Lucent Technologies
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DDM-2000 OC-3 Multiplexer Software Release Description

Release 11.1.3

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DDM-2000 OC-3 Multiplexer
Software Release Description
Release 11.1.3

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1. Overview

1.01 The purpose of this software release description (SRD) is to provide information about Software Release 11.1.3 and its interaction with the DDM-2000 OC-3 System. This practice contains the following parts:

- **Software Release 11.1.3 Features:** This part provides a description of the features provided by Release 11.1.3.
- **Operating Issues Resolved:** This part provides the list of issues (problems) which existed in previous software releases that were resolved with this issue of software.
- **Operating Issues:** This part provides information about the existing issues (problems) in Release 11.1.3 that may become evident during the operation of the DDM-2000 OC-3 System.
- **DDM-2000 Interworking:** This part provides a description of the optical connections that are supported between OC-3, OC-12, and FiberReach shelves and the software releases that can coexist in the same subnetwork.
- **DDM-2000 OC-3 Multiplexer DRI Software Compatibility:** This part provides the dual ring interworking (DRI) software compatibility table for the DDM-2000 OC-3 Multiplexer for both EC-1 and OC-3/IS-3 interfaces.
- **Inservice Upgrades:** This part provides the information required to upgrade the DDM-2000 OC-3 System software to Release 11.1.3.
- **Implementation Procedure:** This part provides the information required to install the DDM-2000 OC-3 System software, Release 11.1.3. Important new information has been added to the "Software Installation and Upgrade Procedure" section.

NOTE:
Read all parts of this practice before implementing the DDM-2000 OC-3 System software update.

1.02 This practice, Issue 3, supersedes the previous Issue 2. Issue 3 provides updated information for DDM-2000 OC-3 Software Release 11.1.3. The updated information is included in the Operating Issues Resolved (Section 3.07) and Implementation Procedure (Section 8, NOTE 1) sections of this practice. Margin bars are used to denote the added information. 363-206-230, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 11.1.1*, Issue 1 provided the coverage for Software Release 11.1.1.

1.03 Lucent Technologies welcomes your comments on this practice. Your comments will aid in improving the quality and usefulness of Lucent Technologies documentation. Please use the Feedback Form provided at the end of this practice.

1.04 Any difficulty encountered while implementing Release 11.1.3 may be resolved by contacting the Regional Technical Assistance Center in your area. Dial 1-800-225-RTAC (7822).

1.05 A tab designated **Software Release Description** has been provided in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 Through 11.1, User/Service Manual (TOP), Volume II* for convenient storage of this practice.

1.06 This practice is issued by Lucent Technologies Customer Training and Information Products organization.

2. Software Release 11.1.3 Features

2.01 The features described below are for DDM-2000 OC-3 Release 11.1.3.

A. **Administration**

- Because of the spinoff of Lucent Technologies from AT&T, the default login ids and software download banners have been changed.

  - Users who receive software upgrades or new **SYSCTL** circuit packs from the factory may find that a new default login (LUC01, LUC02, or LUC03) is needed to allow access into the system. If none of the new default logins permits access to the system, the user should try one of the old default logins (ATT01, ATT02, ATT03).

    If the CIT command "**`init-sys:sysctl`**" (or the TL1 command "**`INIT-SYS`**") has been performed on the system, the new default login IDs will be active. However, it is not necessary to activate the new LUC default login IDs; the old ATT default login IDs can still be used.

    CAUTION:
    *Execution of the "**`init-sys:sysctl`**" command may affect service. The command should* **NOT** *be used on an in-service system. (In in-service systems, the user is encouraged to use the "**`set-lgn`**" command to customize the new logins, if needed).*

    *The "**`init-sys:sysctl`**" command should only be used at the end of installation before system turnup. This command should only be used after a* **SYSCTL** *is replaced.*

- The DDM-2000 TL1 login banner has been changed to include:
  - `Lucent Technologies` <system>, replacing `AT&T` <system>
  - `LUCENT TECHNOLOGIES - PROPRIETARY`, replacing `AT&T - PROPRIETARY` in the login proprietary banner.

- The DDM-2000 CIT login banner has been changed to include:
  - — `Lucent Technologies`, replacing `AT&T`
  - — `LUCENT TECHNOLOGIES - PROPRIETARY`, replacing `AT&T - PROPRIETARY` in the login proprietary banner.
- The reference to `AT&T` in the PC software download banner has been changed to `Lucent Technologies`.

B. **Transmission**

- **BBG20 TMUX Circuit Pack for OC-3 Shelf:** The new **BBG20** Transmultiplexer (**TMUX**) circuit pack is used in the **FUNCTION UNITS** slots of an DDM-2000 OC-3 shelf. The circuit pack provides path termination for an M13 or C-bit parity formatted DS3 signal. It also provides path termination functions for an STS-1 and 28 VT1.5 signals. It demultiplexes the DS3 signal into 28 DS1s, maps each DS1 into a floating VT1.5, multiplexes the 28 VT1.5s into an STS-1, performs the reverse process, and performs DS1 performance monitoring.
- **Stratum 3 BBF4 TG3 Circuit Pack:** The new **BBF4 TG3** circuit pack uses a Stratum 3 clock. OC-3 Release 11.1 continues to support the **BBF2 TGS** and **BBF2B TGS** timing circuit packs. Both hardware and software upgrades will not be service affecting. The **BBF4 TG3** will support all **BBF2B TGS** timing options:
  - — It will be line-timed from Main or Fn-c OC-N interfaces.
  - — External timing from DS1 framed reference.
  - — Mult and Sync-out modes will be supported.

  The **BBF4 TG3** is treated just like the **BBF2B TGS**. The system will not allow the mixing of **BBF4 TG3** with **BBF2/BBF2B TGS** in the same NE. Downstream line-timed **BBF4 TG3** should not receive their timing from an upstream NE equipped with **BBF2/BBF2B TGS** circuit packs. The reverse situation works. The hardware for the Stratum 3 **BBF4 TG3** circuit pack will be available in 6/99.
- **Single DS1 Facility Loopback with the New BBF3B DS1PM Circuit Pack:** The system will provide a facility loopback at the DS1 ports on the **BBF3B DS1PM** circuit packs. The **BBF3B DS1PM** circuit pack can be used as a replacement for the **BBF3 DS1PM** circuit pack in all applications. Operation of the loopback causes the selected incoming DS1 signal(s) on the selected circuit pack to be looped back towards the DSX.

- **High Density Digital Subscriber Line (HDSL) Using the BBF8 HDSL Circuit Pack:** This feature provides an HDSL interface capability on the OC-3 shelf. HDSL is an access technology that allows efficient transport of DS1 payloads over metallic twisted pairs. It splits the DS1 payload into two 784 Kb/s data streams. These two data streams are combined at the far end to reconstruct the original DS1 payload.

  The **BBF8 HDSL** circuit pack fits into a **LOW SPEED** slot and provides two, four wire (2 pair) HDSL interfaces. These interfaces are compatible with PairGain HDSL equipment which may be located up to 12,000 feet away. Each interface provides a full DS1 payload capacity which is mapped to a SONET VT1.5. As with the **BBF1B DS1** circuit pack, a **BBG2 MXRVO** circuit pack must be used in the associated **FUNCTION UNITS** of the OC-3 shelf. Once in SONET, the DS1 payload is treated as a normal DS1.

  Due to the increased power needs of the **BBF8 HDSL** circuit pack, only three **BBF8 HDSL** circuit packs may be used.

C. **Network Topologies**

- **Enhanced FiberReach Topologies Using the 26G2-U OLIU:** The **26G2-U OLIU** supports enhanced routing with one fiber-pair running at the OC-1 rate. This OLIU can only be used in **FUNCTION UNITS** slots. The **26G2-U OLIU** with built-in multiplexer capabilities can drop DS1 signals without the need for the **BBG2 MXRVO** or **BBF5 JMPR** jumper circuit packs. The **26G2-U OLIU** supports OC-1 ring pass-through, OC-1 ring hairpin with one subtending single-homed FiberReach ring or two subtending dual-homed FiberReach rings. In addition, the **26G2-U OLIU** supports a hairpin local drop cross-connection within a single **FUNCTION UNITS** group (Intra-function hairpinning). DDM-2000 OC-3 Group 4 shelves are required for this application.

D. **Applications**

- **Retrieving Active Users:** With OC-3 Release 11.1.3, the (CIT) "**`rtrv-secu`**" command report will report on the user's login id that is currently logged in to the Network Element via the communication port. TL1 will also support this feature and the command is "**`RTRV-CID-SECU`**".

E. **Operations**

- **CPro-2000 and ITM SNC Support:** DDM-2000 OC-3 Release 11.1.3 is supported by CPro-2000 Release 6.1 (currently planned for 6/98) and ITM SNC Release 6.0 (currently planned for 7/98).

F. **Single-Ended Operations**

- **Network Size:** The following provisioning rule applies to a network size of > 16 nodes: A single node can be provisioned for only one of the following attributes - TL1 GNE or AGNE. This is required for optimum network performance.

G. **Performance Monitoring**

- **Intermediate Node STS Performance Monitoring:** This feature allows the collection, reporting and thresholding of PM status for the SONET STS-1 Path (B3 - STS-1 Path Overhead Byte) derived parameters at intermediate NEs. This feature provides the same set of STS-1 Path Performance information as currently provided for STS-1 path terminations, but extends monitoring to all incoming OC-n and EC-1 low speed interfaces to a Network Element independent of whether the STS-1 terminates on the Network Element.

H. **TL1**

- **New TL1 RTRV-LOG Command:** With OC-3 Release 11.1.3, a new TL1 command has been added "**RTRV-LOG**"; equivalent to the "**rtrv-hsty**" CIT command. The "**RTRV-LOG**" command can be initiated by users to generate a history log for the network element. This report contains up to 500 of the most recent events. Events include the start and end of alarm and status conditions, and all craft/OS input activities that affect or would affect the state of the network element that are successfully completed or denied. The history log displays the events in last in-first out order, and each event is time stamped.
- **New TL1 ENT/RTRV-FECOM Commands:** With OC-3 Release 11.1.3, the CIT "**set-fecom**" and TL1 "**ENT-FECOM**" commands can be remotely initiated. These commands can be initiated by users to enable/disable remote access capabilities over the section data communication channels (DCC).

I. **Maintenance**

- **Detect and Alarm STS/VT Path Unequipped Condition for Non-Ring Interface:** With OC-3 Release 11.1.3, "STS/VT `path unequipped`" alarm reporting is added to line protected SONET interfaces on ring shelves. On a non-ring interface (i.e: in a **FUNCTION UNITS** slot), the unequipped condition is reported only at a path termination point. The unequipped condition is treated like a path AIS for Yellow/FERF response and performance monitoring.

3. Operating Issues Resolved

3.01 For information on Release 9.1.1, refer to 363-206-252, Issue 1, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 9.1.1*.

3.02 This part lists the operating issues (problems) which existed in Release 9.1.1 but are resolved in Release 11.0.2.

(1) **ISSUE:**
If the **BBG8/BBG8B SYSCTL** circuit pack in an operational shelf is replaced with any other **BBG8/BBG8B SYSCTL** circuit pack (either a fresh-from-the-factory circuit pack or one that has previously been used in another shelf), the shelf-level parameters should be restored onto the **SYSCTL** from the backup copy on the **TGS** circuit pack. Instead, the values stored on the newly-inserted **SYSCTL** are retained. The specific parameters involved are: tid, dsne, site, ne, shelf, tbos parameters, power minor alarm level, co/rt, and us/ns settings for DCC links.

(2) **ISSUE:**
A new "`unsupported DCC connection`" alarm has been added to this release to warn the user that the DCC link on an OC-1 interface between two DDM-2000 OC-3 network elements is not supported. In some rare cases, this alarm might erroneously be reported on an OC-1 DCC link between a DDM-2000 OC-3 host node and a FiberReach network element.

(3) **ISSUE:**
Under heavy TL1 traffic conditions, combining any two of the following RNE->GNE message traffic types on a single VC may cause some of the messages not to be sent to the OS:

- Command Response Messages
- PM-Related Autonomous Messages
- Other Autonomous Messages.

Unsent autonomous messages may still be retrieved using the "**RTRV-A0**" TL1 command.

(4) **ISSUE:**
In a stand-alone application with 27-Type **OLIU** circuit packs in the **MAIN** slots and the synchronization provisioned to line/external timing with sync-out (DS1 output of the **BBF2B TGS** circuit pack) enabled, AIS will be transmitted for a few seconds followed by a good DS1 signal from the DS1 output of the **TGS** circuit packs while its source (**MAIN-1** or **MAIN-2(P)**) is in line failure.

3.03 For information on Release 11.0.3, refer to 363-206-217, Issue 3, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 11.0.3*.

3.04 This part lists the operating issues (problems) which existed in Release 11.0.3 but are resolved in Release 11.0.4.

(1) **ISSUE:**
When a *SLC*®–2000 shelf is configured for Metallic Feeder application, only the SONET controllers (**BBG8/BBG8B SYSCTL** and **BBG9 OHCTL**) are required to be present in the DDM-2000 OC-3 shelf (no **OLIU**s or **TGS** circuit packs); however OC-3 Release 11.0.3 would not allow execution of the "**`set-ne`**" command without the presence of a **TGS** circuit pack in the DDM-2000 OC-3 shelf.

(2) **ISSUE:**
Assume an FT-2000 (as the GNE) and a DDM-2000 OC-3 Release 11.0 are optically connected, and a TL1 association is established between the FT-2000 and the DDM-2000 shelves (because of a TL1 "**`ACT-USER`**" command). If a TL1 login session is terminated by a TL1 "**`CANC-USER`**" command, and the FT-2000 (GNE) tries to reestablish an association with the DDM-2000 through a TL1 "**`ACT-USER`**" command, the FT-2000 does not get a response from the DDM-2000 OC-3 shelf carrying Release 11.0.

(3) **ISSUE:**
A "**`cpy-prog`**" command executed from a shelf displaying a "`dormant/exec code mismatch`" alarm will complete successfully by copying the dormant software generic. However, the "`COMPLD`" message will indicate that the executing software generic was successfully copied. For instance, if the executing software generic in the source shelf is OC-3 Release 11.0.3 and the dormant software generic is OC-3 Release 11.0.4, and the software copy is successfully completed, the "`COMPLD`" message will indicate that OC-3 Release 11.0.3 was successfully copied.

This was fixed in OC-3 Release 11.0.4, however the benefits will not be seen until OC-3 Release 11.0.4 is the executing software generic in the source shelf.

3.05 For information on Release 11.0.4, refer to 363-206-217, Issue 4, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 11.0.4*.

3.06 This part lists the operating issues (problems) which existed in Release 11.0.4 but are resolved in Release 11.1.1. It is possible a problem listed below as resolved may not have appeared in previous issues of the SRD because the problem was discovered between the time of the release of that SRD and the release of this software.

(1) **ISSUE:**
After a power outage or after disconnecting the X.25 cable from a GNE, the X.25 session is temporarily lost (as expected). However, when the power is recovered or the X.25 cable is reconnected to the GNE, the shelf needs to be reset for it to recover the X.25 session.

(2) **ISSUE:**
In some instances, a user might initiate a "**cpy-prog**" of DDM-2000 OC-3 Release 11.0.4 software from a NE into a target NE, and shortly after that "**cpy-prog**" starts, the user issues another "**cpy-prog**" command for Release 11.0.4 (by accident) to the same target NE within the same subnetwork, but from a different source NE. In this event, the first "**cpy-prog**" attempt may fail and the second attempt will succeed.

(3) **ISSUE:**
To verify Operations System (OS) to Network Element (NE) TL1 communications, an OS had recently used "**ping-ping:<tid>:: <ctag>;**" as the command to send to the NE rather than "**rtrv-hdr:<tid>::<ctag>;**". A problem was seen recently where the TL1 interface would lock up after a couple of weeks of this stimuli and the shelf would have to be reset to recover TL1 communications.

(4) **ISSUE:**
In rare circumstances, such as a loss of signal condition on both **MAIN** slot **OLIU** circuit packs, an erroneous "`DSNE not reachable`" alarm might be reported.

(5) **ISSUE:**
Under some circumstances, one or more alarms indicating the presence of maintenance signals (such as AIS) will be reported even though the maintenance signal either is not or should not be present.

(6) **ISSUE:**
When the **MAIN** slots of an OC-3 shelf with Release 11.1.1 are equipped with **24G-U OLIU** circuit packs, and when those circuit packs are used to establish VT1.5 cross-connects between **MAIN** and **FUNCTION UNITS** slots the following applies:

- If a **FUNCTION UNITS** slot address is specified as *Address1* (e.g., **a-2-2**) and the **MAIN** slot address is specified as *Address2* (e.g., **m-4-1-1**), for the first VT1.5 cross-connect (only) on the specified STS-1, the following will take place:
  - — Good transmission is NOT established on that first VT1.5 cross-connect for the specified STS-1.
  - — When a "**RTRV-STATE-VT1**" report is created, the report will not show an appropriate channel state for the entered cross-connect (e.g., **m-4-1-1**), because no channel state was created for it. Instead, it will show that an inappropriate channel state was created for a non-existent cross-connect (e.g., **m-4-2-2**).

(7) **ISSUE:**
If an DDM-2000 OC-3 Release 11.0 shelf is equipped with an **OLIU** circuit pack in **FUNCTION UNITS** slot **1** and the associated **FUNCTION UNITS** slot **2(P)** is unequipped, and a remote software download ("**ins-prog**") of OC-3 Release 11.1.1 is initiated to this shelf, the software download may not complete successfully.

3.07 This part lists the operating issues (problems) which existed in Release 11.1.1 but are resolved in Release 11.1.2. It is possible a problem listed below as resolved may not have appeared in previous issues of the SRD because the problem was discovered between the time of the release of that SRD and the release of this software.

(1) **ISSUE:**
When both **TGS** circuit packs are removed on an OC-3 shelf equipped with Release 11.1.1, a Service Alarm (SA) is not reported for the second **TGS** circuit pack removal. The absence of this alarm is fixed in Release 11.1.2.

(2) **ISSUE:**
Release 11.1.1 OC-3 shelves equipped with **24G-U OLIU**s require the detection of AIS in both directions of transmission on the target STS-1 before deleting an STS-1 pass through crossconnect.

Release 11.1.2 eliminates the AIS state for deleting an STS-1 pass through crossconnect from **24G-U OLIU**s.

The Commands and Reports pages in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 Through 11.1, User/Service Manual, Volume I*, for "**`dlt-crs-sts1`**" command will be changed to reflect the removal of the AIS state.

3.08 This part lists the operating issues (problems) which existed in Release 11.1.2 but are resolved in Release 11.1.3. It is possible a problem listed below as resolved may not have appeared in previous issues of the SRD because the problem was discovered between the time of the release of that SRD and the release of this software.

(1) **ISSUE:**
Line performance monitoring may report phantom B2 errors on shelves equipped with **24G-U OLIU**s.

(2) **ISSUE:**
This issue applies only to the DCC on an OC-3 1+1 interface between DDM-2000 and FT-2000 and is resolved by FT-2000 Software Release 7.2.7 and 9.1. Under certain installation and failure scenarios, including a single OC-3 fiber cut, the DDM-2000 may be receiving DCC on the protection fiber while the FT-2000 is transmitting DCC on the service fiber. This results in a DCC failure. Specifically, this occurs if both transmit and receive are active on the protection OC-3 fibers (for example, **MAIN-2(P)**) and the DDM-2000 active (protection) transmit fiber fails. In that case, the FT-2000 switches to transmit the DCC on the service fiber, but the DDM-2000 is still expecting DCC (and OC-3) on the protection fiber, thus the DCC fails.

4. Operating Issues

4.01 This part lists information pertaining to recognized operating issues (problems) existing in Release 11.1.3. Suggestions to work around the operating issues are mentioned, if available.

4.02 The following list contains known problems in the software:

A. **Download**

(1) **ISSUE:**
Multiple "**cpy-prog**" executions in the same subnetwork may result in interactions that cause one or more of the executions to fail.

WORK AROUND:
Do only one "**cpy-prog**" at a time in the same subnetwork.

(2) **ISSUE:**
When performing a forced software download to an incompatible controller pair (the **SYSCTL** and the **OHCTL** circuit packs contain different software, indicated by a **d** in the **SYSCTL** window) and the **SYSCTL** contains software that is able to accept compressed format (OC-3 Release 9.1 or OC-12 Release 5.1), the software download will complete but, the **SYSCTL** might display a **d** again.

WORK AROUND:
A second forced software download attempt should clear the **d** (software incompatibility condition) from the **SYSCTL** display.

(3) **ISSUE:**
When upgrading from DDM-2000 OC-3 Release 9.1.1 or 11.0.4 to Release 11.1.3, sometimes the remote install program ("**ins-prog**") from a PC to a remote DDM-2000 fails with the following error response:

```
ins-prog: TID DENY
SSTP
/* Status, execution SToPped */
/* Program installation failed due to Communication
   failure.  Network Element will restart current
   program, if possible.  Retry installation to remote
   NE if it does not restart.  Try a forced download
   to local NE if it does not restart. Check the User's
   Manual to review a list of possible problems and
   their solutions. A successful installation is
   required to restore the system to normal
   operation. */
```

The similar error response may occasionally result from copy program ("**cpy-prog**").

WORK AROUND:
Repeat the same remote install program ("**ins-prog**") or copy program ("**cpy-prog**") again.

B. **Operations Interworking (OI)**

(4) **ISSUE:**
On turnup, if an FT NE and DDM NE are optically connected, sometimes the FT will report a DCC failure and the DDM does not indicate any failure. This condition is caused by the User Side/Network Side parameters not being assigned properly between DDM and FT.

WORK AROUND:
Before setting up an optical connection between DDM and FT, use the "**`rtrv-fecom`**" command to check the User Side/Network Side parameters on the DDM. Use the "**`set-fecom`**" command to change the User Side/Network Side parameters on the DDM, if necessary.

(5) **ISSUE:**
In a mixed DDM-2000/FT-2000 network, a duplicate DSNE will cause corruption of "**`rtrv-map-network`**" report in some nodes, which in turn disables the remote login capability to those sites from other network elements.

WORK AROUND:
Before mixing the two sub-networks, make sure there is only one node with DSNE=yes in the entire network.

C. **Maintenance**

(7) **ISSUE:**
Cutting and restoring power to a DDM-2000 FiberReach shelf while it is connected to an DDM-2000 OC-3 shelf under the conditions described below will cause VT1.5 channels in the OC-3 shelf that are receiving AIS to transition incorrectly to "In Service". This will in turn lead to "`inc. VT AIS`" alarms. The conditions leading to this problem are:

— OC-1 interface (**27G-U/27G2-U OLIU**) in OC-3 shelf in **MAIN** slots.

— STS cross-connects in the OC-3 shelf between **MAIN** and **FUNCTION UNITS** slots containing **BBG2 MXRVO** circuit packs. In this situation, VT1.5 channel states are defined even though the cross-connect is at the STS level.

WORK AROUND:
Execute update ("**upd**") command at the OC-3 shelf. This will cause VT1.5 channels receiving AIS to revert to the "AUTO" state.

5. DDM-2000 Interworking

NOTE:
Interworking between products (DDM-2000, FT-2000, and DACS IV-2000, etc.) is evolving with EC-1, OC-3, IS-3, and DS3 interfaces. Care must be taken to check correct software releases and to check interface provisioning. For **OLIU** interfaces, care must be taken to ensure that both ends of a span are provisioned/equipped for the same protection mode (1+1 or dual 0x1, for example).

5.01 Table A lists the software compatibility within a subnetwork for the DDM-2000 OC-3 and OC-12 Multiplexers. All configurations listed support SEO. The table lists all possible software combinations. Combinations not listed are not supported.

Table A. DDM-2000 OC-3 and OC-12 Software Compatibility

OC-3 Release (Note 1)	OC-12 Release (Note 1)	Interconnection Method (Note 2)	Notes
9.0∗	5.0	22-Type†, 21G-Type, or 21D-Type‡ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
9.1 ∗	5.0	22-Type†, 21G-Type, or 21D-Type‡ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
9.1 ∗	5.1	22-Type†, 21G-Type, or 21D-Type‡ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
11.0 ∗	5.1	22-Type†, 21G-Type, or 21D-Type‡ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
11.1 ∗	5.1	22-Type†, 21G-Type, or 21D-Type‡ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
11.0 ∗	5.2	22-Type†, 21G-Type, 21D-Type‡, or 24G-U§ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI
11.1 ∗	5.2	22-Type†, 21G-Type, 21D-Type‡, or 24G-U§ OLIU	Supports OC-3/OC-12 interworking, 0x1 interfaces, and DRI

See Notes on Next Page.

Table A. DDM-2000 OC-3 and OC-12 Software Compatibility (Contd)

Notes:

(1) All NEs in a ring network, which may be part of a larger network, must be running the same software. Similarly, all NEs in a linear network, which may be part of a larger network, must be running the same software. In a subnetwork, which may consist of a mixture of ring and linear networks, all NEs must be running compatible software according to the table.

(2) The OLIU types referenced in Table A are as follows: 21D-Type - 21D and 21D-U, 21G-Type - 21G, 21G-U, and 21G2-U, 22F-Type - 22F, 22F-U, and 22F2-U, 22G-Type - 22G-U, 22G2-U, and 22G3-U, 22D-U, and 24G-U.

∗ 22-Type OLIUs must be used in DDM-2000 OC-3 ring shelves in **MAIN** and **FUNCTION UNITS** slots for optical extensions. 21-Type OLIUs used in OC-12.

† The 22-Type OLIUs can only be used in the DDM-2000 OC-3 shelf.

‡ The 21D-Type OLIU can be used in the DDM-2000 OC-12 shelf in place of the 21G-Type OLIU for short reach applications.

§ The 24G-U OLIU can only be used in the **MAIN** slots of DDM-2000 OC-3 shelf.

5.02 Table B lists the ring and linear software compatibility for the DDM-2000 OC-3 Multiplexers. All configurations listed support SEO. The table lists all possible software combinations. Combinations not listed are not supported.

Table B. DDM-2000 OC-3 Software Compatibility

OC-3 Release	OC-3 Release	Interconnection (Note) Method	Notes
7.2 (Ring) *	8.0 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
7.2 (Ring) *	8.1 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
7.2 (Ring) *	9.0 (Ring)*	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring networks.
7.2 (Ring) *	9.1 (Ring)*	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring networks.
7.2 (Ring) *	11.0 (Ring)*	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring networks.
9.0 (Ring) *	8.0 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
9.0 (Ring) *	8.1 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
9.1 (Ring) *	8.0 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
11.0 (Ring) *	8.0 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
11.1 (Ring) *	8.0 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.
11.1 (Ring) *	8.1 (Linear)	22-Type OLIU	Supports OC-3/IS-3 interworking between OC-3 ring and linear networks.

Note: The OLIU types referenced in Table B are as follows: 22F-Type - 22F, 22F-U, and 22F2-U, 22G-Type - 22G-U, 22G2-U, and 22G3-U, and 22D-U.

* Requires 22-Type OLIUs in **MAIN** and **FUNCTION UNITS** slots for DDM-2000 OC-3 ring shelves.

5.03 Table C lists the DDM-2000 FiberReach software compatibility for the DDM-2000 OC-3 Multiplexers. All configurations listed support SEO. The table lists all possible software combinations. Combinations not listed are not supported.

Table C. DDM-2000 OC-3 and DDM-2000 FiberReach Software Compatibility

Software Release		Interconnecting Circuit Pack	
DDM-2000 OC-3	**DDM-2000 FiberReach**	**DDM-2000 OC-3**	**DDM-2000 FiberReach**
9.0 (Ring)	1.0 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
9.0 (Ring)	2.0 (Ring)*	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
9.0 (Ring)	2.1 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
9.1 (Ring)	2.0 (Ring)*	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
9.1 (Ring)	2.1 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
11.0 (Ring)	2.0 (Ring)*	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
11.0 (Ring)	2.1 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
11.1 (Ring)	2.1 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U OLIU
11.1 (Ring)	2.2 (Ring)	27G-U/27G2-U OLIU	26G-U/26G2-U or 28G-U† OLIU

* No longer available to order.

† When FiberReach Release 2.2 is equipped with 28G-U OLIUs in the **MAIN** slots, the interconnecting circuit packs in the DDM-2000 OC-3 shelf are 22-Type OLIUs in the **MAIN** slots.

6. DDM-2000 OC-3 Multiplexer DRI Software Compatibility

6.01 Table D lists the dual ring interworking (DRI) software compatibility for the DDM-2000 OC-3 Multiplexer for both EC-1 and OC-3 interfaces. The table lists all possible software combinations. Combinations not listed are not supported.

Table D. DDM-2000 OC-3 Multiplexer DRI Software Compatibility

DDM-2000 OC-3	DDM-2000 OC-12 and FT-2000	Notes
Release 7.2	OC-12 Release 5.X and FT-2000 Releases 4.1, 5.0, 6.0, and 7.X	FT-2000 Releases 4.1 and 5.0 have no DCC connectivity.
Release 9.0	OC-12 Release 5.0 and FT-2000 Releases 4.1, 5.0, 6.0, and 7.0	FT-2000 Releases 4.1 and 5.0 have no DCC connectivity.
Release 9.1	OC-12 Releases 5.X and FT-2000 Releases 7.X	
Release 11.0	OC-12 Releases 5.1/5.2 and FT-2000 Releases 7.1 and 7.2	
Release 11.1	OC-12 Releases 5.1/5.2 and FT-2000 Releases 7.1 and 7.2	

See 824-102-147, *Lucent Technologies 2000 Product Family Operations Interworking Guide* for more information on operations interworking.

7. Inservice Upgrades

7.01 Table E lists the current software releases of the DDM-2000 OC-3 Multiplexer that can be directly upgraded inservice. Specific procedures for upgrades are provided in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 Through 11.1, User/Service Manual (TOP), Volume II*.

Table E. DDM-2000 OC-3 Inservice Software Upgrade Compatibility

Current Release	Upgrade to*							
(See Notes)	7.1	7.2	8.0	8.1	9.0	9.1	11.0	11.1
7.1 (Ring)	X	C	NA	NA	C	C	C	C
7.2 (Ring)	NA	X	NA	NA	C	C	C	C
8.0 (Linear)	NA	C	X	X	C	C	C	C
8.1 (Linear)	NA	NA	NA	X	C	C	C	C
9.0 (Ring)	NA	NA	NA	NA	X	X	X	X
9.1 (Ring)	NA	NA	NA	NA	NA	X	X	X
11.0 (Ring)	NA	NA	NA	NA	NA	NA	X	X
11.1 (Ring)	NA	NA	NA	NA	NA	NA	NA	X

See Notes on Next Page.

Table E. DDM-2000 OC-3 Inservice Software Upgrade Compatibility (Contd)

Notes:

(1) All DDM-2000 OC-3 shelves in a subnetwork should be using the same version of software (except R7.2, R9.0/9.1, and R11.0/11.1). Releases 7.2, 9.0/9.1, and 11.0/11.1 can coexist in the same subnetwork.

(2) See attached **NTP-046** for information and procedures needed for upgrading Release 7.1 or 7.2 to Release 9.0, 9.1, 11.0, or 11.1 for a system in service.

* When doing an upgrade, it is recommended that the latest point release of software be used, if possible.

X Requires local or remote software download only to upgrade the system.

C Indicates software incompatibility. Upon completion of the software download, a **C** will be displayed in the **SYSCTL FE ID** display. This is a caution indicating that the newly installed software has major changes from the previous release. Transmission will not be affected but shelf access, protection switching, alarm reporting, and control functions will be disabled while the **C** is displayed. You must verify that the correct software version has been downloaded and that a **C** was expected as a result of the download (See Table above). After verifying that the correct software download occurred, the system may be forced to run the new software by following the steps provided in **DLP-532** and **DLP-562** attachments.

NA Not Applicable. If an NA conversion is required, contact your local technical support organization.

8. Implementation Procedure

CAUTION:
If this software is to be used in the SONET subsystem of a SLC-2000 Access System, a compatible version of the digital loop carrier (DLC) subsystem software must be installed before upgrading the SONET subsystem software.

NOTE 1:
While attempting to upgrade a Network Element's software version using the Enhanced software upgrade procedure, the software upgrade (using the "**`apply`**" command) will fail if the dormant software is missing or corrupted. In addition, the "**`copy-prog`**" command will fail if the dormant software is missing or corrupted.

NOTE 2:
Before installing Release 11.1.3 software, the following hardware versions *must* be in place at all sites before continuing with the implementation procedure:

BBG8/BBG8B SYSCTL: Series 1:1 or higher
BBG9/BBG10 OHCTL: Series 1:1 or higher.

8.01 For Releases 9.1 and higher, the following parameters must be provisioned to support OSI interworking over the SONET DCC:

- The appropriate User Side/Network Side parameters on opposite ends of any optical span need to be set to opposite values with the "**`set-fecom`**" command. Also, one node in the subnetwork must be provisioned as the DSNE using the "**`set-ne`**" command, and at least one node in the subnetwork must be provisioned as an AGNE using the "**`set-ne`**" command. For instructions about setting the User Side/Network Side, DSNE, and AGNE parameters, refer to 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 Through 11.1, User/Service Manual (TOP), Volume II*.

Software Installation and Upgrade Procedure

CAUTION:
*While doing upgrades, incompatible software between two network elements may cause continuous resets on the shelf that is being upgraded (i.e. when an OC-12 Release 5.0 is connected to an OC-3 Release 7.1). To avoid this situation during upgrades that can result in software incompatibility, it is recommended that the DCC be temporarily disabled until the NE upgrade is completed. The DCC can be disabled through the "***`set-fecom`***" command.*

The following is a brief description of scenarios that may be encountered while upgrading to OC-3 Release 11.1.3 software:

NOTE:
When using the "**apply**" command to upgrade OC-3 Release 9.1 to OC-3 Release 11.0, see the description of the "**apply**" command in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 Through 11.1, User/Service Manual, Volume I*.

- If a NE running OC-3 Release 9.0 is upgraded to OC-3 Release 11.1 through a Forced Software Download, the following scenarios will take place:
  - — Uncompressed software of Release 11.1 is downloaded and installed as the EXECUTING generic.
  - — No dormant area will be available in the NE receiving the software.
  - — Initiating the "**cpy-prog**" command from this NE will send the EXECUTING (uncompressed) generic to the remote NE.
- If the "**ins-prog**" command was initiated to install Release 11.1 to a NE running Release 9.0, the following scenarios will take place:
  - — Uncompressed software of Release 11.1 is downloaded and installed as the EXECUTING generic.
  - — No dormant area will be available in the NE receiving the software.
  - — Initiating the "**cpy-prog**" command from this NE will send the EXECUTING (uncompressed) generic to the remote NE.
- If the "**ins-prog**" command was initiated to install Release 11.1 in a NE running Release 9.1, the following scenarios will take place:
  - — Compressed software of Release 11.1 is downloaded and installed into the DORMANT area of the NE receiving the software.
  - — The "**apply**" command must be used in that NE to install or overwrite the currently executing Release 9.1 software.

    When executing the "**apply**" command in Release 9.1, a 30 minute delay is encountered before starting to overwrite Release 9.1 with Release 11.1. (For more information, refer to the DLP attachments).
  - — Issuing the "**cpy-prog**" command from this NE will send the DORMANT (compressed) generic to the remote NE if that remote NE is running Release 9.1.

    If the remote NE is running Release 9.0, the EXECUTING (uncompressed) generic will be sent to it.

- If a NE running OC-3 Release 9.1 is upgraded to OC-3 Release 11.1 through a Forced Software Download, the following scenarios will take place:
  - — Compressed software of Release 11.1 is downloaded and installed into the DORMANT area of the NE receiving the software.
  - — The "**apply**" command must be used in that NE to install or overwrite the currently executing Release 9.1 software. When executing the "**apply**" command in Release 9.1, a 30 minute delay is encountered before starting to overwrite Release 9.1 with Release 11.1. (For more information, refer to the DLP attachments).
  - — Initiating the "**cpy-prog**" command from this NE will send the DORMANT (compressed) generic if the receiving NE is running Release 9.1. If the receiving NE is running Release 9.0, only the EXECUTING (uncompressed) generic will be sent to the receiving NE.
- If a NE running OC-3 Release 11.0 is upgraded to OC-3 Release 11.1 through a Forced Software Download, the following scenarios will take place:
  - — Compressed software of Release 11.1 is downloaded and installed into the DORMANT area.
  - — Uncompressed software of Release 11.1 is downloaded and installed as the EXECUTING generic (i.e., "**apply**" command not needed in this case).
  - — Initiating the "**cpy-prog**" command from this NE will send the DORMANT (compressed) generic, if the receiving NE is running Release 9.1. If the receiving NE is running Release 9.0, only the EXECUTING (uncompressed) generic will be sent to the receiving NE.
- If a NE running OC-3 Release 11.1 is upgraded to OC-3 Release 11.1 through a Forced Software Download, the following scenarios will take place:
  - — Compressed software of Release 11.1 is downloaded and installed into the DORMANT area.
  - — Uncompressed software of Release 11.1 is downloaded and installed as the EXECUTING generic (i.e., "**apply**" command not needed in this case).
  - — Initiating the "**cpy-prog**" command from this NE will send the DORMANT (compressed) generic, if the receiving NE is running Release 9.1. If the receiving NE is running Release 9.0, only the EXECUTING (uncompressed) generic will be sent to the receiving NE.

- If the "**cpy-prog**" command was initiated to copy Release 11.1 into a remote NE running Release 9.1, the following scenarios will take place:
  - — Compressed software of Release 11.1 is downloaded and installed into the DORMANT area.
  - — The "**apply**" command must be used in remote NE to install or overwrite the currently executing Release 9.1 software.

    When executing the "**apply**" command in Release 9.1, a 30 minute delay is encountered before starting to overwrite Release 9.1 with Release 11.1. (For more information, refer to the DLP attachments).

    If the remote NE is running Release 9.0, the EXECUTING (uncompressed) generic will be sent to it.

DLP-566, **DLP-532**, and **DLP-562** contain the latest information and procedures needed for upgrading a DDM-2000 OC-3 System running any upgradable version of OC-3 software. **DLP-566** and **DLP-561** contain the latest information and procedures needed for installing software in new shelf installations where the **SYSCTL** and **OHCTL** are new and contain no software.

This release of software takes approximately 15 to 25 minutes to download to a local shelf using a newer PC with the autobaud feature. This release of software takes approximately 45 minutes to download to a local shelf using an older PC set to 9600 baud. This release of software takes approximately 20 to 30 minutes to copy from one shelf in the subnetwork to another shelf if the DCC traffic is not excessive from other shelves. The download time will be longer (even without excessive DCC traffic) when there are additional spans between the source and target network elements.

Use the attached copies of **DLP-532**, **DLP-561**, **DLP-562**, and **DLP-566** to install the new software.

Table F. DDM-2000 OC-3 Ring Cross-Connect Types Allowable (MAIN to FUNCTION UNITS)

From MAIN		To FUNCTION UNITS						
Circuit Pack	**Cross-Connect Type**	**22-Type***	**26G2-U**	**27G-U**	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
22-Type	Add/Drop STS	7.0‡ 9.0§				5.1 ¶	5.1	5.1
	Add/Drop VT	7.0‡ 9.0§					5.1	5.0
	Dual 0x1 STS		11.1	9.0	9.0 §§			
	Dual 0x1 VT		11.1	9.0	9.0 §§			
	Dual 0x1 NR STS					11.0 **		
	Single 0x1 STS		11.1	9.0 ††	9.0 ††§§			
	Single 0x1 VT		11.1	9.0 ††	9.0 ††§§			
	Single 0x1 NR STS					11.0		
	Drop/Continue STS	7.2					7.0	
	Drop/Continue VT	7.2 ‡‡					7.0 ‡‡	
	Locked VT							9.0
	Dual Locked STS							

From MAIN		To FUNCTION UNITS						
Circuit Pack	**Cross-Connect Type**	**22-Type***	**26G2-U**	**27G-U**	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
27-Type	Add/Drop STS	9.0				9.0 ¶	9.0	9.0
	Add/Drop VT	9.0					9.0	9.0
	Dual 0x1 STS		11.1	9.0	9.0 §§			
	Dual 0x1 VT		11.1	9.0	9.0 §§			
	Dual 0x1 NR STS					11.0 **		
	Single 0x1 STS		11.1	9.0 ††	9.0 ††§§			
	Single 0x1 VT		11.1	9.0 ††	9.0 ††§§			
	Single 0x1 NR STS					11.0 **		
	Drop/Continue STS	9.0				9.0 ¶	9.0	
	Drop/Continue VT	9.0 ‡‡					9.0 ‡‡	
	Locked VT							9.0
	Dual Locked STS							

From MAIN		To FUNCTION UNITS						
Circuit Pack	**Cross-Connect Type**	**22-Type***	**26G2-U**	**27G-U**	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
24-Type	Add/Drop STS	11.0				11.0	11.0	11.0
	Add/Drop VT	11.0					11.0	11.0
	Dual 0x1 STS		11.1	11.0	11.0 §§			
	Dual 0x1 VT		11.1	11.0	11.0 §§			
	Dual 0x1 NR STS					11.0		
	Single 0x1 STS		11.1	11.0	11.0 §§			
	Single 0x1 VT		11.1	11.0	11.0 §§			
	Single 0x1 NR STS					11.0		
	Drop/Continue STS	11.0					11.0	
	Drop/Continue VT	11.0					11.0	
	Locked VT							11.0
	Dual Locked STS							

* A 22-Type OLIU in a function unit is in “linear” (unprotected or 1+1 line protected), not a ring configuration.

† This table refers to only “low-speed” STS-1 interfaces.

‡ Only FN-B and/or FN-C can be equipped with 22-Type OLIUs in this release.

§ FN-A, FN-B and/or FN-C can be equipped with 22-Type OLIUs in this release.

¶ This entry valid for DS3 circuit packs except the BBG19 front-access pack.

** This entry valid for the BBG19 front-access DS3 circuit pack.

†† One of the pair of function unit slots will be empty.

‡‡ All VT1.5 drop and continue cross-connections in a system must be in the same direction, i.e. from the same ring (m1 or m2).

§§ The mixing of 0x1, Pass-Through, and local Add/Drop cross-connects is supported beginning with OC-3 Release 11.0.3.

Table G. DDM-2000 OC-3 Ring Cross-Connect Types Allowable (FUNCTION UNITS to FUNCTION UNITS)

From FUNCTION UNITS		To FUNCTION UNITS					
Circuit Pack	**Cross-Connect Type**	**22-Type***	**26G2-U**	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
22-Type	Two-Way STS	13.0 / 11.1			13.0 / 11.1	13.0 / 11.1	
	Two-Way VT	9.0				9.0	9.0
	Add/Drop STS		11.1	11.0 **			
	Add/Drop VT		11.1	11.0 **			
27G2-U	Add/Drop STS	11.0 **				11.0 **	11.0 **
	Add/Drop VT	11.0 **				11.0	11.0 **
	Dual 0x1 STS		11.1	9.1 ‡**			
	Dual 0x1 VT		11.1	9.1 ‡**			
	Intra-FN Dual 0x1 VT			9.1 ¶			
	Pass-Through STS			9.1 **			
	Pass-Through VT			9.1 **			
	Single 0x1 STS		11.1	9.1 ‡§**			
	Single 0x1 VT		11.1	9.1 ‡§**			
	Intra-FN Single 0x1 VT			9.1 §¶			
STS1E	Two-Way VT	9.0				9.0	9.0
	Add/Drop STS		11.1	11.0 **			
	Add/Drop VT		11.1	11.0			

From FUNCTION UNITS		To FUNCTION UNITS					
Circuit Pack	**Cross-Connect Type**	**22-Type***	**26G2-U**	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
MXRVO	Two-Way VT	9.0				9.0	
	Add/Drop STS		11.1	11.0 **			
	Add/Drop VT		11.1	11.0 **			
TMUX	Two-Way VT	11.1				11.1	
	Add/Drop STS		11.1 ††	11.0			
	Add/Drop VT		11.1 ††	11.0			

* A 22-Type OLIU in a function unit is in “linear” (unprotected or 1+1 line protected), not a ring configuration.

† This table refers to only “low-speed” STS-1 interfaces.

‡ Cross-connections from one OC-1 ring to a different OC-1 ring in a different function unit.

§ One of the pair of function unit slots will be empty.

¶ Cross-connections from one OC-1 ring to a different OC-1 ring using the two OC-1 ports on the 27G2-U OLIU in the same function unit slot.

** The mixing of 0x1, Pass-Through, and local Add/Drop cross-connects is supported beginning with OC-3 Release 11.0.3.

†† MXRVO functionality within the 26G2-U OLIU is NOT used. Rather, a separate pair of MXRVOs in a different FN group are used.

How Are We Doing?

Document Title: *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 11.1.3*

Document No.: 363-206-230 Issue 3 Date: July 2000

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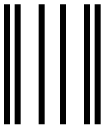

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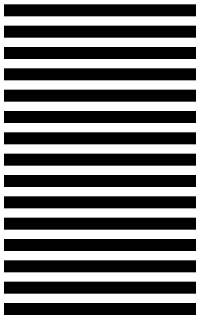

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Upgrade DDM-2000 OC-3
Release 6 to Release 8 or Release 7.1 or 7.2 to Release 9 or 11
System In Service

DO ITEMS BELOW IN ORDER LISTED . . . . FOR DETAILS, GO TO

---

1. ⚠ **CAUTION:**
DDM-2000 circuit packs contain static sensitive components which can be damaged by electrostatic discharge. A static ground wrist strap must be worn when handling the circuit packs. See electrostatic discharge considerations in **Trouble Clearing: TAD-100**.

NOTE 1:
This procedure assumes that the DDM-2000 is in service and is being upgraded from Release 6 software to Release 8 or Release 7.1 or 7.2 software to Release 9 or 11. Releases 8 and 9 or later software require that a new **BBG8/BBG8B SYSCTL** and a **BBG9 OHCTL** be installed in the shelf. This procedure must be performed locally at all shelves in the same control network.

NOTE 2:
If the DDM-2000 fails to respond in the indicated manner, refer to **Trouble Clearing: IXL-001**.

Use the **`rtrv-alm`** command to verify that no alarms, locks, loops, or switches are present.

---

2. Notify maintenance center that alarms will be generated.

DO ITEMS BELOW IN ORDER LISTED . . . . FOR DETAILS, GO TO

---

3. ⚠ **CAUTION:**
Both **TGS** *circuit packs must be installed before performing this procedure. During this procedure, downloading Release 8.x, 9.x, or 11.x software to a shelf running OC-3 Releases 6.x or 7.x requires you to remove the* **TGS** *circuit pack in* **TIMING** *slot* **1** *in order to "force" the system to run the new software. If both* **TGS** *circuit packs are not installed, removal of the only* **TGS** *circuit pack will cause service interruption*.

⇒ **NOTE 1:**
If upgrading from a Release 6 system to a Release 8 system or a Release 7.1 system to a Release 9 or 11 system, after the first shelf is upgraded, single ended operations will not be available and major alarms (section DCC channel failed) will exist until all shelves are upgraded.

⇒ **NOTE 2:**
This procedure will not affect transmission when properly performed.

Before performing this procedure on an in-service system, ensure that both **TGS** circuit packs are installed in the shelf and use the **`switch-sync:s=circuitpack,pri=manual`** command to switch to the protection **TGS** circuit pack in **TIMING** slot **2**, if not already **ACTIVE**. Use **`rtrv-sync:`** command to verify that the **TGS** circuit pack in **TIMING** slot **2** is **ACTIVE**.

DO ITEMS BELOW IN ORDER LISTED . . . . FOR DETAILS, GO TO

4. From system records, work orders, or the retrieve [RTRV-( )] commands, retrieve all parameters that might have been set using the SET commands [**DLP-512**]. See the "Commands and Reports" section of this manual for a description of the **`rtrv-( )`** commands. Note all the parameters that are set using the **`set-ne`** and **`set-fecom`** commands. These parameters may have to be reset when the controllers are replaced and the new software is installed.

5. If upgrading from Release 6 to Release 8 or Release 7.1 to Release 9 or 11, use the **`set-ne:gne=no`** command to discontinue the GNE shelf in the R6 linear or R7.1 ring.

DO ITEMS BELOW IN ORDER LISTED . . . . FOR DETAILS, GO TO

6. ⚠ **CAUTION:**
Removing the **BBG5 SYSCTL** *without performing a 10-second countdown sequence on the* **FE ID** *display (see* **Note***) may result in unexpected and undesirable protection switches, incorrect circuit pack fault indications, or incoming signal failure indications.*

⇶ **NOTE:**
Before removing the **SYSCTL**, you must momentarily depress the **ACO** pushbutton on the User Panel and the **FE SEL** pushbutton on the **SYSCTL** at the same time to start a 10-second countdown on the **FE ID** display (9, 8, 7, etc.). During this countdown, the **SYSCTL** may be safely removed. If the **SYSCTL** is failed, the countdown may not occur.

Remove **BBG5 SYSCTL** circuit pack.

7. Remove **BBG7 OHCTL** circuit pack.

8. Install **BBG9 OHCTL**. **DLP-500**

9. ⇶ **NOTE 1:**
If upgrading from Release 6 to Release 8 or Release 7.1 to Release 9 or 11 (all shelves), after the software download is successfully completed, the **FAULT** LED on the **OHCTL** will flash and the **MJ** LED will be lighted until the other end is upgraded.

DO ITEMS BELOW IN ORDER LISTED . . . . FOR DETAILS, GO TO

NOTE 2:
Users who receive software upgrades or new **SYSCTL** circuit packs from the factory may find that a new default login (LUC01, LUC02, or LUC03) is needed to allow access into the system. If none of the new default logins permits access to the system, the user should try one of the old default logins (ATT01, ATT02, ATT03). The default password is DDM-2000.

Install new **BBG8/BBG8B SYSCTL**. **DLP-501**

10. **CAUTION:**
Do not designate any shelf as the DSNE (Step 12) until all shelves in the network have been upgraded to the new software. Designating the DSNE first will prevent the other nodes from completing the **set-ne** *command.*

NOTE:
Parameters that were previously set by switches on the **BBG7 OHCTL** and **BBG5 SYSCTL** are set by software commands on the new **BBG9 OHCTL** and **BBG8/BBG8B SYSCTL** controllers: **TID, Site, NE, Shelf, PMN, TBOS, CO/RT, Network Side/User Side (NS/US) parameters**.

Use the **set-ne** and **set-fecom** commands to set these parameters on the new controllers: **TID, Site, NE, Shelf, PMN, TBOS, CO/RT, Network Side/User Side (NS/US)**. If other parameters have to be reset from default during this upgrade, use the Commands and Reports section of this manual for a description of the **set-** commands.

DO ITEMS BELOW IN ORDER LISTED	FOR DETAILS, GO TO
11. Repeat this procedure from Step 2 for all shelves being upgraded, if not already performed.	
12. After all shelves have been upgraded to new software, use the **`set-ne:agne=yes`** command to designate one shelf as the AGNE.	
13. After all shelves have been upgraded to new software, use the **`set-ne:dsne=yes`** command to designate one shelf as the DSNE.	

Install New Software Generic Program
In-Service System
Local Shelf Download

1. Before beginning the software installation, refer to the "Software Installation and Upgrade Procedure" section of the Software Release Description. This section contains a description of any special considerations required when installing this version of software.

2. **NOTE:**
   This procedure is used to install a new software program in a local in-service DDM-2000 OC-3 shelf. For procedures to download software in a new shelf (initial installation), see **DLP-561**. For procedures to download software to a remote shelf (using **`ins-prog`** or **`cpy-prog`** command), see **DLP-562**.

   Verify that no DCC failures or transmission failures (OC-3 LOS, flashing **OLIU FAULT** LEDs, etc.) are present on the network element or system receiving the program.

3. **CAUTION:**
   TIMING *slot* **2** *should always be equipped with a* **TGS** *circuit pack and be active prior to software download. To clear a "***C***" condition from the* **SYSCTL FE ID** *display, procedures will require removal of the* **TGS** *circuit pack from* **TIMING** *slot* **1** *to force the system to run the new software. See Table A.*

   NOTE 1:
   When upgrading from releases without synchronization messaging to releases with this feature, it is suggested to upgrade first the shelves which are provisioned for "external timed" or "external mult" timed. This is to prevent timing "holdover" conditions at nodes that derive timing from the OC-3 line.

Table A. DDM-2000 OC-3 In-Service Upgrade Compatibility

Current Release in Shelf (OLD)	Software Release To Be Installed (NEW)						
	Linear		Ring				
	8.0	8.1.n	7.2.n	9.0.n	9.1.n	11.0.n	11.1.n
7.1.n or earlier	NA	NA	C	C	C	C	C
7.2.n (Ring)	NA	NA	X	C	C	C	C
8.0.n (Linear)	X	X	C	C	C	C	C
8.1.n (Linear)	NA	X	NA	C	C	C	C
9.0.n (Ring)	NA	NA	NA	X	X	X	X
9.1.n (Ring)	NA	NA	NA	NA	X	X	X
11.0.n (Ring)	NA	NA	NA	NA	NA	X	X
11.1.n (Ring)	NA	NA	NA	NA	NA	NA	X

C - Indicates software incompatibility. Upon completion of the software download, a "**C**" will be displayed in the **SYSCTL FE ID** display. This is a caution indicating that the newly installed software has major changes from the previous release. Transmission will not be affected but shelf access, protection switching, alarm reporting, and control functions will be disabled while the "**C**" is displayed. You must verify that the correct software version has been downloaded and that a "**C**" was expected as a result of the download (See Table above). After verifying that the correct software download occurred, the system may be forced to run the new software by following the steps provided in this procedure.

NA - Not Applicable. If an NA conversion is required, contact your local technical support organization.

X - Indicates software compatibility. Download procedures will not require the system to be forced to run the software installed. No "**C**" should appear in the **SYSCTL FE ID** display. Other equipment/fiber changes and/or software/equipment provisioning may be required before and/or after the upgrade. See **System Turnup: IXL-001** for particular upgrade procedures and the Software Release Description for the software release being installed.

NOTE 2:
If a linear shelf is in the STS3c mode (**concat** mode enabled by the **set-oc3** command) and a different software generic that does not have the STS3c feature is loaded, the **OLIU**s will stay in the **concat** mode until they are removed and reseated.

NOTE 3:
If the **ins-prog** command is used for software upgrades from Release 9.1 to Release 11, or later, the software is loaded as a dormant copy in the **SYSCTL** receiving the software. At the end of the download, the **rtrv-alm** report will show a status message of "*dormant/exec code mismatch*". The **apply** command must be used to overwrite the original executing copy of software with the new dormant software version. See the "Commands and Reports" section in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 through 11.1, User/Service Manual—Volume 1*, for a description of the **apply** command.

Before performing this procedure, ensure that both **TGS** circuit packs are installed in the shelf, then use the **switch-sync:s=circuitpack,pri=manual** command to switch to the protection **TGS** circuit pack in **TIMING** slot **2**, if not already **ACTIVE**. Use **rtrv-sync:** command to verify that the **TGS** circuit pack in **TIMING** slot **2** is **ACTIVE**.

4. **NOTE:**
If you are using a PC operating in a *Windows** environment, you must **exit** *Windows* and restart your PC in *MS-DOS** mode before performing these download procedures. For example, if your PC is running *Windows 95* you must exit *Windows* by clicking on the **Start** button, then **Shut Down**, then **Restart the computer in** *MS-DOS* **mode**.

Obtain equipment, check software, and connect PC for download.

Reference: **DLP-566**

* Registered trademark of Microsoft Corporation.

5. Observe one of the following indications on the **FE ID** display. Note the indication and follow the suggested procedure.

   A. **Letter "P" in FE ID Display**

   Indicates no software installed in **SYSCTL**. Software must be downloaded locally using these procedures.

   Continue with **Step 6.**

   B. **Letter "P." in FE ID Display**

   Letter "**P**" followed by a period (**P.**) indicates a previous download attempt has failed. New software must be downloaded locally using these procedures.

   Proceed to **Step 19.**

   C. **FE ID Display Blank:**

   Indicates compatible software is installed in **OHCTL** and **SYSCTL**. This procedure assumes the installed software version is not the correct version. (Depress **ACO** button for longer than 2 seconds to display software version on the **FE ID** display.)

   Proceed to **Step 9.**

   D. **Letter "d" in FE ID Display:**

   Indicates **OHCTL** has no software or that software in **OHCTL** and **SYSCTL** is incompatible.

   Proceed to **Step 19.**

   E. **Letter "C" in FE ID Display:**

   Indicates software is installed in **OHCTL** and **SYSCTL**, but it will not support the current shelf provisioning.

   Proceed to **Step 23.**

F. **Letter "U" in FE ID Display:**

Indicates **SYSCTL** Switch **S1** is not set properly for type of shelf being equipped.

Remove **SYSCTL**. Repeat procedures of **DLP-501** to correct switch settings and to reinstall **SYSCTL**.

G. **Letter "E" in FE ID Display:**

Indicates **SYSCTL** must be replaced.

Get replacement **SYSCTL** and repeat procedures of **DLP-501**.

H. **Letter "F" in FE ID Display:**

Indicates **SYSCTL** faceplate latch is not fully seated. If **SYSCTL** has just been replaced, unplug **SYSCTL** and repeat procedures of **DLP-501**. If original **SYSCTL** has just been unplugged and reseated, properly seat the faceplate latch. (A reset occurs after the faceplate is seated.)

I. **Flashing Letter "L" in FE ID Display:**

Indicates a low voltage condition (brownout) on the shelf.

Clear trouble using **Trouble Clearing: TAP-121**.

Letter "P" in FE ID Display

6. **CAUTION:**
If PC hard drive is being used, ensure you are in the correct directory. If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive. Ensure PC is connected to the front CIT (CIT-1) connector.

NOTE:
After the terminal emulator (**`term`**) is started, the software download automatically begins. The download may take up to 45 minutes.

Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. Disregard message "`Can't find script <init>`" if you see it after starting the terminal emulator.

Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows within 2 minutes:

```
Interface ready. (Type Alt-h for help.)
Communications established.

Searching for optimal transfer rate.
Handshake established at <baudrate> baud.
```

`In progress . . . .`

The dots continue to print until program installation is complete. If using floppies, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

`ins-prog:`*`TID`* `COMPLD`
`/* Generic a.b.c is installed */`

The **SYSCTL** resets and the terminal is logged off the system.

7. Was response correct?

   If **YES**, then continue with **Step 8**.
   If **NO**, then proceed to **Step 27**.

8. Did the letter "**C**" appear in the **FE ID** display?

   If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **YES**, then proceed to **Step 23**.

FE ID Display Blank

9. **CAUTION:**
If PC hard drive is being used, ensure you are in the correct directory. If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive.

Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. Disregard message "`Can't find script <init>`" if you see it after starting the terminal emulator.

Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows:

```
Interface ready. (Type Alt-h for help.)
Communications established.
```

10. **NOTE:**
The default shelf is the shelf physically connected to the PC. To set baud rate automatically, enter two carriage returns (**<cr>**), two lower case "a"s (**aa**), or two upper case "A"s (**AA**). All other characters are ignored.

Enter two carriage returns.

Response: PC prompts with:

```
/* Enter a shelf number from 1 to 8 */
shelf [default] =
```

11. Was response correct?

If **YES**, then continue with **Step 12**.
If **NO**, then proceed to **Step 28**.

12. Enter the shelf number for the shelf being used for new program download.

    Response: PC responds with:

```
login<
password<

    /***********************************
    *                                  *
    *                                  *
    *         Lucent Technologies      *
    *      DDM-2000 OC-3 Multiplexer   *
    *                                  *
    *           Release a.b.c          *
    *                                  *
    ***********************************/

                      .
                      .
                      .

    TID date time
 M  rtrv-alm: all COMPLD
    /* Active Alarms and Status Report
```

13. **NOTE:**
    After the system prompt (<), the system will respond normally to commands entered. The "Commands and Reports" section in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 through 11.1, User/Service Manual—Volume I*, gives a description of the commands.

Use **`rtrv-ne`** command to retrieve the name (*tid*) of the shelf having new program installed or see `TID` in response above.

14. Enter the command **`ins-prog:`***`tid`*

    Where tid = the target identifier (shelf name) for the DDM-2000 shelf having the new program installed.

    Response: `/* Testing For Program Installation... */`

    After several seconds, the PC prints a `Caution!` message followed by the prompt:

    `Execute? y/n =.`

15. Was response correct?

    If **YES**, then continue with **Step 16**.
    If **NO**, then do **Trouble Clearing: TAP-116**.

16. Enter a *`y`* or *`yes`* and a carriage return to execute the program. Software download may take up to 45 minutes.

    Response: **ABN** LED lights on User Panel and a **P** is displayed in **SYSCTL FE ID** display in the shelf receiving the program. PC starts download and prints the following message:

    ```
    Searching for optimal transfer rate.
    Handshake established at <baudrate> baud.
    ```

    `In progress . . . .`

    The dots continue to print until program installation is complete. If floppy disks are being used, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

    ```
    ins-prog:TID COMPLD
    /* Generic a.b.c is installed */
    ```

17. Was response correct?

    If **YES**, then continue with **Step 18**.
    If **NO**, then do **Trouble Clearing: TAP-116**.

18. Did the letter "**C**" appear in the **FE ID** display?

    If **NO**, then proceed to **Step 33**.
    If **YES**, then proceed to **Step 23**.

Letter "d" or "P." in FE ID Display

19. ⚠ **CAUTION:**
    If PC hard drive is being used, ensure you are in the correct directory. If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive. Ensure PC is connected to the front CIT (CIT-1) connector.

Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. Disregard message "`Can't find script <init>`" if you see it after starting the terminal emulator.

Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows:

```
Interface ready. (Type Alt-h for help.)
Communications established.
```

20. Unplug and reseat the **SYSCTL** and immediately push and hold the **FE SEL** and **UPD/INIT** buttons at the same time until a **P** appears in the **FE ID** display (takes approximately 15 seconds). The software download automatically begins and may take up to 45 minutes.

    Response: PC starts download and prints the following message:

    ```
    Searching for optimal transfer rate.
    Handshake established at <baudrate> baud.

    In progress . . . .
    ```

    The dots continue to print until program installation is complete. If using the floppy disks, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

    ```
    ins-prog:TID COMPLD
    /* Generic a.b.c is installed */
    ```

    The **SYSCTL** resets and the terminal is logged off the system.

21. Was response correct?

    If **YES**, then continue with **Step 22**.
    If **NO**, then proceed to **Step 27**.

22. Did the letter "**C**" appear in the **FE ID** display?

    If **NO**, then proceed to **Step 33**.
    If **YES**, then continue with **Step 23**.

Letter "C" in FE ID display

23. **CAUTION:**
If the system is in service and is forced to run the current software that is displaying a **C***, service interruption may result.*

NOTE:
Indications are that there may be a problem with the version of software you are installing or you are trying to install a version of software that will not support the current shelf provisioning. If you are downloading an older version of software or upgrading to a new version of software which has major changes or is incompatible with the version that you have, this indication will occur (See Table A). You can *force* the system to run the current software or back out of this procedure by loading another version of software.

You must decide if you want the system to run this current version of software that has been loaded or if you want to download another version (original version or new version) of software.

Do you want to run the current version of software in the **SYSCTL**?

If **NO**, then continue with **Step 24**.
If **YES**, then proceed to **Step 25**.

24. Exit TERM (Alt-F2). Find new version of software and repeat this procedure from Step 19.

25. To *force* the system to run the current software, perform the following:
    a. Ensure that a **TGS** circuit pack is installed in **TIMING** slot **2**.
    b. Remove the **TGS** circuit pack in **TIMING** slot **1**.
    c. Reset (unplug and reseat) the **SYSCTL** to force it to run the current software.
    d. After the current software is up and running (no alarm LEDs lighted or you can log into the shelf), reinstall the **TGS** circuit pack in **TIMING** slot **1**.

26. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

27. Did the download start as indicated by the `In progress` message and rows of dots?

    If **NO**, then continue with **Step 28**.
    If **YES**, then proceed to **Step 30**.

28. Perform the following:

    A. Check that the DDM-2000 is connected to the PC through the **COM** port. If it is not, reconnect the PC to DDM-2000 using the **COM** port and repeat this procedure.

    B. Ensure first (number 1) disk of program being installed is inserted, if using floppies.

    C. Ensure diskette is inserted in correct drive.

    D. Ensure the proper command was used to go to the drive with the diskette or to the proper directory containing the software.

    E. Check for invalid COM port. Exit TERM (Alt-F2), then restart TERM using **term COM1** or **term COM2**.

    F. If the download still does not start, as indicated by the `In progress` message and rows of dots, within 2 minutes after the **P** appears in the **FE ID** display, change the baud rate as follows and repeat this procedure: if the baud rate is currently set to 9600, change it to 4800 or if the baud rate is currently set to 4800, change it to 9600. The baud rate is changed by:

        1. Momentarily depress the "Alt C" keys.

        2. Use the RETURN key to move to the "Speed" field.

        3. Press the "Space" bar until the desired rate appears.

        4. Momentarily depress the "Escape/Esc" key to activate the new baud rate.

    G. If the download still does not start, refer to **Trouble Clearing: TAP-116**.

29. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

30. If the download *starts and fails* during its progress, exit term (Alt-F2) and then restart a new term session.

31. Unplug and reseat the **SYSCTL** and immediately push and hold the **FE SEL** and **UPD/INIT** buttons at the same time until a **P** appears in the **FE ID** display (takes approximately 15 seconds).

    If the download still does not complete, refer to **Trouble Clearing: TAP-116**.

32. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

33. Use the **`rtrv-alm`** command to display alarm and status information.

34. Does status message "`dormant/exec code mismatch`" appear in the report for this shelf?

    If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **YES**, then continue with **Step 35**.

35. **NOTE:**
    The software you downloaded has been loaded as a dormant copy in this shelf. The original software is still the executing software. The **`apply`** command must be used at this shelf to install the dormant copy of software as an executing copy. When the **`apply`** command is executed during an upgrade from Release 9.1 to later releases, there is a 30-minute delay before the dormant copy installation begins.

    When the **`apply`** command is executed during an upgrade from Release 11 to later releases, if you do not specify a *`time`* and *`date`* parameter, there is a default 15-minute delay before the dormant copy installation begins. Once the installation begins, the dormant copy is installed in approximately 10 minutes.

    See the "Commands and Reports" section of 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 through 11.1, User/Service Manual—Volume I*, for a description of the **`apply`** command. The **`apply`** command allows you to coordinate the software download across the network.

Are you going to use the **`apply`** command at this time to install the dormant version of software?

If **YES**, then continue with **Step 36**.
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

36. Execute the **`apply`** command at the shelf to receive the software.

    Response: A "**P**" appears in the **FE ID** display when the installation begins.
    The **SYSCTL** resets after the software is installed.
    LEDs and **FE ID** display go off on **SYSCTL** and User Panel.
    You are logged off the system.
    After approximately 5 minutes you can log back into the shelf and reestablish communications.

37. Was response correct?

    If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO**, then continue with **Step 38**.

38. Did the letter "**C**" appear in the **FE ID** display?

    If **NO**, then do **Trouble Clearing: TAP-116**.
    If **YES**, then proceed to **Step 23**.

Install Software Generic Program - New Shelf Installation Only BBG8/BBG8B SYSCTL and BBG9 OHCTL Installed

1. **NOTE 1:**
This procedure is used to install a software program in a new DDM-2000 OC-3 shelf equipped only with the **BBG8/BBG8B SYSCTL** and **BBG9 OHCTL** controller circuit packs. The circuit packs may be new from the factory or circuit packs used previously that may be loaded with software. For procedures to download software locally to a fully equipped in-service shelf, see **DLP-532**. For procedures to download software remotely to a fully equipped in-service shelf, see **DLP-562**.

NOTE 2:
It is assumed that the **BBG9 OHCTL** and **BBG8/BBG8B SYSCTL** circuit packs have been installed per **DLP-500** and **DLP-549**.

NOTE 3:
If you are using a PC operating in a *Windows** environment, you must **exit** *Windows* and restart your PC in *MS-DOS** mode before performing these download procedures. For example, if your PC is running *Windows 95* you must exit *Windows* by clicking on the **Start** button, then **Shut Down**, then **Restart the computer in** *MS-DOS* **mode**.

Obtain equipment, check software, and connect PC for download.

Reference: **DLP-566**

* Registered trademark of Microsoft Corporation.

2. Observe one of the following indications on the **FE ID** display. Note the indication and follow the suggested procedure.

   A. **Letter "P" in FE ID Display**

   Indicates no software installed in **SYSCTL**. Software must be downloaded locally using these procedures.

   Continue with **Step 3.**

   B. **Letter "P." in FE ID Display**

   Letter "**P**" followed by a period (**P.**) indicates a previous download attempt has failed. New software must be downloaded locally using these procedures.

   Proceed to **Step 6.**

   C. **FE ID Display Blank:**

   Indicates compatible software is installed in **OHCTL** and **SYSCTL**. This procedure assumes the installed software version is not the correct version. (Version is displayed on the **FE ID** display when the **ACO** button is depressed for longer than 2 seconds.)

   Proceed to **Step 6.**

   D. **Letter "d" in FE ID Display:**

   Indicates **OHCTL** has no software or that software in **OHCTL** and **SYSCTL** is incompatible.

   Proceed to **Step 6.**

E. **Letter "U" in FE ID Display:**

Indicates **SYSCTL** Switch **S1** is not set properly for type of shelf being equipped.

Remove **SYSCTL**. Repeat procedures of **DLP-549** to correct switch settings and to install **SYSCTL**.

F. **Letter "E" in FE ID Display:**

Indicates **SYSCTL** must be replaced.

Get replacement **SYSCTL** and repeat procedures of **DLP-549**.

G. **Letter "F" in FE ID Display:**

Indicates **SYSCTL** faceplate latch is not fully latched.

Unplug **SYSCTL** and repeat procedures of **DLP-549**. Ensure you properly latch the faceplate when installing **SYSCTL**.

H. **Flashing Letter "L" in FE ID Display:**

Indicates a low voltage condition (brownout) on the shelf.

Clear trouble using **Trouble Clearing: TAP-121**.

Letter "P" in FE ID Display

3. Ensure PC is connected to the front CIT (CIT-1) connector of shelf receiving software. If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive. If hard drive is being used, ensure you are in the correct directory.

4. ⇒ **NOTE:**
   After the terminal emulator (**`term`**) is started, the software download automatically begins. The download may take up to 45 minutes.

   Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. Disregard message "`Can't find script <init>`" if you see it after starting the terminal emulator.

   Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows within 2 minutes:

   ```
   Interface ready. (Type Alt-h for help.)
   Communications established.

   Searching for optimal transfer rate.
   Handshake established at <baudrate> baud.

   In progress . . . .
   ```

   The dots continue to print until program installation is complete. If using floppies, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

   ```
   ins-prog:TID COMPLD
   /* Generic a.b.c is installed */
   ```

   The **SYSCTL** resets and the terminal is logged off the system.

5. Was response correct?

   If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO**, then proceed to **Step 10**.

Letter "d" or "P." in FE ID Display or **Display Blank**

6. Ensure PC is connected to the front CIT (CIT-1) connector of shelf receiving software. If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive. If hard drive is being used, ensure you are in the correct directory.

7. Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. If after starting the terminal emulator you see the message "`Can't find script <init>`", disregard it.

   Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows:

   ```
   Interface ready. (Type Alt-h for help.)
   Communications established.
   ```

8. Unplug and reseat the **SYSCTL** and immediately push and hold the **FE SEL** and **UPD/INIT** buttons at the same time until a **P** appears in the **FE ID** display (approximately 15 seconds). Software download may take up to 45 minutes.

   Response: PC starts download and prints the following message:

   ```
   Searching for optimal transfer rate.
   Handshake established at <baudrate> baud.

   In progress . . . .
   ```

   The dots continue to print until program installation is complete. If using the floppy disks, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

   ```
   ins-prog:TID COMPLD
   /* Generic a.b.c is installed */
   ```

   The **SYSCTL** resets and the terminal is logged off the system. After approximately three minutes, you can log into the system.

9. Was response correct?

   If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO**, then continue with **Step 10**.

10. Did the download start as indicated by the `In progress` message and rows of dots?

    If **NO**, then continue with **Step 11**.
    If **YES**, then proceed to **Step 18**.

11. Check that the DDM-2000 is connected to the PC through the **COM** port. If it is not, reconnect the PC to DDM-2000 using the **COM** port and repeat the procedure.

    If the download still does not start, as indicated by the `In progress` message and rows of dots, within 2 minutes after the **P** appears in the **FE ID** display, change the CTRM baud rate as follows and repeat this procedure: if the baud rate is currently set to 9600, change it to 4800 or if the baud rate is currently set to 4800, change it to 9600. The baud rate is changed by:

    1. Momentarily depress the "Alt C" keys.
    2. Use the RETURN key to move to the "Speed" field.
    3. Press the "Space" bar until the desired rate appears.
    4. Momentarily depress the "Escape/Esc" key to activate the new baud rate.

12. Ensure first (number 1) disk of program being installed is inserted, if using floppies.

13. Ensure diskette is inserted in correct drive.

14. Ensure the proper command was used to go to the drive with the diskette or to the proper directory containing the software.

15. Check for invalid COM port. Exit TERM (Alt-F2), then restart TERM using **term COM1** or **term COM2**.

16. If the download still does not start, refer to **Trouble Clearing: TAP-116**.

17. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

18. If the download *starts and fails* during its progress, exit TERM (Alt-F2), unplug and reseat the **SYSCTL** and immediately push and hold the **FE SEL** and **UPD/INIT** buttons at the same time until a **P** appears in the **FE ID** display (approximately 15 seconds). Repeat this procedure from **Step 3**.

    If the download still does not complete, refer to **Trouble Clearing: TAP-116**.

19. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

Install New Software Generic Program
In-Service System
Remote Shelf Download

1. Before beginning the software installation, refer to the "Software Installation and Upgrade Procedure" section of the Software Release Description. This section contains a description of any special considerations required when installing this version of software.

2. **NOTE 1:**
   This procedure uses the **cpy-prog** or **ins-prog** commands to install a new software program in a remote in-service DDM-2000 OC-3 shelf. It is assumed that the local shelf has already been upgraded and the software is running normally or has been installed as a dormant copy. For procedures to download software in a new shelf (initial installation), see **DLP-561**. For procedures to download software locally to a shelf, see **DLP-532**.

   Verify that no DCC failures or transmission failures (OC-3 LOS, flashing **OLIU FAULT** LEDs, etc.) are present on the network element or system receiving the program.

3. Use **`rtrv-fecom`**/**`set-fecom`** command to verify/enable far-end communications (fecom).

4. **CAUTION:**
   ***TIMING** slot **2** should always be equipped with a **TGS** circuit pack and be active prior to software download. To clear a "**C**" condition from the **SYSCTL FE ID** display, procedures will require removal of the **TGS** circuit pack from **TIMING** slot **1** to force the system to run the new software. See Table A.*

Table A. DDM-2000 OC-3 In-Service Upgrade Compatibility

Current Release in Shelf (OLD)	Software Release To Be Installed (NEW)						
	Linear		Ring				
	8.0	8.1.n	7.2.n	9.0.n	9.1.n	11.0.n	11.1.n
7.1.n or earlier	NA	NA	C	C	C	C	C
7.2.n (Ring)	NA	NA	X	C	C	C	C
8.0.n (Linear)	X	X	C	C	C	C	C
8.1.n (Linear)	NA	X	NA	C	C	C	C
9.0.n (Ring)	NA	NA	NA	X	X	X	X
9.1.n (Ring)	NA	NA	NA	NA	X	X	X
11.0.n (Ring)	NA	NA	NA	NA	NA	X	X
11.1.n (Ring)	NA	NA	NA	NA	NA	NA	X

C - Indicates software incompatibility. Upon completion of the software download, a "**C**" will be displayed in the **SYSCTL FE ID** display. This is a caution indicating that the newly installed software has major changes from the previous release. Transmission will not be affected but shelf access, protection switching, alarm reporting, and control functions will be disabled while the "**C**" is displayed. You must verify that the correct software version has been downloaded and that a "**C**" was expected as a result of the download (See Table above). After verifying that the correct software download occurred, the system may be forced to run the new software by following the steps provided in this procedure.

NA - Not Applicable. If an NA conversion is required, contact your local technical support organization.

X - Indicates software compatibility. Download procedures will not require the system to be forced to run the software installed. No "**C**" should appear in the **SYSCTL FE ID** display. Other equipment/fiber changes and/or software/equipment provisioning may be required before and/or after the upgrade. See **System Turnup: IXL-001** for particular upgrade procedures and the Software Release Description for the software release being installed.

NOTE 1:
If a linear shelf is in the STS3c mode (**concat** mode enabled by the **set-oc3** command) and a different software generic that does not have the STS3c feature is loaded, the **OLIU**s will stay in the **concat** mode until they are removed and reseated.

NOTE 2:
When the **ins-prog** or **cpy-prog** command is used for software upgrades from Release 9.1 to Release 11, or later, the software is loaded as a dormant copy in the **SYSCTL** receiving the software. At the end of the download, the **rtrv-alm** report will show a status message of "*dormant/exec code mismatch*". The **apply** command must be used to overwrite the original executing copy of software with the new dormant software version. See the "Commands and Reports" section in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 through 11.1, User/Service Manual—Volume I*, for a description of the **apply** command.

Before performing this procedure, ensure that both **TGS** circuit packs are installed in the shelf receiving the program, then use the **switch-sync:s=circuitpack,pri=manual** command to switch to the protection **TGS** circuit pack in **TIMING** slot **2**, if not already **ACTIVE**. Use **rtrv-sync:** command to verify that the **TGS** circuit pack in **TIMING** slot **2** is **ACTIVE**.

5. **NOTE 1:**
If you want to load new software to a remote shelf (if allowed) directly **from a PC**, use the **ins-prog:***tid* command where the TID entered is that of the remote shelf where you want to install the new software. For OC-3 Release 9.0 and earlier, only one **ins-prog:** per **term** session is permitted. After using the **ins-prog:***tid* command to download software to one shelf, you must exit **term** (Alt F2) and re-execute **term** before starting a second **ins-prog:** command. If **term** is not exited, it will stop running if a second **ins-prog:** is started within the same **term** session. The PC will not respond or return any message and the **ins-prog:** will not progress.

NOTE 2:
If remote software downloading is allowed and you want to load new software to a remote site via the DCC **from a local shelf** which already contains the new software, log in (either locally or remotely) to the shelf containing the new software, and then enter the **`cpy-prog:`***`tid`* command (where *`tid`* = the tid of the shelf in which you want to install the software). [The tid is the name given to a shelf (network element) using the **`set-ne:`** command.] The **`cpy-prog:`***`tid`* command will only copy software from a local controller to a remote controller; it is not used to download software from a PC.

NOTE 3:
The download time will be longer (even without excessive DCC traffic) when there are additional spans between the source and target network elements. To minimize the download time and reduce DCC traffic, it is recommended that multi-span software downloading be avoided by remotely logging into the nearest shelf of the same type and remotely downloading the new program from that shelf.

NOTE 4:
When upgrading from releases without synchronization messaging to releases with this feature, it is suggested to upgrade first the shelves which are provisioned for "external timed" or "external mult" timed. This is to prevent timing "holdover" conditions at nodes that derive timing from the OC-3 line.

NOTE 5:
If you are using a PC operating in a *Windows** environment, you must **exit** *Windows* and restart your PC in *MS-DOS** mode before performing these download procedures. For example, if your PC is running *Windows 95* you must exit *Windows* by clicking on the **Start** button, then **Shut Down**, then **Restart the computer in** *MS-DOS* **mode**.

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* Registered trademark of Microsoft Corporation.

Obtain equipment, check software, and connect PC for download.

Reference: **DLP-566**

6. Are you using **ins-prog** or **cpy-prog** command to download software to far-end shelf?

   If **CPY-PROG**, then continue with **Step 7**.
   If **INS-PROG**, then proceed to **Step 14**.

7. ⚠ **CAUTION:**
   Only one **`cpy-prog`** *procedure at a time should be performed in the same maintenance subnetwork. Simultaneous* **`cpy-prog`** *procedures in the same network may fail.*

   Connect and establish session with local shelf being used as a source for the new remote program download.

   Reference: **DLP-521**

8. Enter the command **`cpy-prog:`***`tid`*

   Where tid = the target identifier (shelf name) for the remote DDM-2000 shelf receiving the new program.

   Response: `/* Testing For Program Installation... */`

   After several seconds, the PC prints a `Caution!` message followed by the prompt:

   `Execute? y/n =`.

9. Was response correct?

   If **YES**, then continue with **Step 10**.
   If **NO**, then do **Trouble Clearing: TAP-116**.

10. Enter a *y* or *yes* and a carriage return to execute the program. Software download may take up to 20 minutes.

    Response: **ABN** LED lights on User Panel. A "**P.**" is displayed in **SYSCTL FE ID** display in the far-end shelf receiving the program (for uncompressed executing copy download, not if dormant copy is being loaded). At DDM-2000 shelves connected directly to the shelf receiving the program, **MJ** and **NE ACTY** LEDs light on User Panel and **FAULT** LED flashes on **OHCTL**. At other shelves in the same control system, **MJ** and **FE ACTY** LEDs light on User Panel. Download begins and the following message is displayed:

    ```
    In progress . . . .
    ```

    The dots continue to print until program installation is complete. After installation is completed, the PC prints the following completion message:

    ```
    ins-prog:TID COMPLD
    /* Generic a.b.c is installed */
    ```

    The LEDs go off on the User Panel and **SYSCTL**.

11. Was response correct?

    If **YES**, then proceed to **Step 27**.
    If **NO**, then continue with **Step 12**.

12. Wait approximately 10 minutes for network to stabilize then repeat this procedure from Step 7. If the second attempt to download software fails, then do **Trouble Clearing: TAP-116**. You may have to go to the remote site.

13. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

14. **NOTE:**
The **FE ID** display on the remote **SYSCTL** must show one of the following preceding software installation. Other conditions represent failure conditions or conditions that will not allow a remote software download.

A. The letter (**P.**) displayed in the **FE ID** display indicates that a previous software download has failed and you may be able to download software from another shelf, or locally. Try again to download software from same shelf. If there is no period after the (**P**), the software can only be downloaded locally using the procedures of **DLP-532**.

B. Nothing displayed in the **FE ID** display indicates that compatible software is installed in the **OHCTL** and **SYSCTL** and you may download software remotely if remote software downloading is permitted for this release.

Ensure PC is connected to the front CIT (CIT-1). If floppies are being used, ensure the first (number 1) diskette is installed in floppy drive. If hard drive is being used, ensure you are in the correct directory.

15. Enter **`term`** or **`term COM`***n* command, where *n* = 1 or 2. If **`term`** is entered without the **`COM`***n* option, then **COM1** will be selected by default. If after starting the terminal emulator you see the message "`Can't find script <init>`", disregard it.

Response: Two brief messages are printed and you are instructed to `Press any key to continue . . .` after the second message. After you press any key, the terminal emulator is loaded and the terminal responds as follows:

```
Interface ready. (Type Alt-h for help.)
Communications established.
```

16. **NOTE:**
The default shelf is the shelf physically connected to the PC. To set baud rate automatically, enter two carriage returns (**<cr>**), two lower case "a"s (**aa**), or two upper case "A"s (**AA**). All other characters are ignored.

Enter two carriage returns.

Response: PC prompts with:

```
/* Enter a shelf number from 1 to 8 */
shelf [default] =
```

17. Was response correct?

If **YES**, then proceed to **Step 19**.
If **NO**, then continue with **Step 18**.

18. Check PC to **CIT** port connections. Make sure the cable is connected between the PC **COM( )** port and the **CIT** connector on the DDM-2000. If the rear **CIT** connector is being used on the DDM-2000, make sure a null modem is installed on the port. Check term setup and make sure the **com** port selected matches the port (**COM( )**) on the PC that is connected to the **CIT** port on the shelf. If CIT bay mult cabling is connected to this shelf verify that it is terminated.

Exit term (Alt-F2) and repeat this procedure from Step 14.

19. Enter the shelf number for the local shelf being used for new program download.

    Response: PC responds with:

```
login<
password<

    /************************************
    *                                   *
    *                                   *
    *         Lucent Technologies       *
    *      DDM-2000 OC-3 Multiplexer    *
    *                                   *
    *           Release a.b.c           *
    *                                   *
    ************************************/

                      .
                      .
                      .

    TID date time
 M  rtrv-alm: all COMPLD
    /* Active Alarms and Status Report
```

20. **NOTE:**
    After the system prompt (<), the system will respond normally to commands entered. The "Commands and Reports" section of this manual gives a description of the commands.

    Use **`rtrv-map-network`** command to retrieve the name (*tid*) of the remote shelf having new program installed.

21. Enter the command **`ins-prog:`***`tid`*

    Where tid = the target identifier (shelf name) for the far-end DDM-2000 shelf having the new program installed.

    Response: `/* Testing For Program Installation... */`

    After several seconds, the PC prints a `Caution!` message followed by the prompt:

    `Execute? y/n =`.

22. Was response correct?

    If **YES**, then continue with **Step 23**.
    If **NO**, then do **Trouble Clearing: TAP-116**.

23. Enter a *y* or *yes* and a carriage return to execute the program. Software download may take up to 45 minutes.

    Response: **ABN** LED lights on User Panel. A "**P.**" is displayed in **SYSCTL FE ID** display in the far-end shelf receiving the program (for uncompressed executing copy download, not if dormant copy is being loaded). PC starts download and prints the following message:

    ```
    Searching for optimal transfer rate.
    Handshake established at <baudrate> baud.
    ```

    ```
    In progress . . . .
    ```

    The dots continue to print until program installation is complete. If floppy disks are being used, insert each diskette when prompted. After installation is completed, the PC prints the following completion message:

    ```
    ins-prog:TID COMPLD
    /* Generic a.b.c is installed */
    ```

    The **SYSCTL** resets, and the terminal is logged off the system. The LEDs go off on the User Panel and **SYSCTL**.

24. Was response correct?

    If **YES**, then proceed to **Step 27**.
    If **NO**, then continue with **Step 25**.

25. Wait approximately 10 minutes for the network to stabilize, exit **`term`**, then repeat this procedure from **Step 14**. If the second attempt to download software fails, do **Trouble Clearing: TAP-116**. You may have to go to the remote site.

26. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

27. Wait approximately 5 minutes then verify communications can be reestablished with far-end shelf using **`rtrv-map-network`** command. Verify that *`Comm. Status`* is good (not *`FAILED`*) as indicated by a blank in the report.

28. Is communication status good between local and remote shelf?

    If **YES**, then proceed to **Step 31**.
    If **NO**, then continue with **Step 29**.

29. Dispatch technician to remote site and perform local software download procedures.

    Reference: **DLP-532**

30. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

31. Use **`rlgn:`*`tid`*** command to remotely login to far-end shelf.

    Reference: **DLP-522**

32. **NOTE:**
    If a dormant copy was loaded into the far-end shelf and its release version is different than the currently executing version, a status alarm message of "*`dormant/exec code mismatch`*" will appear in the **`rtrv-alm`** report.

    Use **`rtrv-alm`** command at far-end shelf to check for alarm status message of "*`dormant/exec code mismatch`*".

33. Does alarm report indicate "*`dormant/exec code mismatch`*"?

    If **YES**, then continue with **Step 34**.
    If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

34. **NOTE:**
The software you downloaded to the remote shelf has been loaded as a dormant copy. The original software is still the executing software. The **apply** command must be used at the remote shelf to install the dormant copy of software as an executing copy. When the **apply** command is executed during an upgrade from Release 9.1, there is a 30-minute delay before the dormant copy installation begins.

When the **apply** command is executed during an upgrade from Release 11.0 to later releases, if you do not specify a *time* and *date* parameter, there is a default 15-minute delay before the dormant copy installation begins. Once the installation begins, the dormant copy is installed in approximately 10 minutes.

See the "Commands and Reports" section in 363-206-280, *DDM-2000 OC-3 Multiplexer, Releases 8.0 through 11.1, User/Service Manual—Volume I*, for a description of the **apply** command. The **apply** command allows you to coordinate the software download across the network.

Are you going to use the **apply** command at this time to load dormant version of software?

If **YES**, then continue with **Step 35**.
If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

35. Use the **`rlgn:`*`tid`*** command to login again to the remote shelf, then execute the **`apply`** command.

    Response: At the local shelf, a "**P**" appears in the **FE ID** display when the installation begins.
    The **SYSCTL** resets after the software is installed.
    LEDs and **FE ID** display go off on **SYSCTL** and User Panel.
    The remote login session is terminated.
    After approximately 10 minutes, you can remote login again to the remote shelf.

36. Was response correct?

    If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO**, then continue with **Step 37**.

37. Dispatch technician to remote site to perform trouble clearing procedures and/or install software locally using the procedures of **DLP-532**.

38. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

Obtain Equipment, Check Software, Prepare and Connect Personal Computer (PC) for Software Download

1. Obtain the following equipment:
   (1) *IBM*[*] compatible PC running an *MS-DOS*[†] computer program operating system, Release 2.1 or later.

   (2) RS-232 cable to connect PC **COM** port to User panel craft interface terminal (**CIT**) port.

   NOTE:
   The PC may be connected to either the front or rear CIT port, or remotely through a dial-up modem. If connected to the rear **CIT** port, a null modem is required between the RS-232 cable and the rear **CIT** port.

   (3) Working copies of the new system generic program diskette(s).

   (4) Software Release Description for software being installed.

∗ Registered trademark of International Business Machines Corporation.

† Registered trademark of Microsoft Corporation.

2. Before beginning the software installation procedure, the following is strongly suggested:
   a. Become familiar with the characteristics and operating procedures of your PC and the *MS-DOS* operating system.

      Reference: **DLP-533**

   b. Operate laptop PCs on AC power during download procedures.

   c. Follow proper procedures in handling the diskette(s) (floppies).

      Reference: **DLP-533**

   d. Make working copies and backup copies of the original new generic program diskettes.

      Reference: **DLP-534**

   e. **Read the Software Release Description for software being installed.**

3. Before beginning the software installation, refer to the Software Release Description for the software being installed for a description of any special considerations required when installing this version of the software.

4. ⇒ **NOTE:**
   If you are using a PC operating in a *Windows*‡ environment, you must **exit** *Windows* and restart your PC in *MS-DOS* mode before performing these download procedures. For example, if your PC is running *Windows 95* you must exit *Windows* by clicking on the **Start** button, then **Shut Down**, then **Restart the computer in** *MS-DOS* **mode**.

   Start *MS-DOS* operating system on the PC [**DLP-534**].

   Response: PC displays the prompt (for example, `C>`, `C:\DOS>`) determined by the PC.

‡ Registered trademark of Microsoft Corporation.

5. If you are going to use the PC hard disk to load software to the shelf, **copy** all files on the source diskettes(s) (floppies) to a directory on the hard disk (for example, GEN_1111 for generic version 11.1.1).

6. If you are going to load the software from the hard disk, use the **cd** command to change to the appropriate hard drive directory containing the software.

   If you are going to load the software from the floppies, use the appropriate *MS-DOS* command (for example, **a:** or **b:**) to go to the drive where the floppy disk will be installed.

   Response: PC displays the appropriate prompt (A>, B>, C>, C:\DOS>, etc.) determined by the PC.

   Comment: If you are using floppies and get a disk error message, verify the drive latch is locked and that you have the proper diskette installed in the drive.

7. **NOTE:**
   The new generic program may be on many floppy disks. If you are using the floppy disks, the PC will prompt you to insert disks as needed after the first disk is installed.

   If you are using the floppy disks, insert the first (number 1) floppy disk into the PC drive.

8. **NOTE:**
The **checkpgm** command may take up to 25 minutes to complete.

Execute the command **checkpgm** to check the version number of the program you are installing. If using floppy disks, insert each diskette when prompted.

approx. 15 min. if using hard drive
approx. 25 min. if using floppy drive

Response: `PC has DDM-2000 program version a.b.c`

9. **NOTE 1:**
The shelf rear access CIT port is configured for a modem. A null modem is required to use this port with the PC.

NOTE 2:
The cable from the **CIT** port on the DDM-2000 must be connected to the **COM** (**COM1 or COM2**) RS-232 port of the PC. If a "**P**" or "**d**" is displayed in the **FE ID** display, the PC must be connected to the front **CIT** port.

Connect PC to **CIT** port by connecting one end of an RS-232 cable to the **COM( )** port of the PC and the other end of the cable to the front or rear DDM-2000 **CIT** port.

10. **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**