Meridian SuperNode

Commercial Systems
Routine Maintenance Procedures

NORTEL
NETWORKS™

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Commercial Systems

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Publication history

To comply with Nortel Networks Technical Documentation Standards, the Publication History contains updates for the current release and two releases back.

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Version 09.01, MSL11 Standard release. This version includes only MSL-100 Procedures.

Contents

About this document

When to use this document

This book provides information about routine maintenance procedures on Nortel Networks equipment. It is intended for personnel involved in the maintenance of Meridian SuperNode (MSL-100) switch.

This software delivery is part of an on-going evolution. This document is one of several transitional documents that must be used with the *NA DMS-100 Routine Maintenance Procedures*, 297-8001-546, for the full complement of DMS-100 and XPM documentation.

Disregard the signaling point (SP), Traffic Operator Position System (TOPS), and SuperNode Data Manager (SDM) information in the *DMS-100, Routine Maintenance Procedures*, 297-8001-546, as it does not apply to the MSL-100 switch.

Each routine maintenance procedure contains the following:

- Application-describes the purpose of the procedure

- Interval-indicates when to perform the procedure

- Common procedures-lists a series of steps that repeat in the maintenance procedures. These common procedures include card removal and replacement. Do not use common procedures unless the step-action procedures direct you to the common procedures

- Action-provides a summary flowchart and a list of steps. Use the flowchart to review the procedures. Use the steps to perform the procedure.

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the next software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but re-released in the same software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

This document is written for all MSL-100 Family offices. More than one version of this document may exist. To determine whether you have the latest version of this document and how documentation for your product is organized, check the release information in the *Master Index of Publications.*

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Master Index of Publications*.

References in this document

The following documents are referred to in this document:

- *Alarm Clearing Procedures*
- *Card Replacement Procedures*
- *Customer Data Schema Reference Manual*
- *Disk Maintenance Subsystem Reference Manual*, 297-1001-526
- *Lines Maintenance Guide*, 297-1001-594
- *Office Parameters Reference Manual*
- *Translations Guide*
- *Trouble Locating and Clearing Procedures*

Extended peripheral module (XPM)-specific information has been removed from this document. Refer to the appropriate XPM-specific maintenance manual for these procedures. These manuals are numbered in the 297-8yyy-550 series.

Some procedures in this book may also refer to the *Alarm and Performance Monitoring Procedures*. Meridian SL-100 customers should refer instead to NTP 555-4031-543, *Alarm Clearing Procedures.*

What precautionary messages mean

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

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

Examples of the precautionary messages follow.

ATTENTION - Information needed to perform a task

ATTENTION

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

DANGER - Possibility of personal injury

DANGER
Risk of electrocution
Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage lines. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

WARNING - Possibility of equipment damage

WARNING
Damage to the backplane connector pins
Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

CAUTION - Possibility of service interruption or degradation

CAUTION
Possible loss of service
Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

How commands, parameters, and responses are represented

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

Input prompt (>)

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

>BSY

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

>BSY CTRL

Variables

Variables are shown in lowercase letters:

>BSY CTRL ctrl_no

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

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

FP 3 Busy CTRL 0: Command passed.
```

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

Procedure 1

At your location

1   Manually busy the CTRL on the inactive plane by typing

>BSY CTRL ctrl_no

and pressing the Enter key.

where

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

Example of a MAP Response:

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

FP 3 Busy CTRL 0: Command passed

1 Routine maintenance procedures

Introduction

This book provides information about routine maintenance procedures on Nortel Networks equipment. It is intended for personnel involved in the maintenance of Meridian SuperNode (MSL-100) switch.

- Application
- Interval
- Common procedures
- Action

Application

This section describes the purpose of the procedure.

Interval

This section indicates when to perform the procedure.

Common procedures

This section lists common procedures used during the routine maintenance procedure. A common procedure is a series of steps that repeats in maintenance procedures. Common procedures include card removal replacement. Common procedures are in the common procedures chapter of this NTP.

Do not use common procedures unless the step-action procedure directs you to.

Action

This section provides a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.

2 Routine maintenance common procedures

This chapter describes routine maintenance procedures common to various types of SL-100 equipment.

Precautions

Meridian SL-100 equipment is based on solid state circuitry that is sensitive to static electricity and environmental conditions. To avoid personal injury and equipment damage, follow the precautions in this chapter.

> **DANGER**
> **Possibility of electric shock**
> To avoid the danger of electric shock, be very careful when working with power equipment and connections.
> Displayed warning notices must be heeded.

Performing a TABAUDIT procedure

Application

ATTENTION

Before attempting to correct any table errors be sure to review all TABAUDIT Bulletins and Notices. These will identify any known problems or inconsistencies.

⚠️

CAUTION

TABAUDIT can take anywhere from 2 to 15+ hours to complete.

The total time varies depending on the number and size of tables checked. AUTOTABAUDIT can be used to schedule the execution of TABAUDIT during user-defined time segments. Multiple sessions can be scheduled, but they cannot overlap.

ATTENTION

TABAUDIT is not "image safe." Look at table IMGSCHED before defining AUTOTABAUDIT. Do not schedule TABAUDIT to execute at the same time as Autoimage.

Use this procedure to set up AUTOTABAUDIT to run a scheduled TABAUDIT for BCS36 and higher product computing-module loads (PCL).

The following AUTOTABAUDIT procedure is recommended over manual TABAUDIT because it is fast and does not occupy a terminal.

Otherwise, to manually execute a TABAUDIT session, refer to *Appendix B*, "Steps to execute manual TABAUDIT."

Interval

Perform this procedure 21 days before the software delivery date. This allows time to correct any table data problems that occur. These procedure steps must be completed with all data errors resolved prior to shipping images to Nortel Networks for mock ONP or prior to application date. This ensures that the software application can begin on time and be completed with a minimum of interruptions.

Performing a TABAUDIT procedure (continued)

Common procedures

None

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

If necessary, repeat TABAUDIT until all tables pass the data checks with no errors. Refer translation errors to your local translations department. Additional support can be obtained through your Nortel Networks regional technical assistance support representative.

> *Note 1:* The following procedure steps do not utilize all of the options available to the user. Additional information on TABAUDIT options is included in *Appendix A* "Using TABAUDIT."

> *Note 2:* It is beneficial to schedule AUTOTABAUDIT to start after the completion of the AUTOIMAGE and to stop before the next scheduled AUTOIMAGE begins. This should allow enough time for the AUTOIMAGE to complete.

Performing a TABAUDIT procedure (continued)

Summary of Performing a TABAUDIT procedure

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

```
        Set up
     AUTOTABAUDIT
           │
           ▼
        Define
     AUTOTABAUDIT
       time frame
           │
           ▼
        Activate
          the
        schedule
           │
           ▼
      Obtain error
         report
           │
           ▼
    ┌──────────────┐  Y   ┌──────────────┐      ┌──────────────┐
    │  Any errors  │─────▶│  Correct all │─────▶│ Run TABAUDIT │
    │   found?     │      │    errors    │      │ on corrected │
    └──────────────┘      └──────────────┘      │    tables     │
           │                                     └──────────────┘
           │ N
           ▼
          End
```
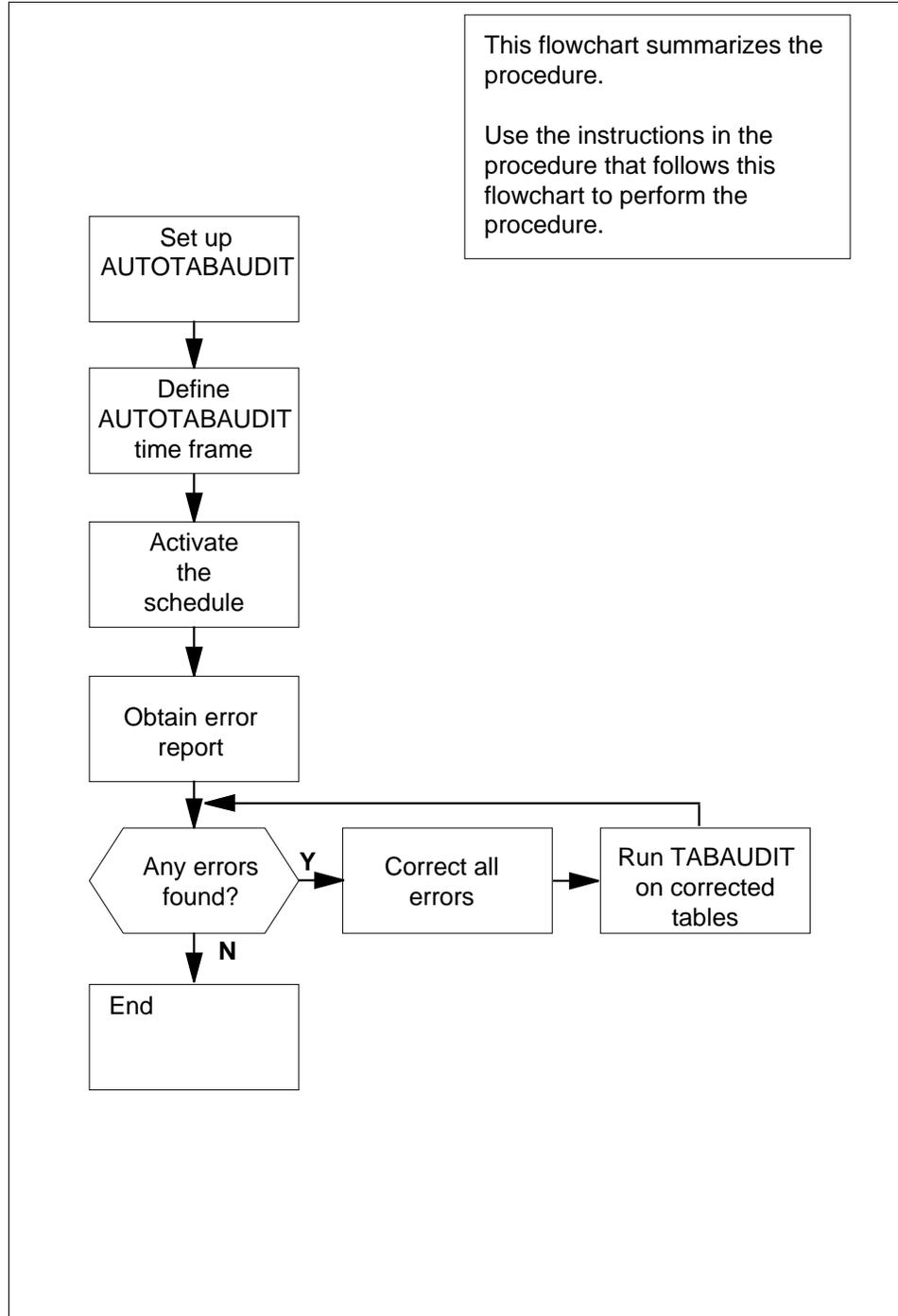
Performing a TABAUDIT procedure (continued)

Performing a TABAUDIT procedure

1   Site/ACT Set-up for AUTOTABAUDIT.

Enter the automated level of the TABAUDIT increment (AUTOTABAUDIT) to enable the auto level commands.
```
> TABAUDIT
TABAUDIT:


> AUTOAUTOT
ABAUDIT:
```
All commands issued from within this level apply to AUTOTABAUDIT. This level has its own includes and excludes list which must be specified from within the auto level. Two additional commands, TIMEFRAME and TERMINATE are explained in this procedure.

> *Note:* AUTOTABAUDIT included and excluded lists do not reset when leaving the AUTOTABAUDIT level. The list remains unchanged until reset by the user.

Clear the included list of tables.
```
Autotabaudit:
> CLEAR INCLUDED
```
Clear the scheduled list of timeframes.
```
Autotabaudit:
> CLEAR SCHEDULE ALL
```
Define the list of tables to be tested.
```
AUTOTABAUDIT:
> INCLUDE ALL
```
This option will include all tables in the office.

> *Note:* The included list of tables should include all the tables listed in the table DART. The excluded list normally would not contain any tables.

2   Define the days and times to run the TABAUDIT session.

The following steps define to AUTOTABAUDIT the timeframe within which TABAUDIT runs and the days on which TABAUDIT runs.
```
> AUTOTABAUDIT
> TIMEFRAME <start time> [start date] <stop time> [stop
date]
```

> *Note:* A time frame cannot be less than 30 minutes. The date can be included as an option.

Example timeframe for TABAUDIT::

Performing a TABAUDIT procedure (continued)

```
> TIMEFRAME 23:30  22:11:1996  19:30  23:11:1996

Where   23:30      is  start time  (hr/min)
        22:11:1996 is  start date  (dd/mm/yy)
        19:30      is  stop time   (hr/min)
        23:11:1996 is  stop date   (dd/mm/yy)
```

The above definition will schedule TABAUDIT to run for 20 hours from 23:30 p.m. to 19:30 p.m. on both November 22 and 23.

Note: Up to eight different sessions can be set up. TImeframe definitions, however, must not overlap one another.

Example timeframe for an AUTOTABAUDIT:

```
                    Start date              Stop date
        Start time              Stop time
           |        |              |         |
           |        |              |         |
           |        |              |         |
>TIMEFRAME 23:30    22:11:1996     19:30     23:11:1996

Is the following schedule correct?

Autotabaudit is to execute from 23:30 to 19:30 between
the following dates:

Start date:  1996/11/22
Stop date:  1996/11/23

Note: Please enter EXECUTE to activate AUTOTABAUDIT once
all timeframes have been specified.

Please confirm (YES, Y, NO, or N):

Y
```

Verify AUTOTABAUDIT is set up and scheduled as intended.
```
AUTOTABAUDIT
>  STATUS
```

This displays the current AUTOTABAUDIT settings.

3   Activate the AUTOTABAUDIT schedule.
```
AUTOTABAUDIT
>  EXECUTE
```

This shows a STATUS. If correct, confirm with YES when prompted.

AUTOTABAUDIT has been activated.
```
>  Y
```

Performing a TABAUDIT procedure (continued)

Note: The scheduler starts AUTOTABAUDIT at the specified start time(s), and stops testing at the specified stop time(s). Only the included tables are tested in the order they are listed in table DART.

To stop the AUTOTABAUDIT session, from the AUTOTABAUDIT level, type the TERMINATE command. This command halts AUTOTABAUDIT and resets the execution order of the tables back to the top of the included list.

The following example illustrates the correct use of the EXECUTE command of AUTOTABAUDIT.

Example AUTOTABAUDIT execute:

```
AUTOTABAUDIT:
>  EXECUTE

AUTOMATED TABAUDIT STATUS


 Active Timeframe                     Executing Timeframe

 Start      Stop                      Start       Stop
 Date       Date                      Time        Time

 1996/11/22  1996/11/23              23:30        19:30


 Current time                   :   1996/11/22  16:32:05
 AUTOTABAUDIT                    :   Inactive

 The following tables are INCLUDED

    From table ACTPATCH (0)        to table SSRFORM (479)


 The following tables are EXCLUDED
    No tables have been excluded.

 Please confirm ("YES", "Y", "NO", or "N"):


 >yes

 AUTOTABAUDIT has been activated.
```

4   After the AUTOTABAUDIT finishes running, obtain an error REPORT to check the results of the testing.

   Note: Several useful options are available with the REPORT command. Type HELP REPORT to see the options.
   TABAUDIT:
   > REPORT ERRORS

Performing a TABAUDIT procedure (end)

The REPORT ERRORS command displays tuples that are in question. To see detailed information on why a tuple failed, position on the table tuple in question and issue a CHECK command. This displays the verify proc messages that fail.

5 After reviewing reported table data errors, correct all the errors. Then execute TABAUDIT on the fixed tables to verify there are no further errors.

```
TABAUDIT:
>   INCLUDE <table_name>
TABAUDIT:
>   EXECUTE
TABAUDIT:
>   REPORT <table_name>
```

Nortel Networks recommends that data integrity checking using TABAUDIT be made a regular and ongoing part of normal maintenance procedures. By using the automatic scheduling function, this function can be accomplished with a minimum of effort.

Returning a card for repair or replacement

Application

Use this procedure to return a circuit card or an assembly, such as a power converter, to Nortel Networks for repair or replacement.

Interval

Perform this procedure as required.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Returning a card for repair or replacement (continued)

Summary of returning a card for repair or replacement

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Call Nortel Networks for order ID number

↓

Pack item(s) carefully

↓

Address carton

↓

Include ID number on carton

↓

Return carton to Nortel Networks

↓

End

Returning a card for repair or replacement (end)

Returning a card for repair or replacement

1   Call Nortel Networks at (972) 684-7888.

2   Provide the following information when you call:

- order type (repair or update)
- order classification (routine or emergency)
- project number
- purchase order number (The purchase order number is required for updates and repairs when applicable.)
- requestor name and phone number
- part number (Product Engineering Code [PEC] or Corporate Product Code [CPC])
- quantity
- shipping instructions

Response:

Nortel Networks provides a unique order ID number. This number must be referenced on the shipping/packing list and failure stickers accompanying all shipments. This number is critical for tracking individual orders and must appear on all correspondence.

3   Pack the card or assembly in a Nortel Networks shipping carton and seal it. If a Nortel Networks carton is:

If a Nortel Networks carton is	Do
available	step 5
not available	step 4

4   Use any suitable carton. Ensure that each card assembly is

- enclosed in packing paper
- surrounded in bubble pack or foam
- secured within the carton to prevent the contents from moving around

5   Return defective items to Nortel Networks at the address below. Be sure to include the order ID number on the shipping label: Nortel Networks, ATTN: Customer Service, 400 N. Industrial, Richardson, TX 75081, Order ID #

6   Return the carton to Nortel Networks.

7   You have completed this procedure.

Returning an OEM/vendor card for repair or replacement

Application

Use this procedure to return OEM or vendor equipment for repair or replacement.
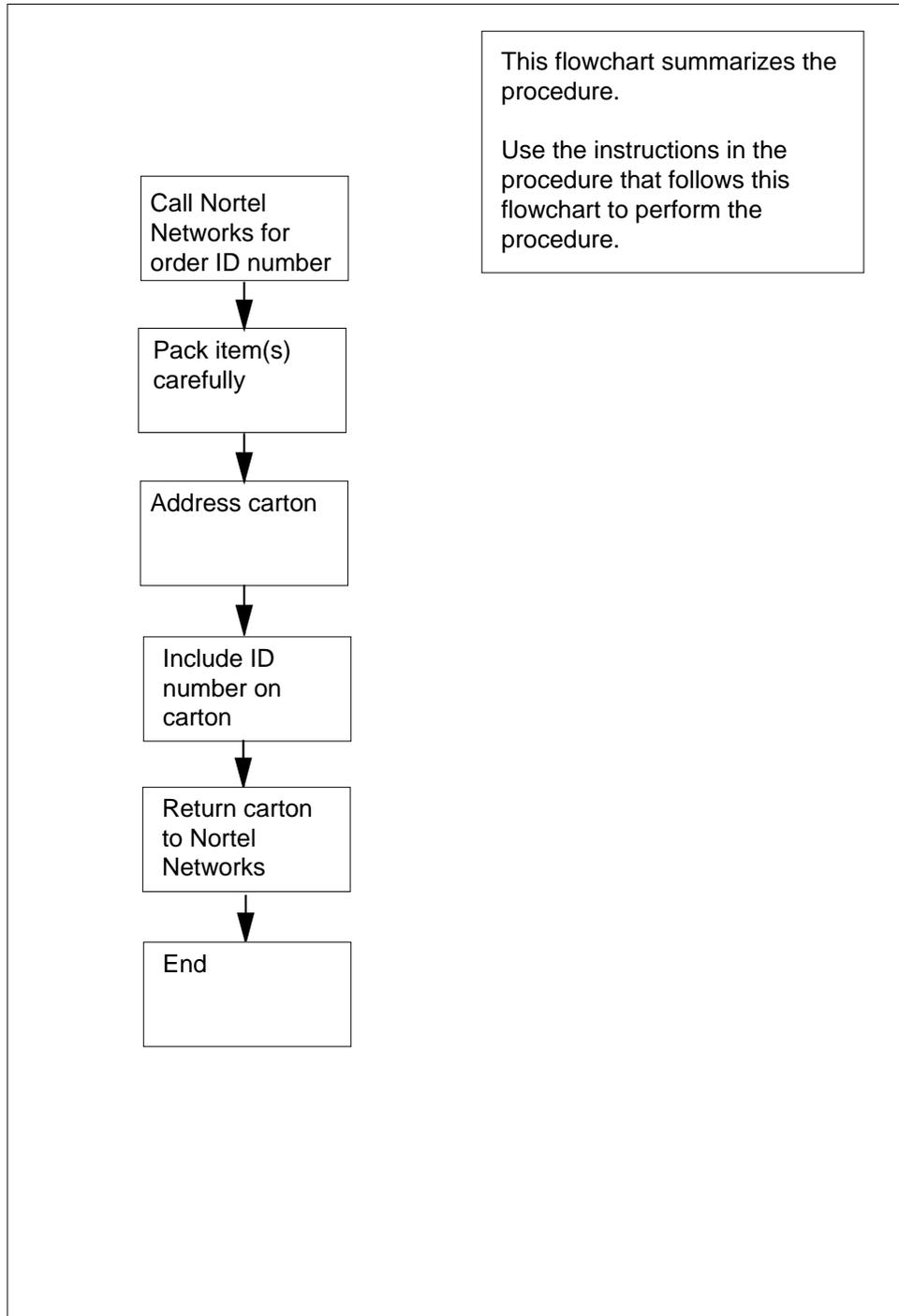
Interval

Perform this procedure as needed.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Returning an OEM/vendor card for repair or replacement (continued)

Summary of returning an OEM/vendor card for repair or replacement

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Call Nortel Networks for order ID number and instructions

↓

Follow instructions for returning card

↓

End

Returning an OEM/vendor card for repair or replacement (end)

Returning an OEM/vendor card for repair or replacement

1   For OEM/vendor normal repair, replacement repair, on-site repair, or tracking call (972) 684-1212.

2   Provide the following information when you call:

- order type
- order classification (routine or emergency)
- project number
- Customer Account Site Location (CASL) number (required for MSL family SNS only.) The CASL consists of two components: CA, the 5-digit account number, and SL, the 3-digit unique number assigned to each system.
- customer name and location
- Purchase Order (PO) number (required for all non-warranty services)
- requestor name and phone number
- part number [Product Engineering Code (PEC) or Corporate Product Code (CPC)]
- serial number and a description of the problem (required for on-site repair only)
- quantity
- shipping instructions

Response:
Nortel Networks issues a unique order ID number for each transaction. The customer must reference this number on the shipping/packing list and failure stickers accompanying all shipments. This number is critical for tracking individual orders and must appear on all correspondence.

3   Nortel Networks provides ship-to address instructions at the time Nortel Networks processes the order.

Returning proprietary station equipment for repair or replacement

Application

Use this procedure to return proprietary station equipment to Nortel Networks for repair or replacement.
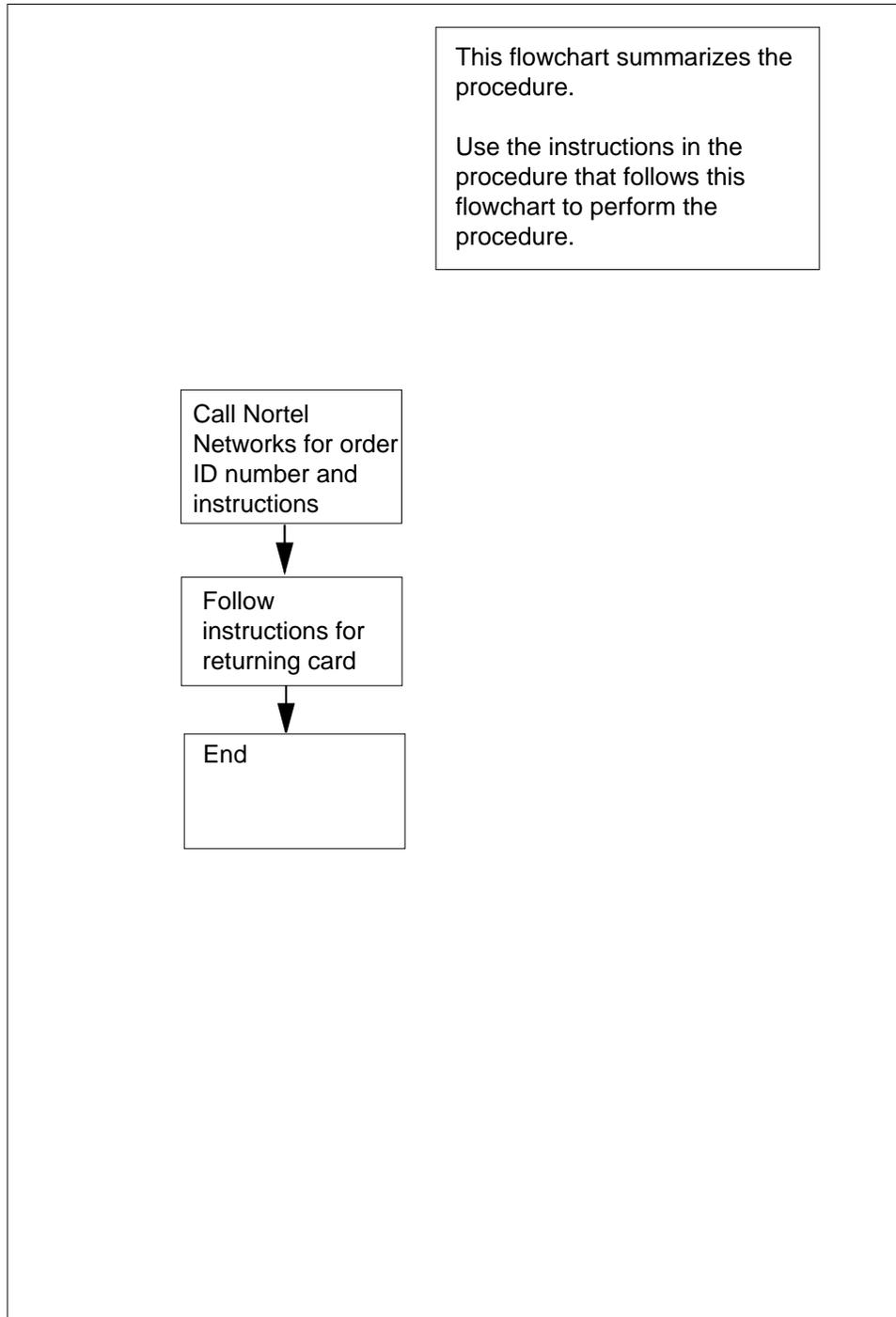
Interval

Perform this procedure as required.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Returning proprietary station equipment for repair or replacement

Summary of returning proprietary station equipment for repair or replacement

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Call Nortel Networks for instructions

↓

Follow the instructions given.

↓

End
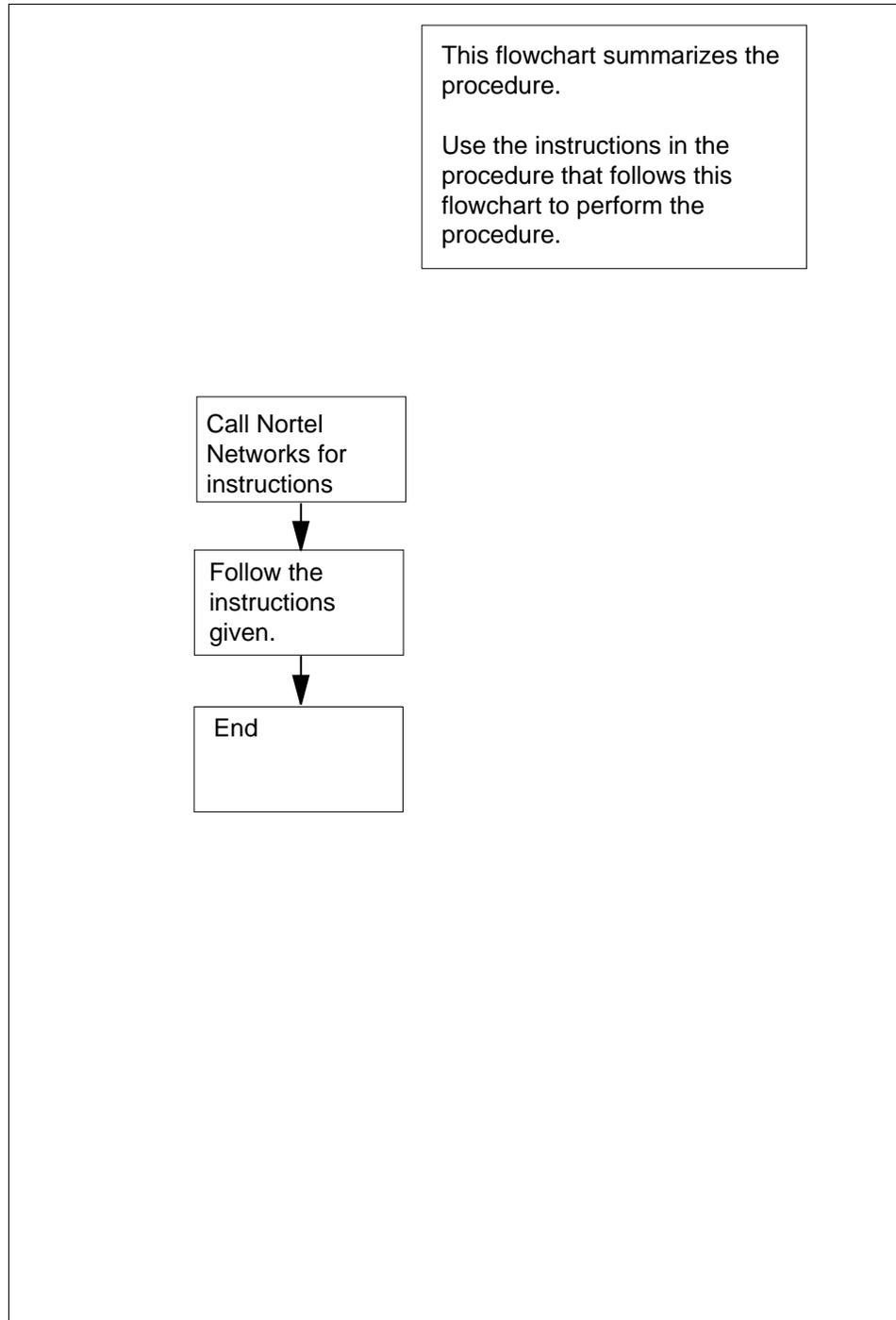
Returning proprietary station equipment for repair or replacement

Returning proprietary station equipment for repair or replacement

1   For routine and update orders, call (972) 684-7758. For emergencies call (972) 684-7888.

2   Provide the following information when you call:

- order type (repair or update)
- requestor name and phone number
- customer name and location
- project number
- purchase order number (The purchase order number is required for updates and repairs when applicable.)
- part number (Product Engineering Code [PEC] or Corporate Product Code [CPC])
- quantity

3   Nortel Networks provides instructions at the time Nortel Networks processes the order.

3 IPE routine maintenance procedures

This chapter describes routine maintenance procedures for Intelligent Peripheral Equipment (IPE).

Precautions

Meridian SL-100 equipment is based on solid state circuitry that is sensitive to static electricity and environmental conditions. To avoid personal injury and equipment damage, follow the precautions in this chapter.

<table>
<tr><td></td><td>

DANGER
Possibility of electric shock
To avoid the danger of electric shock, be very careful when working with power equipment and connections.
Displayed warning notices must be heeded.

</td></tr>
</table>

Removing or replacing the air filter
IPE

Application

An air filter located in the pedestal of each column cleans the cooling air that enters the column. See the following figure. Use this procedure to remove or replace the air filter. The system does not need to be powered down to perform this procedure.

Location of the air intake grill in the pedestal
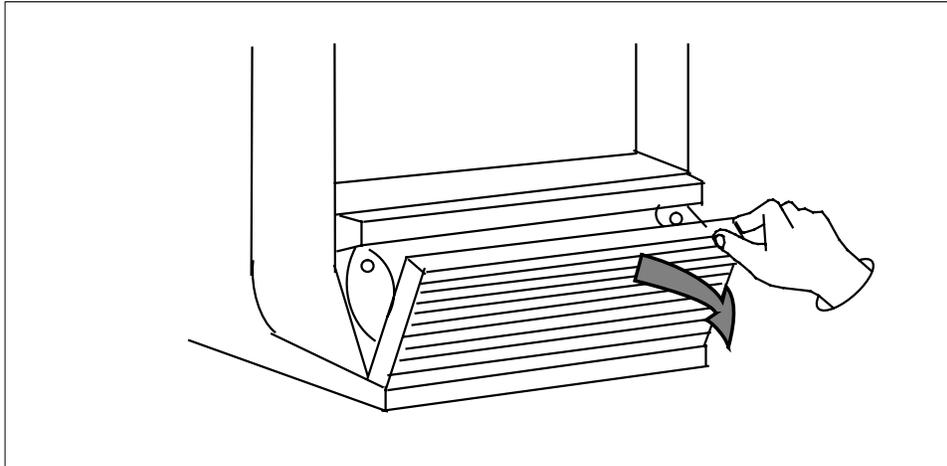
Interval

Perform this procedure at least once a month to clean the air filter (more often in a particularly dusty environment). Perform this procedure to replace all used air filters at least once a year.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Removing or replacing the air filter

1   Grasp the ridges on the outside upper edges of the pedestal front grill. Pull the grill away from the pedestal and set the grill aside. See the following figure.

Removing or replacing the air filter
IPE (continued)

Location of plastic tabs on the air filter

Plastic tab

Blower unit
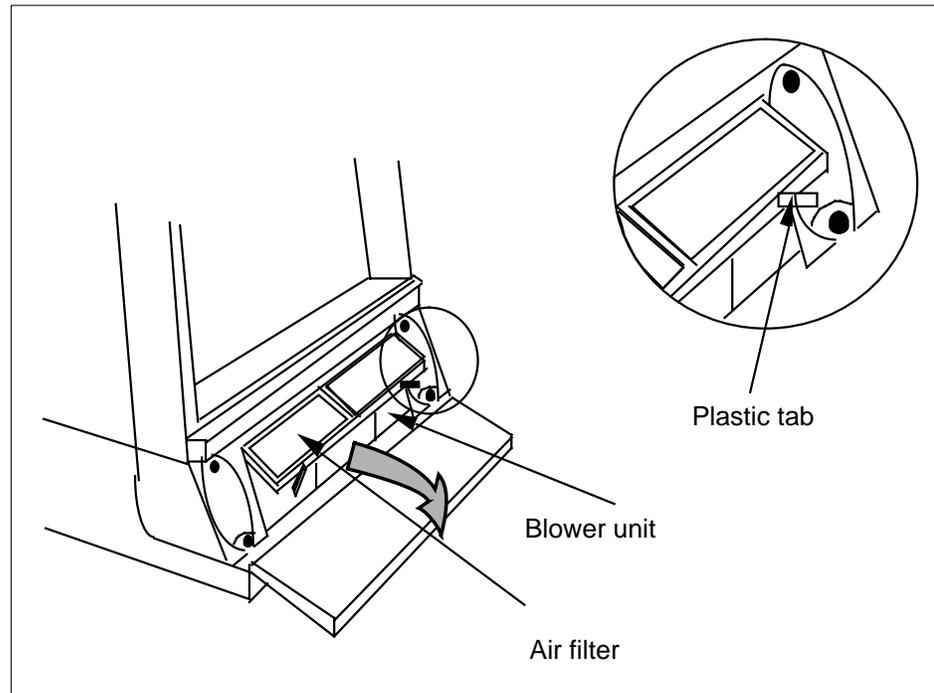
Air filter

2   Remove the screws from the front of the air filter.

3   Grasp the plastic tabs on the front of the air filter, and pull the air filter out of the pedestal.

4   Use the following information to determine where to proceed.

If	Do
you intend to clean and re-use the air filter	Step 5
you intend to replace the air filter	Step 8

5   If the air filter is damaged in any way, discard it, and proceed to Step 8.

Removing or replacing the air filter
IPE (continued)

6

> **DANGER**
> **Do not clean the filter using compressed air**
> Do not use compressed air to clean the air filter. Compressed air may damage the air filter.

If the dirty air filter is not damaged, clean it with warm water and mild detergent.

7   When the air filter is completely dry, re-insert it into the pedestal by pushing the filter into the pedestal slot until it seats fully in the back, or store the filter as a spare. Proceed to Step 9.

8   Install a clean, dry air filter by gently pushing the filter into the pedestal slot until it seats fully in the back.

9   Ensure that the filter is inserted under the following conditions. (See the following figure.)

- The center strap must be on top.
- The air flow indicator etched on the filter frame must point up.
- The plastic tabs must be on the front.

Location of air flow indicator
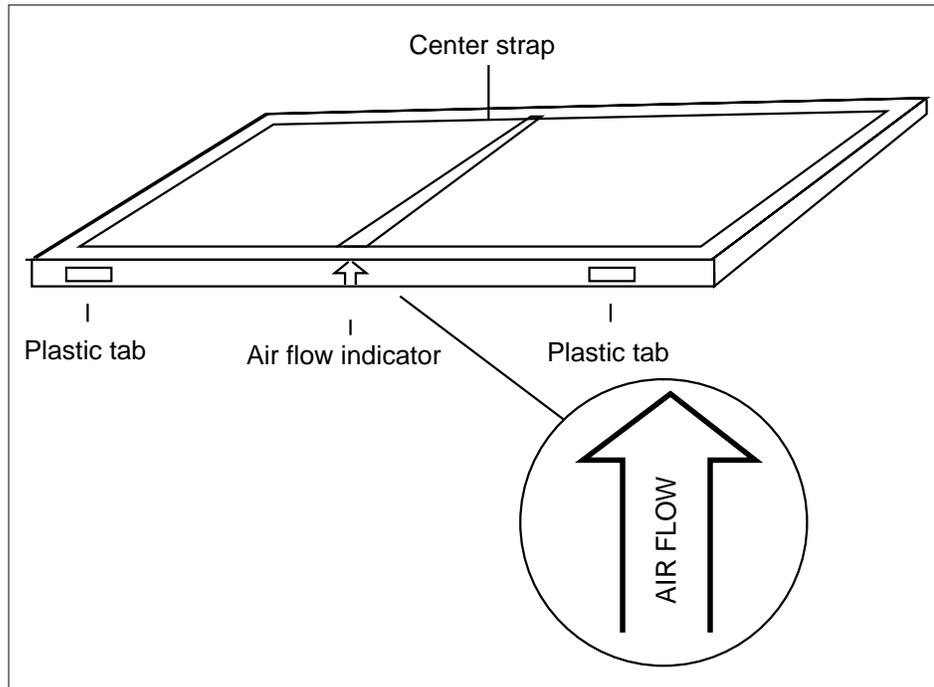
Removing or replacing the air filter
IPE (end)

10   Fit the bottom of the grill into the holes on the bottom edge of the pedestal, and push the grill into a locked position against the pedestal.

11   You have completed this procedure.

Removing or replacing the air probe harness
IPE

Application

The air probe harness is located in the top cap of each column. Use this procedure to remove and replace the air probe harness.

Interval

Perform this procedure as needed.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Removing or replacing the air probe harness
IPE (continued)

Summary of removing or replacing the air probe harness

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Access sublevel of ALT level at MAP terminal

Define parameters for the test

Start the line test

Does the test need to be stopped?

Stop the test

Remove TESTID from Table ALTSCHED

End of procedure
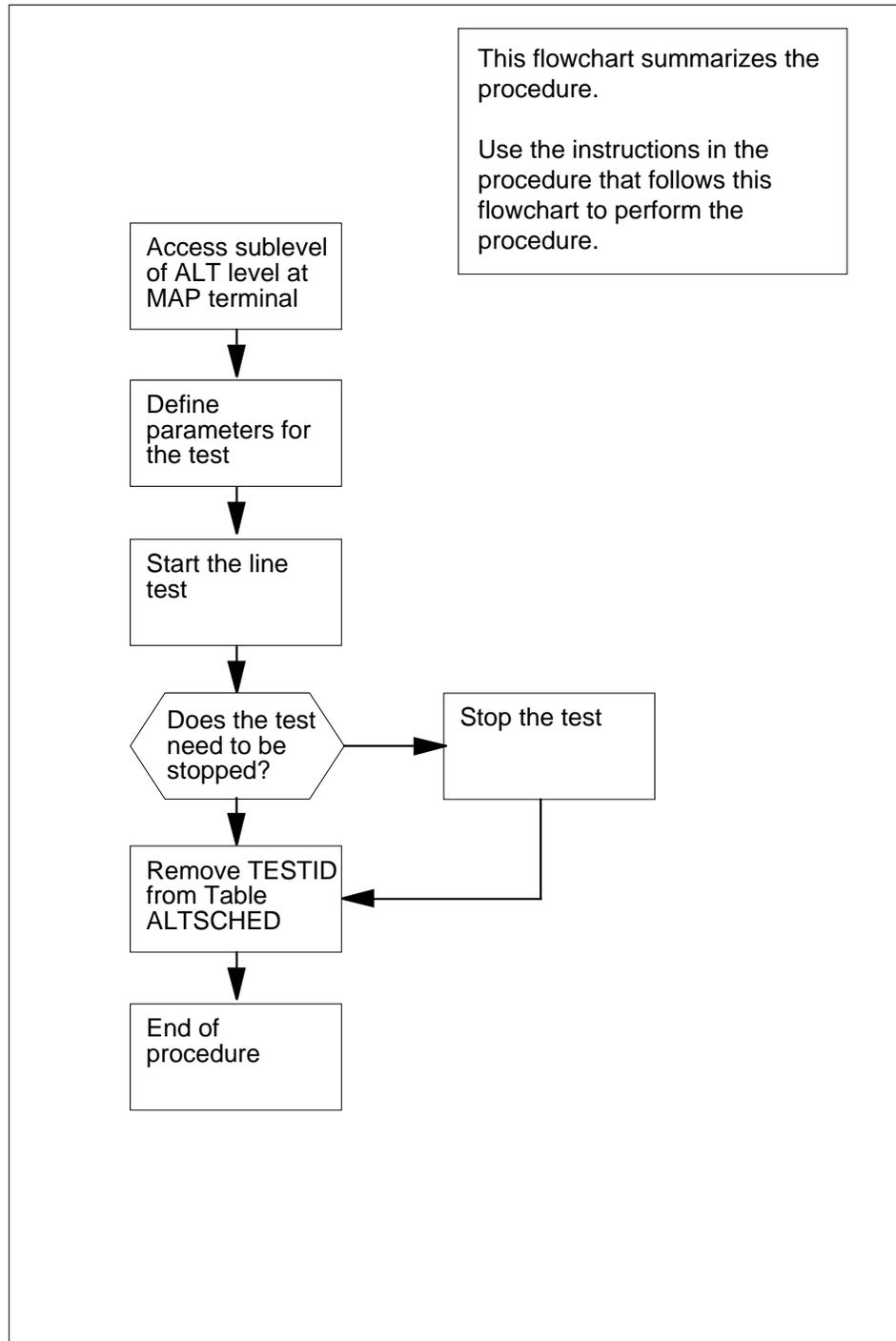
Removing or replacing the air probe harness
IPE (continued)

Removing or replacing the air probe harness

> **DANGER**
> **Module front and rear covers are not hinged**
> Module front and rear covers are *not* hinged; *do not let go of the cover*. Lift the cover away from the module, and set the cover out of the work area.

1 Remove the rear cover on the module below the top cap.

2 Remove the backplane cover on the Input/Output (I/O) assembly.

3 At the top of the rear of the module, disconnect the orange plug connector from the module power harness.

4 Remove the air exhaust grills at the front and rear of the top cap. Pull forward on the two clips underneath the front edge of each grill to remove the grill.

5 Use a 5/16-inch socket wrench to remove the six bolts that secure the top cap and perforated panel.

6 Lift off the top cap.

7 Remove the screw that secures the perforated panel at the LED mounting bracket.

8 Slide the perforated panel slightly to the left (looking at it from the rear of the column).

9 Lift the panel, and turn it over.

10 Pull the air probe out of the clip holder.

11 Clip cable ties that secure the air probe wiring. Be careful not to damage other wiring (such as for the thermostat harness).

12 Remove the orange plug connector from the right angle bracket at the top of the module, and simultaneously push the four small snaps (two on each side) on the connector to release it from the bracket.

13 Gently push the air probe into the clip holder.

14 Route the air probe wiring on the perforated panel.

15 At the rear edge of the panel, route the wires with the wiring for the thermostat harness, and secure loose cabling to the perforated panel with cable ties.

16 Turn the perforated panel over, and slide it slightly to the right (at the rear of the column) so that the panel is in a secure position.

17 Position wiring from the perforated panel so that the wiring rests in the cable well (next to the orange plug connector at the rear of the module).

18 Insert the orange plug connector into the right angle bracket at the top of the module, and simultaneously push the four small snaps on the connector to insert it.

Removing or replacing the air probe harness
IPE (end)

19   Position the perforated panel, and install the screw that secures the panel at the LED bracket.

20   Position the top cap, and install the six screws that secure the top cap and perforated panel.

21   Install the air exhaust grills at the front and rear of the top cap.

22   Connect the orange plug connector to the module power harness.

23   Replace the backplane cover.

24   Replace the rear cover of the module.

25   Tag defective equipment with a description of the problem, and package the equipment for return to a repair center.

26   You have completed this procedure.

Removing or replacing the blower unit
IPE

Application

The blower unit in the pedestal provides forced air cooling with two 2-speed fans. The fans normally operate at low speed; however, if a condition of thermal stress occurs, the fans automatically switch to high speed. Under normal conditions, both fans operate. If one of the two fans fails or the ambient temperature reaches 149 °F (65 °C), the Central Control (CC) is notified with an Extended System Monitor (XSM) fault report.

The following reports provide fan unit status and fault indications:

- Fan unit is operational.
- Fan unit is not operational, and temperature alarm has been triggered.
- Temperature is OK.
- Unit has reached an excessively high temperature.

Use this procedure to remove and replace a blower unit located in the front of the pedestal.

Interval

Perform this procedure as needed.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Removing or replacing the blower unit
IPE (continued)

Summary of removing or replacing the blower unit

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Access sublevel of ALT level at MAP terminal

↓

Define parameters for the test

↓

Start the line test

↓

Does the test need to be stopped? → Stop the test

↓

Remove TESTID from Table ALTSCHED

↓

End of procedure
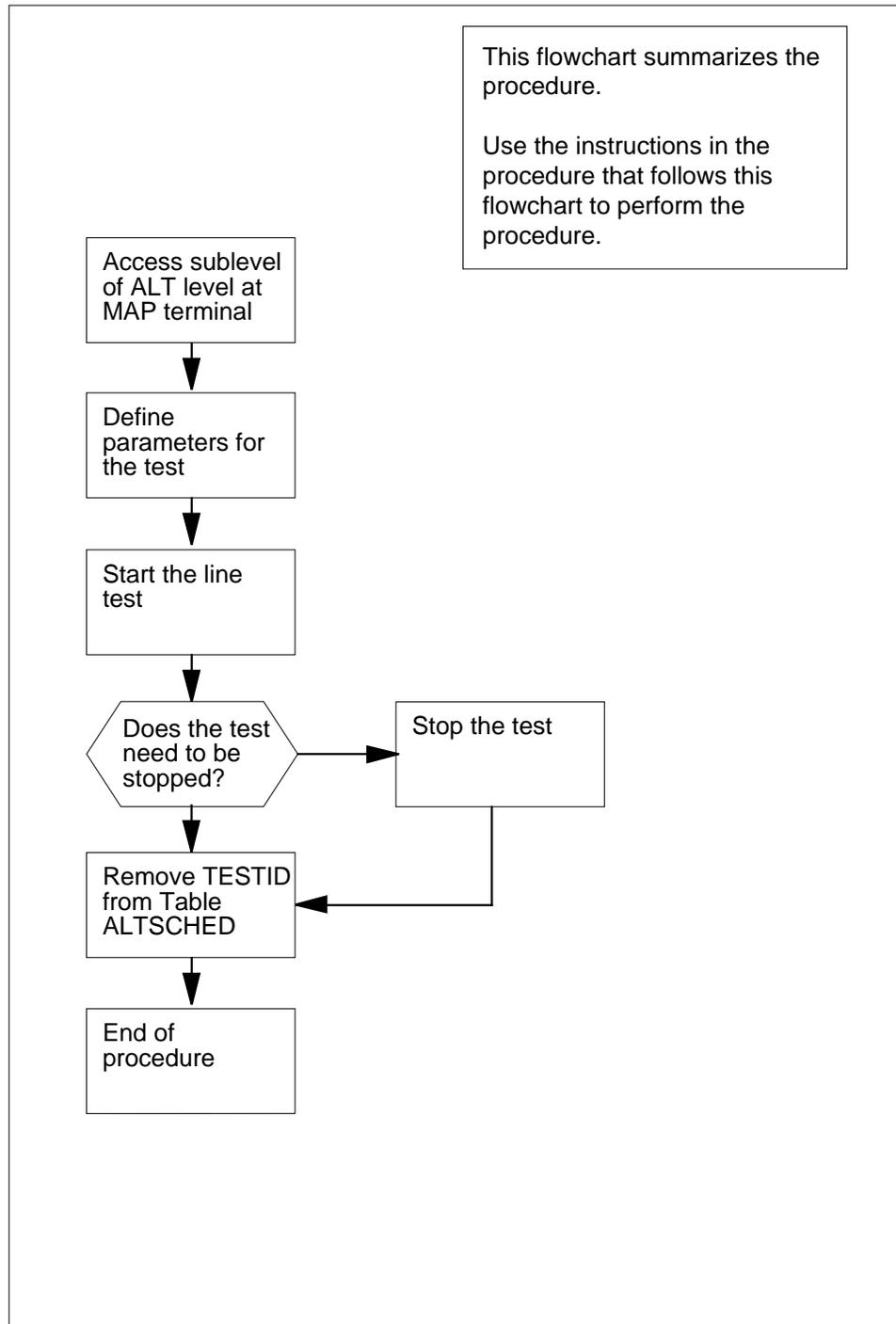
Removing or replacing the blower unit
IPE (end)

Removing or replacing the blower unit

	DANGER **Risk of injury** Blades in the blower unit do not stop instantly when the power is turned off. Wait *two full minutes* before removing the unit.

Removing the blower unit:

1   Grasp the ridges on the outside upper edges of the front pedestal grill. Pull the grill away from the pedestal, and set the grill aside.

2   Turn off the power to the blower unit by setting the toggle switch on the front of the unit to OFF (left).

3   Loosen the two screws on the front of the blower unit by turning them counterclockwise.

4   Grasp the lip at the top edge of the blower unit, and slide the unit out of the glides and onto the bottom ledge of the pedestal.

5   Lift the blower unit out of the pedestal, and store the unit in an upright position.

Replacing the blower unit:

6   Set the replacement blower unit on the bottom ledge of the pedestal.

7   Tilt the back of the blower unit up slightly so that the unit slides into the pedestal glides. (The unit may need to be lifted.)

8   Push the unit gently into position.

9   Tighten the screws on the front of the unit.

10   Turn on the power to the blower unit by setting the toggle switch on the front of the unit to ON (right).

11   Fit the grill into the holes in the bottom ledge of the pedestal, and push the grill back into a locked position.

12   Tag defective equipment with a description of the problem, and package the unit for return to a repair center.

13   You have completed this procedure.

Removing or replacing the power distribution unit
IPE

Application

The Power Distribution Unit (PDU) receives DC power (-48 VDC nominal) from a battery source external to the Intelligent Peripheral Equipment Column (IPEC) and distributes the power through circuit breakers to the IPE modules and to the blower unit in the pedestal.

Use this procedure to remove and replace the PDU.

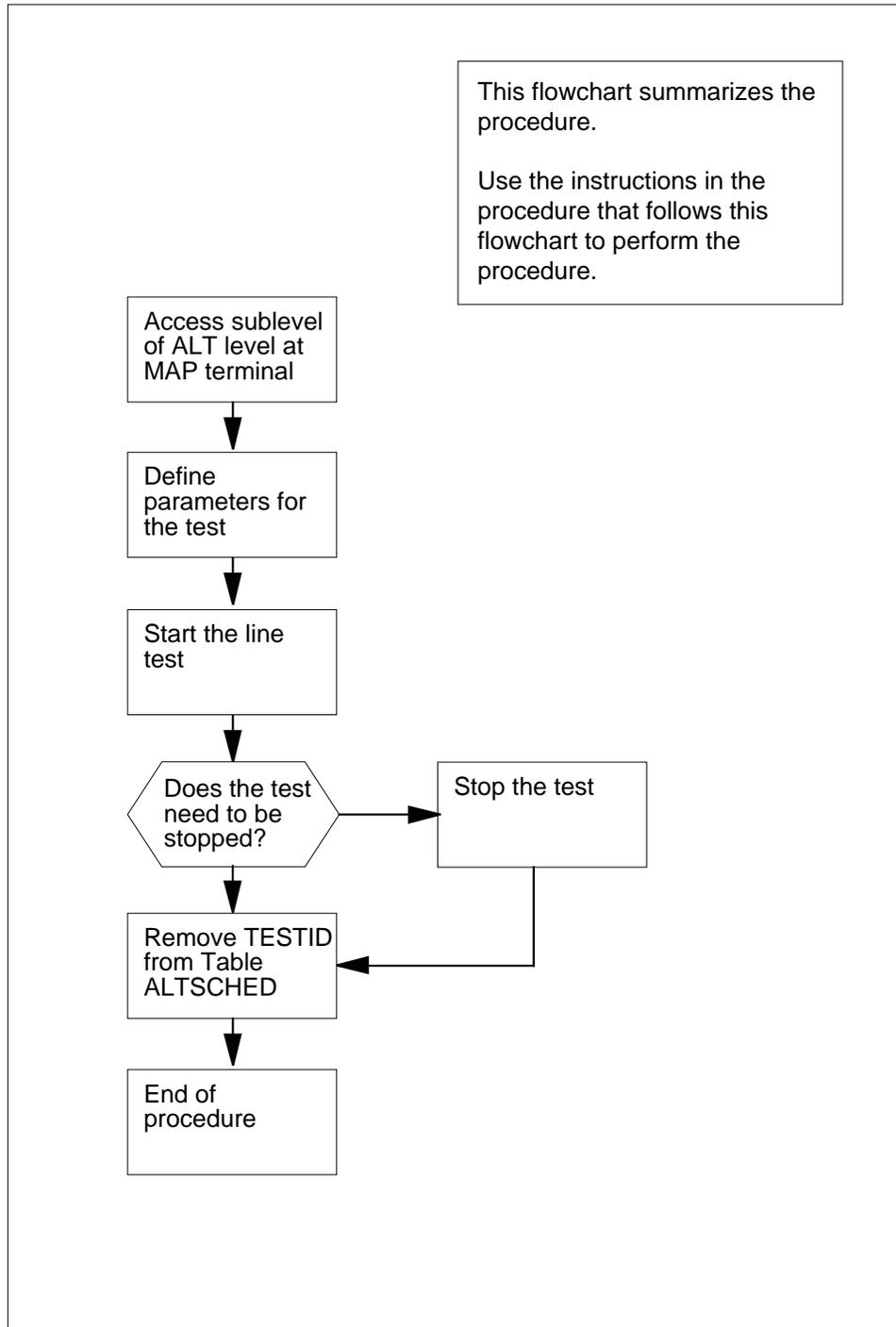## Interval

Perform this procedure as needed.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Removing or replacing the power distribution unit
IPE (continued)

Summary of removing or replacing the power distribution unit

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Access sublevel of ALT level at MAP terminal

Define parameters for the test

Start the line test

Does the test need to be stopped? → Stop the test
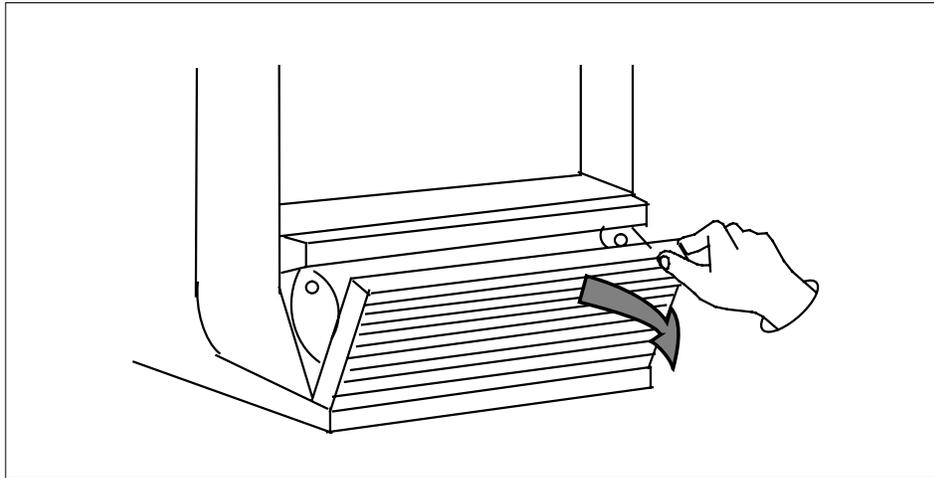
Remove TESTID from Table ALTSCHED

End of procedure

Removing or replacing the power distribution unit
IPE (continued)

Removing or replacing the power distribution unit

Removing the PDU:

1   Disconnect the source of DC power.

2   Remove the screws from the front of the air filter.

3   Remove the rear air intake grill from the pedestal.

4   Turn the column circuit breakers to OFF.

5

DANGER
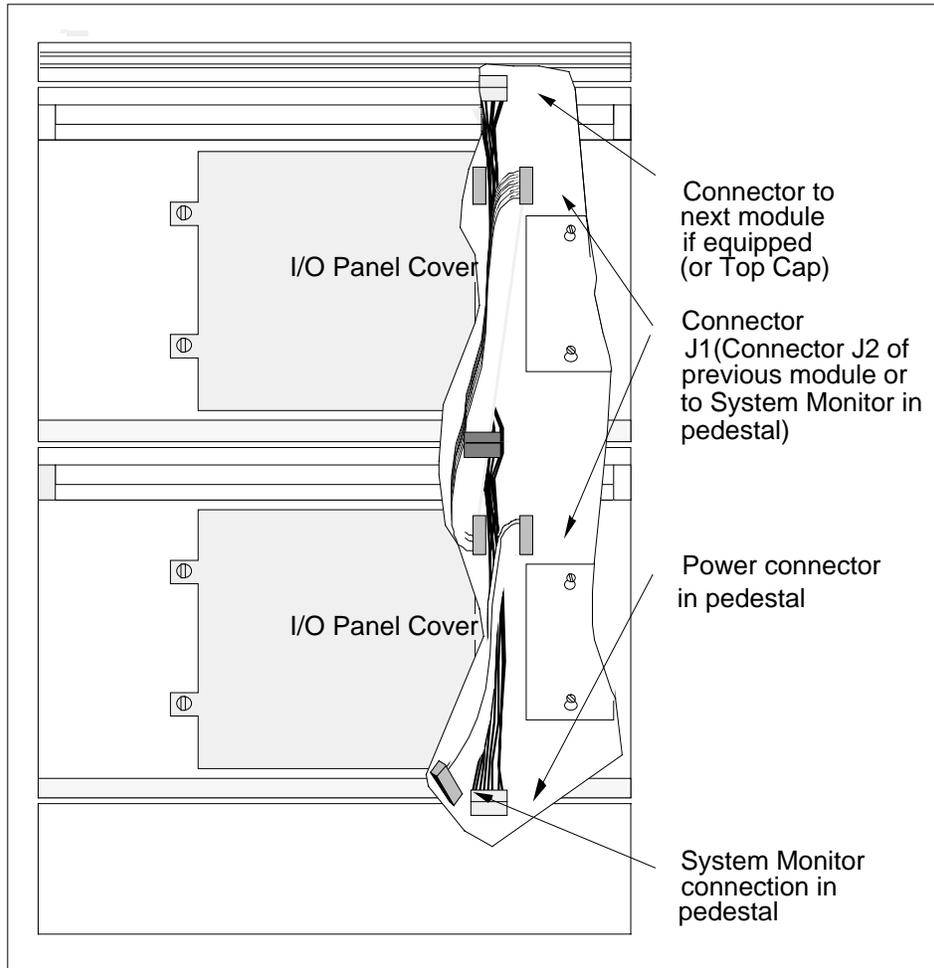**Module front and rear covers are not hinged**
Module front and rear covers are *not* hinged; *do not let go of the cover*. Lift the cover away from the module, and set the cover out of the work area.

Remove the rear cover on Module 0.

6   Remove the backplane cover on the Input/Output (I/O) assembly.

7   Use a screwdriver to remove the four fasteners securing the I/O panel cover plate at the rear of the bottom IPE module.

Removing or replacing the power distribution unit
IPE (continued)

8 Disconnect the power plug (J1) and system monitor ribbon cable to Module 0.

Connector to
next module
if equipped
(or Top Cap)

Connector
J1(Connector J2 of
previous module or
to System Monitor in
pedestal)

Power connector
in pedestal

System Monitor
connection in
pedestal

Note: To disconnect the power plug, a latch trip must be pressed on the sides of the plug.

9

⚠️ **CAUTION**
Removal of PDU
The PDU cannot be completely removed from the pedestal until TB1 is disconnected.

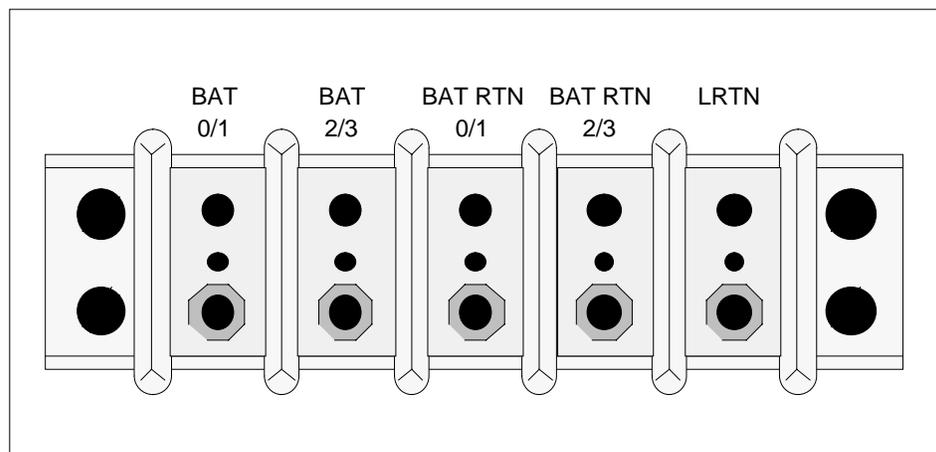# Removing or replacing the power distribution unit
IPE (continued)

> ⚠ **CAUTION**
> **Labeling of wires**
> Label wires carefully. Improper wiring can cause system damage.

10 Tag and disconnect cables to the Extended System Monitor (XSM).

11 Loosen the two screws on the XSM, and remove the card.

12 Remove the grill on the front of the pedestal.

13 Turn off power to the blower unit.

14 Set the toggle switch on the front of the unit to OFF (down).

15 Turn the screws on the front of the blower unit counterclockwise, and pull the blower unit forward several inches.

16 Remove the six screws that position the PDU.

17 Carefully pull the PDU straight back, and set it in back of the pedestal.

18 Tag and disconnect all wiring to the rear of the TB1 terminal block.

19 Remove the cover over the terminal block.

20 Remove the four screws that position the terminal block and lift it out of the pedestal.

Replacing the PDU:

21 Ensure that all five circuit breakers on the replacement PDU are in the OFF position.

22 Position the TB1 terminal block, and replace the screws.

Removing or replacing the power distribution unit
IPE (end)

23   Replace the cover over the terminal block.

24   Reconnect all wiring to the TB1 wiring terminal.

25   Position the replacement PDU, and gently push it into the pedestal.

         Note: Push the unit straight back so that the connector on the rear seats properly with the blower unit connector.

26   Replace the screws on the PDU.

27   Reseat the blower unit by lifting the unit slightly and sliding it into the pedestal glides.

28   Turn on the power to the blower unit by setting the circuit breaker or toggle switch to ON (up).

29   Tighten the screws on the front of the blower unit.

30   Attach power J1 and the XSM cable; replace the backplane cover on the I/O assembly; and, replace the rear cover on the module.

31   Insert the XSM, and tighten the screws on the card.

32   Reconnect all cables to the XSM faceplate.

33   Set the circuit breakers on the PDU to ON (up).

34   Reconnect the source of DC power.

35   Replace the pedestal grill.

36   Tag defective equipment with a description of the problem, and package the unit for return to a repair center.

37   You have successfully completed this procedure.

Removing or replacing the thermostat harness
IPE

Application

Use this procedure to remove and replace the thermostat harness located in the Intelligent Peripheral Equipment (IPE) top cap.

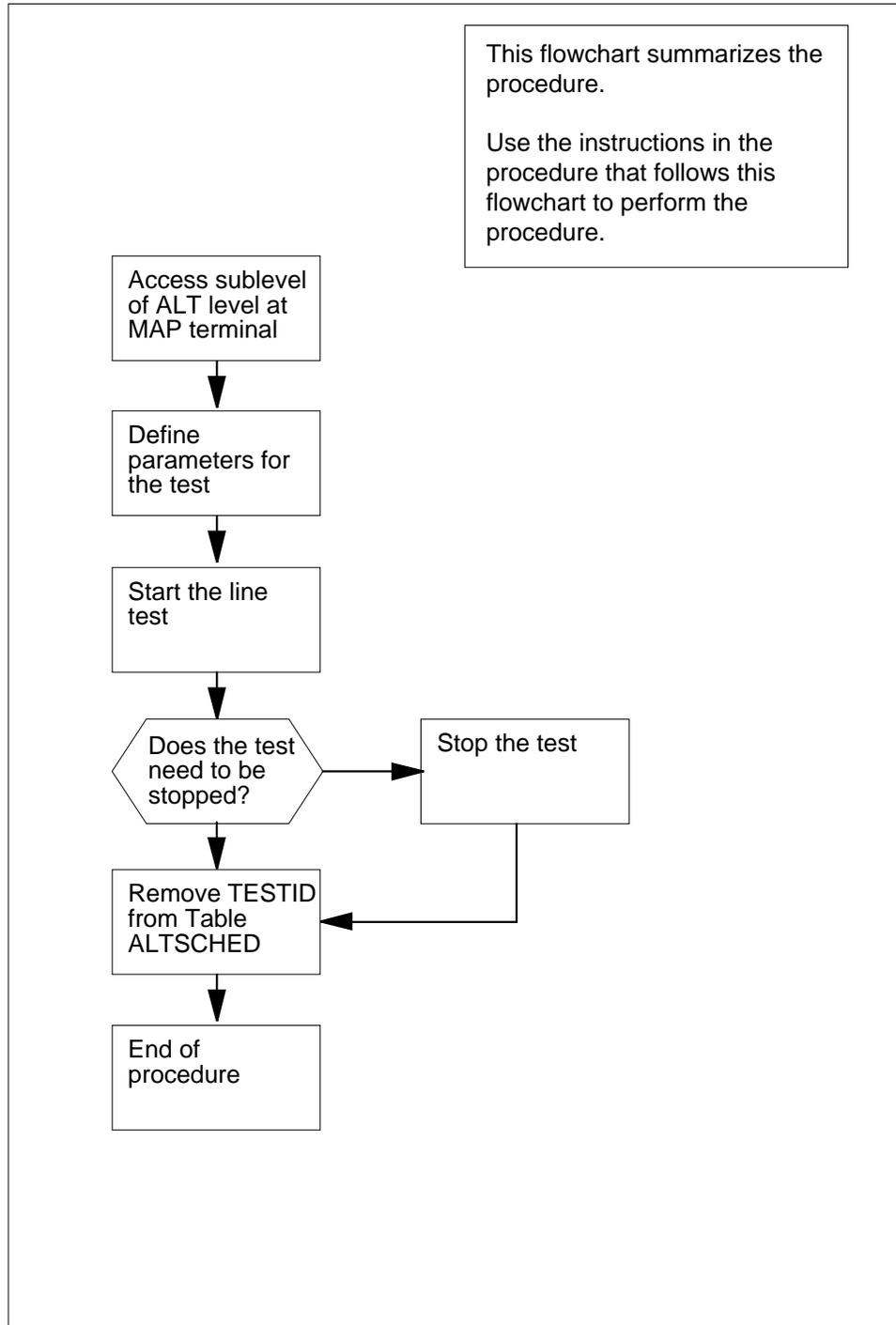## Interval

Perform this procedure as needed.

Action

The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

Removing or replacing the thermostat harness
IPE (continued)

Summary of <Routine maintenance procedure name>

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Access sublevel of ALT level at MAP terminal

↓

Define parameters for the test

↓

Start the line test

↓

Does the test need to be stopped? → Stop the test

↓

Remove TESTID from Table ALTSCHED

↓

End of procedure

Removing or replacing the thermostat harness
IPE (continued)

Removing or replacing the thermostat harness

⚠️ **CAUTION**
You must unseat the Extended System Monitor (XSM)
In this procedure, you must unseat the XSM. If the XSM is not unseated, the IPE column operation shuts down when the thermostat harness is disconnected.

---

1   Remove the grill on the rear of the IPE column pedestal.

2   Loosen the two screws on the XSM, and pull the XSM card out a few inches.

3   Remove the rear cover of the module below the top cap.

4   Remove the backplane cover on the Input/Output (I/O) assembly.

5   Disconnect the orange plug connector from the module power harness at the top of the rear of the module.

6   Disconnect the pin headers on connector J2 on the backplane, and disconnect the ribbon cable connector.

7   Remove the air exhaust grills at the front and rear of the top cap by pulling forward on the two clips underneath the front edge of each grill.

8   Use a 5/16-inch socket wrench to remove the six bolts that secure the top cap and perforated panel.

9   Lift off the top cap only.

10   The column LED and LED wiring are part of the thermostat harness. Pull the LED ring away from the LED mounting bracket. (It may need to be loosened with a standard screwdriver.)

11   Push the LED back completely out of the collar on the LED mounting bracket.

12   Remove the LED ring by pulling it forward over the LED. Keep the ring handy; it will be used with the replacement equipment.

13   Remove the screw that secures the perforated panel at the LED mounting bracket.

14   Slide the perforated panel slightly to the left (looking at it from the rear of the column).

15   Lift the panel and turn it over. Clip all cable ties that secure the thermostat wiring. Be careful not to damage other wiring (such as the air probe harness).

16   Pull the LED through the rubber grommet at the front of the perforated panel.

17   Remove the screws (two each) that secure the thermostats.

18   Remove the thermostats and wiring.

19   Position the replacement thermostats and install the screws.

20   Push the LED through the rubber grommet.

Removing or replacing the thermostat harness
IPE (continued)

21   Route the thermostat wiring on the perforated panel. At the rear edge of the panel, route the wires with wiring for the air probe harness. Secure loose wiring to the perforated panel with cable ties.

22   Turn the perforated panel over. Slide it slightly to the right (at the rear of the column) so it is in a secure position. Position wiring from the perforated panel so that it rests in the cable well (next to the orange plug connector at the rear of the module).

23   Position the perforated panel and install the screw that secures it at the LED mounting bracket.

24   Slide the LED ring over the LED (it will hang loosely at this point).

25   Gently push the LED forward completely through the collar on the LED mounting bracket.

26   Push the LED ring into position over the back of the collar and tight against the LED mounting bracket.

27   Position the top cap and install the six screws that secure the top cap and perforated panel.

28   Install the air exhaust grills at the from and rear of the top cap.

29   Connect the ribbon cable connector to connector J2 on the backplane. Line up the alignment tab on the connector and snap on the pin headers to position the connector correctly.

30   Connect the orange plug connector to the module power harness.

31   Replace the rear cover on the module.

32   Push the XSM into position and tighten the screws.

33   Replace the grill on the pedestal.

34   Tag the defective equipment with a description of the problem and package it for return to a repair center.

35   You have completed this procedure.

4 MCRM-S routine maintenance procedures

This chapter describes routine maintenance procedures for Meridian Cabinet Remote Module-SONET (MCRM-S) equipment.

Precautions

Meridian SL-100 equipment is based on solid state circuitry that is sensitive to static electricity and environmental conditions. To avoid personal injury and equipment damage, follow the precautions in this chapter.

DANGER
Possibility of electric shock
To avoid the danger of electric shock, be very careful when working with power equipment and connections. Displayed warning notices must be heeded.

Checking torque on grounding bolts
MCRM-S

Application

Use this procedure to check the proper torque of all grounding bolts.

Interval

Perform this procedure once a month.
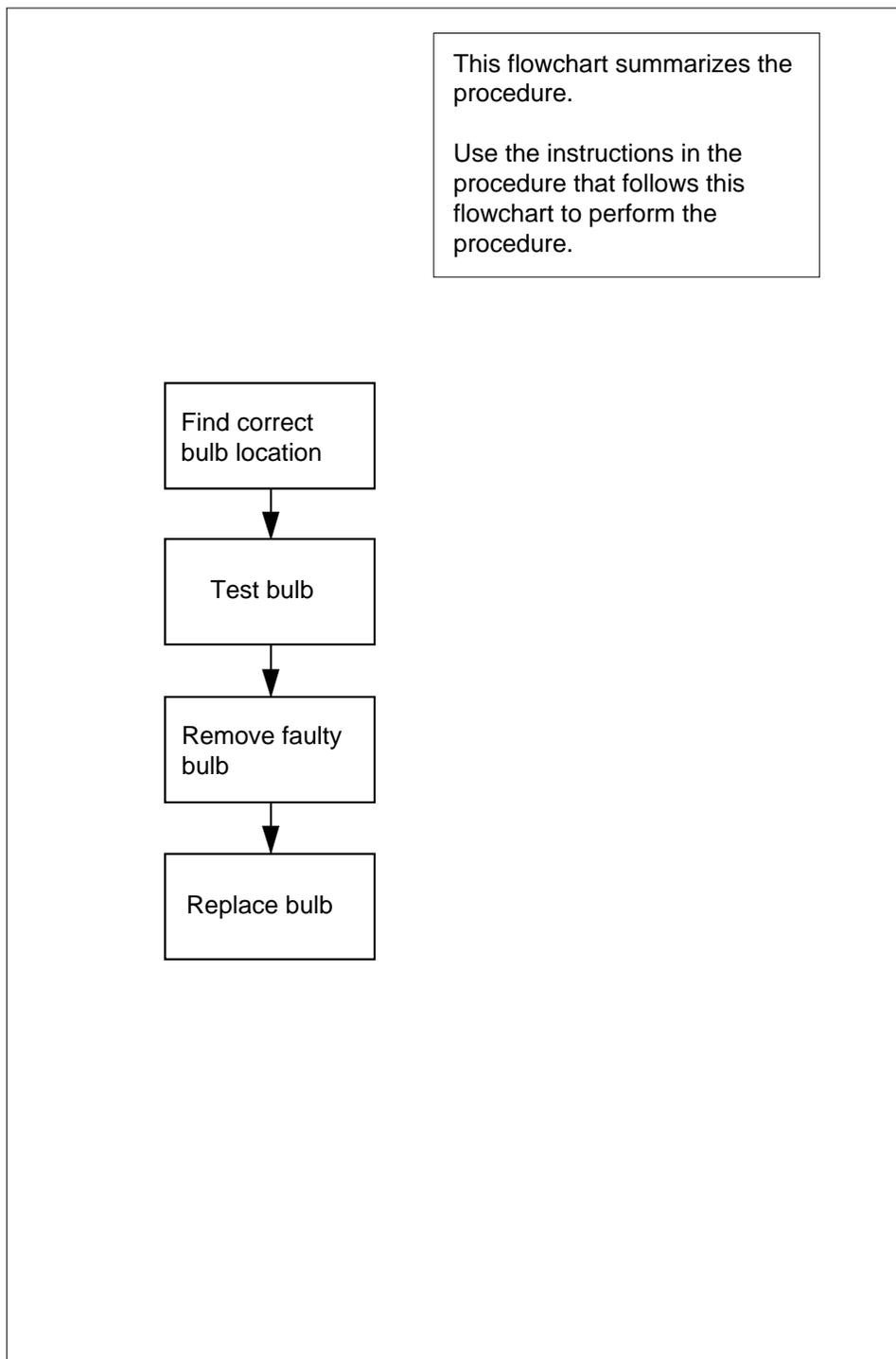
Common procedures

Not applicable

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Checking torque on grounding bolts
MCRM-S (continued)

Summary of checking torque on grounding bolts

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Locate proper torquing tool

↓

Reference the correct torquing value

↓

Set the tool to the correct torque value

↓

Set bolts to the inspection torque settings

↓

End of procedure
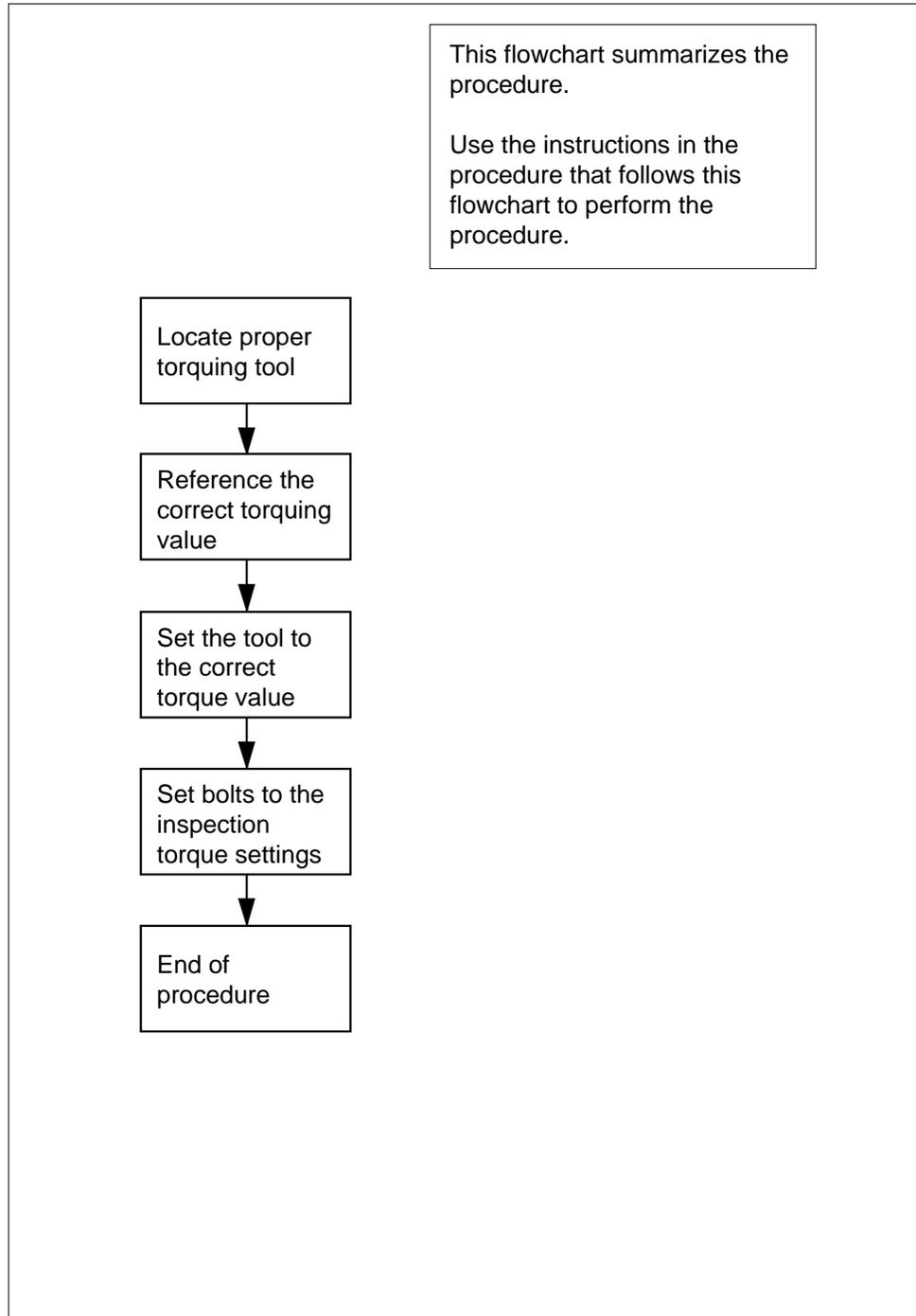
Checking torque on grounding bolts
MCRM-S (end)

Checking torque on grounding bolts

1   Locate the T9958 click-type preset torque wrench.

2   Line up the small fractions on the edge of the handle with the center of the main torque scale.

3   Set the correct inspection torque value by turning clockwise to increase value or counterclockwise to decrease value.

If grounding bolts are type	Do
1/4-20 backplane, -48 V ground first nut	step 4
1/4-20 backplane, -48 V ground second nut	step 5

4   Set inspection torque to 5 ft/lb. Proceed to step 6.

5   Set inspection torque to 25 in/lb.

6   Position the wrench on the grounding bolts and tighten to the specified inspection torque.

7   Return the T9958 torque wrench to its proper location.

8   You have successfully completed this procedure.

Inspecting and changing bulbs
MCRM-S

Application

Use this procedure to inspect and replace faulty fan fail, aisle end, and frame supervisory panel (FSP) bulbs.

Interval

Perform this procedure once a month.

Common procedures

Not applicable

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Inspecting and changing bulbs
MCRM-S (continued)

Summary of inspecting and changing bulbs

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Find correct
bulb location

↓

Test bulb

↓

Remove faulty
bulb

↓

Replace bulb

Inspecting and changing bulbs
MCRM-S (end)

Inspecting and changing bulbs

1   Use the following procedures to inspect the fan fail, aisle end, and FSP panel bulbs.

If bulbs are type	Do
fan fail bulbs	step 2
aisle end bulbs	step 3
FSP panel bulbs	step 4

2   Flip the ALM override switch, located on the FSP, to ON.

If fan fail bulb	Do
does not light	step 5
lights	step 9

3   Press a fuse on the fuse pad located on the FSP.

If aisle end bulb	Do
does not light	step 5
lights	step 9

4   Press a fuse on the fuse pad located on the FSP.

If FSP panel bulb	Do
does not light	step 5
lights	step 9

5   Remove bulb cover. Grasp the bulb tightly with two fingers, squeeze, and pull out. Go to step 6.

6   Remove the bulb frame casing. Grasp the aisle end or FSP panel bulb tightly with two fingers, squeeze, and pull out. Go to step 7.

7   Replace with new bulb.

8   Reattach bulb cover.

9   You have successfully completed this procedure.

Replacing fan unit assemblies
MCRM-S

Application

Use this procedure to replace faulty fan unit assemblies (NTMX2658).

Interval

Perform this procedure whenever a fan unit becomes inoperable. A faulty fan unit is indicated when the fan fail indicator on the front of the MCRM-S is illuminated.

Action

This procedure contains a summary flowchart as an overview of the procedure. Follow the specific steps to perform this procedure.

Replacing fan unit assemblies
MCRM-S (continued)

Summary of replacing fan unit assemblies in the MCRM-S

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.

Locate faulty fan unit assembly

Is faulty fan assembly on the right side?

Y → Disconnect connector at J03 → Loosen thumbscrew for right assembly

N ↓

Disconnect connectors at J02 and J03

Loosen thumbscrews for both assemblies

Remove fan unit assembly from right side.

Remove faulty fan unit assembly from left side

Install replacement fan unit assembly

Remove faulty fan unit assembly

Install replacement fan unit assembly

Tighten thumbscrew

Reconnect connector at J03 → 1

Reinstall original fan unit assembly in correct side → Tighten both thumbscrews → Reconnect connectors at J02 and J03 → End of procedure

1 →

Replacing fan unit assemblies
MCRM-S (continued)

Replacing fan unit assemblies in the MCRM-S

1   The fan fail indicator on the MCRM-S indicates that one or more fan units is faulty. Identify the faulty fan unit by viewing the fan units from the rear of the MCRM-S.

2   Determine which fan unit assembly requires replacement.

If the fan unit assembly on the	Do
right side requires replacement	step 3
left side requires replacement	step 13

3

> **DANGER**
> **High energy hazard**
> Personal injury can result from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

Set the fan alarm override switch on ON.

4

> **DANGER**
> **Overheating, high energy hazard**
> Service interruption or damage to equipment can result from leaving the fans off for longer than 30 min or from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

Ensure the cooling unit fans are turned off by removing fuses F03 and F04 on the face plate of the MCRM-S.

5   Carefully unplug the connector from location J03.

6   Place a section of NoMex protective paper, part number R0113636, over the preformed cable and the terminal blocks. If necessary, use electrical tape or wire ties to secure the paper.

7   Loosen the thumbscrew securing the right fan unit assembly to the base plate.

8   Slide the tabs on the right fan unit assembly (NTMX2658) away from the lacets on the fan base plate assembly.

Replacing fan unit assemblies
MCRM-S (continued)

9

DANGER
High energy hazard
Personal injury could occur if the fan unit assembly shorts the connections on the terminal blocks. Use terminal block safety covers or NoMex protective paper (part number R0113636) to prevent shorting the connections on the terminal blocks.

DANGER
High energy hazard
Service interruption or damage to equipment could occur if the fan unit assembly shorts the connections on the terminal blocks. Use terminal block safety covers or NoMex protective paper (part number R0113636) to prevent shorting the connections on the terminal blocks.

Carefully remove the fan unit assembly (NTMX2658).

10   Carefully install the replacement fan unit assembly (NTMX2658) by sliding the tabs into the clips on the base plate assembly.

11

DANGER
High energy hazard
Personal injury can result from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

DANGER
Overheating, high energy hazard
Service interruption or damage to equipment can result from leaving the fans off for longer than 30 min or from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

Tighten the thumbscrew to secure the fan unit assembly to the base plate assembly.

12   Carefully reconnect fan connector at location J03.

Replacing fan unit assemblies
MCRM-S (continued)

13   Remove the NoMex paper.

14   Proceed to step 23.

15   To remove the faulty fan unit assembly from the left side, you must first remove the fan unit assembly from the right side. To do this, perform steps 3 through 9, then proceed to step 14.

16

> **DANGER**
> **High energy hazard**
> Personal injury can result from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

> **DANGER**
> **Overheating, high energy hazard**
> Service interruption or damage to equipment can result from leaving the fans off for longer than 30 min or from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

Carefully unplug the fan connector located at J02.

17   Loosen the thumbscrew securing the left fan unit assembly to the base plate.

18   Slide the tabs on the left fan unit assembly (NTMX2658) away from the lacets on the fan base plate assembly.

19

> **DANGER**
> **High energy hazard**
> Personal injury could occur if the fan unit assembly shorts the connections on the terminal blocks. Use terminal block safety covers or NoMex protective paper (part number R0113636) to prevent shorting the connections on the terminal blocks.

Replacing fan unit assemblies
MCRM-S (end)

> **DANGER**
> **High energy hazard**
> Service interruption or damage to equipment could occur if the fan unit assembly shorts the connections on the terminal blocks. Use terminal block safety covers or NoMex protective paper (part number R0113636) to prevent shorting the connections on the terminal blocks.

Carefully maneuver the faulty fan unit assembly (NTMX2658) around the bulkhead.

20   Carefully install the replacement fan unit assembly (NTMX2658) by sliding the tabs into the clips on the base plate assembly.

21   Carefully reinstall the original fan unit assembly on the right side by sliding the tabs into the clips on the base plate assembly.

22   Tighten the thumbscrews securing both fan unit assemblies to the base plate assembly.

23

> **DANGER**
> **High energy hazard**
> Personal injury can result from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

> **DANGER**
> **Overheating, high energy hazard**
> Service interruption or damage to equipment can result from leaving the fans off for longer than 30 min or from metallic objects coming into contact with connections on the terminal blocks located on the rear of the MCRM-S.

Remove the NoMex paper covering the terminal blocks.

24   Carefully reconnect both fan connectors at locations J02 and J03.

25   You have successfully completed this procedure.

Meridian SuperNode

Commercial Systems
Routine Maintenance Procedures

**NORTEL
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