Lucent Technologies
Bell Labs Innovations

DDM-2000 OC-3 Multiplexer Software Release Description

Release 11.0.4

363-206-217
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DDM-2000 OC-3 Multiplexer
Software Release Description
Release 11.0.4

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1. Overview

1.01 The purpose of this software release description (SRD) is to provide information about Software Release 11.0.4 and its interaction with the DDM-2000 OC-3 System. This practice contains the following parts:

- **Software Release 11.0.4 Features:** This part provides a description of the features provided by Release 11.0.4.
- **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 11.0.4 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 11.0.4.
- **Implementation Procedure:** This part provides the information required to install the DDM-2000 OC-3 System software, Release 11.0.4. 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 4, supersedes the previous Issue 3. Issue 4 provides updated information for Software Release 11.0.4. The updated information is included in the Operating Issues Resolved (Section 3.03 and 3.04) and Operating Issues (Section 4.03) sections of this practice. Margin bars are used to denote the added information. 363-206-217, *DDM-2000 OC-3 Multiplexer, Software Release Description, Release 11.0.3*, Issue 3 provided the coverage for Software Release 11.0.3.

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 11.0.4 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, Release 8 and Higher, 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 11.0.4 Features

2.01 The features described below are for DDM-2000 OC-3 Release 11.0.4.

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**

- **OC-12 OLIU (24G-U) for OC-3 Shelf:** The new **24G-U OLIU** provides OC-12 optics directly from the DDM-2000 OC-3 shelf. This allows the OC-3 shelf to support an OC-12 ring, with the low-speed inputs and capacity of the OC-3 shelf. The **24G-U OLIU** provides visibility to the full STS-12 bandwidth, and allows for selection of any traffic from any 3 STS-1s on the OC-12 ring for drop at the OC-3 shelf. Remaining traffic can be passed-through on the OC-12 ring.
- **Data Services Interface:** A new **BBG19 DS3** circuit pack and cross-connect software provide the DDM-2000 interface to an external Local Area Network (LAN) router/Asynchronous Transfer Mode (ATM) switch for providing Native Mode LAN or general data services via the SONET network.
- **Native Mode LAN Interface:** By deploying DDM-2000 with an adjunct LAN router/ATM switch, Release 11.0.4 provides a Native Mode LAN interface. DDM-2000 offers up to 4 LAN ports per STS-1 of bandwidth. Point-to-point and point-to-multi-point service is provided. In a later release, this functionality will be integrated directly into the DDM-2000 shelf.
- **Allow the Mixing of Hairpin Local Drop Cross-Connections, Pass-Through, and MAIN to FUNCTION or FUNCTION to FUNCTION 0X1 Cross-Connections:** The mixing of all legal forms of 0X1, Pass-Through, and Hairpin Local Drop cross-connections using the **27G2-U OLIU** in the **FUNCTION UNITS** slots will be allowed. (Refer to Table-F, Page 19 and Table G, Page 21 for more information on the DDM-2000 OC-3 Ring Allowed Cross-Connection types between **MAIN** to **FUNCTION UNITS** slots and **FUNCTION UNITS** to **FUNCTION UNITS** slots using the **27G2-U OLIU**.)

C. **Network Topologies**

- **OC-12 High-Speed Optics for OC-3 Shelf:** Increases ring capacity by providing low-speed DS1 and FiberReach services directly from an OC-12 ring via the OC-3 shelf. Minimizes need for back-to-back equipment. Supports mixing of OC-3 and OC-12 shelves on the same ring during upgrades.

- **Enhanced FiberReach Topologies:** Supports a hairpin local drop of traffic from an OC-1 ring terminated on **27G2-U OLIU**s in one **FUNCTION UNITS** group to a DS1/EC-1/OC-3 interface in another **FUNCTION UNITS** group. The **27G2-U OLIU** is required for these applications. Release 11.0.4 also supports mixing of local drop, pass-through, and 0X1 cross-connect types.
- **Multi-Media Data Services:** A new **BBG19 DS3** circuit pack provides the DS3 interface flexibility to offer a full range of multi-media data services via embedded and new DDM-2000 networks. This full-solution offering is made possible by interfacing DDM-2000 to any of the numerous commercially available data edge devices which provide the various data services interfaces.

D. **Operations**

- **CPro 2000 and ITM SNC Support:** DDM-2000 OC-3 Release 11.0.4 is supported by CPro 2000 Release 6.0 and ITM SNC Release 4.0.

E. **Single-Ended Operations**

- **Enhanced Software Download:** When upgrading from Release 9.1 to Release 11.0.4, Release 11.0.4 provides software installation or copy capability which allows compressed files containing the new software generic to be locally or remotely downloaded to the DDM-2000 system while the current version is still running. This enhancement reduces both the time in which the controller is unavailable and the time to download the software. When the **`apply`** command is initiated, the new software generic is installed. Installation of the new generic can be scheduled, allowing coordination of the cutover of several network elements (NEs) in the subnetwork.
- **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.

F. **Performance Monitoring**

- **Frequency Error Monitoring:** STS pointer justification performance monitoring and thresholding provide a means to detect frequency errors in the synchronization network.

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 SYSCTL** circuit pack in an operational shelf is replaced with any other **BBG8 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.

NOTE:
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 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 OLIUs 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.

4. Operating Issues

4.01 This part lists information pertaining to recognized operating issues (problems) existing in Release 11.0.4. Suggestions to work around the operating issues are mentioned, if available.

4.02 The current plan calls for a resolution to the following operating issues in future DDM-2000 OC-3 software releases. Information and procedures developed subsequent to the release of this practice will be made available to users via the diagnostic dictionary in the Lucent Technologies COACH system. To obtain a COACH login or additional information, please write or call:

COACH Software Development
Lucent Technologies
1600 Osgood Street
North Andover, MA 01845

Telephone: 1-800-238-4021

4.03 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:**
If an DDM-2000 OC-3 Release 9.1 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 11.0.4 is initiated to this shelf, the software download may not complete successfully.

WORK AROUND:
Do not use remote install program (**ins-prog** command) with unprotected **OLIU**s in **FUNCTION UNITS** slots. Use **cpy-prog** command instead.

(3) **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, OC-12 Release 5.1, or FiberReach Release 2.1), 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.

(4) **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.

WORK AROUND:
Insure the issuance of one **cpy-prog** at a time into the same target NE.

(5) **ISSUE:**
When upgrading from DDM-2000 OC-3 Release 9.1.1 or 11.0.3 to Release 11.0.4, 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. **Transmission**

(6) **ISSUE:**
When the **MAIN** slots of an OC-3 shelf with Release 11.0.4 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).

WORK AROUND:
When using **24G-U OLIU** circuit packs in **MAIN** slots of an OC-3 shelf with Release 11.0.4, and when establishing VT1.5 cross-connects, always

specify the **MAIN** slot address as *Address1*, and the **FUNCTION UNITS** address as *Address2*.

C. **Operations Interworking (OI)**

(7) **ISSUE:**
This issue applies only to the DCC on an OC-3 1+1 interface between DDM-2000 and FT-2000. 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.

WORK AROUND:
The first priority is to repair any fiber cuts. If the DCC doesn't restore automatically, the DCC can be restored with a manual protection switch at either DDM-2000 or FT-2000, using the **`switch-line:manual`** command to realign the FT-2000 DCC transmit and DDM-2000 DCC receive.

(8) **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.

(9) **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.

(10) **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.

WORK AROUND:
Check the network status report by typing the CIT **`rtrv-map-network`** or TL1 **`RTRV-MAP-NETWORK`** command. If the communication status for the DSNE network element in the report indicates `FAILED`, then the alarm is legitimate. If there is no status displayed, which would indicate good communication between that node and the DSNE, then the alarm is erroneous.

To remove it from the alarm report, perform a reset by typing CIT **`reset`** or TL1 **`RESET-SYS`** command on the node with this alarm.

D. **TL1**

(11) **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.

WORK AROUND: Lucent Technologies recommends that **`rtrv-hdr`** be used to verify OS-to-NE TL1 communications rather than a non-existent TL1 command.

E. **Maintenance**

(12) **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.

WORK AROUND:
The "stuck" alarms can be cleared by resetting either the node reporting the alarm or the node that is reported as sending the maintenance signal.

(13) **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.

(14) **ISSUE:**
When using the **24G-U OLIU** circuit pack, if an `inc. STS3c LOP OC12` (Loss Of Pointer) condition occurs, it does not get reported as one single `inc. STS3c LOP OC12`.

WORK AROUND:
When using the **24G-U OLIU** circuit pack it will report an `inc. STS3c LOP OC12` condition as three individual `inc. STS1 LOP OC12` alarm conditions. Furthermore, when this condition clears, three individual `inc. STS1 LOP OC12` slot `clrd` messages are recorded in the history file.

The following is an example of an `inc. STS1 LOP OC12` alarm condition report:

```
MINOR   m1-7    01-04 20:33:59  nsa  inc. STS1 LOP OC12 main-1
MINOR   m1-8    01-04 20:33:59  nsa  inc. STS1 LOP OC12 main-1
MINOR   m1-9    01-04 20:34:00  nsa  inc. STS1 LOP OC12 main-1
```

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 (Note 1)

OC-3 Release	OC-12 Release	Interconnection (Note 2) Method	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

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, and 22D-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.

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.

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**

* No longer available to order.

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 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, Release 8 and Higher, User/Service Manual (TOP), Volume II*.

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

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

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). Releases 7.2, 9.0/9.1, and 11.0 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, or 11.0 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:
Before installing Release 11.0.4 software, the following hardware versions *must* be in place at all sites before continuing with the implementation procedure:

BBG8 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, Release 8 and Higher, User/Service Manual (TOP), Volume II*.

Software Installation and Upgrade Procedure

The following is a brief description of scenarios that may be encountered while upgrading to OC-3 Release 11.0.4 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, Release 8 and Higher, User/Service Manual, Volume I*.

- If a NE running OC-3 Release 9.0 is upgraded to OC-3 Release 11.0 through a Forced Software Download, the following scenarios will take place:
  - — Uncompressed software of Release 11.0 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 11.0 to a NE running Release 9.0, the following scenarios will take place:
  - — Uncompressed software of Release 11.0 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 11.0 in a NE running Release 9.1, the following scenarios will take place:
  - — Compressed software of Release 11.0 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 11.0. (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 11.0 through a Forced Software Download, the following scenarios will take place:
  - — Compressed software of Release 11.0 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 11.0. (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 11.0 through a Forced Software Download, the following scenarios will take place:
  - — Compressed software of Release 11.0 is downloaded and installed into the DORMANT area.
  - — Uncompressed software of Release 11.0 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 11.0 into a remote NE running Release 9.1, the following scenarios will take place:
  - — Compressed software of Release 11.0 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 11.0. (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***	**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		9.0	9.0 §§			
	Dual 0x1 VT		9.0	9.0 §§			
	Dual 0x1 NR STS				11.0 **		
	Single 0x1 STS		9.0 ††	9.0 ††§§			
	Single 0x1 VT		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***	**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		9.0	9.0 §§			
	Dual 0x1 VT		9.0	9.0 §§			
	Dual 0x1 NR STS				11.0 **		
	Single 0x1 STS		9.0 ††	9.0 ††§§			
	Single 0x1 VT		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***	**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		11.0	11.0 §§			
	Dual 0x1 VT		11.0	11.0 §§			
	Dual 0x1 NR STS				11.0		
	Single 0x1 STS		11.0	11.0 §§			
	Single 0x1 VT		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***	**27G2-U**	**DS3**	**STS1E†**	**MXRVO**
22-Type	Two-Way STS	13.0		13.0	13.0	
	Two-Way VT	9.0			9.0	9.0
	Add/Drop STS		11.0 **			
	Add/Drop VT		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		9.1 ‡**			
	Dual 0x1 VT		9.1 ‡**			
	Intra-FN Dual 0x1 VT		9.1 ¶			
	Pass-Through STS		9.1 **			
	Pass-Through VT		9.1 **			
	Single 0x1 STS		9.1 ‡§**			
	Single 0x1 VT		9.1 ‡§**			
	Intra-FN Single 0x1 VT		9.1 §¶			

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

How Are We Doing?

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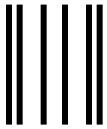

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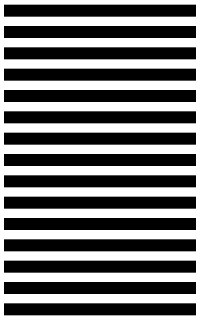

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