC port must be manual busy before you can take the port offline.

Qnode

The QNODE command queries and displays data about the node that connects to an MPC port.

Qmpc_

The QMPC command displays the current status of an MPC port, MPC download file, and the OM tuple that associates with the MPC.

> ***Note:*** The MPC number used to specify an MPC is not always the same OM tuple number used to record data on that MPC. When you request a display of OMs for a given MPC, use the QMPC command to identify the tuple that associates with the MPC.

Qlink

The QLINK command queries system configuration parameters for a given MPC.

Qconv

The QCONV command queries the following information about an MPC conversation:

- number
- link number
- logical channel number
- conversation status
- conversation number
- conversation security number
- parameter device or directory entry
- input indicator
- number of files opened on a conversation
- application owner of a conversation

CAUTION
Service interruption—Use only for processor errors
You can use the REVIVE command under special conditions only. Logs MPC101 and MPC106 indicate process error conditions. Use the command under these conditions.

Revive

The REVIVE command revives a minimum of one MPC application process based on parameters specified for all applications or separate software processes.

IOM MPC level non-menu commands

The following sections describe IOM MPC level nonmenu commands.

MPC tools

The MONMPC tool allows messages to collect and display in the MPC links. These messages store in an internal buffer that overwrites when the buffer becomes full. This command allows for the MPC links to record on to the DDU/MTD devices of SMDI messages in ASYNC. One session of

MONMPC can be conducted at anyone time in the DMS. MONMPC is a single user tool.

The MONMPC tool consists of the following commands:

Mpcstart

The MPCSTART command starts to record MPC messages on a DDU, MTD or DAT. The messages record in a file called RECFILE. Present information in RECFILE overwrites when this command executes.

Mpcstop

The MPCSTOP command stops recording all MPC messages on a DDU, MTD or DAT.

Mpcprint

The MPCPRINT command allows you to display the contents of the recorded file in a readable format.

Startmsgs

The STARTMSGS command starts to monitor messages for a specified MPC. An active MPCSTART command disables this command.

Stopmsgs

The STOPMSGS command stops monitoring messages for a specified MPC. An active MPCSTART command disables this command.

Capture

The CAPTURE command initiates the capturing of MPC messages from any STARTED MPC. An active MPCSTART command disables this command.

Display

The DISPLAY command displays captured MPC messages. An active MPCSTART command disables this command.

Zapdata

The ZAPDATA command clears the MPC message table. An active MPCSTART command disables this command.

Format

The FORMAT command determines how the captured MONMPCCI data displays. The current value appears if a parameter is not specified. The formats are HEX, VERBOSE or BOTH. For Async, HEX is the only option. For X.25, all three formats can be used. The default format is HEX.

Dealloc

The DEALLOC command stops MONMPCCI message capturing and deallocates the memory for the MONMPCCI message table. This command is disabled when the MPCSTART command is active.

Quit

The QUIT command exits the MONMPC tool and does not kill the MPCSTART commands. The MPCSTART commands will continue to run in the background until you enter the MPCSTOP command.

Query

The QUERY command displays current MONMPCCI status information. This command displays the active MPCSTART (MPCRECRD process id) and recording device. This command displays the following:

- current index
- message table wrap
- message size
- message table size
- number of MSGS captured
- currently capturing mode
- started MPCs

IOM commands and responses

This section describes the new and modified commands, the parameters and responses applicable to the input/output module (IOM).

PORT in IOCMDIR

The PORT command is similar to the CARD command in the IOC display where a selected port sublevel will appear. PORT is a menu command.

PORT command parameters and variables

Command	Parameters and variables
PORT	Enter Port level display Parms : <PORT #> {0 to 17} Port types: CONS MTD DDU MPC

PORT command parameters and variables (continued)

Item	Description
	Identifies the Port sublevel to access.

Usage examples

The following table provides an explanation of the responses to the PORT command.

Responses for the PORT commands

MAP output	Meaning and action
`Port command is only applicable for IOM (FX30).` `Use card command instead.`	**Meaning:**This response occurs when the PORT command is on the NT1X61 IIOC. **Action:** There is no action.

`Port - Enter Port level display.`
`Parms: <PORT#> {0 to 17}`
`Known port types: CONS MTD DDU MPC`
	Meaning: This response occurs when you query the PORT command.
	
	Action: There is no action.

`Unknown Port 5`	**Meaning:** This response occurs when the specified port does not have entries. **Action:** There is no action.

QIOM in IOCMDIR

The QIOM command requests information from the IOM controller card NTFX30. Information provided includes board status and state, and downloaded file. QIOM is a menu command.

QIOM command parameters and variables

Command	Parameters and variables
QIOM	[Query IOM configuration and port status Parms: [<OPTION> {ROM}]
Item	**Description**
	An optional parameter to specify if the card configuration table stored in IOM flash ROM appears instead of the IOM board status information.

Usage examples

The following table provides an explanation of the responses to the QIOM command.

Responses for the QIOM command

MAP output	Meaning and action
`QIOM - Query IOM configuration and port status` `Parms: [<OPTION> {ROM}]`	**Meaning:** This response occurs when you query the QIOM command. **Action:** There is no action.
`QIOM command is only applicable for IOM`	**Meaning:** This response occurs when you invoke the QIOM command on the non-IOM IOC hardware. **Action:** There is no action.

`Port IOC 0 Node_no: 6; Status: MBSY; State: DNLDED;`
`Table IOC File: IOMR0001 on D00DV002`
`IOM load on board: IOMR0001; Auto-Load: ON`
`Site Flr Rpos Bay_Id Shf Description Slot EqPEC`
`HOST 01 A05 ISME 03 32 IOC 03 FX30AA`
`Port Info: (C-CON, M-MPC, D-DDU, T-MTD, s-SCSI, F-Fault, P-PBusy)`
`PORT 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17`
`C C C - C T - - - M - - - - - - sD sT`
`. P P P . . . F . . . . . . . . . .`	

—continued—

Responses for the QIOM command (continued)

MAP output	Meaning and action
	Meaning: This response occurs when you issue QIOM to the IOM (FX30IOC). This command contains general information about IOM like node numbers and IOM states. The command contains information like load file information and port information. The first row under port information indicates the port configuration. If the configuration is different from the CC MAP, RTS of the separate port is a requirement. The second row under port information indicates the port status. The on-board diagnostics will mark any hardware failure and store the information on board. **Action:** There is no action.

`EqPEC: FX30AA; HWstream: 01; HWisssue: 01; Checksum: EF`
`BootName: BOOTAA01; Load Name0: IOMRAA01;  Load Name1: IOMRAA01;`
`Release Date: 19951031; Release Time; 13:56`
	Meaning: This response occurs when the QIOM ROM request completes correctly. The IOM card table that configures returns and appears to you.
	
	EqPEC is the PEC code of the IOM board. HWstream and HWissue are the release numbers of the IOM hardware. Checksum indicates the checksum of this table stored in flash. Bootname reflects the bootstrap load manufactured. This bootstrap load contains the basic IOM boot-up functions and you cannot reprogram the load. The LoadName 0 and 1 are the names of the base load programmed in area 0 and area 1 separately. These load names change according to the download-reprogram operation. Release Date and Release Time record the Release Time record the release date and time of the IOM board.
	
	Action: There is no action.

`Failed`	**Meaning:** This response occurs when QIOM or QIOM ROM command fails. The failure can be either a communication problem with the IOM or a firmware problem occurred in the IOM. **Action:** Check IOD logs for failure reasons. RESET the IOM, redownload the firmware again, or replace the IOM hardware.

—continued—

Responses for the QIOM command (continued)

MAP output	Meaning and action
`Invalid` `IOC <iocno> <ioc_state>`	**Meaning:** This response occurs when QIOM or QIOM ROM command fails due to a invalid IOC node. The IOC number and state will be displayed to reflect the invalid node. **Action:** Check the correctness of the IOC number and retry.
	—end—

REBOOTIOM in IOCMDIR

The REBOOTIOM command requests the IOM to perform a firmware reboot restart from the base load resided in RAM. If you use optional FORCE parameter, the command requests that the IOM perform a firmware reboot. The IOM performs a firmware reboot from the base load resided in the Flash ROM memory. REBOOTIOM is a non-menu command.

REBOOT command parameters and variables

Command	Parameters and variables
REBOOTIOM	Request an IOM firmware reboot restart Parms: [<BOOTYPE> { FORCE}]
Item	**Description**
BOOTTYP FORCE	An optional parameter to specify for an IOM firmware reboot restart from Flash ROM.

Error messages

The following table contains an explanation of the warning messages for the REBOOTIOM command.

Warning messages for the REBOOTIOM command

MAP output	Meaning and action
`WARNING: I/O services under this IOM will be interrupted.` `Please confirm (”Yes”, ”Y”, or ”No”, ”N”).`	**Meaning:** As above **Action:** As above

Usage examples

The following table provides an explanation of the responses to the REBOOTIOM command.

Responses for the REBOOTIOM command

MAP output	Meaning and action
`REBOOTIOM - Request an IOM firmware reboot restart` `Parms: [<BOOTTYPE> {FORCE}]`	**Meaning:** This response occurs when you query the REBOOTIOM command. **Action:** There is no action.
`REBOOTIOM command is only applicable for IOM`	**Meaning:** This response occurs when you cause the REBOOTIOM command on the non-IOM IOC hardware. **Action:** There is no action.

—continued—

Responses for the REBOOTIOM command (continued)

MAP output	Meaning and action
OK	**Meaning:** This response occurs when the REBOOTIOM command finishes correctly. **Action:** There is no action. **Note:** Ignore the MS307 log because on any restart of the IOM, communication with the MS is interrupted. Therefore, MS 307 logs, which indicate a Protocol error, or an IOC fault will be generated. An IOM restart occurs when: 1) a full download is done; 2) the UPGIOM command is issued; 3) a reset IOC command is issued; 4) a RebootIOM command is issued; 5) an OOB Reset command is sent by the CM/CC.
Failed	**Meaning:** This response occurs when the REBOOTIOM command fails. The failure can be either a communication problem with the IOM or a firmware problem in the IOM. **Action:** Check IOD logs for the failure reasons. RESET the IOM, download the firmware again, or replace the IOM hardware.
Invalid IOC <iocno> <ioc_state>	**Meaning:** This response caused by an invalid IOC node that causes the REBOOTIOM command fails. The IOC number and state appear to reflect the invalid node. **Action:** Check the accuracy of the IOC number and retry.
May cause severe problems with IO devices Please confirm (“Yes”, “Y”, “No”, or “N”)	**Meaning:** This response occurs to confirm the action when you invoke the REBOOTIOM command. **Action:** There is no action. retry.
—end—	

DOWNLD in IOCMDIR

The DOWNLD command initiates the download sequence to load the IOM. DOWNLD is a menu command.

DOWNLD command parameters and variables

Command	Parameters and variables
DOWNLD	Parms: [<FILE NAME> STRING] [<DEVICENAME> STRING]
Item	**Description**
FILENAME	An optional parameter for load file other than entries in table IOC. Correct file name is eight characters long and starts with IOMxxxxxx where x is alphanumeric value.
DEVICE NAME	An optional parameter to specify the location of the load file.

—end—

Usage examples

The following table provides an explanation of the responses for the DOWNLD command.

Responses for the DOWNLD command

MAP output	Meaning and action
`Downld command is only applicable for IOM (FX30)`	**Meaning:**This response occurs when the DOWNLD command is on the 1X61 IOC version. **Action:** There is no action.

—continued—

Responses for the DOWNLD command (continued)

MAP output	Meaning and action
This command downloads a binary file to the Input/Output Module (IOM). It is only applicable to FX30 boards. The command uses the download file specified in Table IOC unless the user specifies a download filename as a parameter. Parms: [<FILENAME> STRING] [<DEVICENAME> STRING]	**Meaning:** This response occurs when you query the port command. **Action:** There is no action.
File_Id for “IOMR0000” on device “D000PMLOADS” Download of file “IOMR0000” succeeded. File_Id for “IOMR0000” on device “D000PMLOADS” Download of file “IOMR0000” failed. File_Id for “IOMR0000” on device “D000PMLOADS” Board is loaded with “IOMR0001” Please confirm (“Yes”, “Y”, “No”, or “N”)	**Meaning:** The DOWNLD command uses the file specified in table IOC unless the file name appears as the optional parameters. The above are three possible responses that result from issuing the DOWNLD command. Correct file name formats are fixed eight characters and identified as IOMRnnxx. The nn is the release STREAM and xx is the revision number. If the board already downloads with a different file, the command prompts you for confirmation. Static data of separate ports or SCSI devices on board will not download with this command. The RTS command at port level achieves the separate port configuration. RTS IOC does not download the complete configuration data for all ports. The system checks for the correct file name format. The system locates the file and sends a message to the loader to initiate the download sequence. If the board is loaded with the same load, action cannot occur. If the board is loaded with a different load, the command prompts you for confirmation. **Action:** Response with “YES” or “NO” if prompted.

—continued—

Responses for the DOWNLD command (continued)

MAP output	Meaning and action
`IOC must be bsy to download`	**Meaning:** This response occurs if the IOC is not MANB. **Action:** There is no action.
	—end—

TST in IOCMDIR

The TST command functions like the current commands except for the change in parameters in the event of IOM. TST is a menu command.

TST command parameters and variables

Command	Parameters and variables
TST	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}
Item	**Description**
Specify IOC or Port	Specify if the action is on the IOC or the port level
Port#	An optional parameter to specify the port selected for action.

Usage examples

The following table provides an explanation of an additional response to the TST command for IOM.

Responses for the TST command

MAP output	Meaning and action
`OK. Smart connector not present`	**Meaning:**This response occurs when the TST PORT operation succeeds. The operation succeeds while the smart connector for the port that undergoes tests is not present. Since the smart connector for the port is not present, the TST PORT operation does not include the loopback test at the smart connector. **Action:** There is no action.

`Site Flr Rpos Bay_Id Shf Description Slot EqPEC`
`HOST 01 A05 ISME 03 32 IOC 03 FX30AA`
`HOST 01 A05 ISME 03 32 IOC 03 FX31`
	Meaning: This response occurs when the TST fails operation and a card list appears.
	
	Action: Check IOD logs for failure reasons. RESET the IOM, download the firmware again, or replace the hardware that has faults.

`Site Flr Rpos Bay_Id Shf Description Slot EqPEC`
`HOST 01 A05 ISME 03 32 IOC 03 FX30AA`
 	
`Check and replace smart connector for port 3 (FX34, FX35)`
	Meaning: A failure in the smart connector caused by the response occurs when the TST operation fails.
	
	Action: Check IOD logs for failure reasons. RESET the IOM, download the firmware again, or replace the smart connector that has faults.

—end—	

BSY in IOCMDIR

The BSY command functions as the existing commands except for the change in parameters in the example of IOM. BSY is a menu command.

BSY command parameters and variables

Command	Parameters and variables
BSY	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}
Item	**Description**
Specify IOC or Port	Specify if the action is on the IOC or the port level
Port #	An optional parameter to specify the port selected for action.

Usage examples

The following table provides an explanation of an additional response to the BSY command for IOM.

Responses for the BSY command

MAP output	Meaning and action
`Downloading is in progress.` `Please confirm (“Yes”, “Y”, “No”, or “N”)`	**Meaning:**This response appears when a request for the BSY command occurs while the IOC downloads. You will be prompted to confirm. If you enter “No”, the BSY command aborts. If you enter “Yes”, the download aborts and the IOC will be made MANB. **Action:** There is no action.

RTS in IOCMDIR

The RTS command functions as the current commands except for the change in parameters in the event of IOM. RTS is a menu command.

RTS command parameters and variables

Command	Parameters and variables
RTS	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}

RTS command parameters and variables (continued)

Item	Description
Specify IOC or Port	Specify if the action is on the IOC or the port level
Port #	An optional parameter to specify the port selected for action.

Usage examples

The following table provides an explanation of an additional response to the RTS command for IOM.

Responses for the RTS command

MAP output	Meaning and action
`PEC mismatches with datafill`	**Meaning:** This response occurs when the RTS operation fails because of an incorrect entry of the IOM PEC code. The PEC code entered in table IOC is different from the one stored inside the IOM card. **Action:** Correct the IOM PEC code entered in table IOC.
`OK. Smart connector not present`	**Meaning:**This response occurs when the RTS operation succeeds. The operation succeeds while the smart connector for the port that undergoes the test is not present. Since the smart connector for the port is not present, the RTS operation does not include the loopback test at the smart connector. **Action:** There is no action.

`Site Flr Rpos Bay_Id Shf Description Slot EqPEC`
`HOST 01 A05 ISME 03 32 IOC 03 FX30AA`
`HOST 01 A05 ISME 03 32 IOC 03 FX31`
	Meaning: This response occurs when the RTS fails operation and a card list appears.
	
	Action: Check IOD logs for failure reasons. RESET the IOM, download the firmware again, or replace the hardware that has faults.

Responses for the RTS command

```
Site    Flr    Rpos    Bay_Id    Shf    Description    Slot    EqPEC
HOST     01     A05    ISME 03    32     IOC            03     FX30AA
Check and replace smart connector for port 3 (FX34, FX35)
```

Meaning: This response occurs when the RTS operation fails because of a failure in the smart connector

Action: Check IOD logs for failure reasons. RESET the IOM, download the firmware again, or replace the smart connector that has faults.

OFFL in IOCMDIR

The OFFL command functions like the current commands except for the change in parameters in the event of IOM. OFFL is a menu command.

OFFL command parameters and variables

Command	Parameters and variables
OFFL	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}
Item	**Description**
Specify IOC or Port	Specify how to offline the IOC or port
Port #	An optional parameter to specify the port selected for action.

STATUS in IOCMDIR

The STATUS command functions like the current commands except for the change in parameters in the event of IOM. STATUS is a non-menu command.

STATUS command parameters and variables

Command	Parameters and variables
STATUS	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}

STATUS command parameters and variables

Item	Description
Specify IOC or Port	Specify query status of IOC or port
Port #	An optional parameter to specify the port selected for action.

QUERY in IOCMDIR

The QUERY command functions like the current commands except for the change in parameters in the event of IOM. QUERY is a non-menu command.

QUERY command parameters and variables

Command	Parameters and variables
QUERY	Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}
Item	**Description**
Specify IOC or Port	Specify node number of IOC or device
Port #	An optional parameter to specify the port selected for action.

MDN in IOCMDIR

The MDN command functions like the current commands except for the change in parameters in the event of IOM. MDN is a non-menu command.

MDN command parameters and variables

Command	Parameters and variables
MDN	Parms: <Specify IOC >{IOC}
Item	**Description**

MDN command parameters and variables

Specify IOC or Port	Specify maximum device number of IOC (CANNOT specify PORT).
Port #	An optional parameter to specify the port selected for action.

RESET in IOCMDIR

The RESET command functions like the current commands except for the change in parameters in the event of IOM. RESET is a non-menu command.

RESET command parameters and variables

Command	**Parameters and variables**
RESET	RESET – IOC or port Parms: <Specify IOC or Port> {IOC, PORT <Port #> {0 to 17}}
Item	**Description**
Specify IOC or Port	Specify if the action is on the IOC or port level
Port #	An optional parameter to specify the port selected for action.

DEVTYPE in IOCMDIR

The DEVTYPE command functions like the current commands except for the change in parameters in the event of IOM. DEVTYPE is a non-menu command.

DEVTYPE command parameters nad variables

Command	**Parameters and variables**
DEVTYPE	Parms: <Port #> {0 to 17}}

DEVTYPE command parameters nad variables (continued)

Item	Description
Port #	A parameter to specify the port selected for action.

DDU in IOCMDIR

The DDU command is at the IOC or lower level to display the DDU display menu for the specified DDU. This command functions like the current command except that this command and displays DDU on a different IOC platform. DDU is a non-menu command.

DDU command parameters and variables

Command	Parameters and variables
DDU	DISK - Enter disk MTCE Parms: <DISK #> {0 to 9}
Item	**Description**
DISK #	Specify the disk number to display on IOC sublevel.

Usage examples

The following table provides an explanation of an additional response to the DDU command for IOM.

Responses for the DDU command

MAP output	Meaning and action
DDU--COMMAND NOT VALID AT THIS LEVEL Last parameter evaluated was: 1 ERROR: DDU 3 IS NOT ON THE DISPLAYED IOC IT IS ON IOC 2. Enter the correct IOC for device display.	**Meaning:** This command is the current command with an additional restriction. The above error message appears when you issue DDU command across two different IOC platforms (ie. 1X61 and FX30). **Action:** You can access the specified IOC for the corresponding DDU MAP level display.
DDU--COMMAND NOT VALID AT THIS LEVEL Last parameter evaluated was: 1 THIS DDU HAS NOT BEEN DATAFILLED	**Meaning:** This command is the current command with an additional restriction. The above error message appears when the DDU is not entered in a table under the new IOM sublevel. The current DDU display design starts the DDU sublevel with no specified values. The display does not change for IOC sublevel. **Action:** The user can access the specified IOC for the corresponding DDU MAP sublevel display
—end—	

MPC in IOCMDIR

The MPC command issued at the IOC or lower level displays the MPC display for the specified MPC. This command functions like the current command except that this command displays the MPC on a different IOC platform. MPC is a non-menu command.

MPC command parameters and variables

Command	Parameters and variables
MPC	Parms: <MPC UNIT NUMBER> {0 to 255}
Item	**Description**
MPC UNIT NUMBER	Specify the MPC number to appear on IOC sub-level.

Usage examples

The following table provides an explanation of an additional response to the MPC command for IOM.

Responses for the MPC command

MAP output	Meaning and action

`MPC-COMMAND NOT VALID AT THIS LEVEL`
`Last parameter evaluated was: 1`
`ERROR: MPC 3 IS NOT ON THE DISPLAYED IOC`
`IT IS ON IOC 2.`
`Enter the correct IOC for device display.`
	Meaning: This command is an existing command with an additional restriction. The above error message appears when you issue the MPC command across two different IOC platforms (1X61 and FX30)
	
	Action: You must access the specified IOC for the corresponding DDU MAP sublevel display.

UPGIOM in IOCMDIR

The UPGIOM command is only applicable to IOM. TOOPSUP control restricts the command to the operating company personnel of Northern Telecom. This command downloads the complete IOM load file as specified in the parameter and provides options to program the Flash again. UPGIOM is a non-menu command.

UPGIOM command parameters and variables

Command	Parameters and variables
UPGIOM	Parms: <FILE NAME> STRING [<RPGM_OPTION>{RPGM}]
Item	**Description**
FILE NAME	Correct file name is eight characters long starting with IOMxxxxx where x is alphanumeric value.
RPGM_ OPTION	Optional parameter indicates if the option to program again is specified.

Error messages

The following table contains an explanation of the warning messages for the UPGIOM command.

Error messages for the UPGIOM command

MAP output	Meaning and action
`WARNING: This command will reprogram the on IOM board flash memory. Proceed with caution.` `The above warning will be displayed when the command is activated`	**Meaning** As above **Action:** As above

Usage examples

The following table provides an explanation of an additional response to the UPGIOM command for IOM.

Responses for the UPGIOM command

MAP output	Meaning and action
`UPGIOM command is only applicable for IOM`	**Meaning:**This response occurs when an IOC (non-IOM type) posts while the controller executes UPGIOM command. **Action:** There is no action.
`User count exceeded: UPGIOM in use by XXX or UPGIOM access is restricted.`	**Meaning:** This response occurs when the process fails under TOOLSUP control. **Action:** Wait until the other user finishes programming or enable the command by TOOLSUP.
`Load file must be listed prior to command activation or IOM must be MBsy to download or IOM is being downloaded. Try again later.`	**Meaning:** This response occurs when you cannot locate the load file FID. This response can occur if the IOM is not in the correct state to initiate download. **Action:** List the load file and try again or MBsy the IOC or wait for the download of the IOM to finish.
• `This IOC is executing the same load file IOMRAA01` • `This IOC is executing a different base load IOMRAB01` • `This IOC is executing a different application load IOMRAA02` • `This IOC is executing a different load IOMHAA01` `Do you want to continue?`	**Meaning:** These responses occur after the standard warning message and prompt the user to confirm the download. **Action:** Yes to proceed with the download or No to return to the command.
`Note: Reprogram option RPGM is not selected. Download completed. Do you want to reprogram the IOM?`	

—continued—

Responses for the UPGIOM command (continued)

MAP output	Meaning and action
	Meaning: This response occurs when you do not specify the RPGM option and the download is complete. **Action:** Yes to proceed with the download or No to return to the command.
`DO NOT REMOVE BOARD DURING REPROGRAMMING!`	**Meaning:**This response notifies you not to remove the IOM hardware while the system reprograms. **Action:** There is no action.
`Reprogramming xx%`	**Meaning:**This response occurs when you program the IOM again. Periodic display of percentage reprogramming that appears on your screen. **Action:** There is no action
	• `Reprogram IOC x successful` • `Reprogram fail, check IOM hardware` • `Download fail` **Meaning:** These responses are the possible result of the command execution. **Action:** There is no action.
	—end—

BSY in MPCMDIR

The BSY command functions exactly like the current commands except for the change in parameters in the event of IOM. BSY is menu command.

BSY command parameters and variables

Command	Parameters and variables
BSY	Put an MPC or link in MBSY state. (Default MPC) Parms: [<OPTION1> {ALL[<OPTION2> {FORCE}] LINK <LINKNUM> {0 to 3} [<OPTION2> {FORCE}] LINKS [<OPTION2> {FORCE}]}]

Usage examples

The following table contains an additional MAP response for the BSY command in IOM.

Responses for the BSY command

MAP output	Meaning and action
`Request invalid for this unit.` `No link is datafilled on this MOC`	**Meaning:** This response occurs when the MPC cannot be MANB without datafill for the MPC link. This restriction is a new restriction and applies to IOM MPC because the MPCs are single unit in IOM. **Action:** Datafill the link before you MANB the MPC and then bring up the MPC.

RTS in MPCMDIR

The RTS command functions like the current commands except for the change in parameters in the event of IOM. RTS is a menu command.

RTS command parameters and variables

Command	Parameters and variables
RTS	RTS an MPC or link. (Default MPC) Parms: [<OPTION1> {ALL LINK <LINKNUM> {0 to 3} LINKS}]

OFFL in MPCMDIR

The OFFL command functions exactly like the current commands except for the change in parameters in the event of IOM. OFFL is a menu command.

OFFL command parameters and variables

Command	Parameters and variables
OFFL	Put an MPC or link in OFFL state. (Default MPC) Parms: [<OPTION1> {ALL LINK <LINKNUM> {0 to 3} LINKS}]

QLINK in MPCMDIR

The QLINK command functions exactly like the current commands except for the change in parameters in the event of IOM. QLINK is a menu command.

QLINK command parameters and variables

Command	Parameters and variables
QLINK	Performs query of configuration data for a particular MPC link Parms: [<LINKNUM> {2 TO 3}

QIOMALL in PRODIR

The QIOMALL command displays the iOM ports entry information QIOMALL is a non-menu command.

QIOMALL command parameters and variables

Command	Parameters and variables
QIOMALL	Display all IOM datatfilled inventory in CC
Parms: [<OPTIONS> {AVAIL, USED}]	
Item	**Description**
OPTIONS	AVAIL will display all the empty ports and USED will display all IOM datafilled ports

Usage examples

The following table provides an explanation of an additional response to the QIOMALL command for IOM.

Responses for the QIOMALL command

MAP output	Meaning and action
—continued—	

Responses for the QIOMALL command (continued)

MAP output	Meaning and action

```
Default response: QIOMALL

This command only reports IOM ports information
    ***IOC 0 NOT DISPLAYED***
    ***IOC 1 NOT DISPLAYED***
    ***IOC 2 NOT DISPLAYED***
    ***IOC 3 NOT DISPLAYED***

    IOC  PORT  DEVICE  DEV_ID
    ---  ----  ------
    5    0  -     -
    5    1  -     -
    5    2  -     -
    5    3  -     -
    5    4  -     -
    5    5  -     -
    5    6  -     -
    5    7  -     -
    5    8  -     -
    5    9  -     -
    5   10    CONS IOMMAP
    5   11  -     -
    5   12  -     -
    5   13  -     -
    5   14  -     -
    5   15  -     -
    5   16  DDU      7
    5   17  MTD      7
```

—continued—

Responses for the QIOMALL command (continued)

MAP output	Meaning and action

```
AVAIL option response: QIOMALL AVAIL

This command only reports IOM ports information

    ***IOC 0 NOT DISPLAYED***
    ***IOC 1 NOT DISPLAYED***
    ***IOC 2 NOT DISPLAYED***
    ***IOC 3 NOT DISPLAYED***

    IOC  PORT  DEVICE  DEV_ID
    ---  ----  ------
    5    0  -     -
    5    1  -     -
    5    2  -     -
    5    3  -     -
    5    4  -     -
    5    5  -     -
    5    6  -     -
    5    7  -     -
    5    8  -     -
    5    9  -     -
    5   10  -     -
    5   11  -     -
    5   12  -     -
    5   13  -     -
    5   14  -     -
    5   15  -     -
```

—continued—

Responses for the QIOMALL command (continued)

MAP output	Meaning and action

```
USED option response: QIOMALL USED

This command only reports IOM ports information

    ***IOC 0 NOT DISPLAYED***
    ***IOC 1 NOT DISPLAYED***
    ***IOC 2 NOT DISPLAYED***
    ***IOC 3 NOT DISPLAYED***

    IOC  PORT  DEVICE  DEV_ID
    ---  ----  ------
    5   10  CONS   IOMMAP
    5   16   DDU   7
    5   17   MTD   7
```

Meaning: The above examples display IOM ports entry information. The QIOMALL command is applicable to IOM. The old version of IOC (1X61) will not appear as shown in IOC 0-3 above.

Action: You must access the specified IOC for the corresponding DDU MAP sub-level display.

—end—

IOD-related card requirements

Description of card replacement procedures

Card replacement procedures can be stand-alone procedures or can be part of another maintenance procedure such as an alarm clearing procedure. Table 7-1 lists card replacement procedures for the input/output controller (IOC) shelf and the input/output module (IOM) in the integrated systems module (ISM) shelf.

Table 7-1
IOD circuit card replacement

Card	Replacement procedure
NT0X67 NT1X62	Refer to “System cards in an IOC” in *Card Replacement Procedures*.
NT1X55 NT1X68	Refer to “Disk drive and magnetic tape controller cards in an IOC” in *Card Replacement Procedures*.
NT1X67	Refer to “NT1X67 in an IOC” in *Card Replacement Procedures*.
NT1X78	Refer to“NT1X78 in an IOE DDU shelf” in *Card Replacement Procedures*.
NT1X89	Refer to “NT1X89 in an IOC shelf” in *Card Replacement Procedures*.
NT2X70	Refer to “NT2X70 in an IOC” in *Card Replacement Procedures*.
NTFX30	Refer to “NTFX30 in an ISM” in *Card Replacement Procedures*.

—continued—

Table 7-1
IOD circuit card replacement (continued)

Card	Replacement procedure
NTFX31	Refer to “NTFX31 in an ISM” in *Card Replacement Procedures*.
NTFX32	Refer to “NTFX32 in an ISM” in *Card Replacement Procedures*.
	—end—

Replacement procedures for DDU, MTD, and DAT

Table 7-2 summarizes the replacement procedures for DDU, MTD, and DAT. The procedures are for the input/output devices (IODs) attached to the IOC or IOM cards listed in table 7-1.

Table 7-2
DDU, MTD, and DAT replacement procedures

Equipment	Action summary
14-in. DDU	Replace the disk drive unit (DDU) when the DDU has faults and no longer records. Do not copy files from a DDU that has faults. Backup all DDU files on a parallel device. Post the associated controller card. Make sure that open files are not present in DDU disk volumes. Test the disk drive controller. Busy the controller card and offline the disk drive. Power down the DDU to turn OFF the associated power converter and remove the associated fuses. Replace the DDU. If necessary, set the switches on the replacement DDU. Insert the fuses and power up the DDU. Busy the controller card and start the disk drive motor. Allocate disk space. Perform allocation tests. Perform interference and file transfer tests. Create disk volumes and add the disk volume names to the directory. Test and return to service the DDU controller. Restore files in disk volumes. For a description of the procedure for the replacement of a 14-in. DDU, refer to “How to replace a 14–in. DDU” in *Trouble Locating and Clearing Procedures.*
	—continued—

Table 7-2
DDU, MTD, and DAT replacement procedures (continued)

Equipment	Action summary
8-in. or 5.25-in. DDU	Replace the disk drive unit (DDU) when the drive has faults and no longer records. Do not copy files from a DDU that has faults. Backup all DDU files should on a parallel device. Post the associated controller card. Make sure open files are not present in DDU disk volumes. Test the disk drive controller. Busy the controller card and offline the disk drive. Power down the DDU. Turn off the associated power converter. Replace the DDU. If necessary, set the switches on the replacement DDU. Power up the DDU. Busy the controller card and start the disk drive motor. Test the disk drive. Allocate disk space. Perform allocation tests. Perform interference and file transfer tests. Create disk volumes and add the disk volume names to the directory. Return the disk drive to service. Restore files in disk volumes. For a more detailed description of the procedure for the replacement of an 8-in. or 5.25-in. DDU. Refer to “How to refer an 8-in. or 5.25-in. DDU” in *Trouble Locating and Clearing Procedures.*
3.5-in. DDU	Replace the disk drive unit (DDU) when the drive has faults and no longer records. Do not copy files from a DDU that has faults. Back up all DDU files on a parallel device. Post the associated controller IOM controller card port. Make sure that open files are not present in DDU disk volumes. Test the IOM controller. Busy the DDU port on the IOM controller and offline the disk drive. Replace the DDU on the IOM media card. If necessary, set the switches on the replacement DDU. Power up the DDU. Busy the IOM controller port and start the disk drive motor. Test the disk drive. Allocate disk space. Perform allocation tests. Perform interference and file transfer tests. Create disk volumes and add the disk volume names to the directory. Return the disk drive to service. Restore files in disk volumes. For a description of the procedure for the replacement of an 3.5-in. DDU, refer to “How to replace an 3.5-in. DDU”in *Trouble Locating and Clearing Procedures.*
IOC DDU, or SCSI DDU	Refer to NT1X55 in Table 7-1

—continued—

Table 7-2
DDU, MTD, and DAT replacement procedures (continued)

Equipment	Action summary
Magnetic tape on the MTD	Check the write enable ring. Leave it in place for read-write operation and remove it for read-only operation. Examine the tape reel for warpage. Open the cover door and unlock the reel hub. Position the supply reel firmly on the hub, and lock the reel in place on the hub. In the same method, position the take-up reel. Unwind four or five feet of tape from the supply reel and thread the tape according to your particular unit's instructions. Manually, wind five to six turns of the tape on the take-up reel. Set the power switch on.
Magnetic tape on the digital audio tape (DAT) drive	Check the fault lights on the DAT drive unit. Determine if the DDS tape in the drive is not at the end of the tape. If the tape is not at its end, clean the tape drive. Use cleaning cartridge A0627569. Replace the tape with a new DDS tape if necessary. Do not force eject the tape. After about 30 s the cleaning cartridge ejects from the drive. Replace the tape. The read/write process starts automatically.
—end—	

Fault isolation and correction

This chapter describes fault isolation and correction procedures for input/output devices (IOD).

The following devices are included in this chapter:

- an input/output controller (IOC)
- an input/output module controller (IOM) card
- a magnetic tape drive (MTD)
- a console or a terminal (CONS)
- a disk drive unit (DDU)
- a digital audio tape (DAT) drive

Fault isolation and correction procedures

You perform IOD fault isolation and correction at IOD MAP sublevels. These levels are IOC, IOM, Card, MTD and DAT, CONS, and DDU.

Each IOC has a separate MAP display. An IOC MAP display indicates the type of controller cards on an IOC shelf. The IOC MAP display also indicates the state of the equipped ports on each card. To display information for an IOC, include the number of an IOC in each command.

Each IOM has a separate MAP display. An IOM MAP display indicates the type of port on an IOM controller in an ISM shelf. The IOM MAP display also indicates the statue of the equipped ports on the controller. To display information for an IOC, include the number of the IOC in each command. An IOM MAP appears only if there is an IOM provisioned.

fault isolation and correction procedures for IOD are categorized as follows:

- how to locate and clear faults
- fault isolation tests
- diagnostic tests
- product-specific test tools

Locating and clearing faults

Fault conditions for IOD are identifed in the following:

- operational measurements (OM)
- log reports
- alarms
- data tables

Operational measurements

The OM system monitors and counts events, as described in chapter 4. OMs can help detect both existing and potential IOD subsystem troubles. Use the OM thresholding feature to monitor and report key IOD activity. Generate these reports at regular intervals (daily or weekly).

Logs

The logs identified in chapter 3 provide detailed information on IOD subsystem faults. There may be an IOD subsystem problem when one or more of the following occurs:

- an increase in volume of iod or IOD-related logs
- the message *not printed* appears in log reports
- a large number of similar IOD or IOD-related logs

The log utility (LOGUTIL) tracks all IOD activities. The system generates a log report when the state of an IOD component changes. There is a different log report each type of state change. Log reports identify faults and describe corrective actions.

Check IOD and IOD-related log reports at regular intervals. IOD and IOD-related log reports are generated for following components:

- MTDs
- DDUs
- consoles
- ports
- multiprotocol controllers and other interface cards

To access the IOD subsystem log buffer that has the most recent log reports, enter the OPEN IOD command from the CI MAP level.

For more information on IOD and IOD related logs, refer to *Log Report Reference Manual*.

Alarms

The most severe IOD faults generate alarms that are displayed under the IOD header of the alarm banner at the MTC and lower levels of the MAP.

Alarms, both audible and visual, indicate that a fault requires corrective action. Alarm severity and the corresponding urgency for corrective action are indicated by the alarm severity (critical, major, minor). The alarm severity indicator appears directly under the alarm indicator in the alarm banner.

Table 8-1 describes the IOD-related alarms.

Table 8-1
IOD alarms

Alarm	Possible causes
IOD DEVB*nn*	The device driver, DIRPDSON or DIRPTSON, either failed to bind itself to the Device Independent Recording Package (DIRP) utility, or no longer runs. The software or hardware on which the driver depends has faults.
IOD HOLD*nn*	Only nn slots out of a possible 100 slots are free in table DIRPHOLD.
IOD NO AMA *C*	Files are not available (on disk or tape) to record data from the automatic message accounting (AMA) subsystem.
IOD NO ssys	Files are not available (on disk or tape) to record data from the subsystem. The abbreviation *ssys* represents the affected subsystem. The alarm can affect subsystems that include journal file (JF), OM, and AMA.
IOD *nn*JF	The DIRP utility cannot open enough recording files to meet the number of files specified in table DIRPSSYS.
IOD *nn*OM	The DIRP utility cannot open enough recording files to meet the number of files specified in table DIRPSSYS.
IOD *nn*AMA	The DIRP utility cannot open enough recording files to meet the number of files specified in table DIRPSSYS.
IOD P*nn*1V*nn*2	The V*nn* identifies the recording volume in the recording pool. P*nn* identifies the recording pool. The recording pool has less than 1 MB of free space. The utility can mark the volume as INERROR by the DIRP utility.

—continued—

Table 8-1
IOD alarms (continued)

Alarm	Possible causes
IOD POOL*nn*	A pool has entries in table DIRPPOOL but does not have entries in table DIRPSSYS.
IOD ssys B	The subsystem either failed to bind to the DIRP utility or does not run. This event occurs because the subsystem is not entered in table DIRPSSYS.
IOD ssys E	The DIRP utility completed an emergency rotation of the regular files of a subystem.
IOD ssys F	More than 24 subsystems attempted to bind into the DIRP utility.
IOD ssys I	ACTIVE and STANDBY one volumes in a subsystem are on the same IOC.
IOD ssys P	The parallel file assigned to a subsystem does not record.
IOD ssys MP	The parallel file assigned to a subsystem does not record.
IOD *n*CKEr	A minimum of one I/O device disconnects at the I/O controller. The number (*n*) that precedes CKEr indicates the number of disconnected I/O devices.
IOD *n*CkOS	A minimum of one circuit is out of service. The number (*n*) that precedes CkOS indicates the number of circuits that are out of service. For IOM, the CkOS (circuit out-of-service) fault condition occurs when a controller port is out-of-service. Service discontinues to any device associated with an out-of-service circuit.
IOD *n*DDUOS	A minimum of one DDU is out of service. The number (*n*) that precedes DDUOS indicates the number of DDUs out of service. For IOM, the DDUOS (disk drive unit out-of-service) fault condition occurs when A minimum of one of the disk drive units is out of service. Files cannot record or download to or from tape or DDU.
IOD *n*DPCOS	A minimum of one DATAPAC controllers is out of service. The number (*n*) that precedes DPCOS indicates how many DATAPAC controllers are out of service.

—continued—

Table 8-1
IOD alarms (continued)

Alarm	Possible causes
IOD *n*IOCOS	Two or more IOCs are out of service. The number (*n*) that precedes IOCOS indicates how many IOCs are out of service. For IOM, a problem in the IOM controller card (NTFX30) causes the CkOS (input/output module out-of-service) fault condition. All devices that associate with the out-of-service IOC lose communication with the DMS-100 switch.
IOD *n*MPCOS	A minimum of one MPC is out of service. The number (*n*) that precedes MCPOS indicates how many MPCs are out of service. For IOM, the (multiprotocol controller port out-of-service) fault occurs when a problem is present with a minimum of one of the multiprotocol ports. Access to the DMS-100 switch by remote terminals is lost for any affected ports.
IOD *n*MTDOS	A minimum of one MTD is out of service. The number (*n*) that precedes MTDOS indicates how many MTDs are out of service. For IOM, the MTDOS (magnetic tape drive or digital audio tape out-of-service) fault condition occurs when a problem is present. The problem is present in a minimum of one tape drive or digital audio tape.
IOD DMNT*n*	Transmission of a tape from a tape drive to a remote data center completed. The number (*n*) following DMNT indicates the number of the MTD that has a tape.
IOD KEEP*n*	Retain a file on a recording device in an office, following transmission to a data center. The number (*n*) following KEEP represents the number of the recording device.
IOD SEND*n*	Transport a data tape on a recording device to a remote data center. The number (*n*) following SEND indicates the number of the recording device that has a tape.
IOD XMIT*n*	A remote data center requested transmission of a file from a recording device. The number (*n*) following indicates the number of the recording device that contains the file.
—end—	

Table 8-2 describes IOD alarm severities.

Table 8-2
IOD alarm severities

Alarm	severity indicator	Effect on service
Critical	*C*	service outage or potential service outage
Major	M	service degradation or potential service degradation
Minor	blank	non service-affecting

Some fault conditions generate more than one alarm indicator. Critical alarms can hide less severe alarms. Major alarms can hide minor alarms. Clear critical alarms first.

The performance of routine system maintenance can minimize the occurrence of alarms.

Clearing alarms

Use the following guidelines when you respond to alarms:

- When more than one alarm of the same severity appears on the MAP screen, clear the alarms starting at the left of the alarm banner.
- If, while clearing an alarm, an alarm of greater severity occurs, respond to the new alarm. Do not continue attempts to clear a less severe alarm.

For additional information on alarm clearing, refer to *Alarm and Performance Monitoring Procedures*.

Fault isolation tests (IOC)

This section describes testing and special procedures to isolate and clear the IOD-related faults listed in table 8-1. Table 8-3 identifies the hardware devices associated with IOD alarms.

Table 8-3
IOD fault types

Fault	Affected hardware
IOCOS	Input/output message processor card (NT1X62)
	—continued—

Table 8-3
IOD fault types (continued)

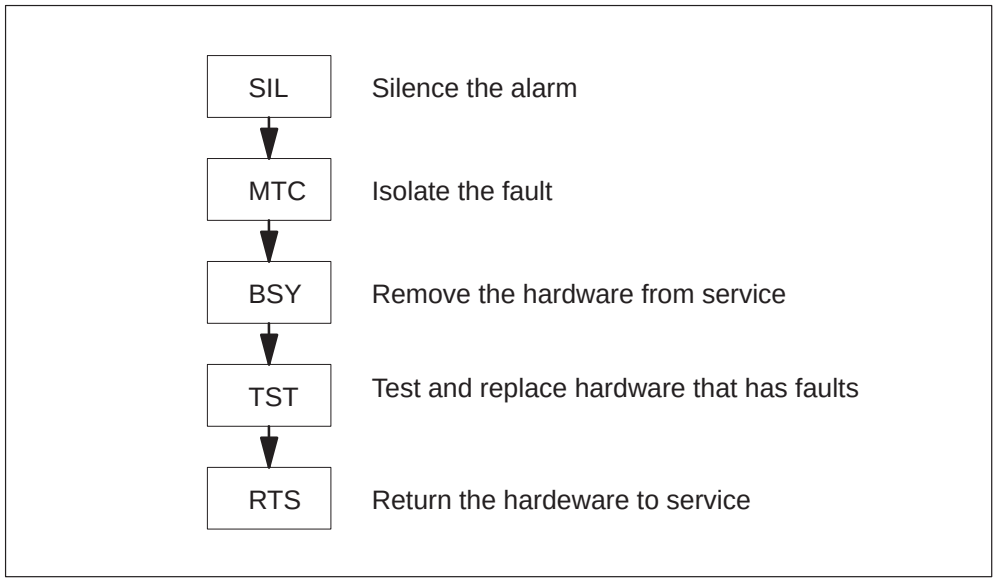
Fault	Affected hardware
	Input/output terminator card (NT0X67) Power converter card (NT2X70)
CkOS	Terminal controller card (NT1X67)
MTDOS	Magnetic tape controller card (NT1X68)
DDUOS	Disk drive controller card (NT1X55)
	—end—

For additional information of IOD related fault clearance procedures, refer to *Alarm and Performance Monitoring Procedures*.

IOCOS faults

Figure 8-1 shows standard problem solving commands and procedures to respond to an IOD alarm. The commands and procedures isolate and correct an IOCOS fault.

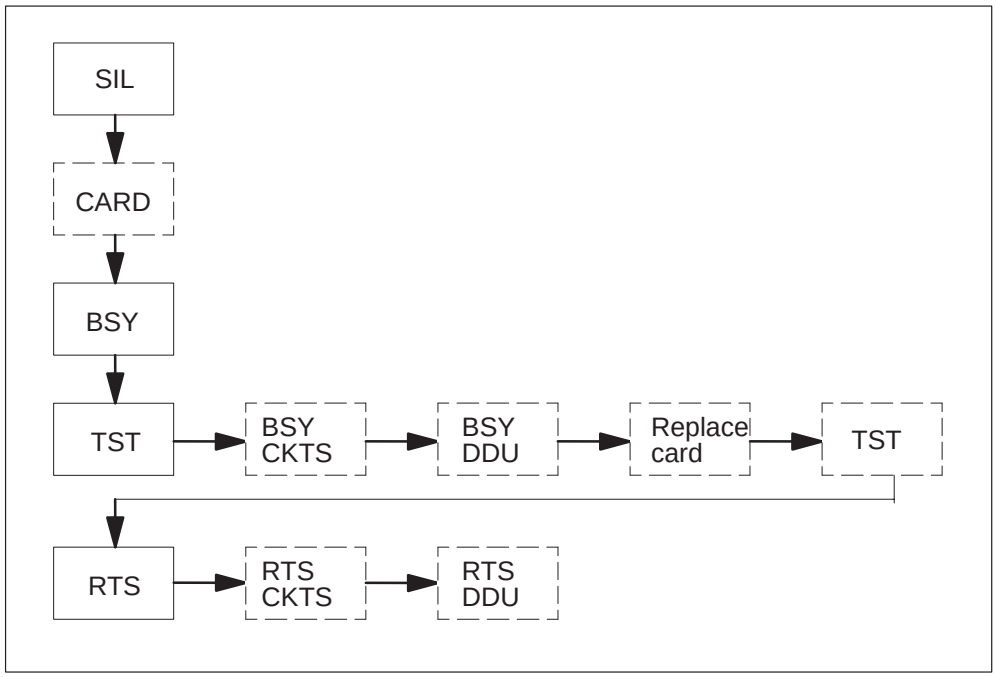
Figure 8-1
Standard problem solving procedures



CkOS faults

Figure 8-2 shows the commands and special procedures to clear a CkOS fault. These procedures include manually busying the ports or circuits (CKTS) on the card (CARD) that has faults.

Figure 8-2
Special procedures: CkOS fault



Testing and replacing DDU cards

If testing fails after performance of standard problem solving procedures and the system generates a card list, replace the card that has faults. For a CkOS fault, replace a terminal controller card that has faults *only after all ports on the card are manually busied*. If all ports are not busied, the system detects additional CkOS faults that relate to the ports that function on the card that has faults.

All DDUs that connect to an IOC must be manually busied before you can replace any cards. This procedure prevents DDU file damage. Before you remove a DDU from service, all files must close to prevent data loss.

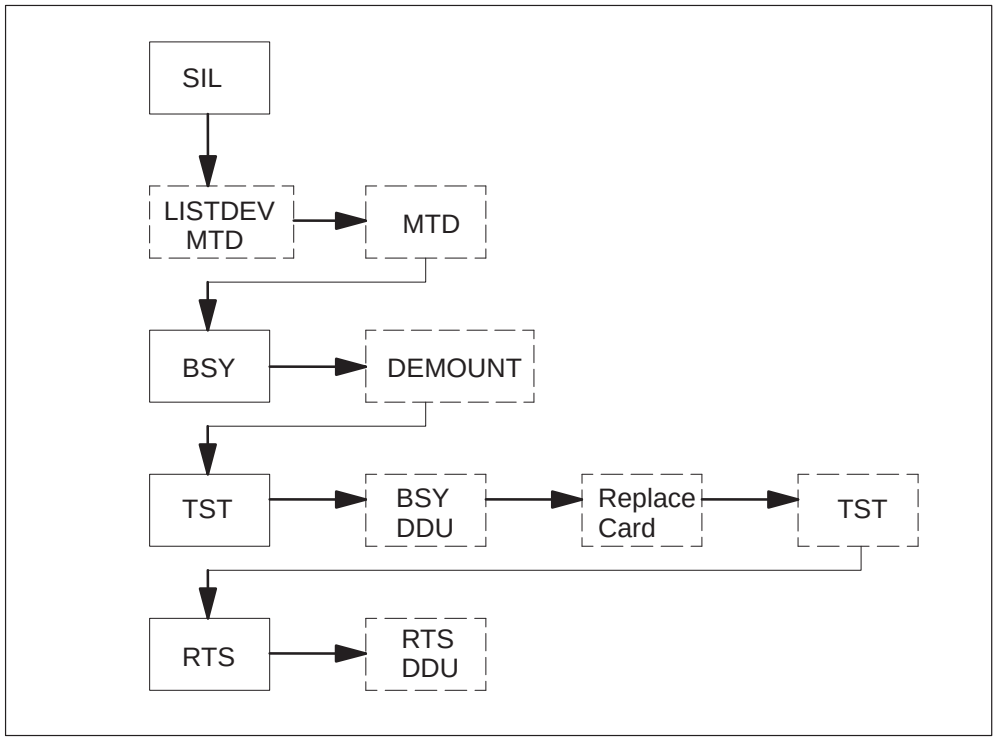
Mainstreaming hardware

Before you can return a DDU to service, you must return all ports on the associated terminal controller cards to service.

MTDOS faults

Figure 8-3 shows commands and special procedures for clearance of an MTDOS fault.

Figure 8-3
Special procedures: MTDOS fault



Isolating the faulty MTD card

After you silence the alarm from the IOD level, use the LISTDEV MTD command to determine the status of the MTD that has faults. Manually busy the MTD and enter the LISTDEV MTD command a second time. Determine if you must demount the MTD. If the MTD requires a demount, enter the DEMOUNT command. If the system does not generate a message that indicates that open files are present on the MTD, the demount is successful.

Testing and replacing MTD cards

Use standard problem solving procedures to test the MTD. If the test fails, and the system generates a card list that has faults, replace the card that has faults. Before you can replace an MTD card, all DDUs that connect to the IOC must be manually busied to prevent damage. Close all DDU files before you remove a DDU from service. Enter the LISTDEV command to check the DDU status. Use the standard procedures to replace MTD cards that have faults.

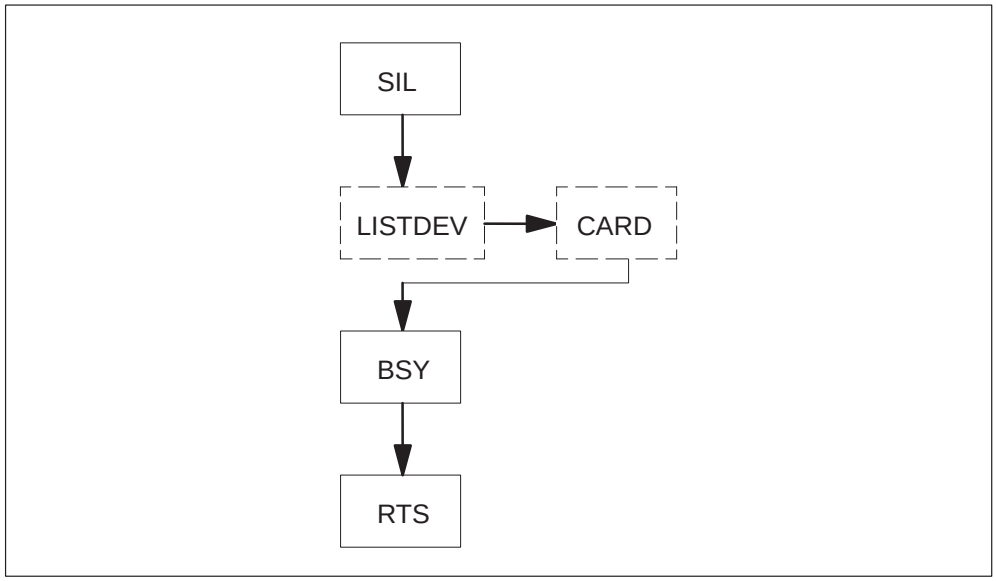
Mainstreaming the hardware

Return the DDU to service at the MTD CARD level. After you return a MTD that has faults to service, follow the correct local office procedures to establish recording activity on the tape drive again. (This procedure varies according to the specifications of each operating company.) Return the DDU to service.

DDUOS faults

Figure 8-4 shows the commands and special procedures to clear a DDUOS fault.

Figure 8-4
Special procedures: DDUOS fault



Isolating the faulty DDU card

After you silence the alarm, enter the LISTDEV DDU command to determine the DDU card number. The LISTDEV DDU command displays the number, user (system), and status for all DDUs in the DMS switch. the command also displays the IOC, card, and port that associates with each DDU.

Offstreaming and mainstreaming DDU hardware

The DDU must be manually busied. After you busy the DDU, follow the correct maintenance procedures. The procedures you must follow depend on information that appears under `drive_status` header of the MAP display. Return the DDU to service to test the DDU.

Fault isolation tests (IOM)

This section describes testing and special procedures to isolate and clear the IOD related faults for the IOM listed in table 8-4.

Table 8-4
IOD fault types (IOM)

Fault	Affected hardware
IOCOS	Input/output controller card (NTFX30) Input/output controller paddle board (NTFX31)
CkOS	Input/output controller card (NTFX30) RS232C smart connector (NTFX34) V.35 smart connector (NTFX35) Current loop smart connector (NTFX38)
MTDOS	Input/output controller card (NTFX30) Digital audio tape drive (NTFX32CA) PERTEC smart connector (NTFX36)
DDUOS	Input/output controller card (NTFX30) Disk drive unit (NTFX32BA)

For additional information on IOD-related fault clearance procedures, refer to *Alarm and Performance Monitoring Procedures*.

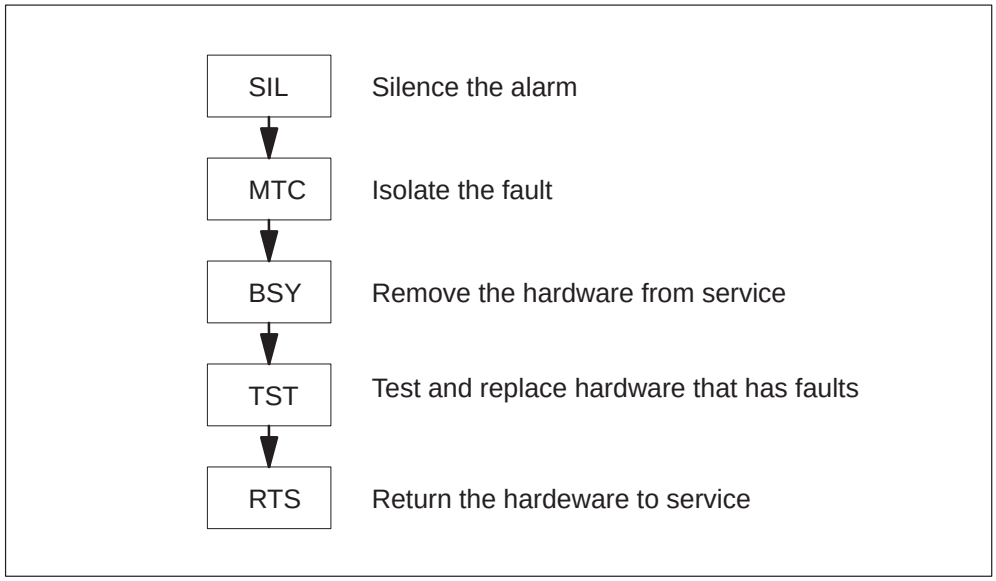
If the MAP the display identifies a controller that has faults, test the controller and return the controller to service. If you test the controller port and find that the port has faults, move the port connector to another connector on the IOM paddle board. For a cabinetized integrated services module (CISM), move the port connector on the bulkhead until a scheduled replacement occurs.

If a smart connector or PERTEC connector is the cause of the problem, replace the connector. To replace the connector, use alarm clearance procedures for the IOD. Chapter 7 discusses card replacement procedures for IODs. For additional information on card changing procedures, refer to *Card Replacement Procedures*.

IOCOS faults

Figure 8-5 shows standard problem solving commands and procedures to respond to an IOD alarm. The commands and responses isolate and correct an IOCOS fault.

Figure 8-5
Standard problem solving procedures



Isolating the faulty IOCOS port

After you silence the alarm from the IOD level, determine the status of a port from the MAP display. Determine if an alarm is present under the MS header. Clear the alarm. Select busy and reset the controller card. Test and return the card to service. If the reset fails, replace the IOM controller card.

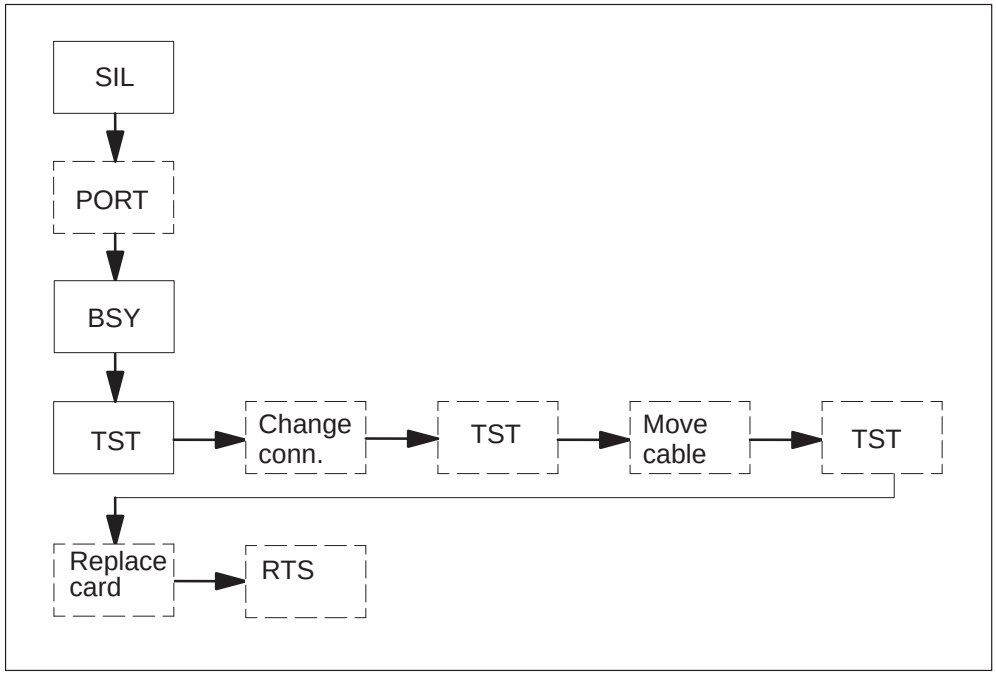
Testing and isolating IOM cards

A test can fail after performance of standard problem solving procedures and after the system generates a card list. If the test fails, replace the IOM controller card that has faults.

CkOS faults

Figure 8-6 shows the commands and special procedures to clear a CkOS fault. These procedures include manually busying the IOM ports.

Figure 8-6
Special procedures: CkOS fault



Isolating the faulty CkOS port

After you silence the alarm from the IOD level, determine the status of the terminal controller port from the MAP display. Determine if an alarm is present under the MS header. Clear the alarm. Test the affected devices. Select the IOM port. Offline and test the affected port. Check the command response for replacement of a smart connector. Replace the connector and return the connector to service.

If the command response does not indicate a connector, move to a new controller port. Select an open port. Check and make entries in the port if required. Locate the smart cable for the port that has faults. Move the cable to the new port and return to service. If open ports are not available on the current IOM, you can make entries to a new IOM.

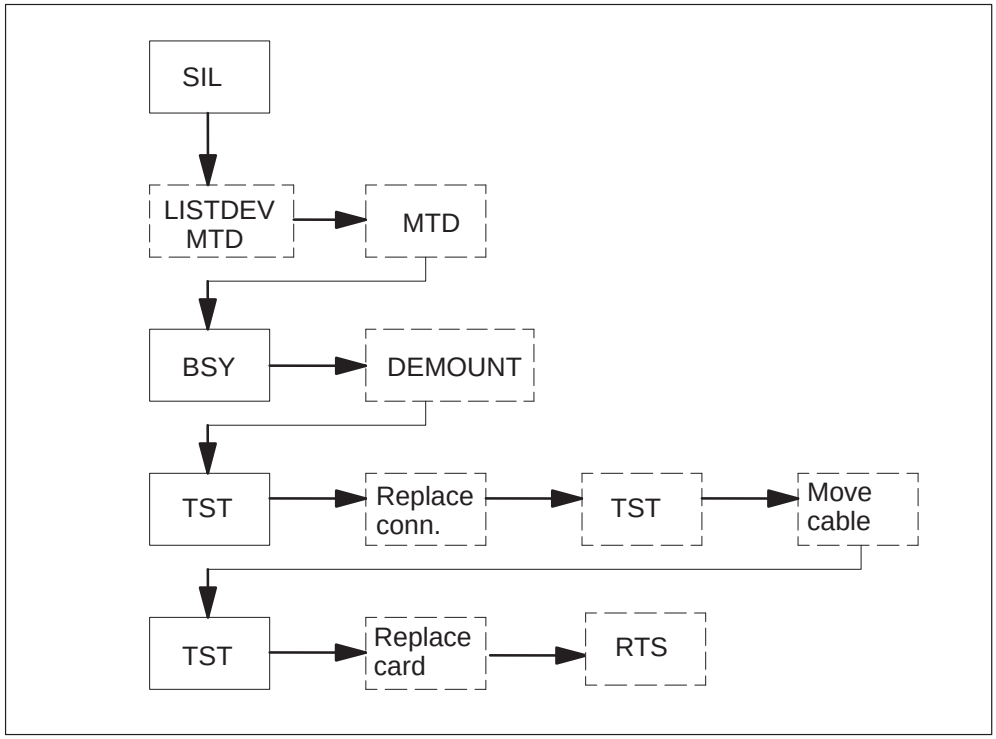
Testing and isolating IOM cards

A test can fail after you perform standard problem solving procedures and after a system generates a card list. If a test fails, replace the IOM controller card that has faults.

MTDOS faults

Figure 8-7 shows commands and special procedures for the clearance of an MTDOS fault.

Figure 8-7
Special procedures: MTDOS fault



Isolating the faulty MTD or DAT port

After you silence the alarm from the IOD level, use the LISTDEV MTD command to determine the status of the MTD or DAT port that has faults. Manually busy the port and enter the LISTDEV MTD command a second time to determine if the MTD or DAT needs to demount. If the MTD or DAT needs to demount, enter the DEMOUNT command. If the system does not generate a message that indicates that open files are present on the MTD, the demount is successful.

Testing and isolating the MTD port

Use standard problem solving procedures to test the MTD or DAT. Post and demount the MTD or DAT units as required. Unload the MTD tape or DAT cartridge. Test the affected devices. Select the IOM port. Offline and test the affected port. Check the command response for replacement of a smart connector. Replace the connector and return the connector to service.

If the command response does not indicate a connector, move the affected port cable to a new control port. Select an open port. If required make table entries to the port. Locate the smart cable for the affected port. Move the cable to the new port and return the port to service. If open ports are not available on the current IOM, make entries to a new IOM.

Offstreaming and mainstreaming DAT hardware

The DAT port must be manually busied. After the DAT is busied, check the LEDs on the face of the unit for the condition of the drive. The check depends on the display under the `status` header of the MAP display. Use standard procedures to check the cartridge or cleaning of the drive heads. If the unit has faults, use standard procedures to replace the DAT drive.

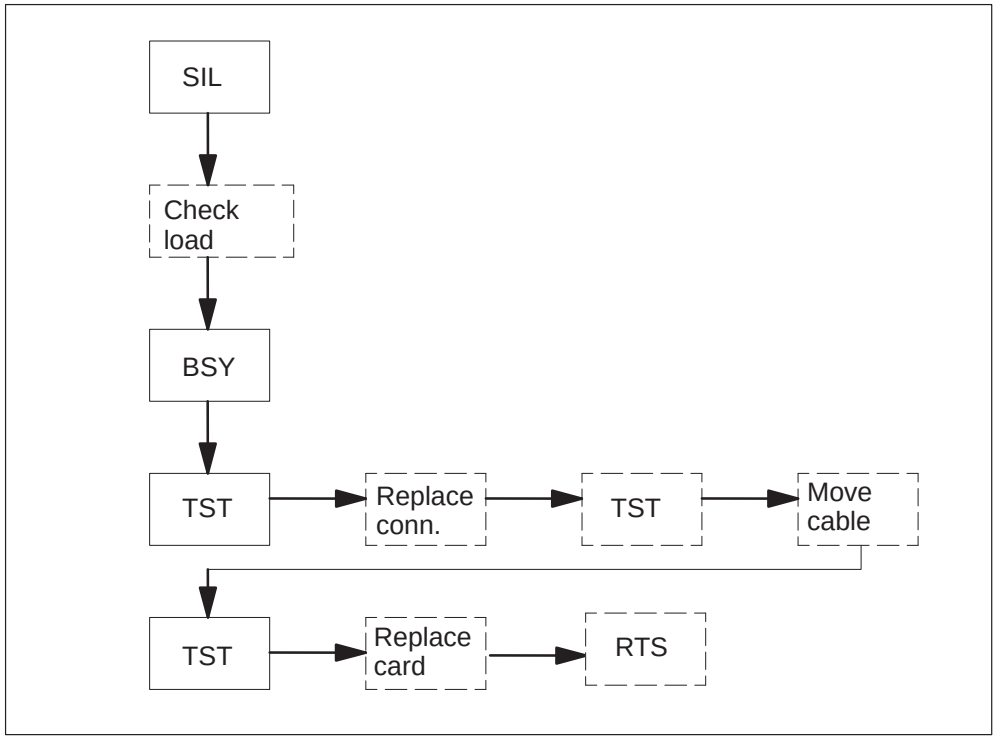
Testing and replacing IOM cards

A test can fail after you perform standard problem solving procedures and after the system generates a card list. If a test fails, replace the IOM controller card that has faults.

MPCOS faults

Figure 8–8 shows commands and special procedures to clear MPCOS faults in an IOM.

Figure 8-8
Special procedures: MPCOS fault



Isolating the faulty MPC port

After you silence the alarm from the IOD level, determine the status of the MPC port from the MAP display. Enter the QIOM command to determine the status of the IOM load. If the controller does not have a load and the autoload is on, allow the autoload process to reload the controller and return

the controller to service. If the controller does not have a load and the autoload is off, manually load the controller again. The process allows three attempts to load the controller before the system takes additional action. Review log IOD610 and return the log to service.

If the IOM did not load again, post and test the affected port. Check for replacement of a smart connector. Replace the connector and return the connector to service. If the command response does not indicate a connector, select an open port. Check the port. If required, make entries to the port. Locate the smart cable for the affected port. Move the cable to the new port and return the port to service. If open ports are not available on the current IOM, make table entries in a new IOM as required.

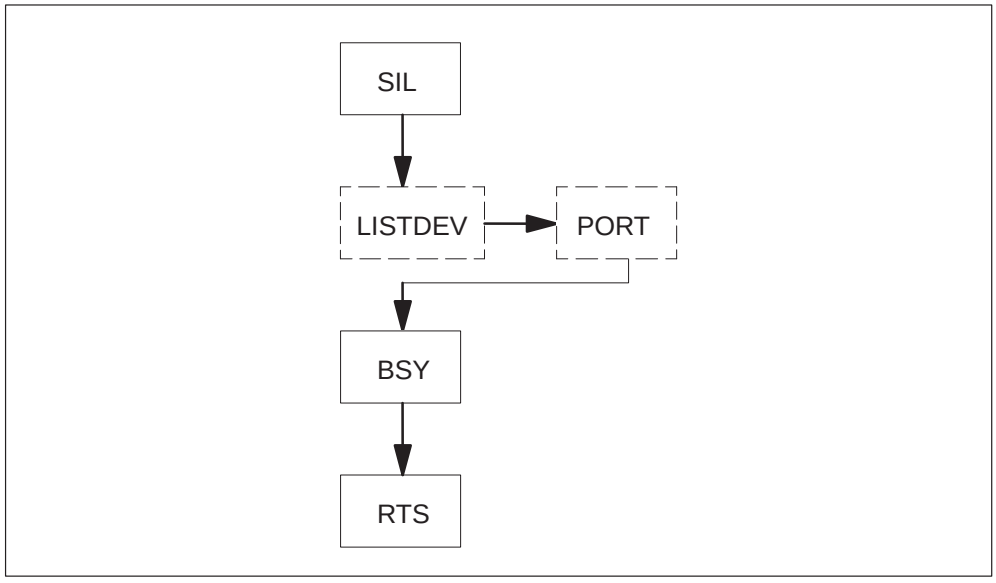
Testing and isolating IOM cards

A test can fail after you perform standard problem solving procedures and after the system generates a card list. If the test fails, replace the IOM controller card that has faults.

DDUOS faults

Figure 8-9 shows the commands and special procedures to clear an DDUOS fault.

Figure 8-9
Special procedures: DDUOS fault



Isolating the faulty DDU

After you silence the alarm, enter the LISTDEV DDU command to determine the DDU port number. The LISTDEV DDU command displays

the number, user (system), and status for all DDUs in the DMS switch. this command displays the IOC and port that associates with the DDU.

Offstreaming and mainstreaming DDU hardware

The DDU port must be manually busied. After you busy the DDU, follow the correct maintenance procedures. The procedure you must follow depend on information that appears under the depending `drive_status` header of the MAP display. To test the DDU, return the DDU to service.

Testing and isolating IOM cards

A test can fail after you perform standard problem solving procedures and after the system generates a card list. If a test fails, replace the IOM controller card that has faults.

Diagnostic tests

To identify faults, the system performs self-diagnostics. System actions on a IOD component that has faults include isolation and testing of the component. The actions can include an attempt to return the part to service. When system actions do not clear a fault, manual actions are required.

Detailed IOD fault-clearing procedures are included in the following publications:

- *Alarm and Performance Monitoring Procedures*
- *Trouble Locating and Clearing Procedures*
- *Card Replacement Procedures.*

Product specific test tools

Product specific test tools are not identified at this time.

Fault clearing

Clearing alarms

The following chart contains a summary of problem solving procedures for the clearance of alarms on an input/output device (IOD). Chapter 8 describes IOD alarms and alarm severity. Detailed alarm clearing procedures for IODs are included in *Alarm and Performance Monitoring Procedures*.

Table 9-1
IOD alarm clearing

Alarm condition	Possible cause	Action
Critical	The device driver fails to bind to the Device Independent Recording Package (DIRP) utility. The drive does not continue to run because the software or hardware on which the driver depends has faults. If you repair the device driver now, service is not affected. If you do not repair the device driver, a loss in Automatic Message Accounting (AMA) data occurs.	1 Contact the next level of support. 2 Activate the device driver.
	Files are not available to record data from the AMA subsystem. A loss of billing information occurs.	1 Silence the alarm. 2 Allocate disk volume.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Critical (continued)	Files are not available to record data from the subsystem. A loss of information occurs.	1 Silence the alarm. 2 Allocate tape volumes. 3 If tape volumes are full, replace old tape with new tape and allocate new tape volume. 4 If tape volume has faults, allocate an alternate volume, and repair and reallocate volumes that have faults. 5 Contact the next level of support.
	Files are not available to record data from the journal file (JF), operational measurements (OM), or AMA subsystems. If this is a NO AMA or NO Station Message Detail Recording (SMDR) alarm, a loss of billing data occurs. If this is an alarm that affects any other subsystem, a loss of switch information occurs.	1 Silence the alarm. 2 Allocate disk volume.
	Files are not available to record data from the journal file (JF), operational measurements (OM), or AMA subsystems. If this is a NO AMA or NO Station Message Detail Recording (SMDR) alarm, a loss of billing data occurs. If this is an alarm that affects any other subsystem, a loss of switch information occurs.	1 Silence the alarm. 2 Allocate tape volumes. 3 If tape volumes are full, replace old tape with new tape and allocate new tape volume. 4 If tape volume has faults, allocate an alternate volume, and repair and reallocate volumes that have faults. 5 Contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Critical (continued)	The DIRP utility cannot open enough recording files to meet the number of files specified in table DIRPSSYS. A loss of records (on disk or tape) of changes made to data tables or of service orders of the DMS-100 switches occurs.	1 Find *NN* available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The DIRP utility cannot open enough recording files to meet the number of files that specifies in table DIRPSSYS. A loss of measurement data on the operating system occurs. The system cannot collect or display data.	1 Find *NN* available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The DIRP utility cannot open enough recording files to meet the number of files specified in table DIRPSSYS. A backup recording of AMA data is not made.	1 Find *NN* available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Critical (continued)	The alarm indicates the subsystem. This subsystem has a parallel file. This paralllel file does not record. A loss of backup files of billing occurs.	1 Silence the alarm. 2 Wait 3 min while the parallel volume rewinds. 3 If the parallel volume does not rewind, and if the parallel device type is tape, select the MTD or DAT, and load and format the tape. 4 If the parallel volume does not rewind, and if the parallel device type is disk, select the disk volume. Perform CLEANUP and format the volume. 5 Add volume to table DIRPPOOL. 6 Verify that the volume mounted. 7 If multiple parallel volumes are present, allocate additional volumes.
Major	The device driver either fails to bind to the DIRP utility, or does not run. The software or hardware on which the driver depends is defective. If the device driver is repaired now, a loss of service does not occur. If the device driver is not repaired, a loss of AMA data occurs.	1 Contact the next level of support. 2 Activate the device driver.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	Files are not available to record data from the JF, OM, or AMA subsystems. If this is a NO AMA or NO SMDR alarm, loss of billing data occurs. If this is an alarm that affects any other subsystem, a loss of switch information occurs.	1 Silence the alarm. 2 Allocate disk volume.
	The DIRP utility cannot open enough recording files to meet the number of files that table DIRPSSYS specifies. A loss of records, (on disk or tape) of changes made to data tables or service orders of the DMS-100 switches occurs.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The DIRP utility cannot open enough recording files to meet the number of files that the table DIRPSSYS specifies. A loss of measurement data on the operating system occurs. The system cannot collect or display measurement data.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The DIRP utility cannot open enough recording files to meet the number of files that the table DIRPSSYS specifies. Backup recording of AMA data is not available.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	A minimum of one IOC circuit is out of service. The number that precedes CK0S indicates how many circuits are out of service. Service does not continue to any device that associates with an out-of-service circuit.	1 Check the circuit status of the consoles. 2 If the circuit status is P, contact the next level of support. 3 If the circuit status is C, and an MS alarm is present, clear the MS alarm. Use the correct procedure in *Alarm and Performance Monitoring Procedures*. 4 Select and busy a circuit. 5 Test the circuit. 6 Return the circuit to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	A minimum of one IOM circuit is out of service. The number that precedes CK0S indicates how many circuits are out of service. Service does not continue to any device that associates with an out-of-service circuit.	1 Check the circuit status of the consoles. 2 If the circuit status is P, contact the next level of support. 3 If the circuit status is C, and an MS alarm is present, clear the MS alarm. Use the appropriate procedure in *Alarm and Performance Monitoring Procedures*. 4 Select IOM port. Post, busy and test the console. 5 Check response. If the system generates a card list, replace card. Test and return the card to service. 6 Check response. If required change smart connector. 7 If command response does not indicate a connector, select a new port. Check and make entries to the port as required. 8 Locate the port cable and move to the new port. 9 If ports are not available, equip another IOM. Repeat steps 7 and 8. 10 Return the circuit to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	A minimum of one DDU is out of service. The number that precedes DDUOS indicates how many DDUs are out of service on IOC or IOM. Files can record or download to or from tape or the DDU.	1 Determine the status of the DDU. 2 If the status of the DDU is SBsy, determine the DDU drive state. 3 Post and busy the DDU. Test the DDU. Return the DDU to service. 4 If the DDU did not return to service, but did not fail with a card list, contact the next level of support. 5 IOC only. If the DDU did not return to service and failed with a card list, replace the cards and return the DDU to service. 6 IOM only. If the DDU did not return to service, replace the DDU, and return the DDU to service. 7 If the status of the DDU is – – – –, contact the next level of support. 8 If the status of the DDU is OffL or ManB, post the DDU and return it to service.
	A minimum of two input/output controllers (IOC) are out of service. The number that precedes IOCOS indicates how many IOCs are out of service. All devices that associate with the out-of-service IOC lost communication with the switch.	1 Check the status of the IOC. 2 IOC only. If the status is S, busy the IOC, replace the cards, test the IOC, and return the IOC to service. 3 If the status is C, clear the alarm and return the IOC to service. 4 If the status is O or M, check and return the IOC to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	A minimum of one input/output modules (IOM) is out of service. The number that precedes IOCOS indicates how many IOMs are out of service. All devices that associate with the out-of-service IOM lose communication with the switch.	1 Check the status of the IOM. 2 If the status is S, busy, test and reset the IOM controller card. Test the IOM, and return to service. 3 If the reset fails, replace the controller card, retest and return the IOM to service. 4 If the status is C, clear the alarm and return the IOM to service. 5 If the status is O or M, check and return the IOM to service.
	One or more IOC multiprotocol controllers are out of service. The number that precedes MPCOS indicates how many multiprotocol controllers are out of service. Multiple controller cards on the IOC shelf are out of service. A loss of remote terminal access to the switch occurs for any affected cards.	1 Display the status of the MPC card. 2 If the status is CBsy or SysB, post and busy the MPC card and links and test the MPC card. 3 If the card passes the test, return the MPC card and links to service. 4 If the MPC card status is OffL, busy the MPC card and links. Return the card and links to service. 5 If the MPC card status is ManB, return the MPC card and links to service. 6 If you return the MPC card and links to service, and the RTS command does not pass, contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Major (continued)	A minimum of one IOM multiprotocol controller is out of service. The number that precedes MPCOS indicates how many multiprotocol controllers are out of service. Multiple controller ports on the IOM controller card are out of service. A loss of remote terminal access to the switch occurs for any affected ports.	1 Display the status of the MPC port on the IOM. 2 If the status is CBsy or SysB, post and determine the status of the IOM load. 3 If the controller does not have a load and the autoload is on, allow the autoload process to reload the controller. The process allows three attempts to load the controller before you can take additional action. Return the controller to service. 4 If the controller does not have a load and the autoload is off, determine from table IOC if the open port has correct entries. Enter the correct file again as required. 5 If the IOM did not load again, post and busy the affected port. Test the MPC port and check for the replacement of a smart connector. Replace the connector. Busy and return the port to service. 6 The command response does not indicate a connector. Select a new port. Check entries for the new port in a table. Make entries in a table for the port. 7 Locate the port cable and move to the new port. 8 If the MPC port status is OffL, busy the MPC port and links and return the port and links to service. 9 If the MPC port status is ManB, return the MPC port and links to service. 10 If you return the MPC port and links to service, and the RTS command does not pass, contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor	The device driver either fails to bind to the DIRP utility or does I run. The software or hardware on which the driver depends is defective. If you repair the device driver now, a loss of service does not occur. If you do not repair the device driver, a loss of AMA data occurs.	1 Contact the next level of support. 2 Activate the device driver.
	Only nn slots out of a possible 100 are free in table DIRPHOLD. A loss of service does not occur.	1 Contact the next level of support.
	Files are not available to record data from the JF, OM, or AMA subsystems. If this is a NO AMA or NO SMDR alarm, a loss of billing data occurs. If this is an alarm that affects any other subsystem, a loss of switch information occurs.	1 Silence the alarm. 2 Allocate disk volume.
	The DIRP utility cannot open enough recording files to meet the number of files that the table DIRPSSYS specifies. A loss of records, (on disk or tape) of changes made to data tables or service orders of the DMS-100 switches occurs.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	The DIRP utility cannot open enough recording files to meet the number of files that the table DIRPSSYS specifies. A loss of measurement data on the operating system occurs and the system cannot collect or display data.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The DIRP utility cannot open enough files to meet the number of files specified in table DIRPSSYS. A backup recording of AMA data is not being made.	1 Find nn available recording volumes. 2 Allocate the recording volumes. 3 Contact the next level of support.
	The V*nn* identifies the recording pool. The P*nn* identifies the recording pool. The recording pool has less than 1 MB of free space. The DIRP utility can mark the volume as INERROR A loss of service does not occur.	1 Access table DIRPPOOL. 2 Identify the affected volume. 3 Reset the affected volume. 4 Remove files not needed from the affected volume. 5 Reset volume. 6 Deallocate old volume. 7 Allocate new volume.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	You entered a pool in table DIRPPOOL, but you did not enter the pool in table DIRPSSYS. A loss of service does not occur.	1 Access table DIRPPOOL. 2 Position the pool number. 3 Access table DIRPSSYS. 4 Position the subsystem. 5 If the pool type is parallel, change the parallel pool name and the parallel recording. 6 If the pool type is regular, change the pool name. 7 Contact the next level of support.
	The subsystem either fails to bind to the DIRP utility or does not run. The subsystem does not have entries in table DIRPSSYS. A loss of service does not occur.	1 Contact the next level of support. 2 Refer to the description of table DIRPSSYS in the Data Schema section of *Translations Guide*.
	The DIRP utility completes an emergency rotation of the regular files of the regular files of the indicated subsystem. A loss of service does not occur.	1 Access the DIRP level of the MAP. 2 Audit the subsystem. 3 Check the logs.
	More than 24 subsystems tried to bind into the DIRP utility. A loss of service does not occur.	1 Contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	The ACTIVE and STANDBY 1 volumes in the indicated subsystem are on the same IOC. A loss of service does not occur.	1 Silence the alarm. 2 If any volumes are INERROR, reset the volumes. 3 If volumes are not INERROR, wait approximately two hours. 4 If the alarm did not clear, contact the next level of support.
	A minimum of one I/O device disconnects at the IOC or IOM. The number that precedes `CKEr` indicates the number of disconnected devices. Service to any disconnected device does not continue.	1 Connect the I/O or IOM device again, or disable the CKEr alarm for the device. For information on how to disable the CKEr alarm, refer to the description of table TERMDEV in chapter 8.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one circuits is out of service. The number that precedes CKOS indicates how many circuits are out of service. Service does not continue to any device that associates with an out-of-service circuit.	1 Check the circuit status of the consoles. 2 If the circuit status is P, contact the next level of support. 3 If the circuit status is C, and an MS alarm is present, clear the MS alarm. Follow the appropriate procedure in *Alarm and Performance Monitoring Procedures*. 4 For IOC, complete steps 5 to 7. For IOM, complete steps 8 to 13. 5 Select and busy a circuit. 6 Test the circuit. 7 Return the circuit to service. 8 Select IOM port, offline and test the port. 9 Check the response. Change the smart connector as required. Bsy and return the port to service. 10 If the command response does not indicate a connector, move the port cable to a new port. 11 Select a new port. Check and make entries to the port as required. 12 Locate the port cable and move to the new port. 13 Return the circuit to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one DDU is out of service. The number that precedes DDU0S indicates how many DDUs are out of service. Files cannot record or download to or from tape or the DDU.	1 Determine the status of the DDU. 2 If the status of the DDU is SBsy, determine the DDU drive state. 3 Post and busy the DDU. Test the DDU. Return the DDU to service. 4 If the DDU did not return to service but did not fail along with a card list, contact the next level of support. 5 IOC only. If the DDU did not return to service, and failed along with a card list, replace the cards and return the DDU to service. 6 IOM only. If the DDU did not return to service, replace the DDU and return the DDU to service. 7 If the status of the DDU is – – – –, contact the next level of support. 8 If the status of the DDU is OffL or ManB, post the DDU and return the unit to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one DATAPAC controllers is out of service. The number that precedes DPC0S indicates how many DATAPAC controllers are out of service. You cannot transfer data to and from the IOC shelf.	1 Post and busy the DATAPAC card. 2 Test the card. 3 If the card fails the test, replace the card and test the card again. If the card fails again, contact the next level of support. 4 If the card passes the test, return the card to service. 5 If the card did not return to service, test the DATAPAC link and the network connection. 6 If the test of the DATAPAC link and the network connection fail, contact the next level of support.
	A minimum of two IOCs or IOMs are out of service. The number that precedes IOC0S indicates how many IOCs or IOMs are out of service. All devices that associate with the out-of-service IOC or IOM lose communication with the switch.	1 Check the status of the IOC or IOM. 2 IOC only. If the status is S, busy the IOC, replace the cards, test the IOC, and return the IOC to service. 3 IOM only. If the status is S, busy, test and reset the IOM controller card. Test the IOM, and return the IOM to service. 4 If the reset fails, replace the controller card and return the IOM to service (IOM). 5 If the status is C, clear the alarm and return the IOC or IOM to service. 6 If the status is O or M, return the IOC or IOM to service.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one IOC multiprotocol controllers is out of service. The number that precedes MPCOS indicates how many multiprotocol controllers are out of service. Multiple controller cards on the IOC shelf are out of service. A loss of access to the switch by remote terminals for any affected cards occurs.	1 Display the status of the MPC card. 2 If the status is CBsy or SysB, post and busy the MPC card and links. Test the MPC card. 3 If the card passes the test, return the MPC card and links to service. 4 If the MPC card status is OffL, busy the MPC card and links. Return the card and links to service. 5 If the MPC card status is ManB, return the MPC card and links to service. 6 If you return the MPC card and links to service, and the RTS command does not pass, contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one IOM multiprotocol controller is out of service. The number that precedes MPCOS indicates how many multiprotocol controllers are out of service. Multiple controller ports on the IOM controller card are out of service. Loss of remote terminal access to the switch occurs for any affected ports.	1 Display the status of the MPC port on the IOM. 2 If the status is CBsy or SysB, post and determine the status of the IOM load. 3 If the controller does not have a load and the autoload is on, allow the autoload process to load the controller again. The process allows three attempts to load the controller before you can take additional action. Return the controller to service. 4 If the controller does not have a load and the autoload is off, manually load the controller again. Return the controller to service. 5 If the IOM does not load again, post and test the affected port. Check for the replacement of a smart connector. Replace the connector and return the controller to service. 6 If command response does not indicate a connector, select a new port. Make entries in the table for the port. 7 Locate the port cable and move to the new port. 8 If the MPC port status is OffL, busy the MPC port and links and return them to service. 9 If the MPC port status is ManB, return the MPC port and links to service. 10 If you return the MPC port and links to service, and the RTS command does not pass, contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one magnetic tape drives (MTD) is out of service on the IOC. The number that precedes MTDOS indicates how many MTDs are out of service. If the DIRP utility uses the MTD to record billing data, loss of billing data occurs. If the DIRP utility does not use the MTD, files cannot downloaded or record to or from tape.	1 Determine the status of the MTD. 2 If the status of the MTD is SBsy, post and busy the MTD; mount a tape; replace any cards; return the MTD to service. 3 If the status of the MTD is CBsy, display the IOC status and clear any alarms. 4 If the status of the MTD is OffL or ManB, return it to service. 5 If the MTD does not return to service, contact the next level of support.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	A minimum of one magnetic tape drives (MTD) or digital audio tape (DAT) is out of service on the IOM. The number that precedes MTDOS indicates how many MTDs or DATs are out of service. If the DIRP utility uses the MTD to record billing data, a loss of billing data occurs. If the DIRP utility does not use the MTD, files cannot download or record to or from tape.	1 Determine the status of the MTD or DAT port. 2 If the status of the MTD is SBsy, post and busy the MTD or DAT. 3 Test the MTD or DAT. 4 Busy the IOM port for the MTD or DAT. Offline and test the IOM at the IOC level. 5 Check the response. Change smart connector as required. 6 If command response does not indicate a connector. Select a new port. Make entries in a table for the port as required. 7 Locate the port cable and move to the new port. 8 Return the circuit to service. 9 If the status of the MTD is CBsy, display the IOC status and clear any alarms. 10 If the status of the MTD or DAT is OffL or ManB, return the MTD to service. 11 If the MTD or DAT does not return to service, contact the next level of support.
	Transmission of a tape from a tape drive or digital audio tape drive (DAT) to a remote data center is complete. The number that follows DMNT represents the number of the tape drive that has the tape. A loss of service does not occur.	1 Demount the tape on the MTD or the DAT. 2 Busy and offline the MTD. Enable the switches. Demount the tape. 3 Busy and offline the DAT and demount the tape. 4 Remove the tape.

—continued—

Table 9-1
IOD alarm clearing (continued)

Alarm condition	Possible cause	Action
Minor (continued)	Retain a file on a recording device in the office, after transmission to a data center. The number that appears after KEEP represents the number of the recording device. A loss of service does not occur.	1 Access the XFER level of the MAP. 2 Record the file number. 3 In the event of a DMNT alarm, clear it.
	Transport a data tape on a recording device to a remote data center. The number that appears after SEND represents the number of the recording device that has the tape. A loss of service does not occur.	1 Determine the location of the file. 2 If the file is on disk, mount a tape and transfer the file from disk to tape. 3 Demount the tape and unload and package the tape for transport. 4 If the file is on tape, demount the tape and unload and package the tape for transport.
	A remote data center requested transmission of a file from a recording device. The number that follows XMIT represents the number of the recording device that contains the file. A loss of service does not occur.	1 Display the file information. 2 If the file is on disk, list the disk volume. 3 If the file is on tape, locate the MTD that contains the file. Load and mount the tape. List the tape. 4 Send the file.

—end—

Trouble locating and clearing procedures

The following chart contains a summary of trouble locating and clearing procedures for input/output devices (IOD). Detailed trouble locating and clearing procedures for IODs are included in *Trouble Locating and Clearing Procedures.*

Table 9-2
IOD trouble locating

Fault condition	Action
Replacing a 14-inch DDU	1 Access the MAP IOD level. 2 Busy the DDU controller and shut off the motor. 3 Disconnect the DDU and pull the DDU clear of the frame. 4 Connect the new DDU, push the DDU back into the frame, and start the motor. 5 Allocate disk space. 6 Test the controller and place the DDU in service.
Replacing an 8-in. or 5.25-in. DDU	1 Access the MAP IOD level 2 Busy the DDU controller and shut off the motor. 3 Disconnect the DDU and pull the DDU clear of the frame. 4 Set the DIP switches on an 8-in DDU. 5 Connect the new DDU, push the DDU back into the frame, and start the motor. 6 Allocate disk space. 7 Test the controller and place the DDU in service.

—continued—

Table 9-2
IOD trouble locating (continued)

Fault condition	Action
Replacing an 3.5-in. DDU	1 Access the MAP IOD level. 2 Post the IOM DDU port and record the number of the DDU that you must replace. 3 Test the DDU. 4 Busy the DDU port and offline the DDU. 5 Disconnect electrically and remove the DDU. Unscrew the locking mechanism and pull down the locklatch. The locklatch pushes the DDU away from the media card. 6 Insert the new DDU and lock the DDU into position. Turn the locking mechanism inward to secure the DDU and make the electrical connection between the DDU and the media card. 7 Busy, start and test the DDU. 8 Perform volume allocation, interference, and file transfer tests. 9 Test the controller port and place the DDU in service.

—continued—

Table 9-2
IOD trouble locating (continued)

Fault condition	Action
Replacing an digital audio tape (DAT) unit	1 Access the MAP IOD level. 2 Post the controller and the port associated with the DAT drive. 3 Remove the tape cartridge. 4 Busy, offline, and demount the tape. 5 Disconnect electrically and remove the DAT. Unscrew the locking mechanism and pull down the locklatch. The locklatch pushes the DAT away from the media card. 6 Insert the new DAT and lock the DAT into position. Turn the locking mechanism inward to secure the DAT and make the electrical connection between the DAT and the media card. Turn the spring loaded lock mechanism clockwise. 7 Allocate disk space. 8 Test the controller and place the DAT in service.
	—end—

Advanced procedures

Task list

The information for this section was not available at publication time. The information will become available at a later date.

Advanced trouble locating procedures

The information for this section was not available at publication time. The information will become available at a later date.

Powering up the IOC

To power up the input/output controller (IOC) shelf, perform the following steps:

1 Turn ON all correct power converter cards, like the IOC shelf and disk drive unit (DDU).

2 Manually busy and return the IOC to service

3 Manually busy and return each port on each card of the IOC to service

Powering down the IOC

To power down the IOC shelf, perform the following steps:

1 Manually busy and take each port on each card of the IOC offline

2 Manually busy and take the IOC offline

3 Turn OFF all correct power converter cards, like the IOC shelf and DDU.

Common procedures

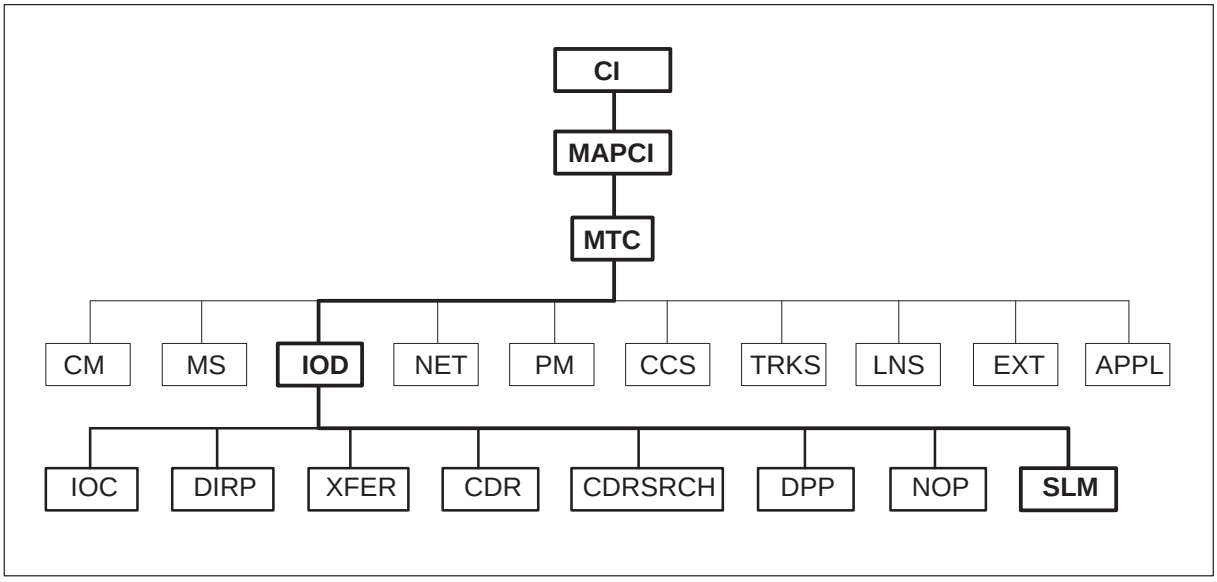
There are no common procedures.

Appendix: **System Load Module Maintenance**

The system load module (SLM) is a mass storage system in a DMS SuperNode and DMS SuperNode SE processor that stores office images. The SLM contains both tape and disk storage devices. You can load new loads or stored images into the computing module (CM) from the SLM.

You can perform SLM maintenance at the SLM MAP menu level. The SLM and the input/output controller (IOC) are at the same sublevel in the subsystem. The sublevel is part of the maintenance and administrative subsystem for the input/output device (IOD). Figure 11-1 shows the position of the SLM MAP level in relation to the IOC and the other MAP levels.

Figure 11-1
SLM position in the MAP level order



Note: You can perform maintenance on the links that connect the SLMs to the CM at the MAP level of the P-side maintenance controller (PMC). The PMC menu level is a sublevel of the CM maintenance subsystem. For more information on the PMC menu level, refer to *DMS SuperNode and DMS SuperNode SE Computing Module Maintenance Guide.* For more information on PMC and other commands, refer to the *DMS-100 Family Commands Reference Manual*.

SLM alarms

Three alarms associate with the SLM. The alarms appear under the alarm header of the IOD maintenance subsystem. Table 11-1 describes the alarms.

Table 11-1
SLM alarms

Fault Type	Alarm Level	Alarm Code	Description
SLMbsy	major or minor	M or blank	A minimum of one SLM is busy. If the alarm is major, an SLM is system busy. If the alarm is minor, an SLM is manual or central-side (C-side) busy.
SLMoff	minor	blank	A minimum of one SLM is offline.
SLMtbl	minor	blank	A minimum of one SLM is in-service trouble.

Status displays

The SLM status appears in the IOD and SLM menu levels. The indicator displays the most severe alarm or status condition. The indicator can overwrite any less severe conditions.

Accessing the SLM menu MAP level

Use the SLM command from the IOD level to access the SLM menu level. To choose the SLM that you want to work on, specify 0 or 1 on the SLM command. When you access the SLM level for a specified SLM, the commands that you issue from the SLM level affect only that SLM.

Primary and secondary SLMs

Load devices can be primary or secondary. The primary and secondary load devices appear in the computing module maintenance (CMMNT) menu level. For additional information about load devices, refer to *DMS SuperNode and DMS SuperNode SE Computing Module Maintenance Guide*. Both the primary and secondary load devices can be tape or disk SLMs.

You cannot make the primary SLM manual busy because the switch uses the primary SLM to load the system. To manually busy the primary SLM, release the SLM from the primary state and change the SLM to the secondary device. To release the SLM from the primary state, designate another load device as primary. Use the AUTOLD command in the CMMNT menu level to make another load device primary. This action changes the SLM from the primary state to a secondary device. This action allows you to manually busy the SLM.

Changing tapes between SLM versions

The SLM versions, tape capacities, and disk capacities are as follows:

Version	PEC	Tape Capacity	Disk Capacity
SLM I	NT9X44AA	60 MB	150 MB
SLM II	NT9X44AB	150 MB	600 MB

You can mount both SLM versions on the same shelf. Several restrictions apply to the exchange of tapes between SLM I and SLM II:

- SLM I cannot read or write to tapes that SLM II records.
- SLM II can read tapes that SLM I records. SLM II cannot write to tapes that SLM I records.
- SLM I can read and write to DC600A tape cartridges only.
- SLM II can read DC600A tape cartridges. SLM II cannot write to DC600A tape cartridges.
- SLM II can read and write to DC600XTD/DC6150 tape cartridges.

You can use an SLM II to boot the DMS SuperNode or DMS SuperNode SE switch with tapes recorded on either SLM version.

Upgrading from SLM I to SLM II

To upgrade from SLM I to SLM II, perform the following steps:

1 Make sure that the SLM I is on the inactive side.

2 Drop sync on the CM.

3 Place the SLM I in the offline state.

4 When the disk drive stops spinning, replace the SLM I with the SLM II version.

5 Return the SLM II to service.

6 Synchronize the CM.

Taking an SLM offline

Before you can take an SLM offline, you must meet the following conditions:

- The SLM that you take offline must not be the primary SLM.
- The SLM that you take offline must be on the inactive central processor unit (CPU) side.
- The CM must be out of sync.
- The SLM must be manually busy.

You cannot take the SLM on the active CPU offline. For example, if CPU 0 is active and SLM 0 is manual busy, you cannot take SLM 0 offline. If CPU 1 is active and SLM 0 is manual busy, you can take SLM 0 offline.

SLM faceplate LED

A light emitting diode (LED) is on the faceplate of the SLM. The LED indicates disk drive states. The following table describes the disk drive states:

SLM LED state	Description
completely ON	The disk drive spins at working speed.
flashes	The disk drive spins up to working speed or spins down to stop.
completely OFF	The disk drive stops—you can remove the SLM from the shelf.

Tape cartridge precautions

Each tape cartridge that the manufacturer receives contains precautions on how to handle tape cartridges. Read these precautions before you use the cartridge. Each brand can have different procedures.

Do not leave the tape cartridge in the SLM when the tape is not in use. When you finish with the tape, remove the tape from the SLM. Put the tape in a storage area.

List of terms

AMA

automatic message accounting

American Standard Code for Information Interchange (ASCII)

A coded set of characters used for the interchange of information between systems that process information, communications systems, and associated equipment. The ASCII defines one format that consists of the exchange of data between an input/output device and the device controllers of the DMS-100 Family switches.

ASCII

American Standard Code for Information Interchange

automatic message accounting (AMA)

An automatic recording system documenting all the necessary billing data of long distance calls dialed by the subscriber.

central control CPU (NT40 or SuperNode)

A 16-bit stack-oriented microprogrammable processor. The processor has two separate parallel bus memory ports. One port connects to the external memory that contains program instructions (program store) of varied lengths. The other port connects to the external memory that contains data (data store). The other port connects to two central message controllers. The central message controllers provide communication with other elements of the system.

central message controller (CMC)

A hardware device in the central control complex (CCC) frame. The CMC provides an interface between the central processing unit (CPU), network module controller (NMC), and input/output controller (IOC).

central office (CO)

A switching office (SO) arranged for terminating subscriber lines. The CO has switching equipment and trunks to establish connections to and from other SOs. The CO is also known as local office.

central processing unit (CPU)

The hardware unit of a computing system. The CPU contains the circuits that control and perform the execution of instructions.

central side (C-side)

The side of a node that faces away from the peripheral modules (PM) and toward the central control (CC). The C-side is also known as control side. *See also* peripheral side.

CISM

a cabinet that contains integrated services modules (ISM)

CMC

central message controller

CO

central office

DAT

digital audio tape drive

Datapac

A system that transmits data between switching points over a switched network dedicated to data. The system transmits packets of data and checks for errors before the system sends additional packets of data.

Data Packet Network (DPN)

A packet-switched networking system manufactured by Northern Telecom. For example, the DPN-100 data networking system is a data communications system. This data communications system connects the host and applications with your environments.

DC

device controller

DDU

disk drive unit

device

In a DMS switch, a device is a piece of hardware that provides an interface with the central control complex (CCC) through the input/output controller (IOC). The following are examples of devices: modems, magnetic tape drives (MTD), disk drives, visual display units (VDU), keyboard send/receives (KSR), and printers. A device also can be volumes from disk drive units or files from store files. *See also* volume.

device controller (DC)

A hardware device in the form of cards that plug into positions in the input/output controller (IOC). The DC provides an interface between the IOC and external I/O devices. The visual display unit (VDU), magnetic tape unit (MTU), and teletypewriter (TTY) are examples of external I/O devices.

Device Independent Recording Package (DIRP)

Software that automatically directs data from different administrative and maintenance facilities to the correct recording devices.

digital modem

A transmission device. A digital modem converts data received from the central controller to a shift keying data format for digitized frequency. The modem converts data for transmission and display on the visual display unit (VDU) of the International Traffic Operator Position System (ITOPS).

Digital Multiplex System (DMS)

A switching system for the CO. The DMS converts all external signals to digital data. The DMS stores the signals in specified time slots. Switching occurs when the original time slots are assigned again.

DIP

dual in-line package

DIRP

device independent recording package

disk drive unit (DDU)

A hardware device that consists of a disk drive and a power converter card installed in an input/output equipment (IOE) frame.

Distributed Processing Peripheral (DPP)

A peripheral module (PM) that accepts data from the DMS-100, formats the data (if necessary), and stores the data on disk. Following a request, the DPP retrieves and sends data to the host office collector.

DMS

Digital Multiplex System

DPN

Data Packet Network

DPP

Distributed Processing Peripheral

dual in-line package (DIP)

A standard method to package integrated circuits with input/output pins. The input/output pins bend at right angles and in lines along the two long sides of the unit. The pins bend to allow the pins to go straight into holes in a printed circuit board.

ICMO

incoming message overload

incoming message overload (ICMO)

An overload caused by messages sent at a high rate. A line card or business set sends the messages toward the line group controller (LGC) or line trunk controller (LTC).

input/output (I/O)

A device or medium used to achieve a bidirectional exchange of data. Data exchange in the DMS-100 switch agrees with the Input/Output Message System (IMS).

input/output controller (IOC)

An equipment shelf that provides an interface between a maximum of 36 I/O devices (IOD) and the central message controller (CMC). The IOC contains a peripheral processor (PP) that independently performs local tasks. The IOC relieves the load on the CPU. *See also* IOC shelf.

input/output device (IOD)

A device that allows a data processing system to receive or send data. The device can allow a data processing system to receive and send data.

input/output equipment (IOE) frame

A frame that contains I/O devices.

I/O

input/output

IOC

input/output controller

IOC shelf

A shelf that provides an interface between a maximum of 36 I/O devices and the central message controller (CMC). *See also* input/output controller.

IOD

input/output device

IOE

input/output equipment

IOM

An input/output module that replaces the IOC shelf. The IOM provides the functionality of the current input/output controller (IOC).

ISM shelf

An equipment shelf that replaces the current trunk module (TM) and maintenance trunk module (MTM) shelves.

ISME

a frame that houses integrated services modules (ISM)

JF

journal file

journal file (JF)

A facility that records changes made to the entry tables of the DMS-100 Family switches. The JF provides a method to restore the tables, if you must load office software again from a backup source.

magnetic tape drive (MTD)

In a DMS switch, a device used to record DMS-100 Family data. An MTD can be mounted on a magnetic tape center (MTC) frame or an input/output equipment (IOE) frame. An MTD is also known as tape drive.

message switch (MS)

A communications facility with high capacity. The MS functions as the messaging hub of the dual-plane combined core (DPCC) of a DMS SuperNode processor. The MS concentrates and distributes messages to control messaging between the DMS-Bus components. The MS also allows

other DMS-STP components to communicate directly with each other in order to control messaging between DMS-Bus components.

MLC

A collection of a multiprotocol controller (MPC), a link, and a channel.

MPC

multiprotocol controller

MS

message switch

MTD

magnetic tape drive

multiprotocol controller (MPC)

A general-purpose card that allows data communications between a DMS-100 Family switch and an external computer. An example of this type of communication is between a central office (CO) billing computer and a DMS-100 Family switch. The MPC card is on the input/output controller (IOC) shelf. The system downloads the MPC card protocol software from the DMS-100 CPU. The system uses the MPC card protocol software to support software routines for Data Packet Network (DPN) communications.

network module controller (NMC)

A group of circuit cards that communicates with the central message controller (CMC). The NMC is in the network module (NM). The NMC directs messages to the peripheral modules (PM) in order to organize the flow of internal messages. The NMC also interprets connection instructions to the crosspoint switches in order to organize the flow of internal messages.

network operations protocol (NOP)

A protocol that provides an interface between a DMS-100 Family switch and the remote systems of the switch.

NMC

network module controller

NOP

network operations protocol

Northern Telecom (NT)

A part of the corporate structure that consists of Bell-Northern Research, Bell Canada, and Northern Telecom.

Northern Telecom publication (NTP)

A document that contains information about Northern Telecom hardware or software modules. The document also contains information about performance-oriented practices (POP) to install, test, or maintain the system. The NTP is part of the standard documentation package provided to an operating company.

NT

Northern Telecom

NT40

See central control CPU.

NTP

Northern Telecom publication

OM

operational measurements

open systems interconnection (OSI)

A model accepted world-wide for the use of standardized procedures. The OSI allows the connection of data processing systems in networks.

operational measurements (OM)

The hardware and software resources of the DMS-100 Family switches. These resources control the collection and display of measurements taken on an operating system. The OM subsystem organizes the measurement data and manages the transfer of measurement data to displays and records. Operating company personnel use the OM data for maintenance, traffic, accounting, and provisioning decisions.

OSI

open systems interconnection

peripheral side (P-side)

The side of a node that faces away from the central control (CC) and toward the peripheral modules (PM). *See also* central side.

P-side

peripheral side

Remote Data Polling System (XFER)

A system that allows an operating company to transfer information about the operation of a DMS-100 Family office to the data processing center.

SLM

system load module

SuperNode

See central control CPU.

system load module (SLM)

A mass storage system in a DMS SuperNode processor that stores office images. Boot new loads or stored images into the computing module (CM) from the SLM.

tape drive

See magnetic tape drive.

terminal

- The originating or terminating point in a communications network.
- Any device that is able to send information, receive information, or both over a communication channel.
- The smallest unit of address space in the input/output (I/O) system, in a DMS switch.

VDU

visual display unit

visual display unit (VDU)

An electronic output device that presents data to a terminal user in the form of a television image. In a DMS switch, the VDU is one of the components of the MAP terminal. Along with a keyboard, the VDU provides the main user interface in the DMS-100 Family switches.

volume

- A specified amount of data, together with the data carrier, that the system can handle as a unit.
- A data carrier (for example, a reel of magnetic tape), that the system can mount and dismount as a unit.

- The amount of a single unit of storage that is accessible to a single read/write mechanism. An example of a single read/write mechanism is a disk pack. *See also* device.

XFER

Remote Data Polling System

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