297-7001-502

DMS-100 Family

DMS VoiceMail

Card Replacement Procedures

SPM 02 Standard 02.02 March 1994

northern telecom

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Draft 02.02 is the first standard version of this document for Release SPM 02 DMS VoiceMail.

Contents

List of terms 4-1

List of figures

List of procedures

List of tables

About this document

When to use this document

This document is written for all DMS-100 Family offices. More than one version of this document may exist. To determine whether you have the latest version of this document, check the release information in *DMS-100 Family Guide to Northern Telecom Publications*, 297-1001-001.

How DMS VoiceMail documentation is organized

This document is part of DMS VoiceMail documentation that supports the Northern Telecom line of DMS VoiceMail products. DMS VoiceMail documentation is a subset of the DMS-100 Family library.

The DMS-100 Family library is structured in numbered layers, and each layer is associated with an NT product. To understand DMS VoiceMail products, you need documents from the following layers:

- DMS-100 Family basic documents in the 297-1001 layer
- DMS VoiceMail documents in the 297-7001 layer

DMS VoiceMail documents and other documents that contain related information are listed in "Finding DMS VoiceMail information" in *DMS VoiceMail Product Guide* (NTP 297-7001-010).

References in this document

The following documents are referred to in this document.

Number	Title
297-7001-010	*DMS VoiceMail Product Guide*
297-7001-300	*DMS VoiceMail System Administration Guide*
297-7001-503	*DMS VoiceMail Trouble Locating and Alarm Clearing Procedures*

What precautionary messages mean

Danger, warning, and caution messages in this document indicate potential risks. These messages and their meanings are listed in the following chart.

Message	Significance
DANGER	Possibility of personal injury
WARNING	Possibility of equipment damage
CAUTION	Possibility of service interruption or degradation

Examples of the precautionary messages follow.

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

WARNING
Damage to backplane connector pins
Use light thumb pressure to align the card with the connectors. Next, use the levers to seat the card into the connectors. Failure to align the card first may result in bending of the backplane connector pins.

CAUTION
Loss of service
Subscriber service will be lost if you accidentally remove a card from the active unit of the peripheral module (PM). Before continuing, confirm that you are removing the card from the inactive unit of the PM.

Regulatory notices

1 The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be

aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution ma;y be particularly important in rural areas.

DANGER
Risk of electrocution
Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

2 **Notice for installations in the United States:**

The Northern Telecom service peripheral module (SPM) system complies with Part 68 of the FCC rules. On the inside door of the cabinet is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

The REN represents the electrical load that will be applied to your telephone line once a SPM port is connected to the network. The telephone line serving your premises will not operate properly if the total ringer load exceeds the capability of your telephone company central office equipment. If you desire to know the total REN allowed for your line, call your telephone company and they will inform you. Normally, no SPM modem port should share the line with any other device.

If your Northern Telecom SPM causes harm to the telephone network, the telephone company may disconnect your service temporarily. The telephone company may ask you to disconnect the equipment from the network until the problem has been corrected or may ask you to check for any equipment malfunction. If possible, the telephone company will notify you in advance of any loss of service; if not, you will be notified as soon as possible. You will then be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. You will be given advanced notice of these changes in order to maintain uninterrupted service.

If you experience problems with your Northern Telecom SPM equipment, contact your authorized distributor or service center in the United States for repair and warranty information. If you are unable to contact your distributor, call 1-800-NORTHERN.

3 The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the load numbers of all the devices does not exceed 100.

Understanding DMS VoiceMail

This chapter includes a description of the capabilities and operation of DMS VoiceMail, and the relationship of DMS VoiceMail to the public switching telephone network.

DMS VoiceMail overview

DMS VoiceMail is a voice processing system designed to provide call answering and voice messaging services for the central office (CO) environment. A DMS VoiceMail system uses a service peripheral module (SPM) and voice processing software, and is administered from either a local or remote terminal.

In the CO environment, DMS VoiceMail supports the DMS-100 switch as well as other central office switches. DMS VoiceMail provides a variety of voice mail services which are sold to user groups as packages. A package can include some or all of the available services.

DMS VoiceMail users are assigned a voice mailbox which they have the option of accessing with a private password. Recorded prompts guide users whenever necessary, and also assist callers to leave messages.

The Simplified Call Answering feature package includes call answering and message retrieval functions, with a subset for users with dial pulse sets. It is intended for residential and small business users.

The Voice Messaging feature package offers enhanced voice mail capabilities in addition to basic call answering and message retrieval. This feature package is primarily intended for Centrex business users.

Optional feature packages include AMIS Analog Networking, Voice Forms, Voice Menus, and Family Mailbox.

How typical messaging systems are deployed

Messaging systems can be deployed as either a small adjunct processor located with individual end offices, or as a larger centralized messaging system that supports a number of end offices. In either case, the voice path is usually over dedicated T1 trunks and the signaling path is typically over dedicated simplified message desk interface (SMDI) links.

Figure 1-1 illustrates a typical end office deployment strategy.

Figure 1-1xxx
Typical end office deployment

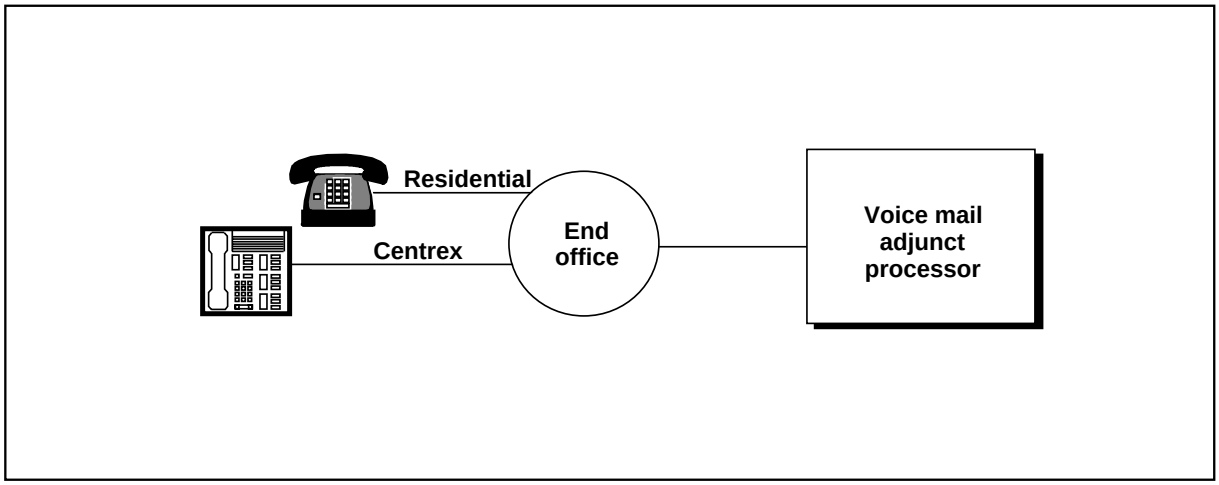
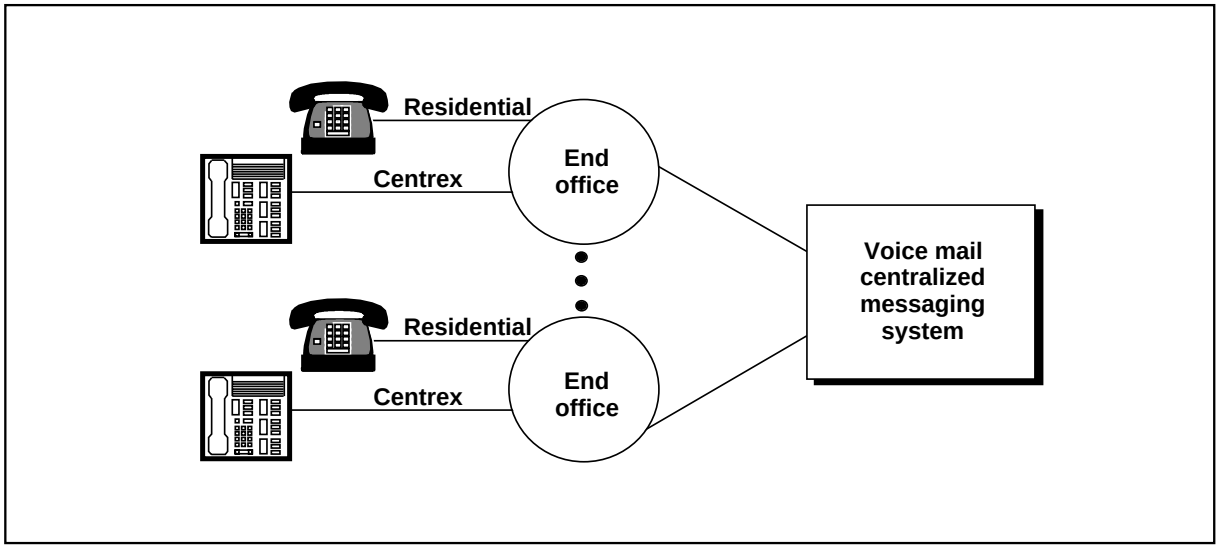


Figure 1-2 illustrates a typical centralized deployment strategy.

Figure 1-2xxx
Typical centralized deployment



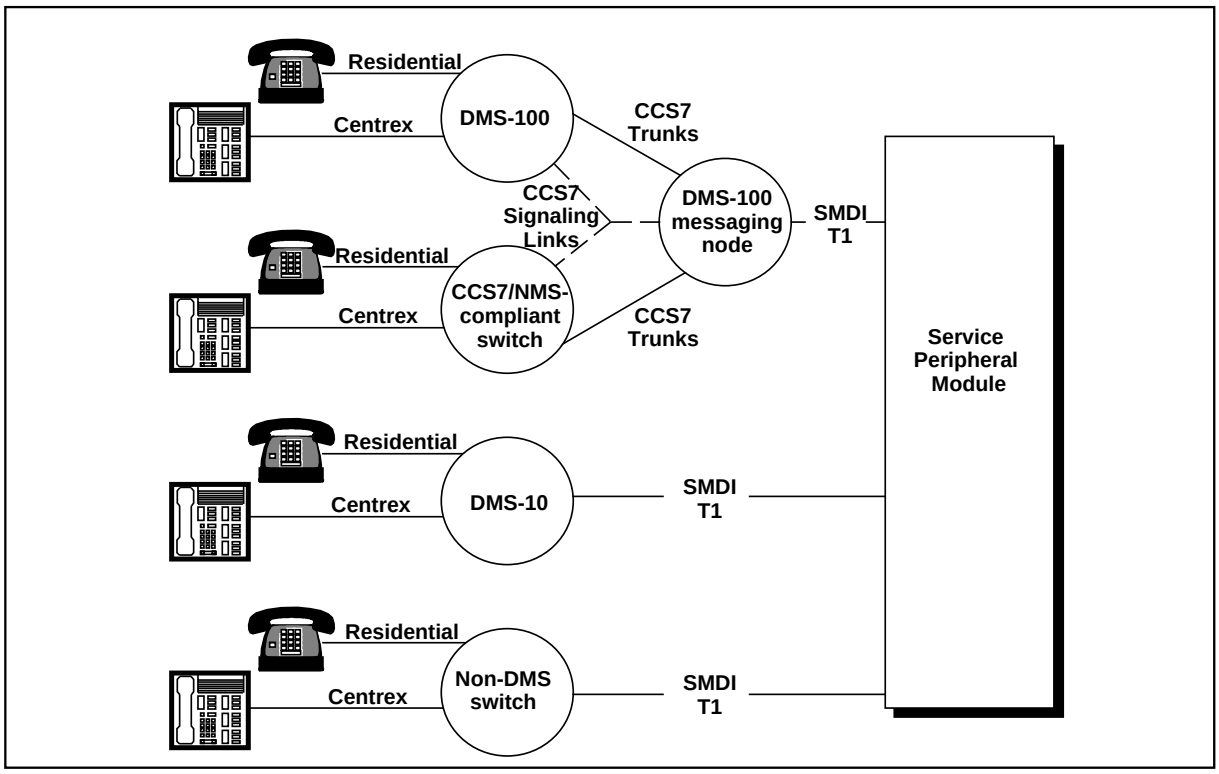
DMS VoiceMail deployment

Deploying an SPM is a solution for messaging systems serving less than 40,000 users. DMS VoiceMail provides a voice messaging system that consists of one SPM and voice processing software, administered from a local or remote terminal.

The SPM is a voice processing server developed for DMS-100 Family and other types of central office switches. The SPM contains up to 192 voice channels for the operating company to provide voice mail service to users.

Figure 1-3 illustrates a typical network configuration using an SPM.

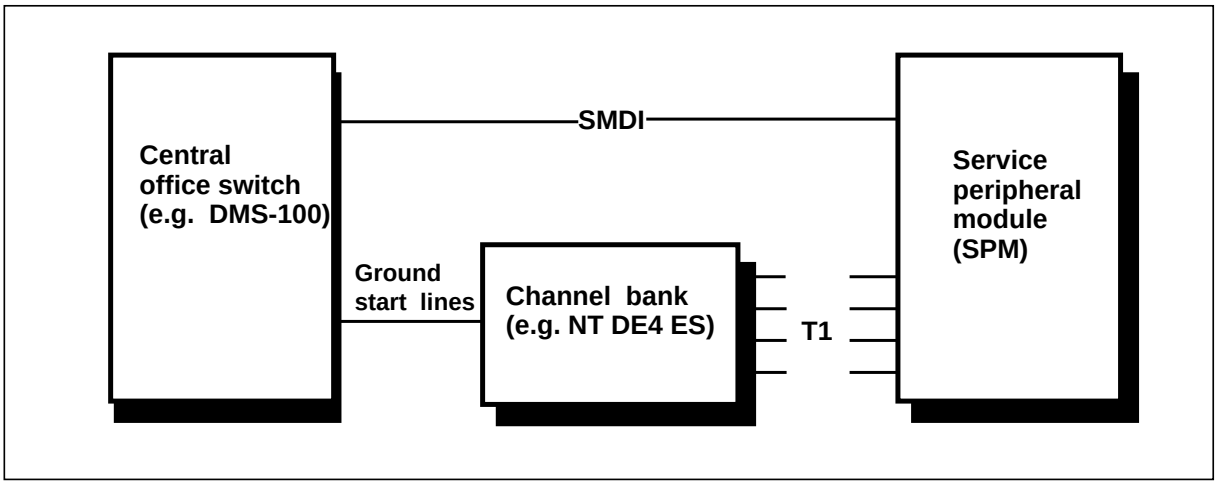
Figure 1-3xxx
Dedicated SPM



Note: Network Message Service (NMS) is an optional network interface for DMS VoiceMail. NMS uses common channel signaling 7 (CCS7) to offer message service to an entire city, or LATA, from a centralized DMS-100 messaging node in the network.

Figure 1-4 illustrates how the SPM is provisioned with the DMS-100 Family, or alternate, central office switch.

Figure 1-4xxx
SPM hardware configuration



System capacity

The number of mailboxes on a DMS VoiceMail system is calculated by the total available hours of storage, divided by the average time taken by each user's messages and greetings. The average per mailbox time depends on the mailbox size limits and message deletion policy, both of which are set by the service provider.

The SPM is provisioned by selecting appropriate numbers of voice ports and hours of storage. The amount of memory is fixed and is sufficient to run all the supported applications and utilities under full load even in the presence of single point failures. Capacity will be limited more by the number of ports than by limitations of the SPM.

Table 1-1 shows the maximum capacities for the dedicated SPM configuration.

Table 1-1xxx
DMS VoiceMail system capacities

Item	System maximum
Voice messaging channels	192
Voice storage hours	1,200
Storage hours for voice menus, voice form definitions, and personal verifications	100
Customer groups per system	2,000
Registered mailboxes per system	40,000
Messages per mailbox	999
Minutes per mailbox	360
Voice service DNs	4,000
Voice menus	4,000
Classes of service	127
Distribution lists per organization	No Limit
Entries per organization distribution list	120
Distribution lists per mailbox	9
Entries per mailbox list	99
Administrative positions	4
Maintenance console	1
Maintenance printer	1
SMDI links	16
Languages	3

System response time

Under normal conditions, for most voice messaging functions, response time should be under one second 95% of the time, and over four seconds no more than one per 10,000 instances.

Administration of DMS VoiceMail

Up to four administrative positions can operate simultaneously from locally or remotely attached terminals: one main administration terminal and up to three multiple administration terminals (MATs) which can only be used to perform user administration, voice services administration, and (view-mode

only) class of service administration. System events are recorded in a log file and reports are printed on a locally attached printer.

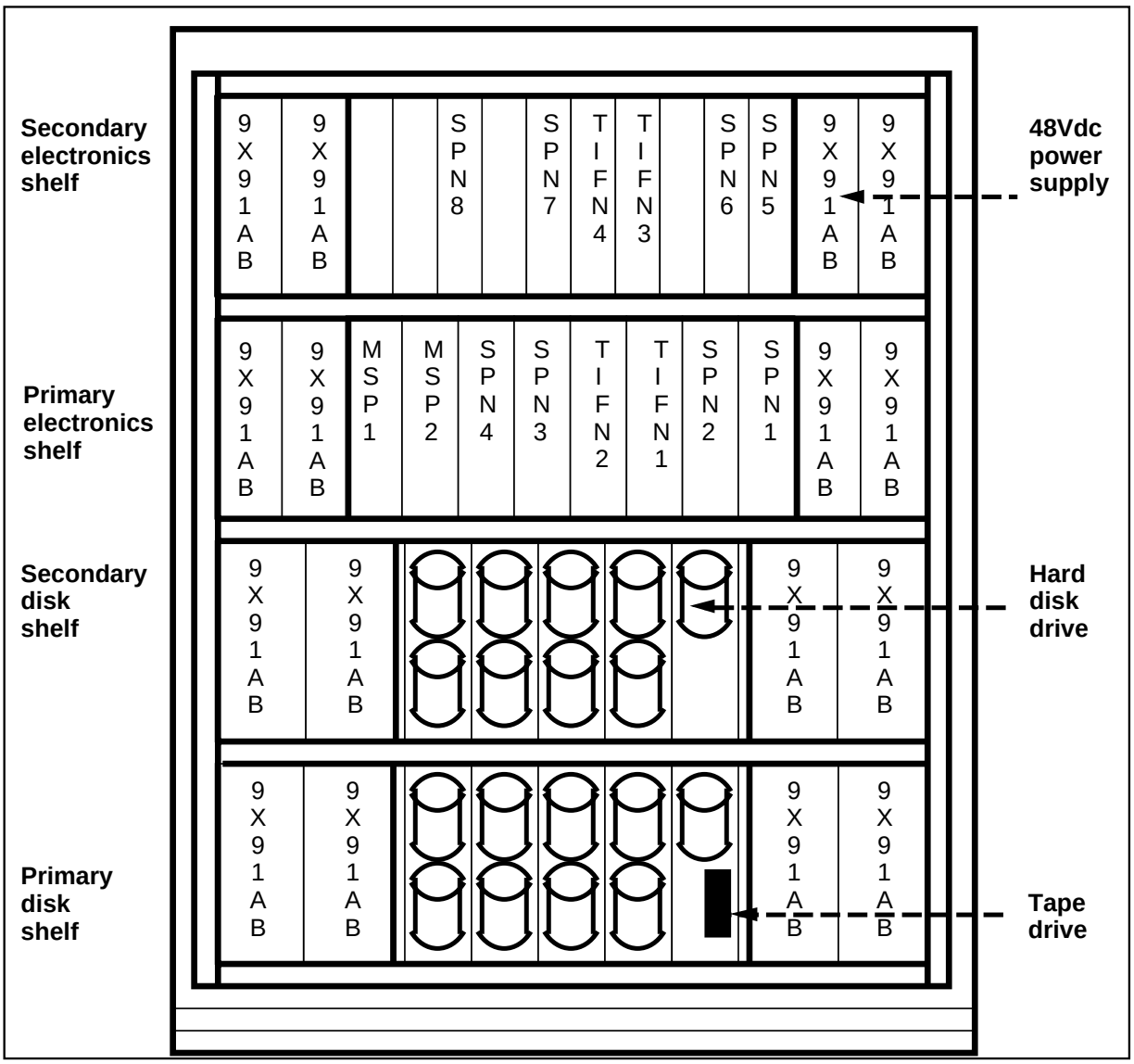
The system can be administered remotely through modem access. However, the system cannot be administered both locally and remotely at the same time.

Hardware components

The Service Peripheral Module (SPM) for DMS VoiceMail contains two Multi-Server Processors (MSPs), one or more Signal Processing Nodes (SPNs) and a proportionate number of Telephony Interface Nodes (TIFNs). An MMail bus transports signals between the nodes. The Service Peripheral Module also contains storage modules, a tape drive, transition modules (paddleboards), and power supplies. The transition module (TM) is plugged into the back of the Service Peripheral and provides external connections to the Service Peripheral. Refer to Figures 1-6 and 1-5 for illustration of the main components and their locations in the SPM.

Figure 1-5 illustrates the physical layout of a SPM for a fully configured DMS VoiceMail system.

Figure 1-5
Service Peripheral Module (SPM) for a fully configured DMS VoiceMail system



The system hardware has the following characteristics:

- 192 port, 1200 hour capacity
- Disk shadowing
- High reliability
- Paired MSP, T1, and SPN nodes
- T1/Groundstart links

- C42 cabinet
- Enhanced Service node

Multi-server processor (MSP)

The MSP consists of two full-size cards, the 68K processor card and the Bus Controller. The 68K card provides the processing environment for common system data such as directory and message transfer. The Bus Controller provides system clocks and acts as bus master. A storage module is associated with each MSP to hold system data.

Signal processing node (SPN)

The SPN has a 68K processor card, plus one or two VP12 cards (12 ports each). The SPNs handle all voice processing, up to a maximum capacity of 24 channels per SPN. A storage module is associated with each SPN to hold user data. SPNs are paired so that if one fails, the other can access the user messages associated with the failed SPN.

Telephony interface node (TIFN)

The TIFN consists of a 68K processor card and a T1 card. The 68K card provides processing for the T1 environment. The T1 card terminates 4 T1 links. Incoming voice calls are transported from TIFNs to SPNs over two parallel voice buses. The telephony interface functionality is isolated on a node separate from the SPN to allow new interfaces to be developed without requiring any changes to the SPN.

MMail Bus

The MMail Bus provides communication between the nodes. It has two components-an asynchronous packet bus for data transmission and a synchronous voice bus for PCM voice traffic. The voice bus allows separation between the voice processing and telephony interface functions. This separation allows for flexible mapping of voice processing resources to incoming channels, facilitating development of advanced services such as FAX and speech recognition.

Storage Modules

Disk drives

A storage module consisting of one or two disk drives is associated with each MSP and SPN. Information is written to two disks at the same time, one called the primary disk and one the shadow disk. In case of a disk drive failure, either disk drive has a complete set of information to allow it to continue full service alone.

Tape drive

A 150MB tape drive is supplied with the MSP node and is used for program loading and backup/restore procedures. A partial backup involving system data, user profiles, and spoken names for a 192-port system will take

approximately two hours and four tapes. The disk shadowing capability of the system reduces the need for backups, since the data is implicitly "backed up" by shadowing.

Transition modules

All electronics cards are inserted into a backplane from the front of the cabinet. Most cards have a transition module (paddleboard) connected from the rear of the cabinet which provide the connection for all system input and output except battery, grounding, and frame supervisory panel connections.

68K transition module

The 68K transition module handles the I/O requirements at the 68K board.

Bus controller transition module

The bus controller transition module provides relays for alarm signals.

T1 transition module

The T1 transition module provides external connectorization and termination for the four T1 lines.

Modem transition module

The modem transition module provides four SMDI links for use with the TIFN.

Bus extension transition module

This transition module is used to extend the MMail bus from shelf to shelf.

Bus termination transition module

This transition module provides the electrical termination for the MMail bus.

SPM logical architecture

Figure 1-6 shows the main hardware components of the Service Peripheral Module. Figure 1-7, 1-8, 1-9, and 1-10 show the logical architectures for SPM capacity configurations up to 192 ports.

Figure 1-6
SPM logical architecture for DMS VoiceMail

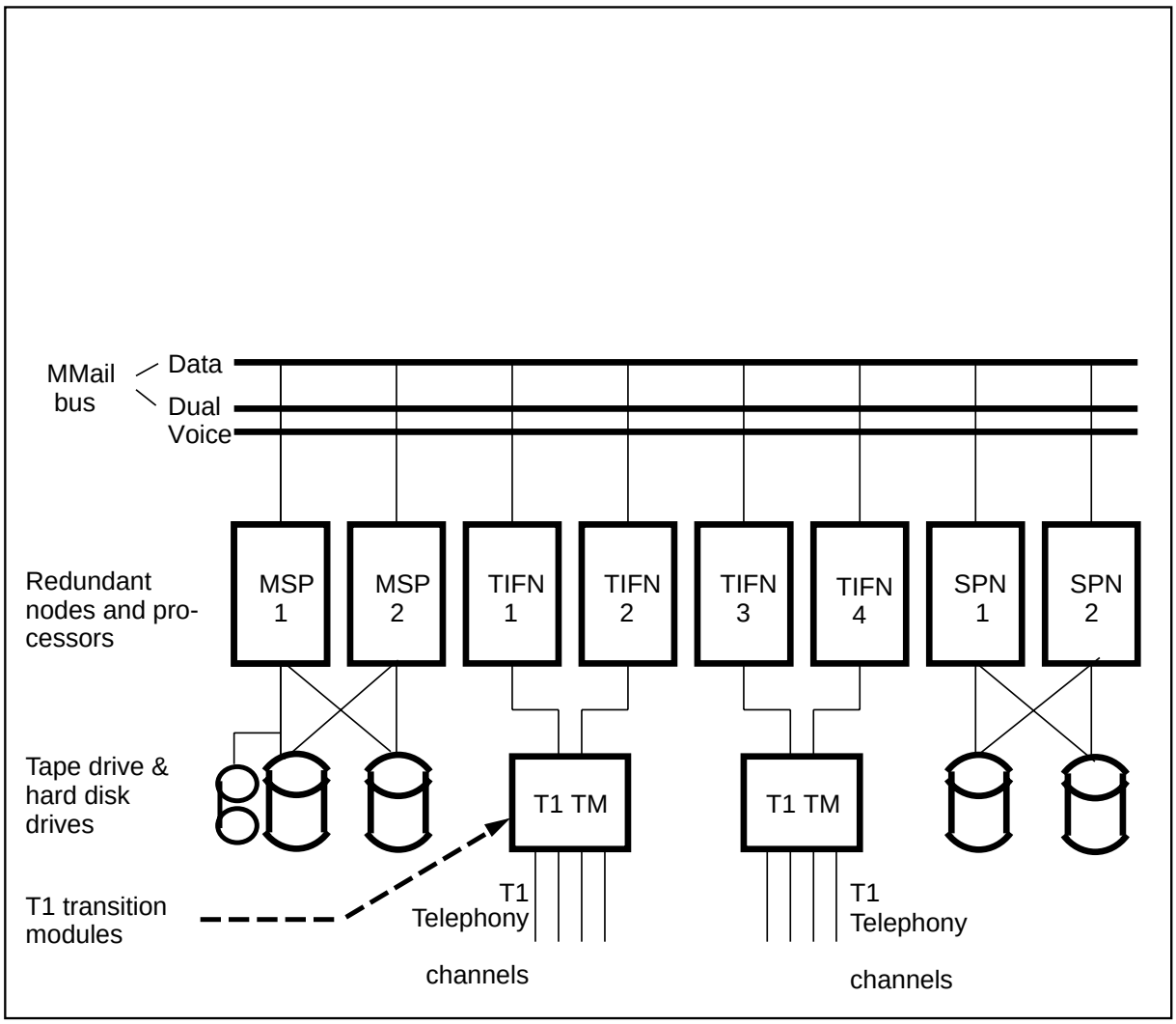


Figure 1-7xxx
DMS VoiceMail logical architecture - primary electronics shelf (24-48 ports)

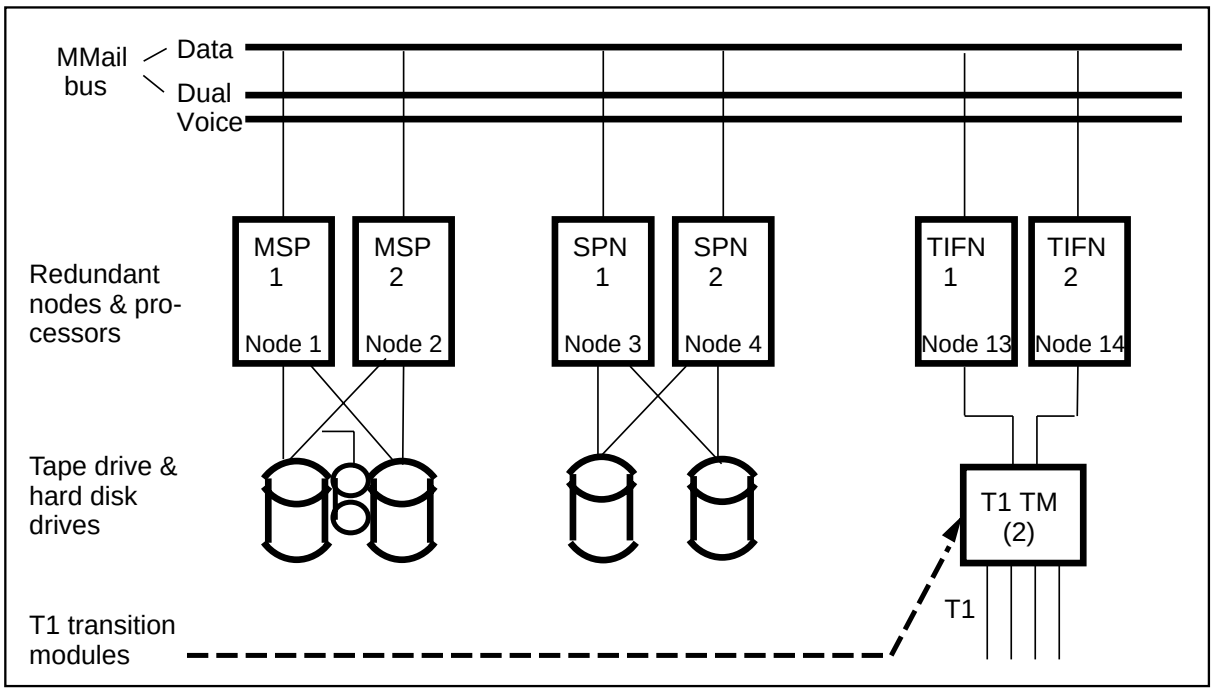


Figure 1-8
DMS VoiceMail logical architecture - primary electronics shelf (72 - 96 ports)

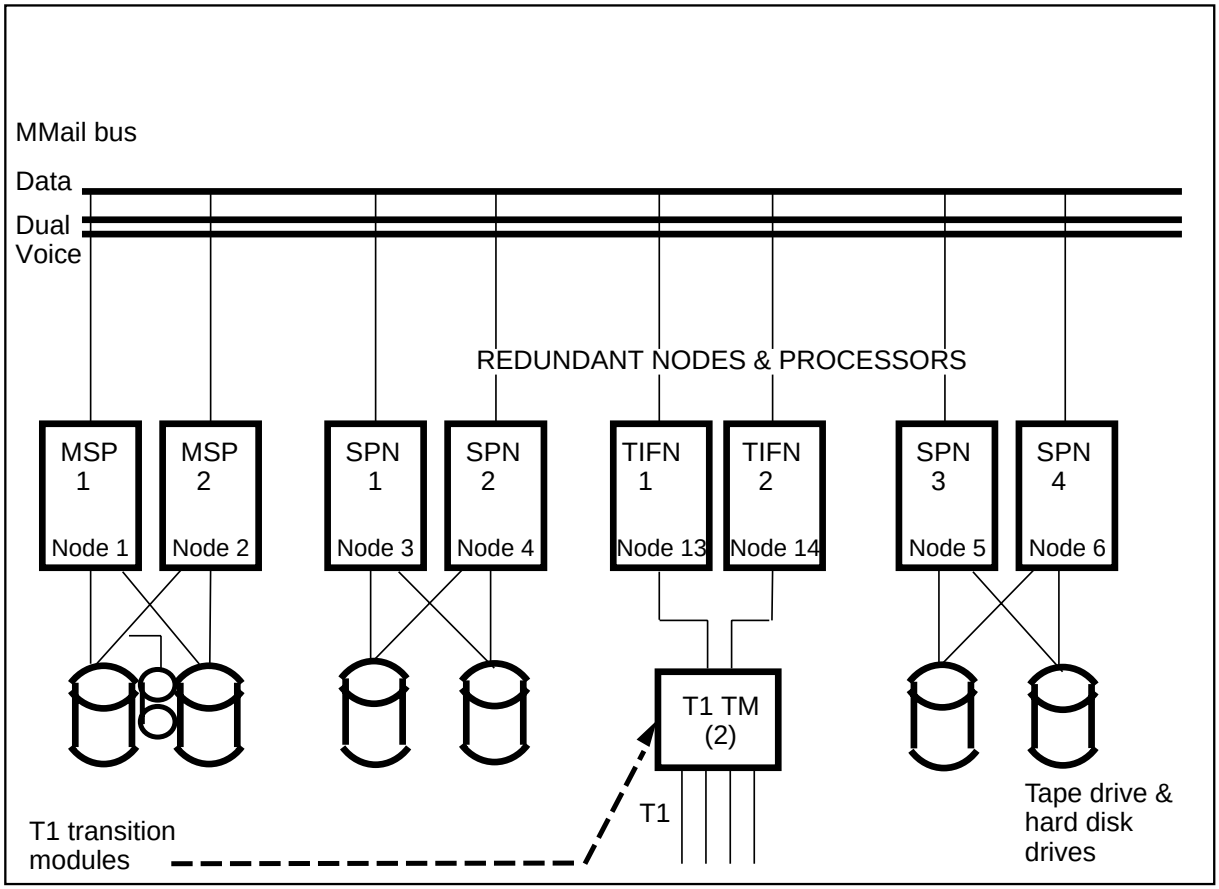


Figure 1-9
DMS VoiceMail logical architecture - secondary electronics shelf (120 - 144 ports)

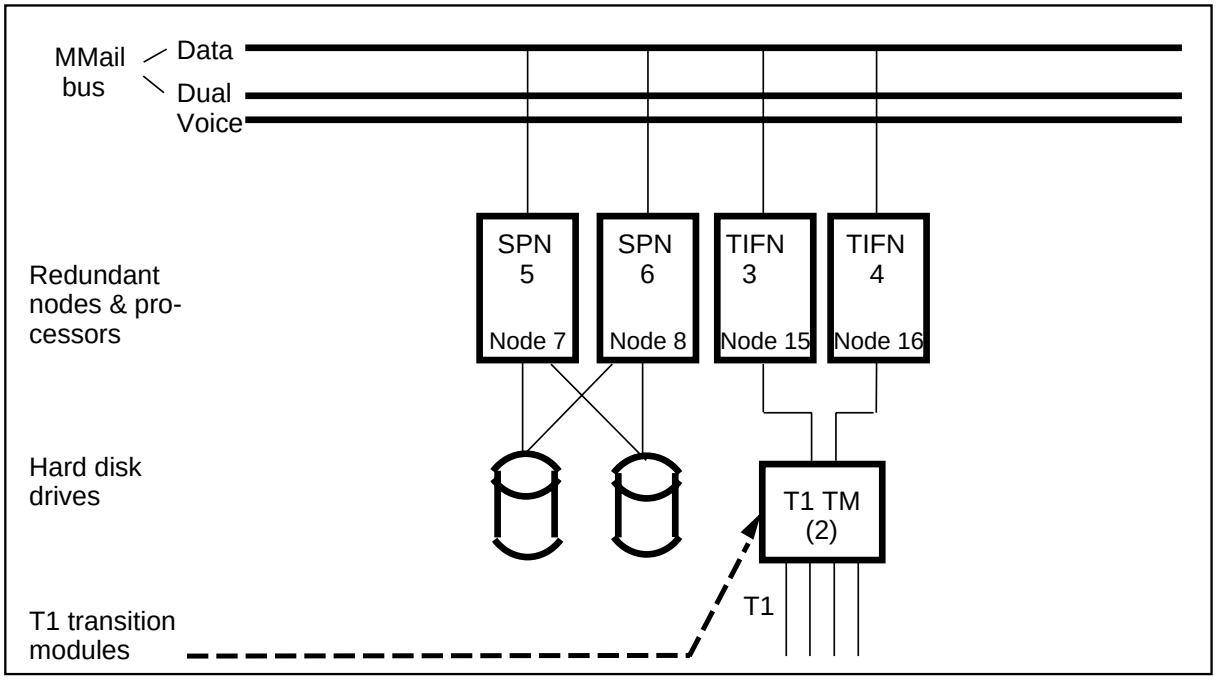
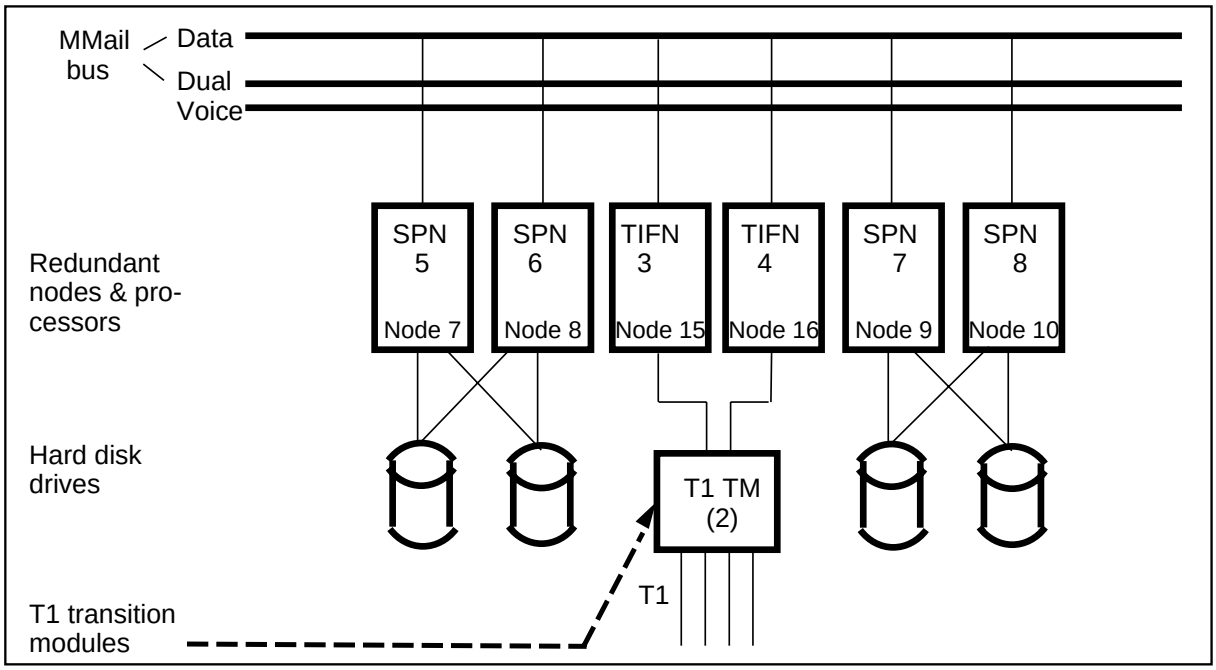


Figure 1-10
DMS VoiceMail logical architecture - secondary electronics shelf (168 - 192 ports)



External hardware packaging

The Service Peripheral Module is housed in the S/DMS SuperNode cabinet in Streamline packaging. The cabinet provides four shelves- two electrical and two disk shelves. Each half shelf is powered by a pair of redundant converters. The electronics interface from the system to the outside is carried out via four I/O panels, located on bulkheads at both electronics shelves.

Power requirements

The Service Peripheral Module is powered from a 48 V dc supply. All shelves are powered by NT9X91AB power units in a redundant A/B configuration. Estimated power drain for the SPM is 50 amps, and there are no special safety/grounding issues.

Hardware maintenance

All components can be taken out of service immediately, or via "courtesy-down", which allows calls-in-progress to end first. Diagnostics are executed automatically on node or system powerup, or when a reset is requested. Voice ports are enabled only if the diagnostics are successfully passed. Cards, unless specified otherwise, are "hot-pluggable" in that the card can be inserted or removed while under power without damage to the card or backplane, and without affecting other system resources.

Connectivity

Multiple SMDI links

Up to four SMDI links can be supported for each TIFN pair. Each of the SMDI links is duplicated so that in the event of a TIFN failure, the link is switched to the redundant TIFN. This works out to a total of eight redundant ports or 16 non-redundant ports.

T1 links

Up to eight T1 links transmit the digitized voice signals to the TIFN at the Service Peripheral Module, with a maximum of 4 T1s per redundant TIFN pair. A Channel Bank digitizes the analog signal arriving on the Ground-Start lines from the Central Office switch before transmitting the signal to the T1 link.

The Service Peripheral Module (SPM) supports the following connections:

- Single Connection, Network Service
  - SPM services a network of switches (possibly multi-vendors) through a single logical connection to one DMS switch.
  - Switches connected via Network Message Service or equivalent.
  - Single UCD queue and SMDI link. Multiple queues/links can be used if desired for traffic control and/or capacity reasons.

- Multiple Switch Connectivity
  - SPM ports are divided into separate groups each serving a specified switch.
  - Separate trunking and SMDI links for each port group.

Physical provisioning information

Provisioning information for the Service Peripheral Module is detailed in Tables 1-2, 1-3, 1-4 and 1-5. Corresponding physical shelf/slot numbers are provided in Tables 1-6, 1-7, 1-8, and 1-9.

Table 1-2
Primary electronics shelf physical card layout with provisioning algorithm

Unit	Slot	Card (front)	PEC code	Trans. module (rear)	PEC code	Ports						
						48	72	96	120	144	168	192
Power	1 2 3		NT9X91AB			X	X	X	X	X	X	X
Power	4 5 6		NT9X91AB			X	X	X	X	X	X	X
MSP1 Node 1	7 8 9	 68K BC	 NTGX05AA NTGX10AA	BUS-X 68K TM BC TM	NTGX04BA NTGX06AA NTGX11AA	X X X	X X X	X X X	X X X	X X X	X X X	X X X
MSP2 Node 2	10 11 12	BC 68K	NTGX10AA NTGX05AA	BC TM 68K TM	NTGX11AA NTGX06AA	X X	X X	X X	X X	X X	X X	X X
	13											
SPN4 Node 6	14 15 16	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	 68K TM	 NTGX06AA		X X	X X X	X X X	X X X	X X X	X X X
SPN3 Node 5	17 18 19	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	 68K TM	 NTGX06AA		X X	X X X	X X X	X X X	X X X	X X X
TIFN2 Node 14	20 21 22	68K T1	NTGX05AA NTGX08AA	MODM TI TM	NTGX07AA NTGX09AA	X X	X X	X X	X X	X X	X X	X X
TIFN1 Node 13	23 24 25	T1 68K	NTGX08AA NTGX05AA	T1 TM MODM	NTGX09AA NTGX07AA	X X	X X	X X	X X	X X	X X	X X
	26											
SPN2 Node 4	27 28 29	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	 68K TM	 NTGX06AA	X X X	X X X	X X X	X X X	X X X	X X X	X X X
SPN1 Node 3	30 31 32	68K VP12 VP12	NTGX05AA NTGX12AA NTGX12AA	68K TM BUS-T	NTGX06AA NTGX04AA	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Power	33 34 35		NT9X91AB			X	X	X	X	X	X	X
Power	36 37 38		NT9X91AB			X	X	X	X	X	X	X

Table 1-3
Secondary (expansion) electronics shelf physical card layout with provisioning algorithm

Unit	Slot	Card (front)	PEC code	Trans. module (rear)	PEC code	Ports						
						48	72	96	120	144	168	192
Power	1 2 3		NT9X91AB								X	X
Power	4 5 6		NT9X91AB								X	X
	7 8 9 10 11 12			BUS-X	NTGX04BA				X	X	X	X
SPN8 Node 10	13 14 15	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	 68K TM	 NTGX06AA						X X	X X X
	16											
SPN7 Node 9	17 18 19	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	68K TM	NTGX06AA						X X	X X X
TIFN4 Node 16	20 21 22	68K T1	NTGX05AA NTGX08AA	MODM TI TM	NTGX07AA NTGX09AA				X X	X X	X X	X X
TIFN3 Node 15	23 24 25	T1 68K	NTGX08AA NTGX05AA	T1 TM MODM	NTGX09AA NTGX07AA				X X	X X	X X	X X
	26											
SPN6 Node 8	27 28 29	VP12 VP12 68K	NTGX12AA NTGX12AA NTGX05AA	 68K TM	 NTGX06AA				X X	X X X	X X X	X X X
SPN5 Node 7	30 31 32	68K VP12 VP12	NTGX05AA NTGX12AA NTGX12AA	68K TM BUS-T	NTGX06AA NTGX04AA				X X	X X X	X X X	X X X
Power	33 34 35		NT9X91AB						X	X	X	X
Power	36 37 38		NT9X91AB						X	X	X	X

Table 1-4
Primary (lower) disk shelf physical card layout with provisioning algorithm

Unit	Slot	PEC Code (front view)	PEC code (rear view)	Ports						
				48	72	96	120	144	168	192
Power	1 2 3	NT9X91AB		X	X	X	X	X	X	X
Power	4 5 6	NT9X91AB		X	X	X	X	X	X	X
Disk 1	7 8 9 10 11	NTGX14AA/BA	NT9X19BC (Filler)	X	X	X	X	X	X	X
Disk 2	12 13 14 15 16	NTGX14AA/BA	NT9X19BC (Filler)	X	X	X	X	X	X	X
Disk 3	17 18 19 20 21	NTGX14AA/BA	NT9X19BC (Filler)		X	X	X	X	X	X
Disk 4	22 23 24 25 26	NTGX14AA/BA	NT9X19BC (Filler)		X	X	X	X	X	X
Disk/ Tape	27 28 29 30 31	NTGX15AA	NT9X19BC (Filler)	X	X	X	X	X	X	X
	32		NT9X19BB (Filler)	X	X	X	X	X	X	X
Power	33 34 35	NT9X91AB		X	X	X	X	X	X	X
Power	36 37 38	NT9X91AB		X	X	X	X	X	X	X

Table 1-5xxx
Secondary (upper) disk shelf physical card layout with provisioning algorithm

Unit	Slot	PEC code (front view)	PEC code (rear view)	Ports						
				48	72	96	120	144	168	192
Power	1 2 3	NT9X91AB					X	X	X	X
Power	4 5 6	NT9X91AB					X	X	X	X
Disk 5	7 8 9 10 11	NTGX14AA/BA	NT9X19BC (Filler)				X	X	X	X
Disk 6	12 13 14 15 16	NTGX14AA/BA	NT9X19BC (Filler)				X	X	X	X
Disk 7	17 18 19 20 21	NTGX14AA/BA	NT9X19BC (Filler)						X	X
Disk 8	22 23 24 25 26	NTGX14AA/BA	NT9X19BC (Filler)						X	X
Disk 9	27 28 29 30 31	NTGX14AA	NT9X19BC (Filler)	X	X	X	X	X	X	X
	32	NT9X19AA	NT9X19BB	X	X	X	X	X	X	X
Power	33 34 35	NT9X91AB		X	X	X	X	X	X	X
Power	36 37 38	NT9X91AB		X	X	X	X	X	X	X

Table 1-6
Primary electronic shelf (Shelf 26F)
Physical shelf/slot number and component designation

Node number	Slot number	Cards provisioned	PEC number	Administration terminal reference
Node 1	07	filler	NT9X19AA	
MSP 1	08	68K	NTGX05AA	1-2
	09	Bus controller	NTGX10AA	1-3
Node 2	10	Bus controller	NTGX10AA	2-1
MSP 2	11	filler	NT9X19AA	
	12	68K	NTGX05AA	2-3
Node 3	30	68K	NTGX05AA	3-1
SPN 1	31	VP12	NTGX12AA	3-2-*
	32	VP12	NTGX12AA	3-3-*
Node 4	27	VP12	NTGX12AA	4-1-*
SPN 1	28	VP12	NTGX12AA	4-2-*
	29	68K	NTGX05AA	4-3
Node 5	17	VP12	NTGX12AA	5-1-*
SPN 3	18	VP12	NTGX12AA	5-2-*
	19	68K	NTGX05AA	5-3
Node 6	14	VP12	NTGX12AA	6-1-*
SPN 3	15	VP12	NTGX12AA	6-2-*
	16	68K	NTGX05AA	6-3
Node 13	23	T1	NTGX08AA	13-1-*
TIFN1	24	filler	NT9X19AA	
	25	68K	NTGX05AA	13-3
Node 14	20	68K	NTGX05AA	14-1
TIFN2	21	filler	NT9X19AA	
	22	T1	NTGX08AA	14-3-*
-* port/link				

Table 1-7
Secondary electronic shelf (Shelf 39F)
Physical shelf/slot number and component designation

Node number	Slot number	Cards provisioned	PEC number	Administration terminal reference
Node 7	30	68K	NTGX05AA	7-1
SPN 5	31	VP12	NTGX12AA	7-2-*
	32	VP12	NTGX12AA	7-3-*
Node 8	27	VP12	NTGX12AA	8-1-*
SPN 6	28	VP12	NTGX12AA	8-2-*
	29	68K	NTGX05AA	8-3
Node 9	17	VP12	NTGX12AA	9-1-*
SPN 7	18	VP12	NTGX12AA	9-2-*
	19	68K	NTGX05AA	9-3
Node 10	13	VP12	NTGX12AA	10-1-*
SPN 8	14	VP12	NTGX12AA	10-2-*
	15	68K	NTGX05AA	10-3
Node 15	23	T1	NTGX08AA	15-1-*
T!FN 3	24	filler	NT9X19AA	
	25	68K	NTGX05AA	15-3
Node 16	20	68K	NTGX05AA	16-1
TIFN4	21	filler	NT9X19AA	
	22	T1	NTGX08AA	16-3-*
-* port/link				

Table 1-8
Primary disk shelf (Shelf 00F)
Physical shelf/slot number and component designation

Node number	Slot number	Cards provisioned	PEC number	Administration terminal reference
Node 1 MSP 1	27	Disk/tape	NTGX15AA	
Node 3 SPN 1	07	Disk	NTGX14_A	
Node 4 SPN 2	12	Disk	NTGX14_A	
Node 5 SPN 3	17	Disk	NTGX14_A	
Node 6 SPN 4	22	Disk	NTGX14_A	

Table 1-9
Secondary disk shelf (Shelf 13F)
Physical shelf/slot number and component designation

Node number	Slot number	Cards provisioned	PEC number	Administration terminal reference
Node 2 MSP 2	27	Disk	NTGX14AA	
Node 7 SPN 5	07	Disk	NTGX14_A	
Node 8 SPN 6	12	Disk	NTGX14_A	
Node 9 SPN 7	17	Disk	NTGX14_A	
Node 10 SPN 8	22	Disk	NTGX14_A	

Hardware provisioning

Hardware product codes

The hardware product codes for the Service Peripheral Module (SPM) are detailed in the following table.

Table 1-10xxx
Hardware product codes

Product status	PEC	Title
STD	NTGX01AA	Network Applications Serv Cabinet
STD	NTGX04AA	Bus Term Transition Module (PB)
STD	NTGX04BA	Bus Extender Transition Module (PB)
STD	NTGX05AA	68K Main Circuit Pack
STD	NTGX06AA	68K Transition Module (PB)
STD	NTGX07AA	Modem Transition Module (PB)
STD	NTGX08AA	T1 Main Circuit Pack
STD	NTGX09AA	T1 Transition Module (PB)
STD	NTGX10AA	Bus Controller Main Circuit Pack
STD	NTGX11AA	Bus Controller Transition Module (PB)
STD	NTGX12AA	VP12 Circuit Pack
STD	NTGX14AA	1200 MB Disk Module Assembly
STD	NTGX14BA	Dual 1200 MB Disk Module Assembly
STD	NTGX15AA	Disk Tape Module Assembly
STD	NTGX19BC	Disk Shelf Rear Filler CP
STD	NTGX19CA	Power Converter Filler Pack Assembly
STD	NT9X91AB	+5V/+12 V Power Converter Circuit Pack

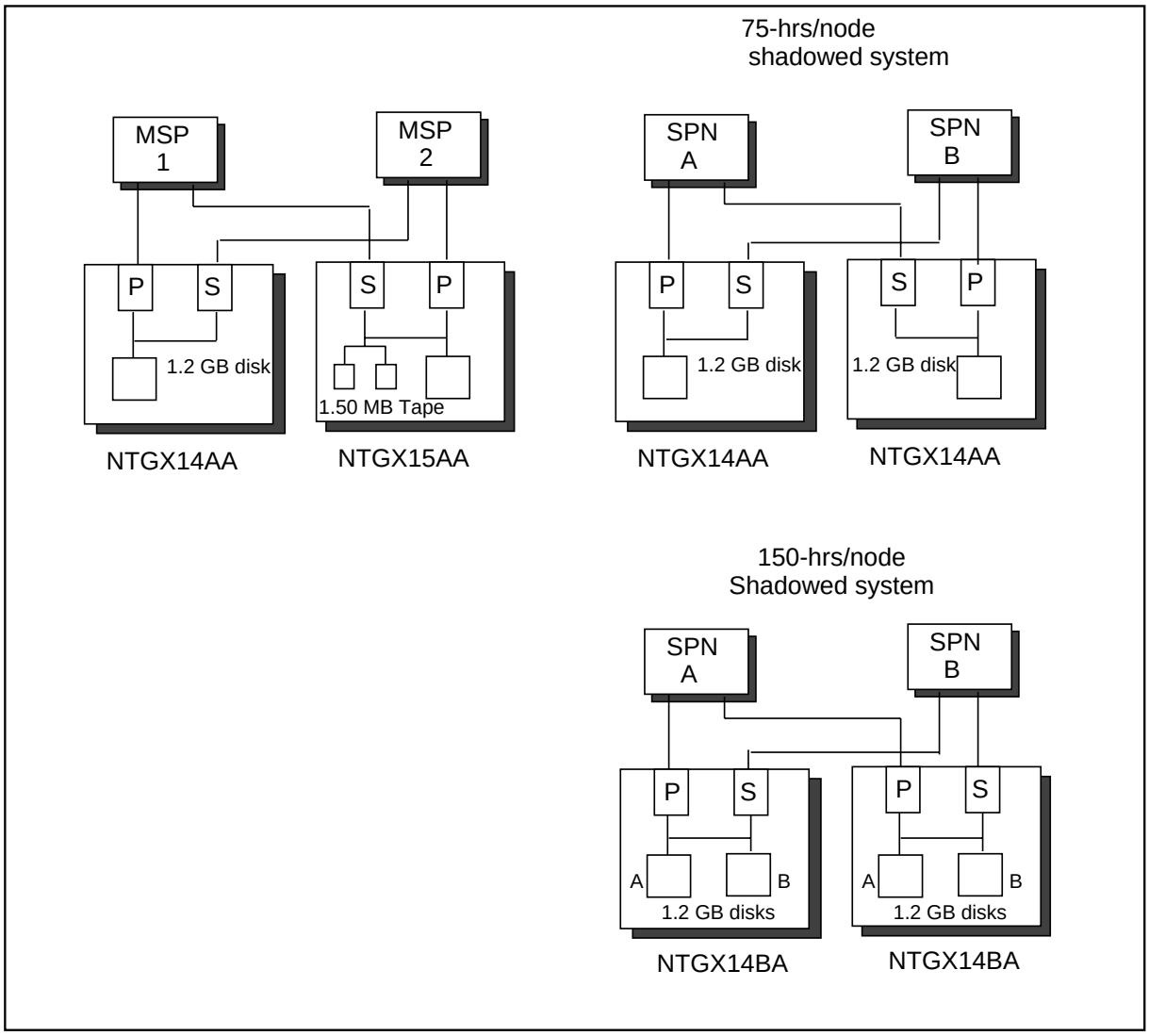
Note: PB stands for paddle board. The transition module is a paddle board that provides connections between the various nodes of the SPM and external devices.

Disk storage options

Several disk storage options are available for the MSP and the SPN. They are:

- SPN 75-hr shadowed/150-hr unshadowed systems - NTGX14AA
- SPN 150-hr (dual) shadowed systems - NTGX14BA
- MSP Disk/Tape unit - NTGX15AA

Figure 1-11xxx
Disk storage configurations for shadowed systems



Hardware dependencies

The Service Peripheral Module uses the S/DMS Supernode frame. The outcome of the S/DMS program will thus impact the SPM.

Physical specifications

The following specifications are for the SPM.

- Height 72 in. (183 cm)
- Width 42 in. (107 cm)
- Depth 28 in. (71 cm)
- Current drain 50 Amps
- Power consumption 1200 watts for a 96-port system
  2400 watts for a 192-port system
- Thermal profile not more than $20\ ^{0}$ C above ambient

Electromagnetic interference (EMI) information

The Service Peripheral Module uses the S/DMS Supernode frame. EMI and earthquake compliance will depend on the outcome of the S/DMS program.

Earthquake information

The Service Peripheral Module uses the S/DMS Supernode frame. EMI and earthquake compliance will depend on the outcome of the S/DMS program.

Sparing recommendations

The sparing information is detailed below. Mean Time Between Failure (MTBF) figures are shown for the main Service Peripheral Module components.

- MSP: 4.4 years
- SPN: 3.5 years
- TIFN: 4.4 years
- SPM system: 42.7 years

Table 1-11xxx
Spares planning- recommended number of spares

PEC	Description	Spares
NTGX04AA	DMS VoiceMail Bus Terminator Transition Module (PB)	1
NTGX04BA	DMS VoiceMail Bus Extender Transition Module (PB)	1
NTGX05AA	68K Main Circuit Pack	2
NTGX06AA	68K Transition Module (PB)	2
NTGX07AA	Modem Transition Module (PB)	1
NTGX08AA	T1 Main Circuit Pack	1
NTGX09AA	T1 Transition Module (PB)	1
NTGX10AA	Bus Controller Main Circuit Pack	1
NTGX11AA	Bus Controller Transition Module (PB)	1

NTGX12AA	VP12 Circuit Pack	2
NTGX14AA	1200 MB Disk Module Assembly	1 or 2
NTGX14BA	Dual 1200 MB Disk Module Assembly	1 or 2 *
NTGX15AA	Disk Tape Module Assembly	1
NT9X91AB	+5V/+12 V Power Converter Circuit Pack	2
	SMDI Link cable	1

***** 1200 Mb Disk module assembly (NTGX14BA) not required in CPE

Fusing requirements

Table 1-12
Fusing requirements for the SPM

Shelf	**Fuse** (amps)
Shelf Pos 00 - A	20
Shelf Pos 00 - B	20
Shelf Pos 13 - A	20
Shelf Pos 13 - B	20
Shelf Pos 26 - A	30
Shelf Pos 26 - B	30
Shelf Pos 39 - A	30
Shelf Pos 39 - B	30
Blower - A	10
Blower - B	10

Maintenance impact

Analysis of a switching system is based on a combination of maintenance and traffic indicators. These indicators denote the state of the system and assist in identifying actual or potential service problems.

To assist in an analysis of the grade of service provided and of DMS VoiceMail performance, a set of operational measurements is provided by the DMS VoiceMail system. Operational measurements associated with provisioning and administration can be used to determine if adequate software and hardware resources are provided. For more information on these measurements, refer to the *System Administration Guide* (297-7001-300) for multi-customer systems, or the *Administration Guide* (297-7001-302) for single-customer systems.

In addition, maintenance measurements, along with log reports, provide data that is used to evaluate DMS VoiceMail performance and the impact on system performance.

Card replacement procedures

Task list

The following list provides the names of the procedures in this chapter. The procedures are organized alphanumerically by the Product Engineering Code (PEC) of the card. To find the appropriate procedure, look for the PEC in the left column and go to the page number listed in the right column. If more than one entry appears under a PEC, look for the appropriate shelf location of the card (that is, primary or secondary shelf).

This chapter contains procedures for changing cards in the DMS VoiceMail

- explanatory and context-setting information
- summary flowchart
- step-action instructions

Explanatory and context-setting information

In each procedure, the paragraph titled “Application” tells you where you can use this procedure and for which versions of a card. Read this section before you try to perform the step-action instructions. The paragraph titled “Common procedures” lists common procedures that you may be asked to perform as you follow the step-action instructions. Go to these common procedures only when directed to do so.

Summary flowchart

The flowchart is a simplified summary of the main actions, decision points, and possible paths you may take. **Do not use the summary flowchart to perform the procedures**. Instead, use it to preview what you will be doing and to prepare for the procedure. For example, if you see that these instructions will involve another office, you will know to advise that office before you begin the step-action instructions.

Step-action instructions

The step-action instructions tell you how to change a card. Normally, you will perform the steps in order, but you may be directed to return to a previous step and repeat a sequence. The successful completion of a step in a sequence may depend on previous steps; therefore, always perform the steps in the order specified.

While following the step-action instructions, you may be referred to the “Common procedures” chapter of this book to perform a set of instructions or to another NTP for a related procedure. If this happens, you will be told when to return to the original instructions, and to which point in those instructions you should go.

The step-action instructions provide the command syntax and machine output you use or see while performing this procedure. For help on DMS commands or output (for example, problems logging into a utility), see *DMS VoiceMail Administration Guide,* 297-7001-300.

NTGX04AA
in a primary electronics shelf

Application

Use this procedure to replace the following card in a primary electronics shelf.

PEC	Suffixes	Name
NTGX04	AA	Bus terminator transition module

Action

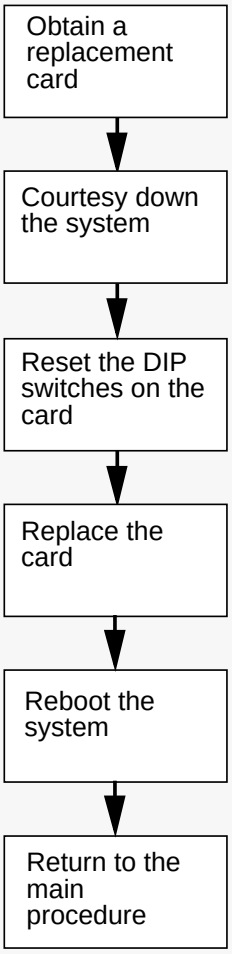
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

NTGX04AA (continued)
in a primary electronics shelf (continued)

Replacing a NTGX04AA in a primary electronics shelf

This flowchart summarizes the procedure.

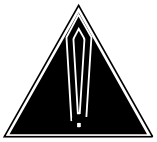
Use the instructions in the step-action table that follows this flowchart to perform the procedure.



NTGX04AA (continued)
in a primary electronics shelf (continued)

Replacing a NTGX04AA in a primary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.



CAUTION
Interruption of service
Service will be interrupted while the system is undergoing a courtesy-down procedure.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

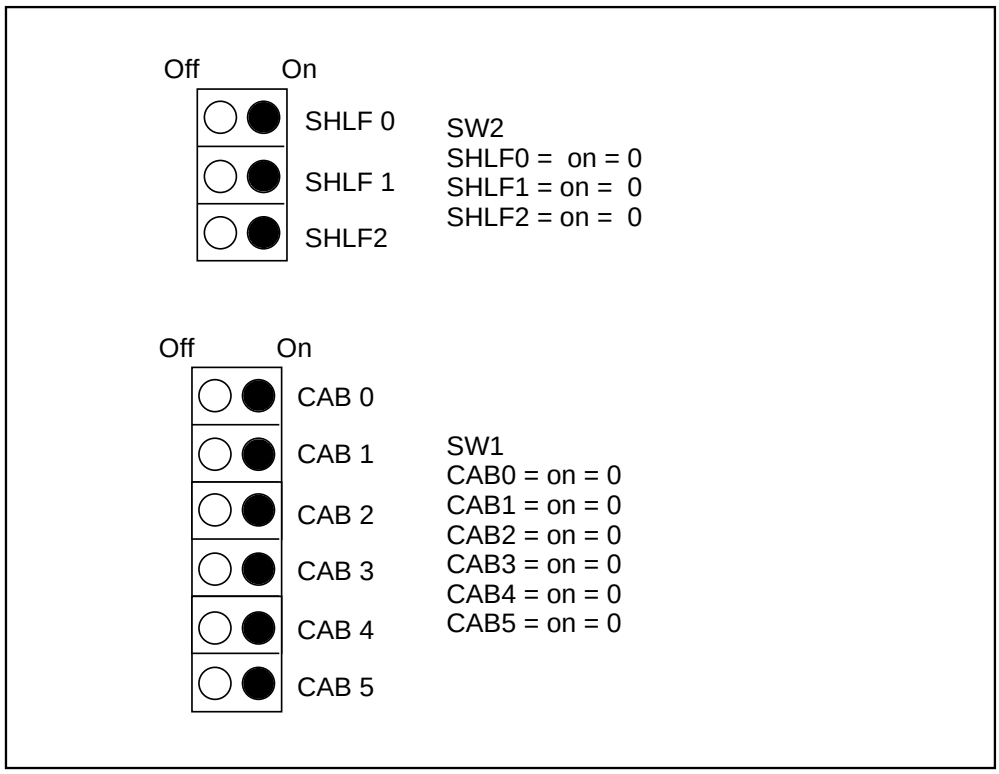
3	Perform the procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to access the System Status and Maintenance screen, followed by procedure 3-2 *Enabling and disabling nodes and disabling the system* on page 3-25 to courtesy down the system .
4	Set the DIP switches on the new card. The settings on the new card must be the same as those on the old card. See Table 2-1. When you have set the DIP switches, continue with step 5.
5	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9, replacing the NTGX04AA a 26R, slot 32. When you have completed that procedure, continue with step 6.
6	Reboot the system by turning the power off for ten seconds, then turning it on again.

-continued-

NTGX04AA (continued)
in a primary electronics shelf (end)

Replacing a NTGX04AA in a primary electronics shelf (continued)	
Step	**Action**
7	If you need further assistance, contact the personnel responsible for the next level of support.
8	You have completed this procedure.
	End

Table 2-1
Switch settings for the bus terminator transition module on the primary electronics shelf



NTGX04AA
in a secondary electronics shelf

Application

Use this procedure to replace the following card in a secondary electronics shelf.

PEC	Suffixes	Name
NTGX04	AA	Bus terminator transition module

Action

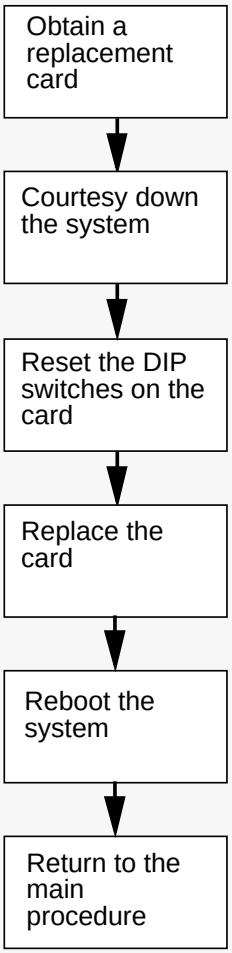
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

NTGX04AA (continued)
in a secondary electronics shelf (continued)

Replacing an NTGX04AA in a secondary electronics shelf.

This flowchart summarizes the procedure.

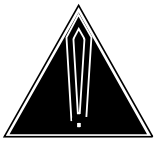
Use the instructions in the step-action table that follows this flowchart to perform the procedure.



NTGX04AA (continued) in a secondary electronics shelf (continued)

Replacing a NTGX04AA in a secondary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.



CAUTION
Interruption of service
Service will be interrupted while the system is courtesied down.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

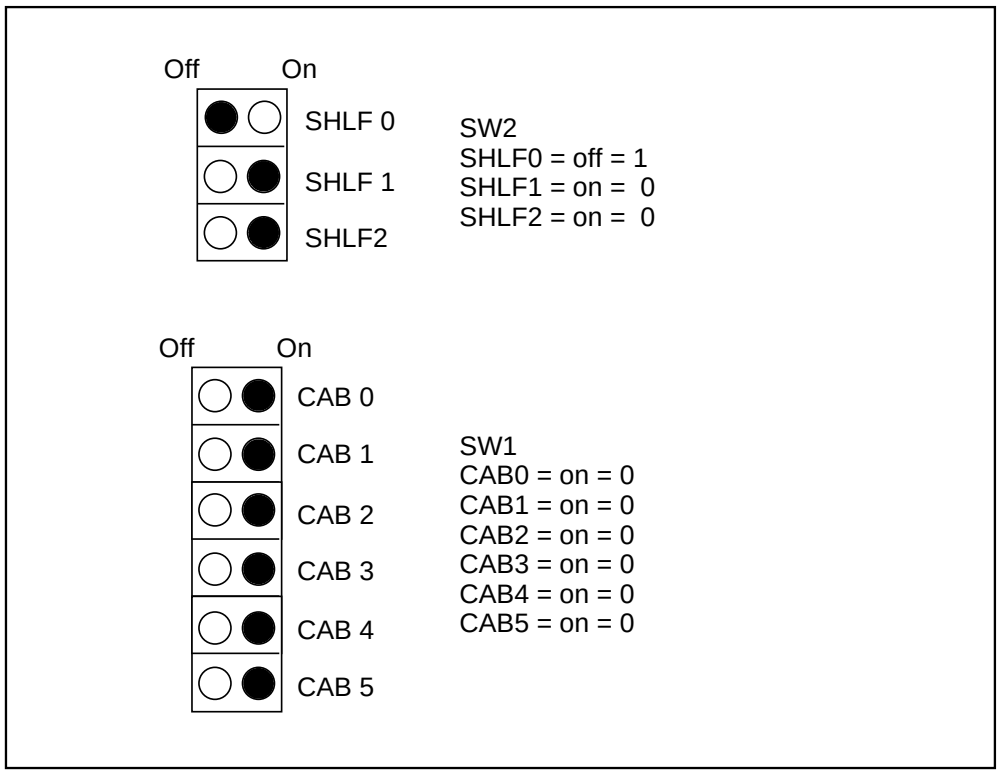
3	Perform the procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to access the System Status and Maintenance screen, followed by procedure 3-2 *Enabling and disabling nodes* on page 3-25 to courtesy down the system .
4	Set the DIP switches on the new card. The settings on the new card must be the same as those on the old card. See Table 2-2. When you have set the DIP switches, continue with step 5.
5	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9 replacing the NTGX04AA at 39R, slot 32. When you have completed that procedure, continue with step 6.
6	Reboot the system by turning the power off for ten seconds, then turning it on again.

-continued-

NTGX04AA (end)
in a secondary electronics shelf (end)

Replacing a NTGX04AA in a secondary electronics shelf (continued)	
Step	**Action**
7	If you need further assistance, contact the personnel responsible for the next level of support.
8	You have completed this procedure.
	End

Table 2-2
Switch settings for the bus terminator transition module on the secondary electronics shelf



NTGX04BA
in an electronics shelf

Application

Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX04	BA	Bus extender transition module

Action

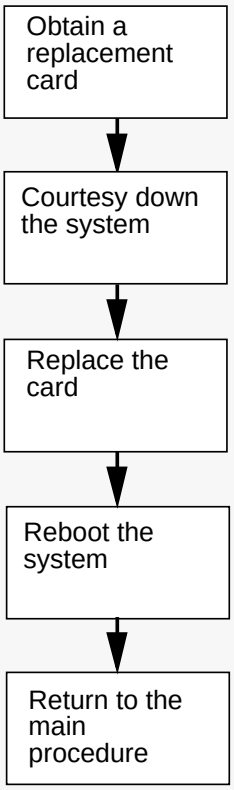
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

NTGX04BA (continued)
in an electronics shelf (continued)

Replacing an NTGX04BA in an electronics shelf.

This flowchart summarizes the procedure.

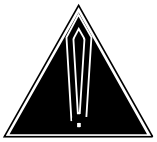
Use the instructions in the step-action table that follows this flowchart to perform the procedure.



NTGX04BA (continued) in an electronics shelf (continued)

Replacing an NTGX04BA in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.



CAUTION
Interruption of service
Service will be interrupted while the system is courtesied down.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

3	Perform the procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to access the System Status and Maintenance screen, followed by procedure 3-2 *Enabling and disabling nodes* on page 3-25 to courtesy down the system .
4	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9 replacing the NTGX04AA in slot 07 of either shelf 26R or 39R. When you have completed the procedure, continue with step 5.
5	Reboot the system by turning the power off for ten seconds then turning it on again. Refer to the *Trouble Locating and Alarm Clearing* manual (NTP 297-7001-503) for Power-up and Power-down procedures.
6	If you need further assistance, contact the personnel responsible for the next level of support.
7	You have completed this procedure.
	End

NTGX04BA (end)
in an electronics shelf (end)

NTGX05AA
in an electronics shelf

Application

Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX05	AA	68K circuit pack

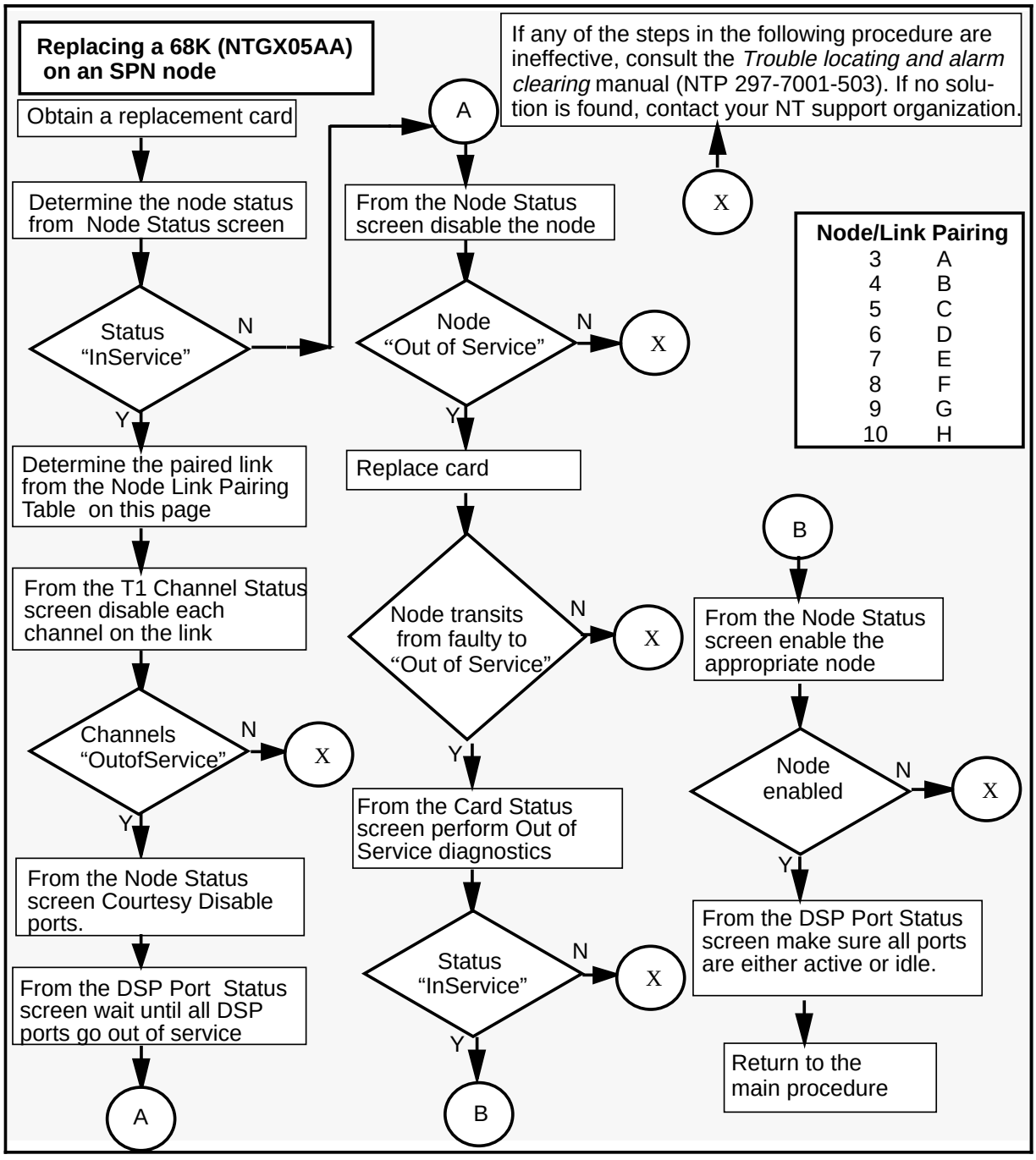
Action

The following flowcharts are summaries of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

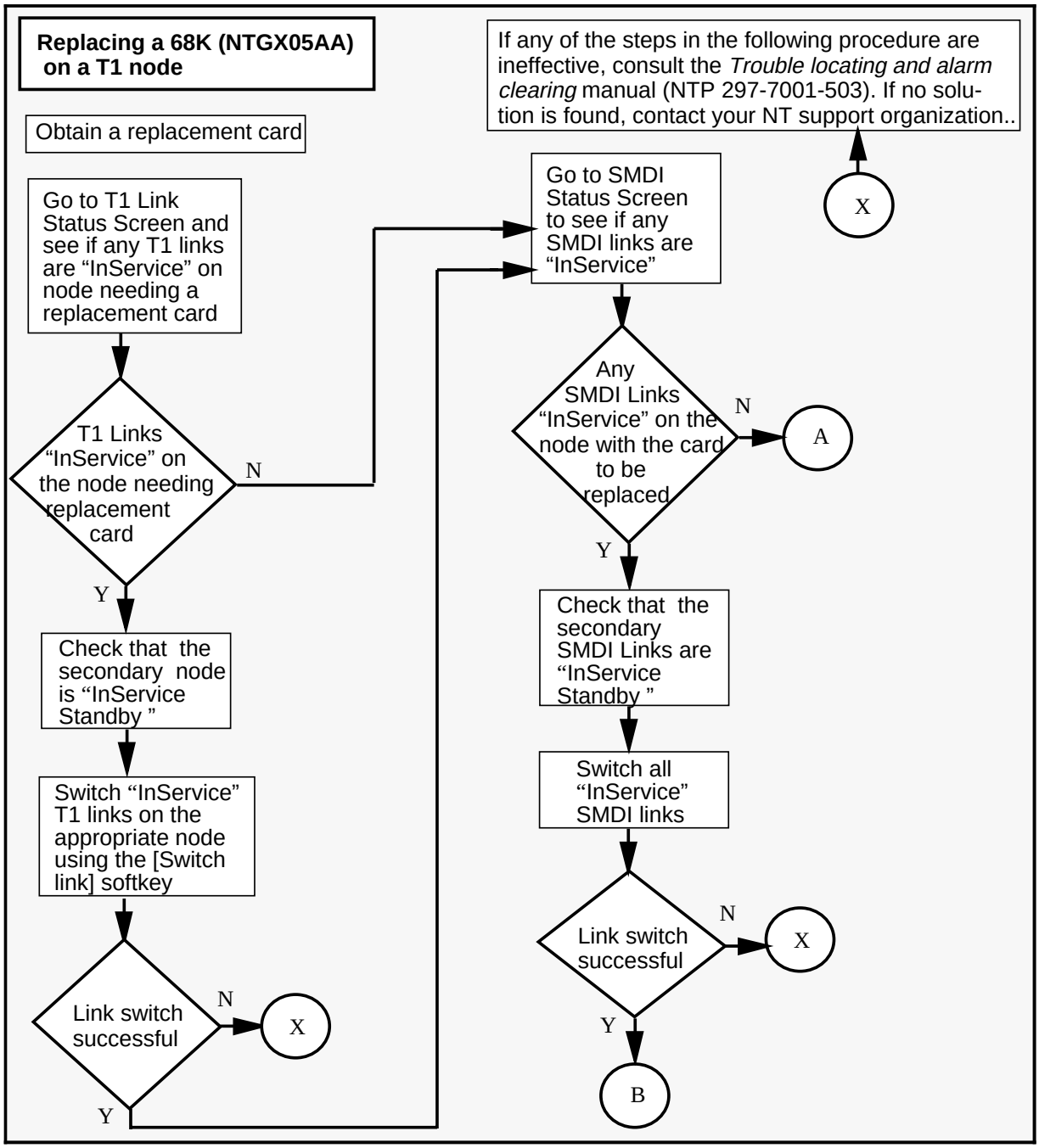
There are three separate procedures for replacing this card, depending on which node the faulty card is on, SPN node, T1 node or MSP node. Follow the procedure for the appropriate node when replacing this card.

Note: If the 68K circuit pack is not physically replaced within 80 seconds on a SPN and T1 node or 7 minutes on MSP node, the card will be marked FAULTY in the hardware database and a major alarm will occur.

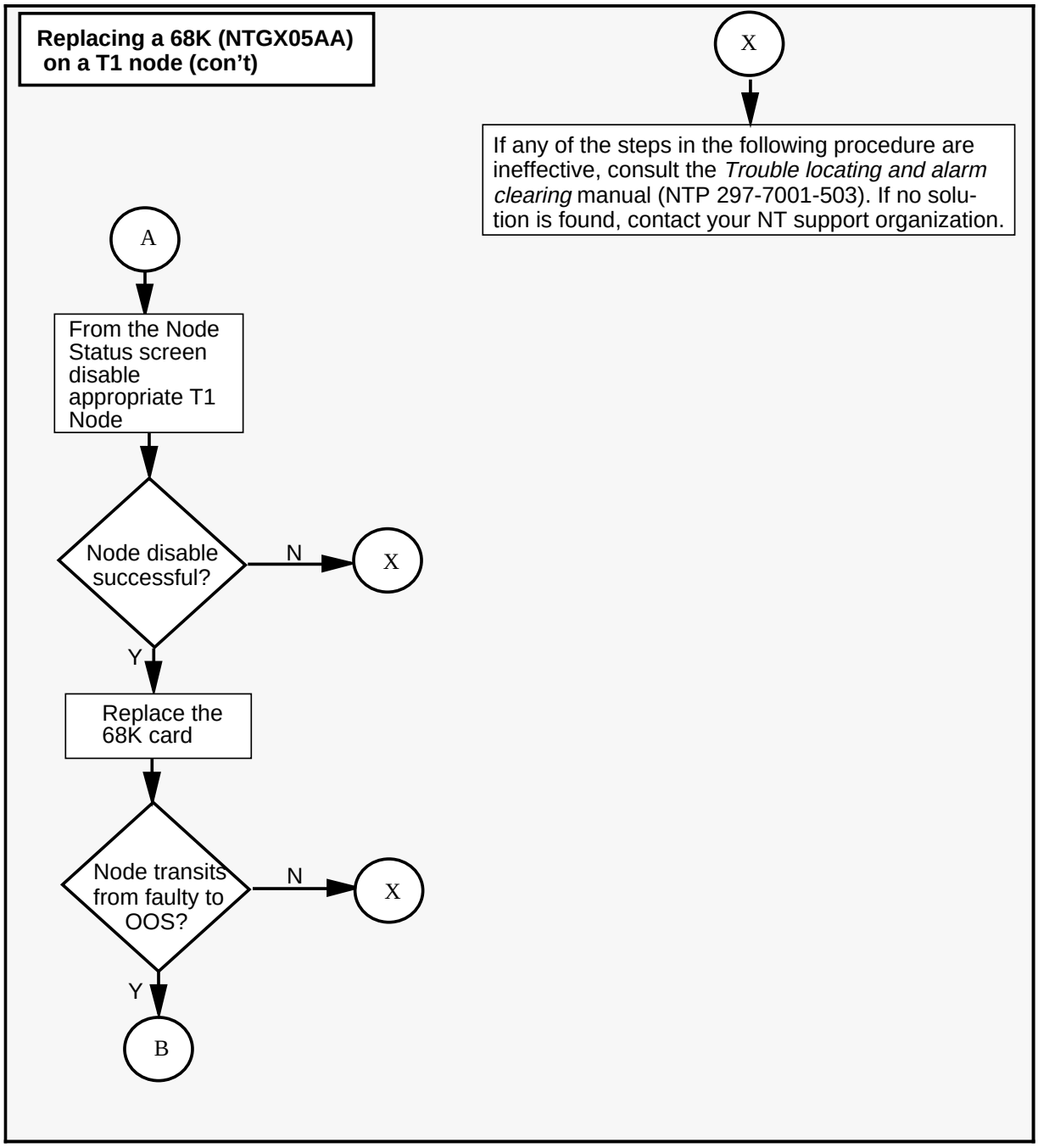
NTGX05AA (continued)
in an electronics shelf (continued)



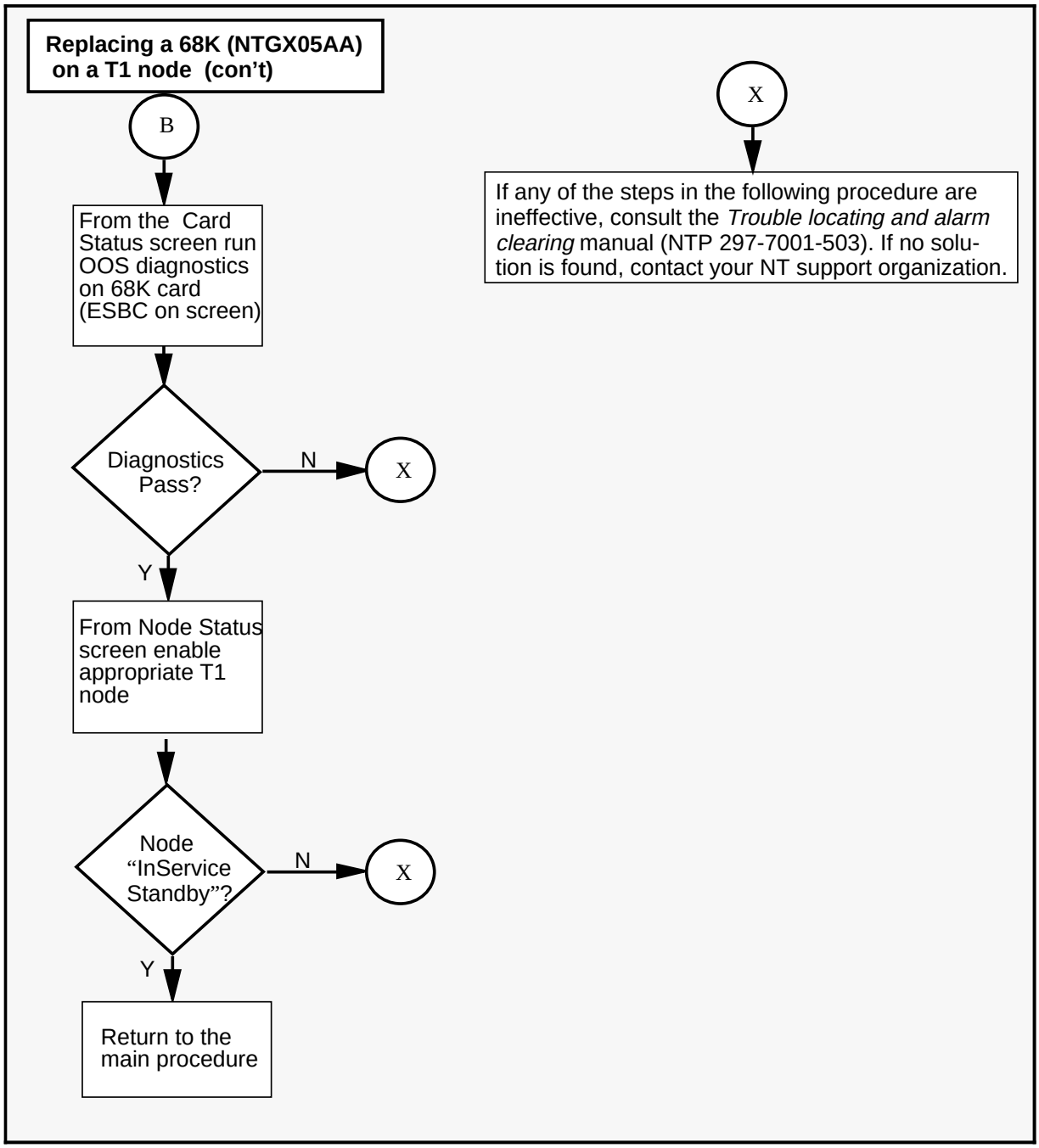
NTGX05AA (continued)
in an electronics shelf (continued)



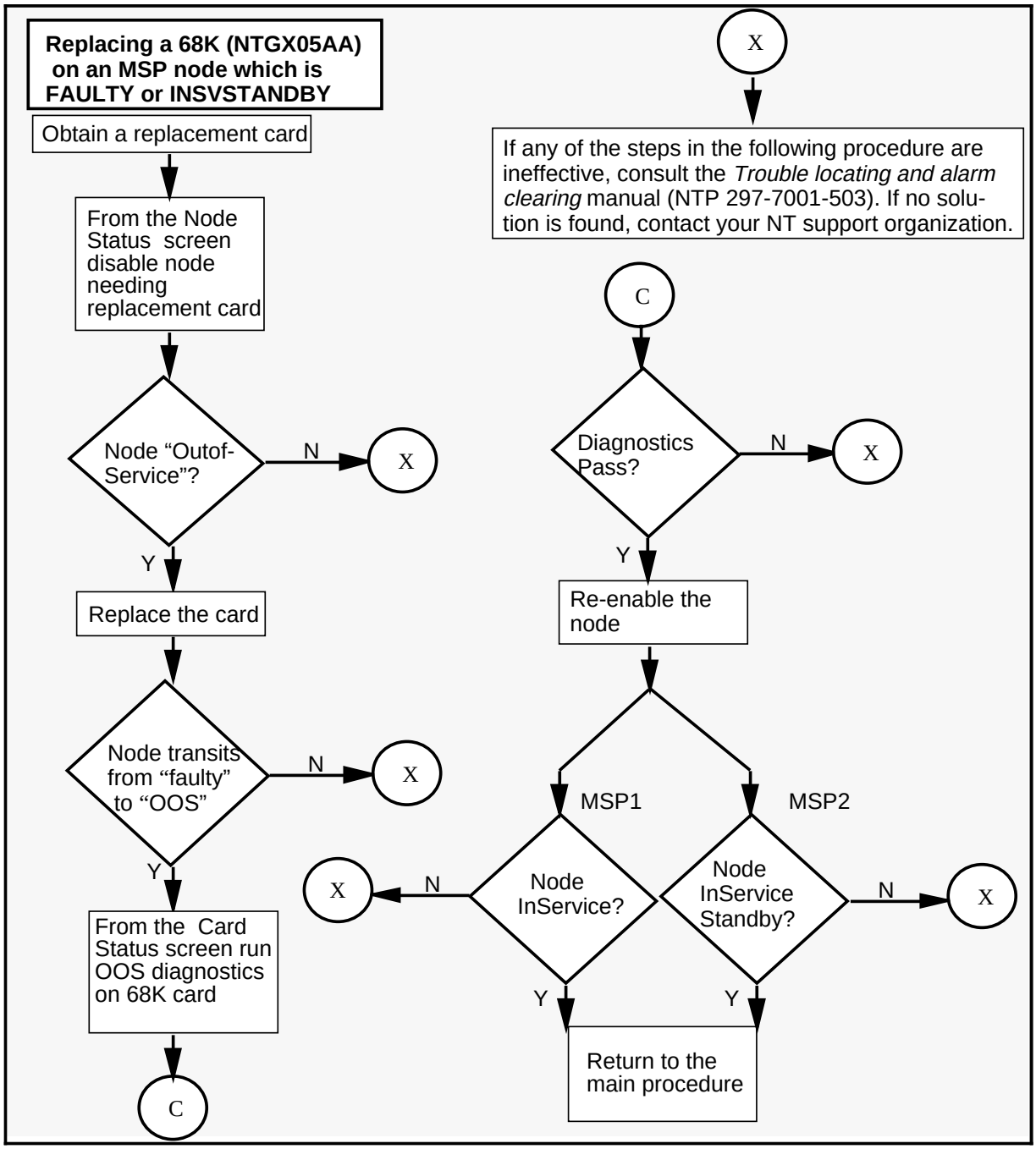
NTGX05AA (continued)
in an electronics shelf (continued)



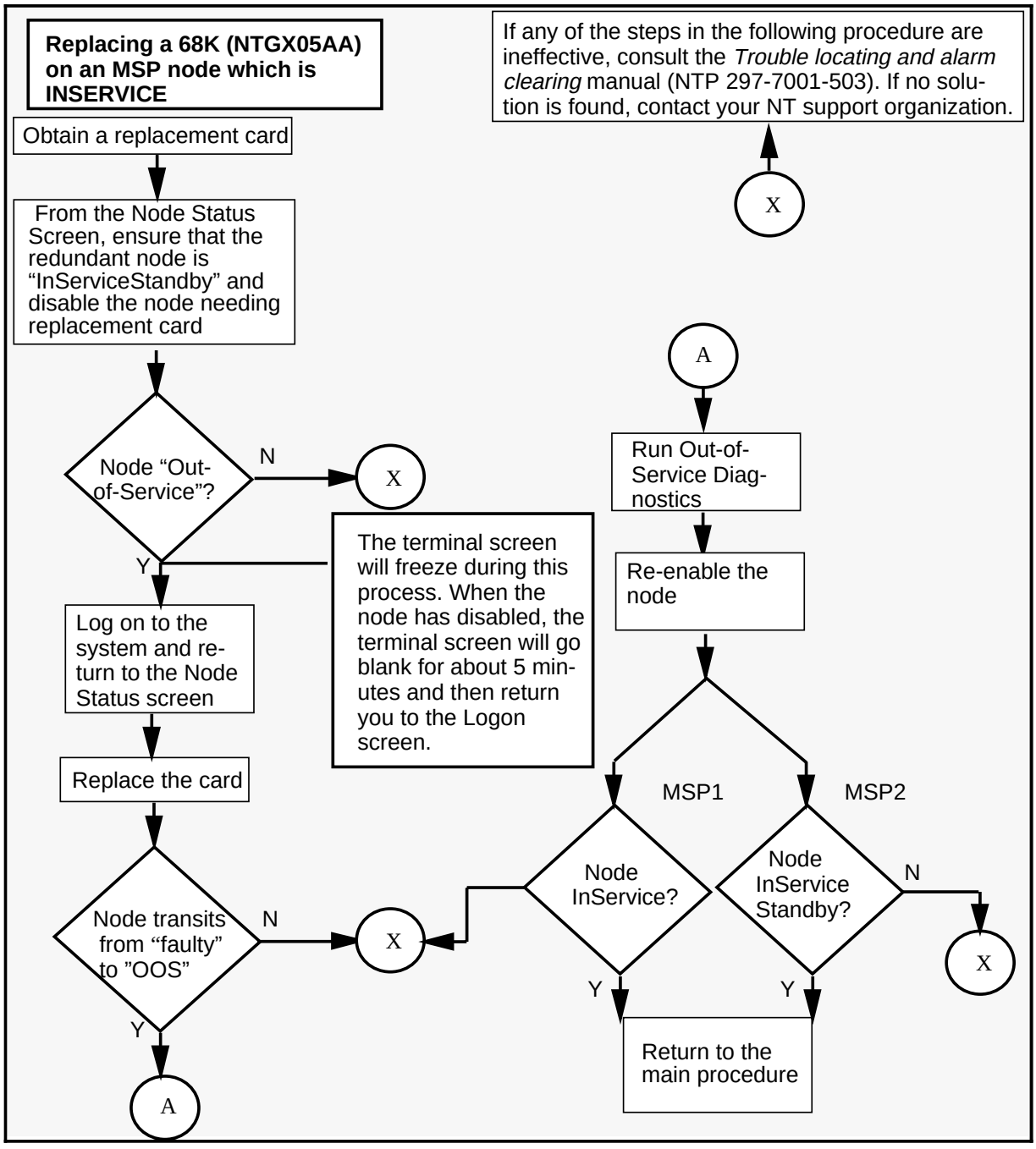
NTGX05AA (continued)
in an electronics shelf (continued)



NTGX05AA (continued)
in an electronics shelf (continued)



NTGX05AA (continued)
in an electronics shelf (continued)



NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf
SPN node

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to go to the Node Status screen and determine the status of the node on which a replacement card is needed. If the status of the node is not “InService”, go to step 9. If the status is “InService”, continue with the following step.
4	Determine the paired link from the Node Link Pairing Table on the flowchart. To do this, look for the number of the node with the faulty card in the left column and read across to the corresponding letter. This is the paired link you will see on the T1 channel status screen.
5	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling and disabling T1 channels* on page 3-37 to disable each channel on the link. When disabling the channels, you DO NOT have to wait until each channel is disabled before disabling the next channel. However, once you have finished specifying the channels you want to disable, you DO have to wait until all the channels are “OutofService” before continuing to the next step.
6	Return to the Node Status screen by pressing [Exit] and selecting Node Status from the Main Menu.
7	Courtesy disable the ports. Then exit from Node Status screen.

-continued-

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf
SPN node(continued)

Step	Action
8	Go to the DSP Port Status screen and wait until all the DSP ports are "OutOfService". Exit from the DSP Status screen and return to the Node Status screen.
9	Disable the node following procedure 3-3 E*nabling and disabling nodes* on page 3-25. Wait for the node to be "OutofService". This will take about five minutes. While the node is being disabled the status will change on the screen: "Shutting down", "Faulty", "Booting" and "OutofService".
10	Go to the SPM Cross reference table (see figure 3-11 on page 3-43) for the shelf and slot location of the card.
11	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 to replace the 68K (NTGX05AA) card.
12	Go to the Card Status screen and perform out of service diagnostics by pressing the [OutofService Diagnostics] softkey. **Note:** The Card Status screen shows the 68K card as Enhanced Single Board Computer (ESBC). If the diagnostics fail, try replacing the card again and consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
13	Re-enable the node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. This will take about 5 minutes.
14	Go to the DSP Port Status screen and make sure all the ports are either idle or active. If you wish, you can go to the T1 Channel screen to check that the T1 channels are becoming active. If the channels on the node do not become active or idle, try re-enabling the node again and consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf
SPN node

Step	Action
15	For further assistance, contact the personnel responsible for the next level of support.
16	You have completed this procedure.
	End

Replacing an NTGX05AA in an electronics shelf
T1 node

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Go to the T1 Link Status screen to see if any T1 links are InService on the node needing a replacement card. Switch all "InService" T1 links using the [Switch Links] softkey. You do not have to wait for each T1 link to be switched before moving on to the next one. If there are no T1 links in service, ignore this step. From the T1 status screen, check that all channels are idle or active before proceeding on to the next step. If the link switch is successful, continue with the procedure. If the switch is not successful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
	End

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf
T1 node (continued)

Step	Action
4	Go to the SMDI Status screen to see if there are any SMDI links InService on the node needing a replacement card. Switch all InService SMDI links on that node. If there are no SMDI links "InService", proceed to step 5. If the link switch is successful, continue with the procedure. If the switch is not successful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
5	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the T1 node needing a replacement card. Disabling the node will take approximately 10 minutes. If the node is successfully disabled, continue with the procedure. If the disable is not successful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
6	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 to replace the 68K card (NTGX05AA). When the card is replaced, the node status changes from Faulty to "OutOfService". If the card does not return to OutOfService status, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern T elecom support organization.
7	From the Card Status screen, perform OutOfService Diagnostics on the new card by pressing the [OutOfService Diagnostics] softkey. This will take approximately 5 minutes.
8	If the diagnostics fail, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf
T1 node (continued)

Step	Action
9	Return to the Node Status screen and re-enable the T1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the node is successfully enabled (status “InSvStandby”), return to the main procedure. If the node does not enable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
10	You have completed this procedure.
	End

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf on an MSP node which is in FAULTY or INSVSTANDBY

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Go to Node Status and perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP node needing a replacement card. Disabling the node will take approximately 10 minutes. If the node is successfully disabled the terminal screen will freeze during this process. When the node has disabled, the terminal screen will go blank for approximately 5 minutes and then return you to the Logon screen. If the node does not disable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
4	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 to replace the 68K card (NTGX05AA). When the card is replaced, the node status changes from Faulty to OutOfService. If the card does not return to OutOfService status, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern T elecom support organization.
5	From the Card Status screen, perform OutOfService Diagnostics on the new card by pressing the [OutOfService Diagnostics] softkey. This will take approximately 5 minutes.

-continued-

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf on an MSP node which is in FAULTY or INSVSTANDBY (continued)

Step	Action
6	From the Node Status screen, re-enable the MSP node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the node is successfully enabled (status “InSvStandby”), return to the main procedure. If the node does not enable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
7	You have completed this procedure.
	End

NTGX05AA (continued)
in an electronics shelf (continued)

Replacing an NTGX05AA in an electronics shelf on an MSP node which is INSERVICE

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Go to Node Status and perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP node needing a replacement card. Disabling the node will take approximately 10 minutes. If the node is successfully disabled the terminal screen will freeze during this process. When the node has disabled, the terminal screen will go blank for approximately 5 minutes and then return you to the Logon screen. If the node does not disable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
4	Log on to the system and return to the Node status screen. Wait for the card to go out of service.
5	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 to replace the 68K card (NTGX05AA).
6	From the Card Status screen, perform OutOfService Diagnostics on the new card by pressing the [OutOfService Diagnostics] softkey. This will take approximately 5 minutes.
7	If the diagnostics fail, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX05AA (end)
in an electronics shelf (end)

Replacing an NTGX05AA in an electronics shelf on an MSP node which is INSERVICE (continued)

Step	Action
8	Return to the Node Status screen and re-enable the MSP node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the node is successfully enabled (status “InSvStandby”), return to the main procedure. If the node does not enable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
9	If the 68K card was replaced on MSP1, the state of the node will be ”InService.”
10	You have completed this procedure.
	End

NTGX06AA
in an electronics shelf

Application

Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX06	AA	68K transition module

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.

CAUTION
Loss of data
Do not alter any of the SCSI cables while the disks are resynchronizing. This will result in a loss of data.

This procedure refers you to tables at the end of the procedure. When using the tables, be sure to use the table that is set up for the specific NTGX06AA card you are replacing: refer to the table 2-3 below. In addition, the card location is given at the top of the table. Each table is set up for an NTGX06AA in a different location so you will only need to refer to one of the charts when using this procedure.

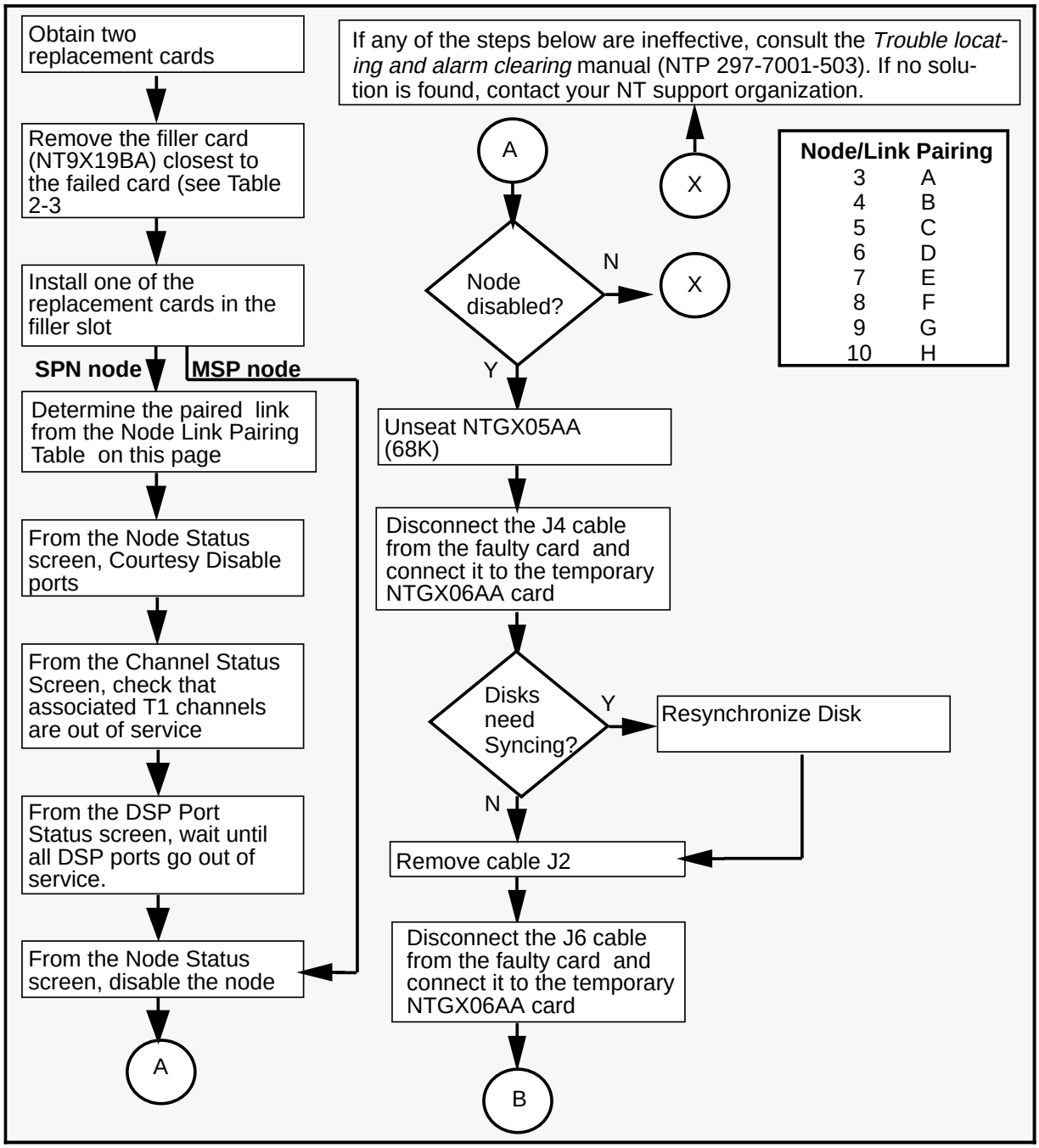
To use these tables, look for the step number under the “Step number in procedure” column and follow the row across to the column containing the information you need.

NTGX06AA (continued)
in an electronics shelf (continued)

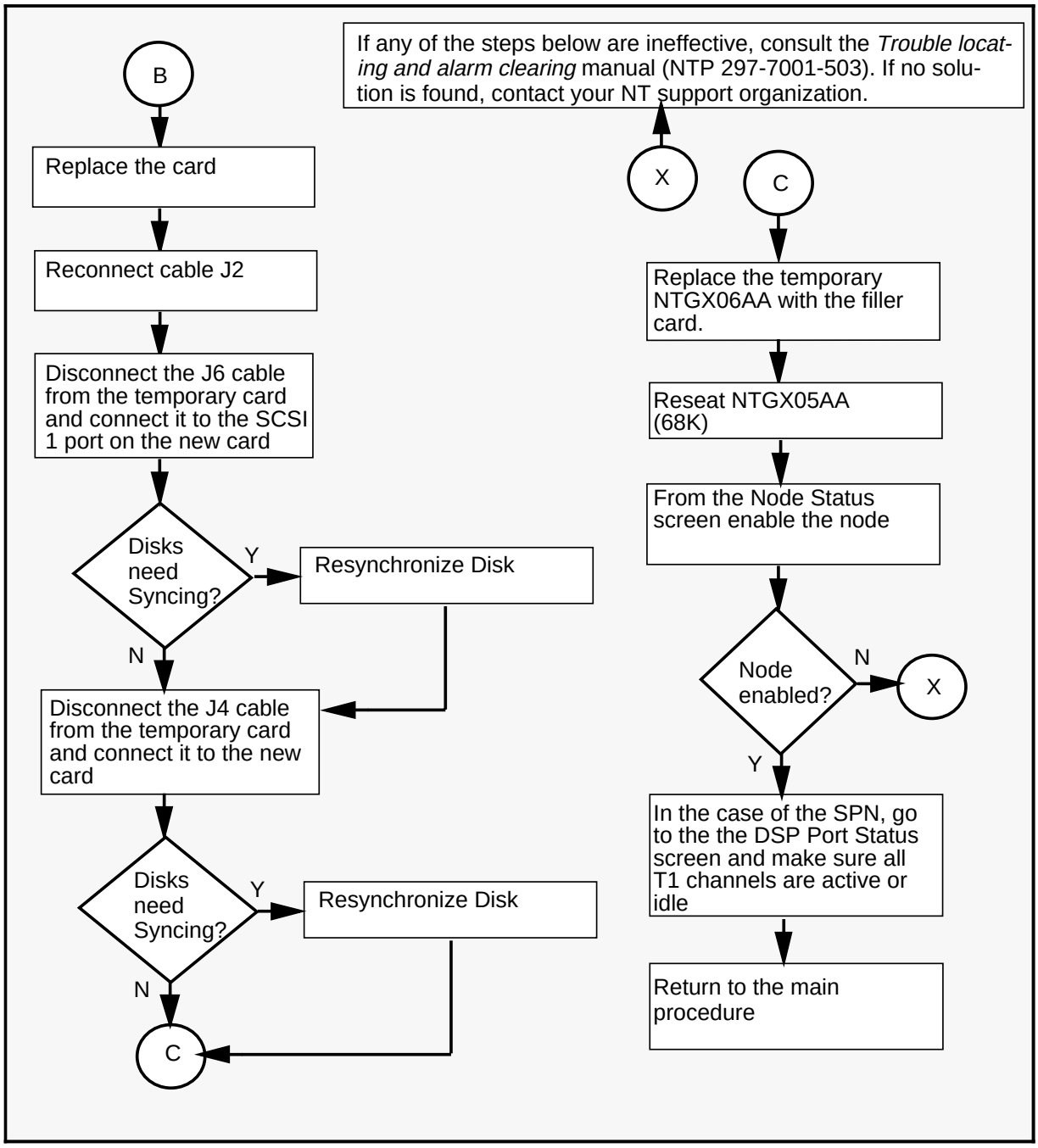
Table 2-3xxx
1 Table to use for specific NTGX06AA cards that are faulty

Faulty NTGX06AA card location	**Go to...**
Node 1, Shelf 26, Slot 08R	Table 2-5
Node 2, Shelf 26, Slot 12R	Table 2-6
Node 3, Shelf 26, Slot 30R	Table 2-7
Node 4, Shelf 26, Slot 29R	Table 2-8
Node 5, Shelf 26, Slot 19R	Table 2-9
Node 6, Shelf 26, Slot 16R	Table 2-10
Node 7, Shelf 39, Slot 30R	Table 2-11
Node 8, Shelf 39, Slot 29R	Table 2-12
Node 9, Shelf 39, Slot 19R	Table 2-13
Node 10, Shelf 39, Slot 15R	Table 2-14

NTGX06AA (continued)
in an electronics shelf (continued)



NTGX06AA (continued)
in an electronics shelf (continued)



NTGX06AA (continued) in an electronics shelf (continued)

Replacing an NTGX06AA in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain two replacement cards. Ensure that both replacement cards have the same product engineering code (PEC), including suffix, as the card being removed.
3	Remove the filler card (NT9X19BB) from the filler slot closest to the NTGX06AA to be replaced. This slot will depend on the location of the faulty card. Tables 2-5 to 2-14 at the end of this procedure tell you which filler slot number to use. Table 2-3 at the beginning of the procedure on page 2-34 tells you which of these tables to use for the specific card you are replacing. **Note:** Refer to the note at the beginning of the procedure for an explanation on how to use the tables.
4	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9, inserting one of the NTGX06AA replacement cards into the filler slot.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
5	Continue with step 6 if you are replacing a card on an SPN node. Continue with step 10 if you are replacing a card on an MSP node.
6	Determine the paired link from the Node Link Pairing Table on page 2-34. To do this, look for the number of the node with the faulty card in the left column and read across to the corresponding letter. This is the paired link you will see on the terminal.

-continued-

NTGX06AA (continued)
in an electronics shelf (continued)

Replacing an NTGX06AA in an electronics shelf (continued)

Step	Action
7	Go to the node status screen on the administration terminal and disable the ports on the node with the faulty card using the [Courtesy Disable Ports] softkey. Refer to procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to access the System Status and Maintenance screen, followed by procedure 3-2 *Enabling and disabling nodes* on page 3-25 to courtesy down the ports.
8	Go to the T1 Channel status screen 3-36 and courtesy disable all associated T1 channels if not already out of service.
9	Go to the DSP Port Status screen to check the status of the ports. *DO NOT* proceed until all ports on the node are “OutofService”. Disabling the ports will take approximately 10 minutes.
10	Return to the Node Status screen and disable the node with the faulty card. *DO NOT* proceed until the node is “OutofService”. Return to Node Status and perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the node needing a replacement card. Disabling the node will take approximately 10 minutes. If the node is successfully disabled then continue following the procedure. If it is not, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
11	Unseat the NTGX05AA (68K) card on the node that needs a replacement card. At this point, the node state will transit to faulty.
12	Disconnect cable J4 (SCSI 0) from the card to be replaced (see Figure 2-1) and connect it to the same location on the temporary replacement card in the filler slot. Refer to the table at the end of the procedure you were referred to in step 3. **Note:** If necessary, refer to the note at the beginning of the procedure for an explanation on how to use the tables.

-continued-

Replacing an NTGX06AA in an electronics shelf (continued)

Step	Action
13	From the Disk Maintenance Screen, check to see if any of the disks have gone “OutofSync”. If they have not, go on to the next step. If they have, perform the procedure *Resynchronizing the disks* on the disks that have gone “OutofSync”. See page 3-53. (SEER 6602 will also indicate that disks have gone “OutofSync”.
	CAUTION **Loss of data** Do not change any SCSI cables while the buses are resynchronizing. This could result in data loss.
14	Disconnect cable J2 (I/O cable) from the card to be replaced. (See Figure 2-1.)
15	Disconnect cable J6 (SCSI 1) from the card to be replaced (See Figure 2-1) and connect it to the same location on the temporary replacement card in the filler slot. Refer to the table at the end of the procedure you were referred to in step 3.
16	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9 to replace the the faulty NTGX06AA with the second replacement NTGX06AA.
17	Reconnect cable J2 (I/O).
18	Disconnect cable J6 (SCSI 1) from the temporary replacement card in the filler slat and connect it to the SCSI 1 location on the new card . See Figure 2-1 and the table at the end of the procedure you were referred to in step 3.
19	From the Disk Maintenance Screen, check to see if any of the disks have gone “OutofSync”. If they have not, go on to the next step. If they have, perform the procedure *Resynchronizing the disks* on the disks that have gone “OutofSync”. See page 3-53. (Seer 6602 will also indicate that a disk has gone “OutofSync”.
20	Disconnect cable J4 (SCSI 0) from the temporary replacement card in the filler slot and connect it to the SCSI 0 location on the new card . See Figure 2-1 and the table at the end of the procedure.
21	Ensure that all cables are fully secured with screws on the cable hoods to the NTGX06AA.

-continued-

NTGX06AA (continued)
in an electronics shelf (continued)

Replacing an NTGX06AA in an electronics shelf (continued)	
Step	**Action**
22	From the Disk Maintenance Screen, check to see if any of the disks have gone “OutofSync”. If they have not, go on to the next step. If they have, perform the procedure *Resynchronizing the disks* on the disks that have gone “OutofSync”. See page 3-53. (Seer 6602 will also indicate that a disk has gone “OutofSync”.
23	Remove the temporary replacement NTGX06AA in the filler slot and replace it with the filler card (NT9X19BA).
24	Reseat the NTGX05AA (68K) card on the node that had the card replaced on.
25	Go to the node status screen on the administration terminal and enable the node with the new card using the [Enable] softkey. Enabling the node will take about ten minutes. Refer to procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 to access the System Status and Maintenance screen, followed by procedure 3-2 *Enabling and disabling nodes* on page 3-25 to courtesy down the ports.
26	If the card was replaced on SPN, go to the DSP Port Status screen on the administration terminal and make sure the channels are active.
27	For further assistance, contact the personnel responsible for the next level of support.
28	You have completed this procedure.
End	

Table 2-4
Node numbers on electronic shelves of DMS VoiceMail

Node numbers on electronic shelves

			10	9	16	15	8	7
	1	2	6	5	14	13	4	3

Electronics Shelf

Electronics Shelf

7	8	9	10	2
3	4	5	6	1

Disk Shelf

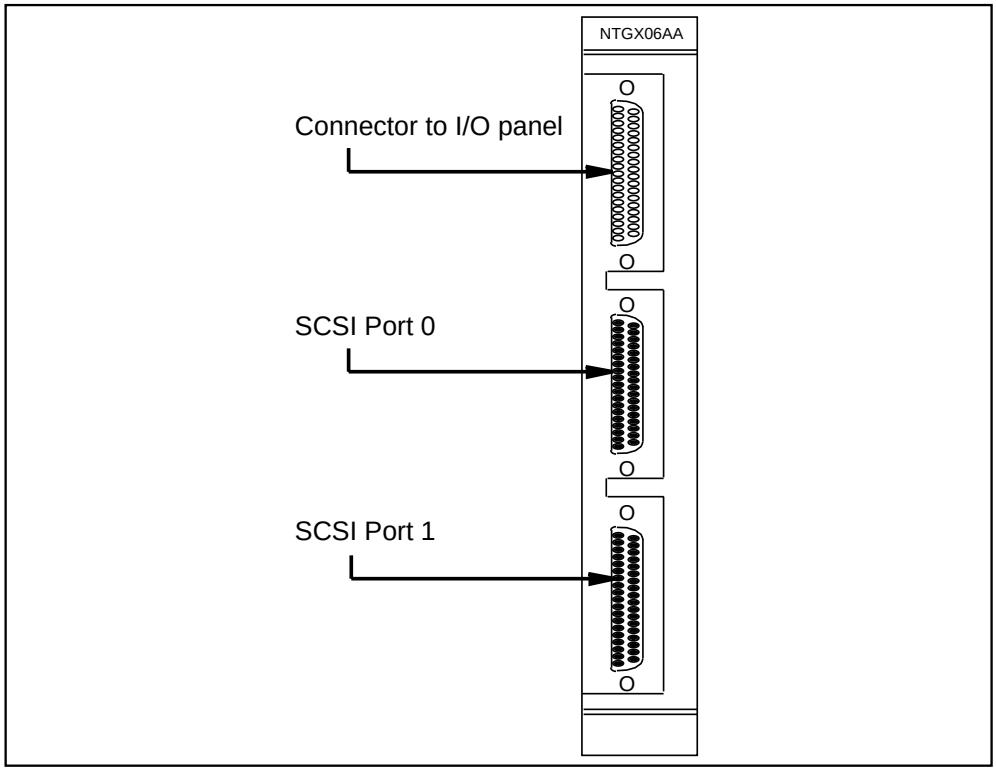
Disk Shelf

Node numbers for disk units

Front View

Node	Redundant Node
1	2
2	1
3	4
4	3
5	6
6	5
7	8
8	7
9	10
10	9
13	14
14	13
15	16
16	15

Figure 2-1
68K transition module (rear view)



NTGX06AA (continued)
in an electronics shelf (continued)

Table 2-5
NTGX06AA faulty on node 1, shelf 26, slot 08 (rear)

Faulty card: Node 1, Shelf 26, slot 08 (at rear of cabinet) Shadowed node 2 NTGX06AA is in shelf 26, slot 12 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 11R		
Step 9	Shelf 26 Slot 11R	Shelf 26 Slot 08R	
Step 10			2
Steps 11 to 15		Shelf 26 Slot 08R	
Step 16			2
Step 17	Shelf 26 Slot 11R	Shelf 26 Slot 08R	
Step18		Shelf 26 Slot 08R	
Step 19			2
Step 20	Shelf 26 Slot 11R		

Table 2-6
NTGX06AA faulty on node 2, shelf 26 slot 12 (rear)

Faulty card: Node 2, Shelf 26, slot 12 (at rear of cabinet) Shadowed node 1 NTGX06AA is in shelf 26, slot 08 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 11R		
Step 9	Shelf 26 Slot 11R	Shelf 26 Slot 12R	
Step 10			1
Steps 11 to 15		Shelf 26 Slot 12R	
Step 16			1
Step 17	Shelf 26 Slot 11R	Shelf 26 Slot 12R	
Step 18		Shelf 26 Slot 12R	
Step 19			1
Step 20	Shelf 26 Slot 11R		

NTGX06AA (continued)
in an electronics shelf (continued)

Table 2-7
NTGX06AA faulty on node 3, shelf 26, slot 30 (Rear)

Faulty card: Node 3, Shelf 26, slot 30 (at rear of cabinet) Shadowed node 4 NTGX06AA is in shelf 26, slot 29 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 31R		
Step 9	Shelf 26 Slot 31R	Shelf 26 Slot 30R	
Step 10			4
Steps 11 to 15		Shelf 26 Slot 30R	
Step 16			4
Step 17	Shelf 26 Slot 31R	Shelf 26 Slot 30R	
Step 18		Shelf 26 Slot 30R	
Step 19			4
Step 20	Shelf 26 Slot 31R		

Table 2-8
NTGX06AA faulty on node 4, shelf 26R slot 29 (rear)

Faulty card: Node 4, Shelf 26, slot 29 (at rear of cabinet) Shadowed node 3 NTGX06AA is in shelf 26, slot 30 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 31R		
Step 9	Shelf 26 Slot 31R	Shelf 26 Slot 29R	
Step 10			3
Steps 11 to 15		Shelf 26 Slot 29R	
Step 16			3
Step 17	Shelf 26 Slot 31R	Shelf 26 Slot 29R	
Step 18		Shelf 26 Slot 29R	
Step 19			3
Step 20	Shelf 26 Slot 31R		

NTGX06AA (continued)
in an electronics shelf (continued)

Table 2-9
NTGX06AA faulty on node 5, shelf 26, slot 19 (rear)

Faulty card: Node 5, Shelf 26, slot 19 (at rear of cabinet) Shadowed node 6 NTGX06AA is in shelf 26, slot 16 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 17R		
Step 9	Shelf 26 Slot 17R	Shelf 26 Slot 19R	
Step 10			6
Steps 11 to 15		Shelf 26 Slot 19R	
Step 16			6
Step 17	Shelf 26 Slot 17R	Shelf 26 Slot 19R	
Step 18		Shelf 26 Slot 19R	
Step 19			6
Step 20	Shelf 26 Slot 17R		

Table 2-10
NTGX06AA faulty on node 6, shelf 26 slot 16 (rear)

Faulty card: Node 6, Shelf 26, slot 16 (at rear of cabinet) Shadowed node 5 NTGX06AA is in shelf 26, slot 19 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 26 Slot 17R		
Step 9	Shelf 26 Slot 17R	Shelf 26 Slot 16R	
Step 10			5
Steps 11 to 15		Shelf 26 Slot 16R	
Step 16			5
Step 17	Shelf 26 Slot 17R	Shelf 26 Slot 16R	
Step 18		Shelf 26 Slot 16R	
Step 19			5
Step 20	Shelf 26 Slot 17R		

NTGX06AA (continued)
in an electronics shelf (continued)

Table 2-11
NTGX06AA faulty on node 7, shelf 39, slot 30 (rear)

Faulty card: Node 7, Shelf 39, slot 30 (at rear of cabinet) Shadowed node 8 NTGX06AA is in shelf 39, slot 29 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 39 Slot 31R		
Step 9	Shelf 39 Slot 31R	Shelf 39 Slot 30R	
Step 10			8
Steps 11 to 15		Shelf 39 Slot 30R	
Step 16			8
Step 17	Shelf 39 Slot 31R	Shelf 39 Slot 30R	
Step 18		Shelf 39 Slot 30R	
Step 19			8
Step 20	Shelf 39 Slot 31R		

Table 2-12
NTGX06AA faulty on node 8, shelf 39 slot 29 (rear)

Faulty card: Node 8, Shelf 39, slot 29 (at rear of cabinet) Shadowed node 7 NTGX06AA is in shelf 26, slot 30 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 39 Slot 31R		
Step 9	Shelf 39 Slot 31R	Shelf 39 Slot 29R	
Step 10			7
Steps 11 to 15		Shelf 39 Slot 29R	
Step 16			7
Step 17	Shelf 39 Slot 31R	Shelf 39 Slot 29R	
Step 18		Shelf 39 Slot 29R	
Step 19			7
Step 20	Shelf 39 Slot 31R		

NTGX06AA (continued)
in an electronics shelf (continued)

Table 2-13
NTGX06AA faulty on node 9, shelf 39 slot 19 (rear)

Faulty card: Node 9, Shelf 39, slot 19 (at rear of cabinet) Shadowed node 10 NTGX06AA is in shelf 26, slot 15 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed, replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 39 Slot 21R		
Step 9	Shelf 39 Slot 21R	Shelf 39 Slot 19R	
Step 10			10
Steps 11 to 15		Shelf 39 Slot 19R	
Step 16			10
Step17	Shelf 39 Slot 21R	Shelf 39 Slot 19R	
Step18		Shelf 39 Slot 19R	
Step19			10
Step 20	Shelf 39 Slot 21R		

Table 2-14
NTGX06AA faulty on node 10, shelf 39 slot 15 (Rear)

Faulty card: Node 10, Shelf 39, slot 15 (at rear of cabinet) Shadowed node 9 NTGX06AA is in shelf 26, slot 19 (at rear of cabinet)			
Step number in procedure	**Slot number: Filler card is removed and replaced by temporary NTGX06AA**	**Faulty card**	**Resync from node**
Steps 3,4	Shelf 39 Slot 31R		
Step 9	Shelf 39 Slot 31R	Shelf 39 Slot 15R	
Step 10			9
Steps 11 to 15		Shelf 39 Slot 15R	
Step 16			9
Step 17	Shelf 39 Slot 31R	Shelf 39 Slot 15R	
Step 18		Shelf 39 Slot 15R	
Step 19			9
Step 20	Shelf 39 Slot 31R		

NTGX06AA (end)
in an electronics shelf (end)

NTGX07AA
in an electronics shelf

Application

Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX07	AA	Modem transition module

Action

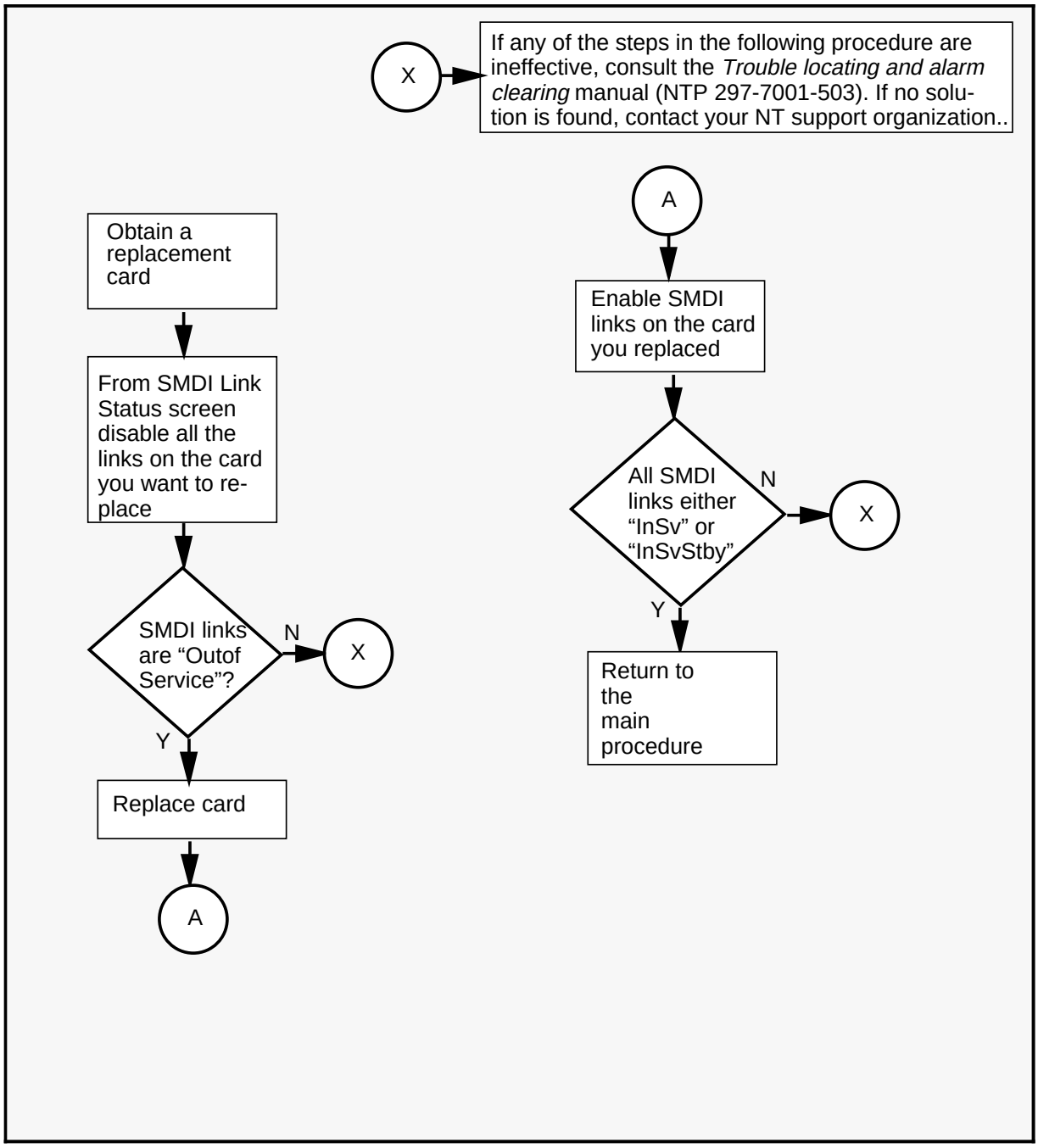
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

To identify the faulty pack from the terminal screen, refer to tables 1-6 and 1-7 in Chapter 1. The slot locations for NTGX07AA are listed in the table below:

Table 2-15
Slot locations for NTGX07AA

Node number	TIFN number	Shelf	Slot
13	1	26R	25
14	2	26R	20
15	3	39R	25
16	4	39R	20

NTGX07AA (continued)
in an electronics shelf (continued)



Replacing an NTGX07AA in an electronics shelf
SMDI links on a redundant node (node 14, TIFN 2 or node 16, TIFN 4) to be replaced

Step	Action
1	Proceed only if you are replacing the card on the node 14 or 16 (inactive nodes). Refer to Figure 1-2 for card layout. If you are replacing the card on the active node (node 13 or 15), go to the procedure on page 2-57.
2	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
3	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

CAUTION
Service Interruption
If the system has less than 96 ports, replacing the primary modem transition module will result in loss of system functionality for the duration of the card replacement procedure.

-continued-

NTGX07AA (continued)
in an electronics shelf (continued)

Replacing an NTGX07AA in an electronics shelf (continued)
SMDI links on a redundant node (node 14, TIFN 2 or node 16, TIFN 4) to be replaced

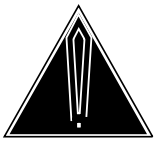
Step	Action
4	Ensure that all SMDI links on the card to be replaced are 'OutofService'. To do this, perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-18 followed by procedure 3-8 *Enabling, disabling and switching SMDI links* on page 3-42 . Note 1: You need to change the status of only those SMDI links on the card to be replaced that do not show 'OutofService' on your MMI administration screen. Note 2: Disabling the SMDI links on the card to be replaced ensures that all traffic is switched to the active node and service is not disrupted. Note 3: If the SMDI links do not go 'OutofService', contact your Northern Telecom support organization.
5	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9. When you have completed the procedure, continue with step 6.
6	Enable the SMDI links on the *new* card by performing procedure 3-8 *Enabling, disabling and switching SMDI links* on page 3-42 . Note : Enabling the SMDI links on the new card on the redundant node allows the active node to transfer traffic to the redundant node as the need arises.
7	If the status for an SMDI link does not show either 'InService' or 'InSvStandby', consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern T elecom support organization.
8	For further assistance, contact the personnel responsible for the next level of support.
9	You have completed this procedure.
	End

NTGX07AA (continued) in an electronics shelf (continued)

Replacing an NTGX07AA in an electronics shelf
SMDI links on a primary node (node 13 TIFN 1 or node 15 TIFN 3) to be replaced

Step	Action
1	Proceed only if you are replacing the card on the node 13 or 14 (active nodes). If you are replacing nodes 14 or 16 (inactive nodes), go to the procedure which follows on page 2-55.
2	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
3	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.



CAUTION
Service Interruption
If the system has less than 96 ports, replacing the primary modem transition module will result in loss of system functionality for the duration of the card replacement procedure.

4	If TIFN 1 is to be replaced, ensure that all SMDI links on TIFN 1 and 2 are ‘out of service’. If TIFN 3 is to be replaced, ensure that all SMDI links on TIFN 3 and 4 are ‘out of service’. To do this, perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-8 *Enabling, disabling and switching SMDI links* on page 3-42 . Note 1: Because the card to be replaced is on the primary node, both the primary and redundant SMDI links must be temporarily taken ‘out of service’.

-continued-

NTGX07AA (end)
in an electronics shelf (end)

Replacing an NTGX07AA in an electronics shelf (continued)
SMDI links on a primary node (node 13 TIFN 1 or node 15 TIFN 3) to be replaced

Step	Action
5	Perform the procedure *Replacing a DMS VoiceMail card at the back of the cabinet* on page 3-9. When you have completed the procedure, continue with step 6.
6	Ensure the status on the SMDI links on the *new* card (active node, TIFN 1 or 3) is ‘InService‘ and the status on the SMDI links on the redundant node (TIFN 2 or 4) is ‘Standby‘ by enabling the links. Perform procedure 3-8 *Enabling, disabling and switching SMDI links* on page 3-42 .
7	If you need further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
8	You have completed this procedure.
	End

NTGX08AA
in an electronics shelf

Application

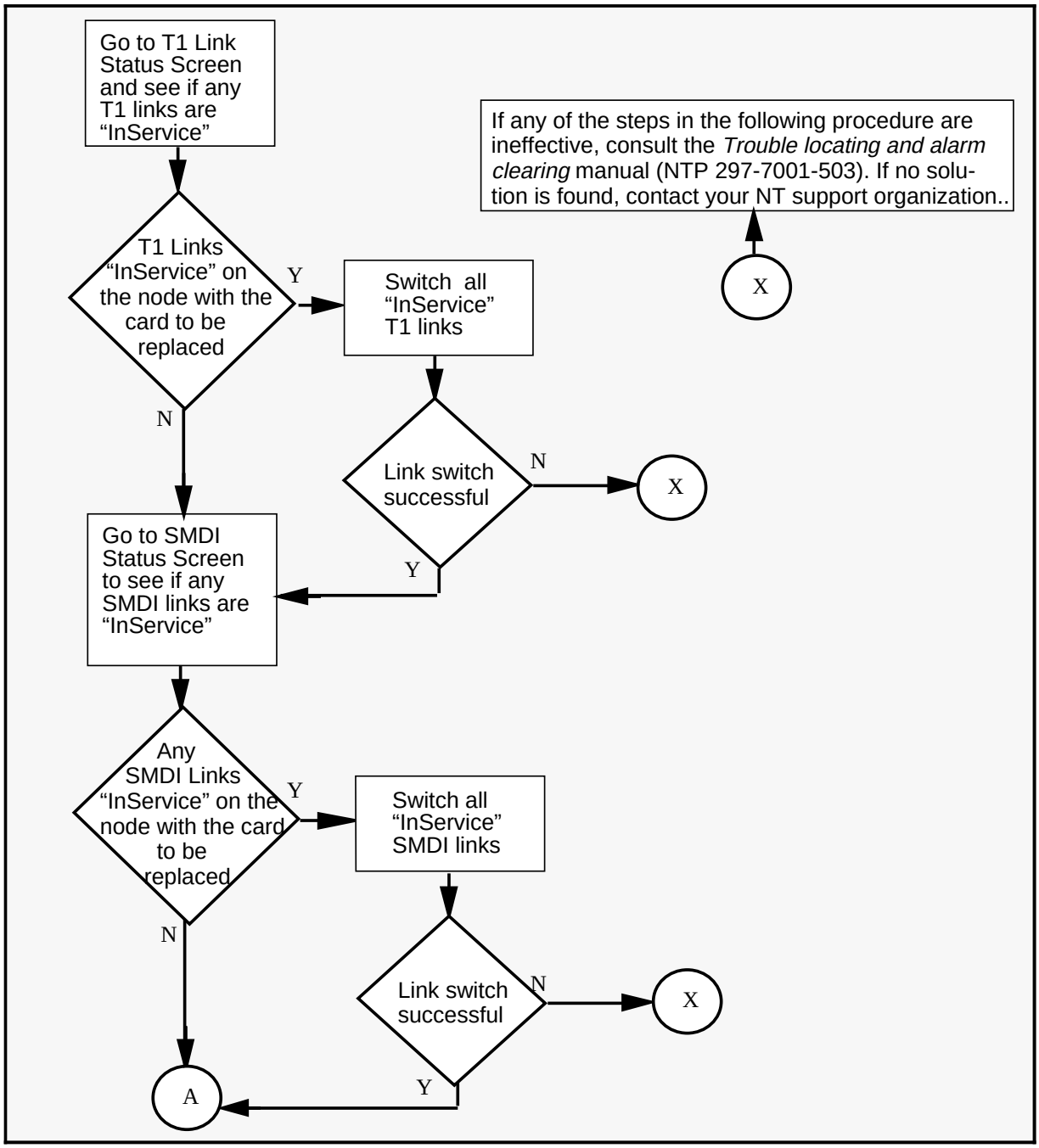
Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX08	AA	T1 circuit pack

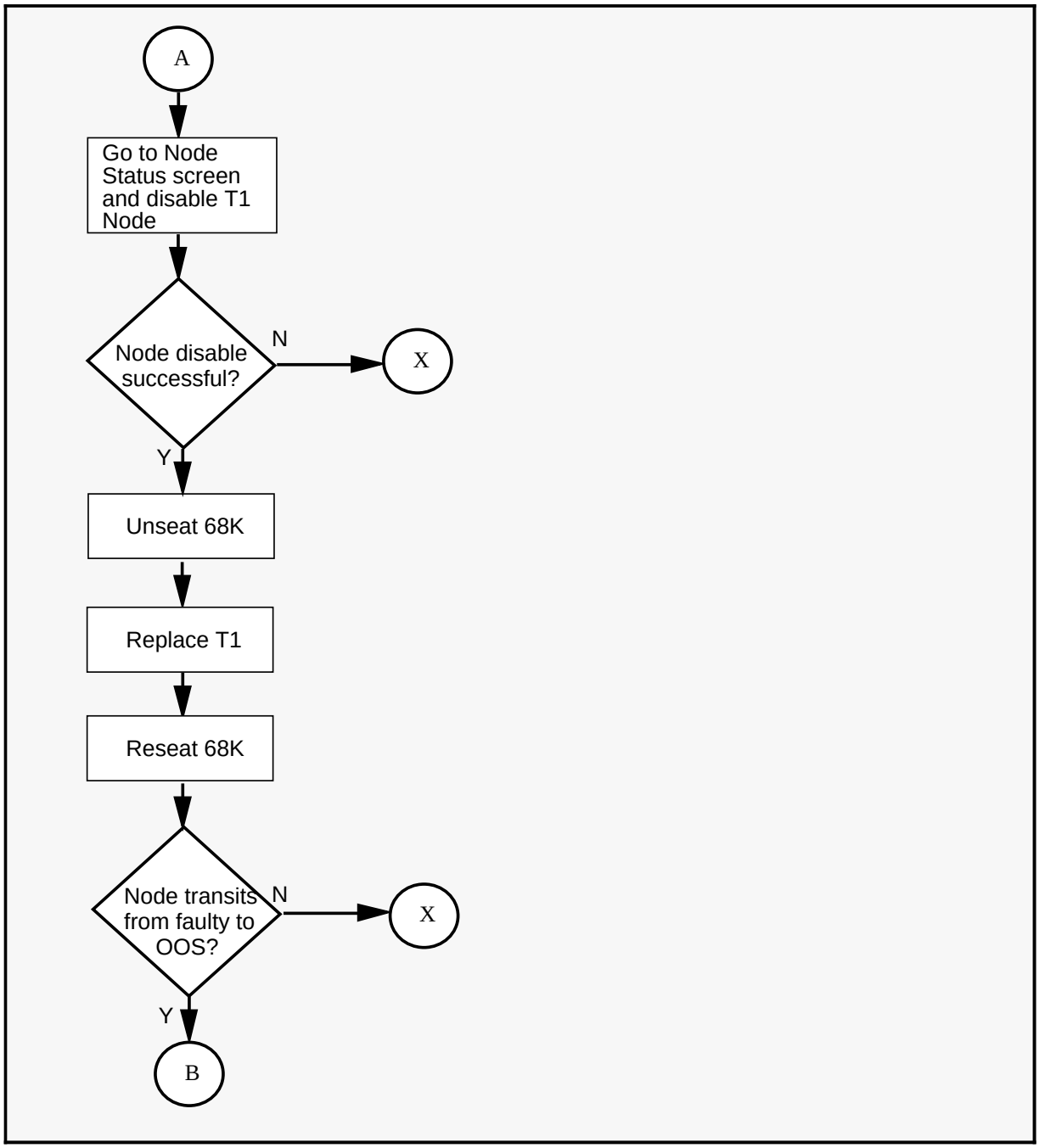
Action

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.

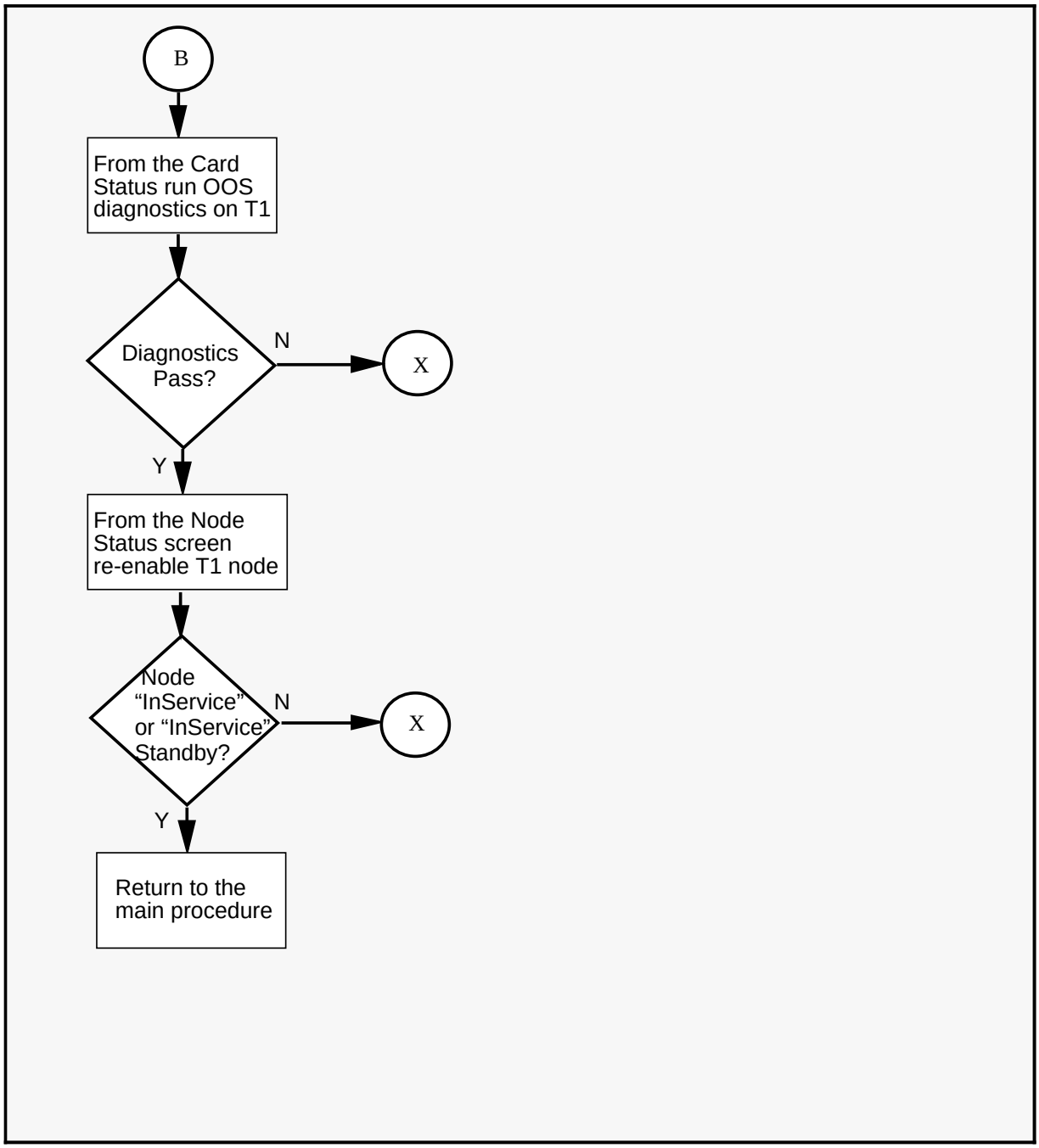
NTGX08AA (continued)
in an electronics shelf (continued)



NTGX08AA (continued)
in an electronics shelf (continued)



NTGX08AA (continued)
in an electronics shelf (continued)



NTGX08AA (continued) in an electronics shelf (continued)

Replacing an NTGX08AA in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Go to the T1 Link Status screen to see if any T1 links are “InService” on the node with the card to be replaced. Switch all “InService” T1 links using the [Switch Links] softkey. If there are no T1 links in service then ignore this step. If the link switch is successful, continue with the procedure. If the switch is not successful contact your Northern Telecom support organization for assistance.
4	Go to the SMDI Status screen to see if there are any SMDI links “InService” on the node with the card to be replaced. Switch all “InService” SMDI links. If there are no SMDI links “InService”, proceed to step 5. If the link switch is successful, continue with the procedure. If the switch is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization..

-continued-

NTGX08AA (continued)
in an electronics shelf (continued)

Replacing an NTGX08AA in an electronics shelf (continued)

Step	Action
5	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the T1 node on which the faulty card resides. Disabling the node will take approximately 5 minutes. If the node is successfully disabled, continue with the procedure. If the disable is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
6	Unseat the 68K card . (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
7	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3.
8	Reseat the 68K card.
9	Once the card is reseated and after a few minutes and a few status transitions, the node status changes from Faulty to OutOfService. If the card does not return to OutOfService status, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
10	From the Card Status screen, perform OutOfService Diagnostics on the new card by pressing the [OutOfService Diagnostics] softkey. This will take approximately 5 minutes.
11	If the diagnostics pass, go to step 12. If they fail, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
12	Return to the Node Status screen and re-enable the T1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the node is successfully enabled, return to the main procedure. If the node does not enable consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern T elecom support organization.

-continued-

NTGX08AA (continued)
in an electronics shelf (continued)

Replacing an NTGX08AA in an electronics shelf (continued)	
Step	**Action**
13	For further assistance, contact the personnel responsible for the next level of support.
14	You have completed this procedure.
	End

NTGX08AA (end)
in an electronics shelf (end)

NTGX09AA
in an electronics shelf

Application

Use this procedure to replace the following card in an electronics shelf.

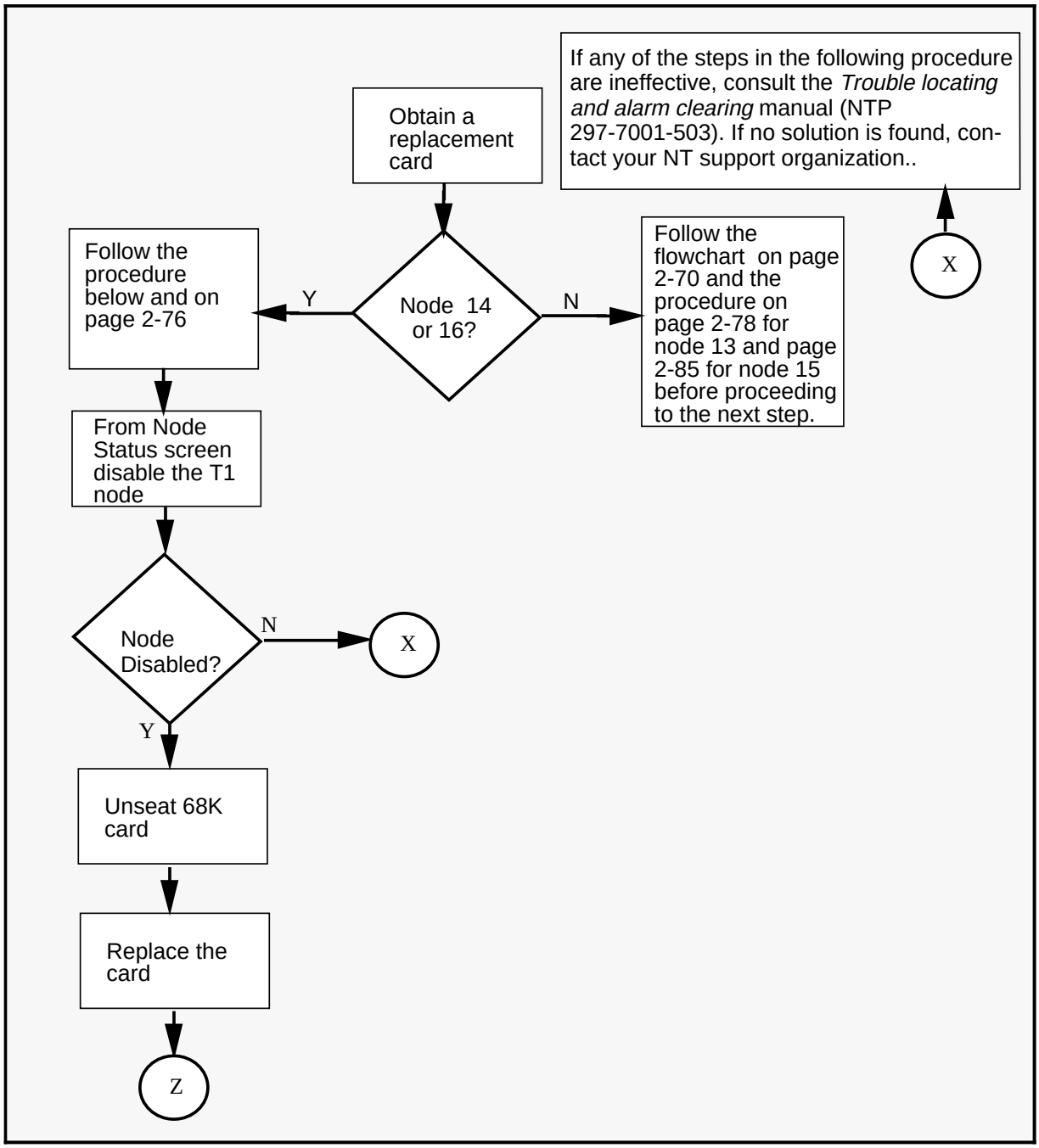
PEC	Suffixes	Name
NTGX09	AA	T1 transition module

Action

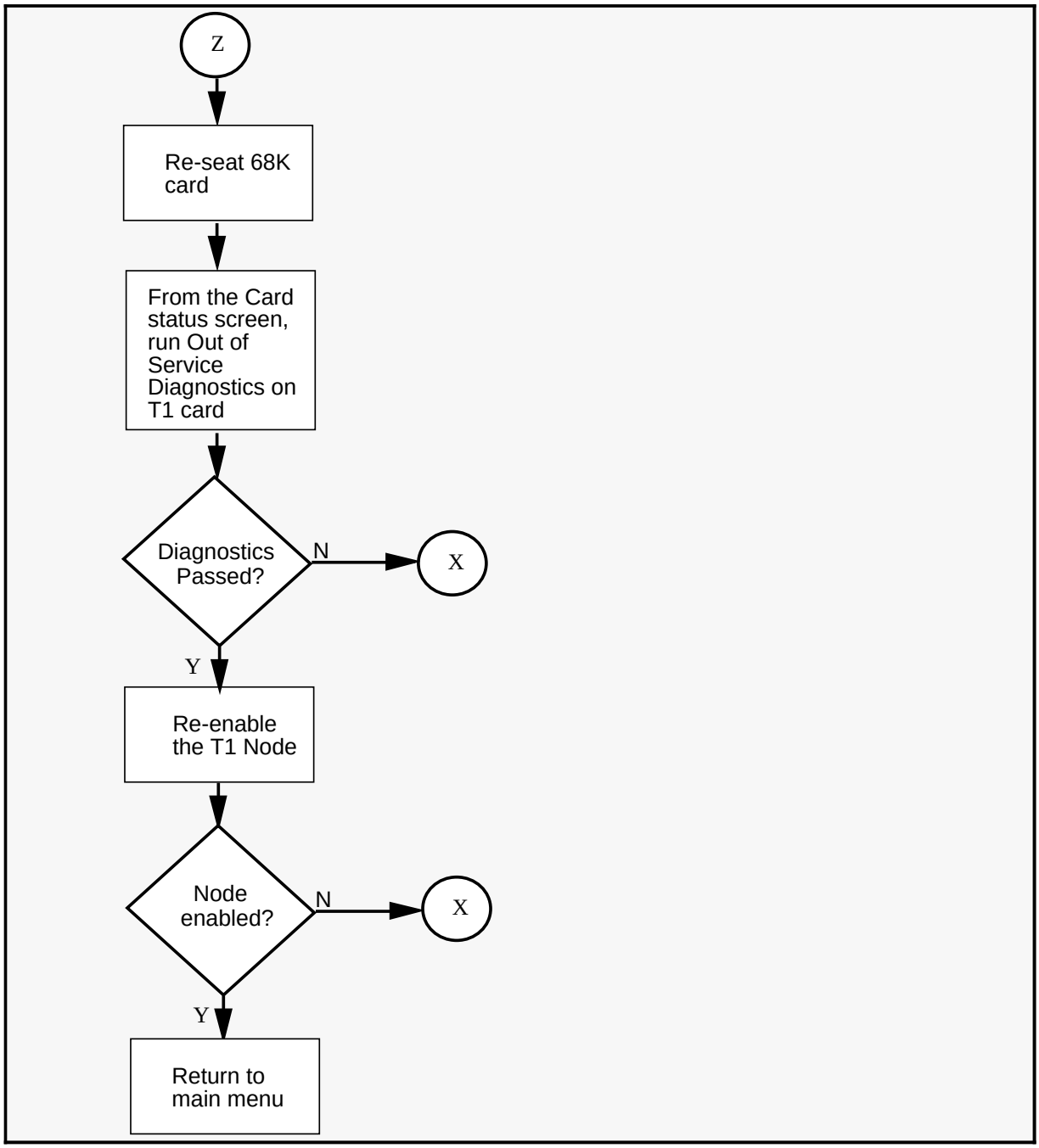
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

Note: The locations for the T1 links are discussed in this procedure as they are identified on your terminal. For example, location 13-1-1 in this procedure refers to node 13, the first card, link 1; 14-3-3 refers to node 14, the third card, link 3, etc. For a complete list of these locations and the terminology, refer to Tables 1-3 to 1-6.

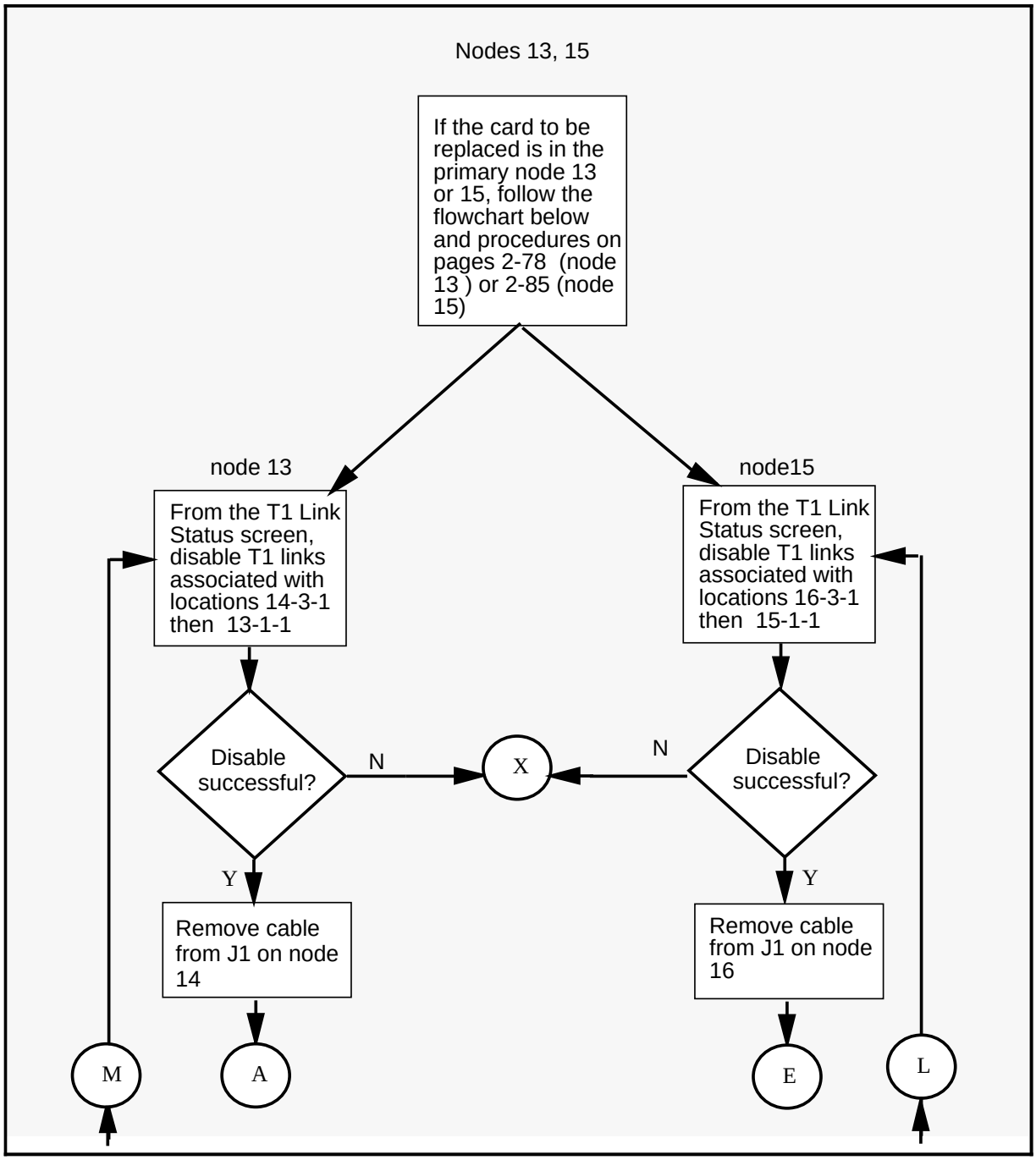
NTGX09AA (continued)
in an electronics shelf (continued)



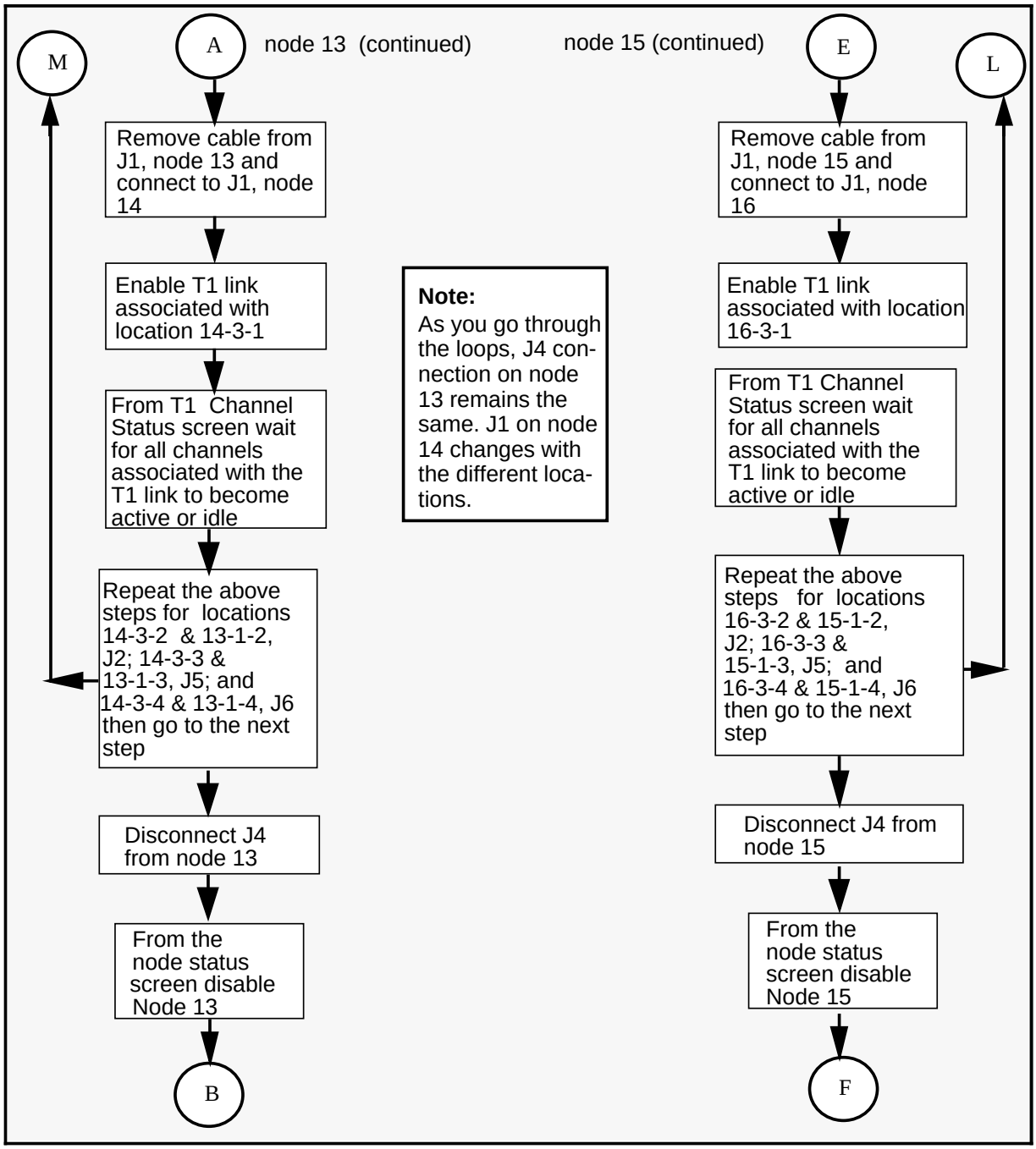
NTGX09AA (continued)
in an electronics shelf (continued)



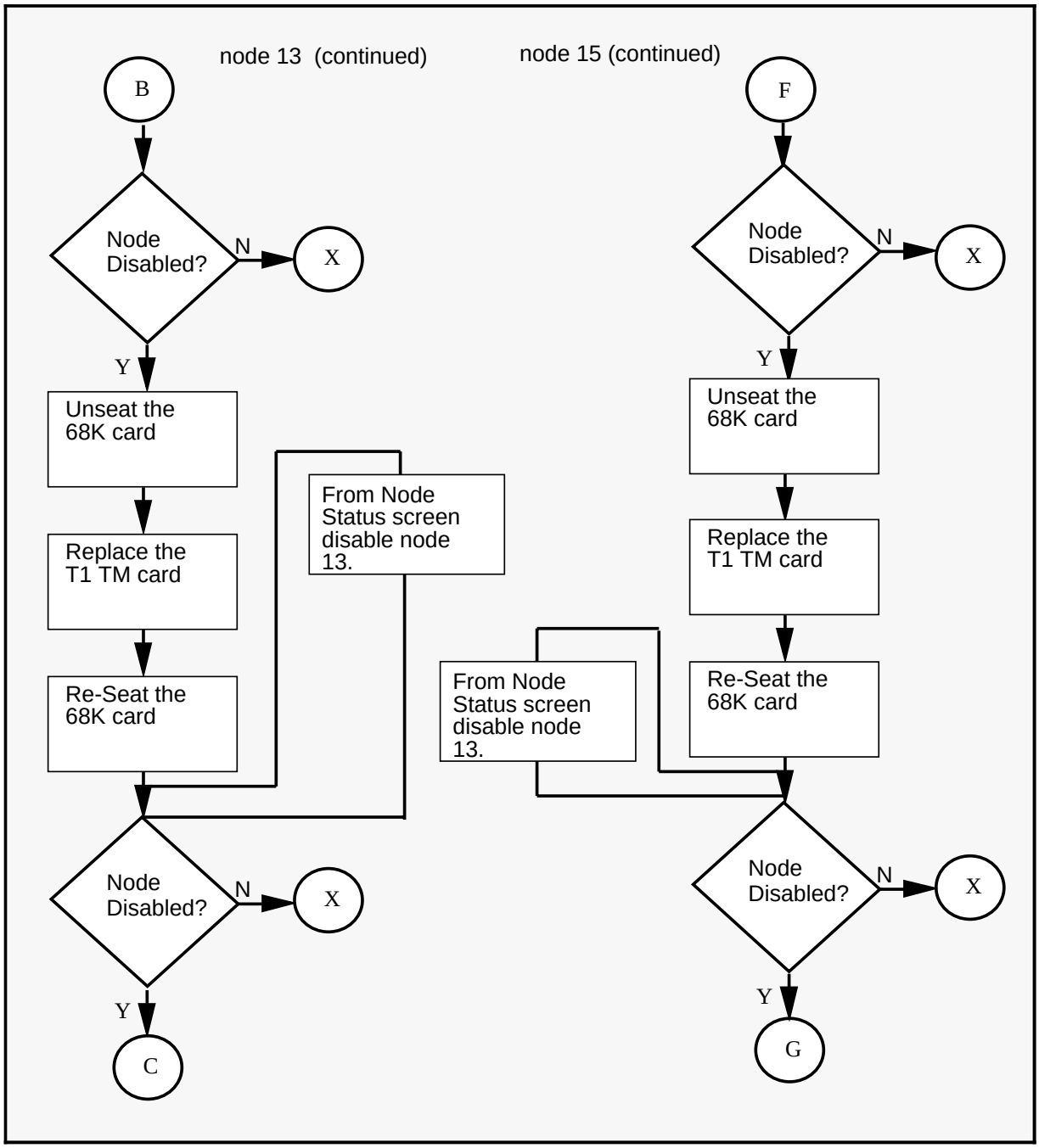
NTGX09AA (continued)
in an electronics shelf (continued)



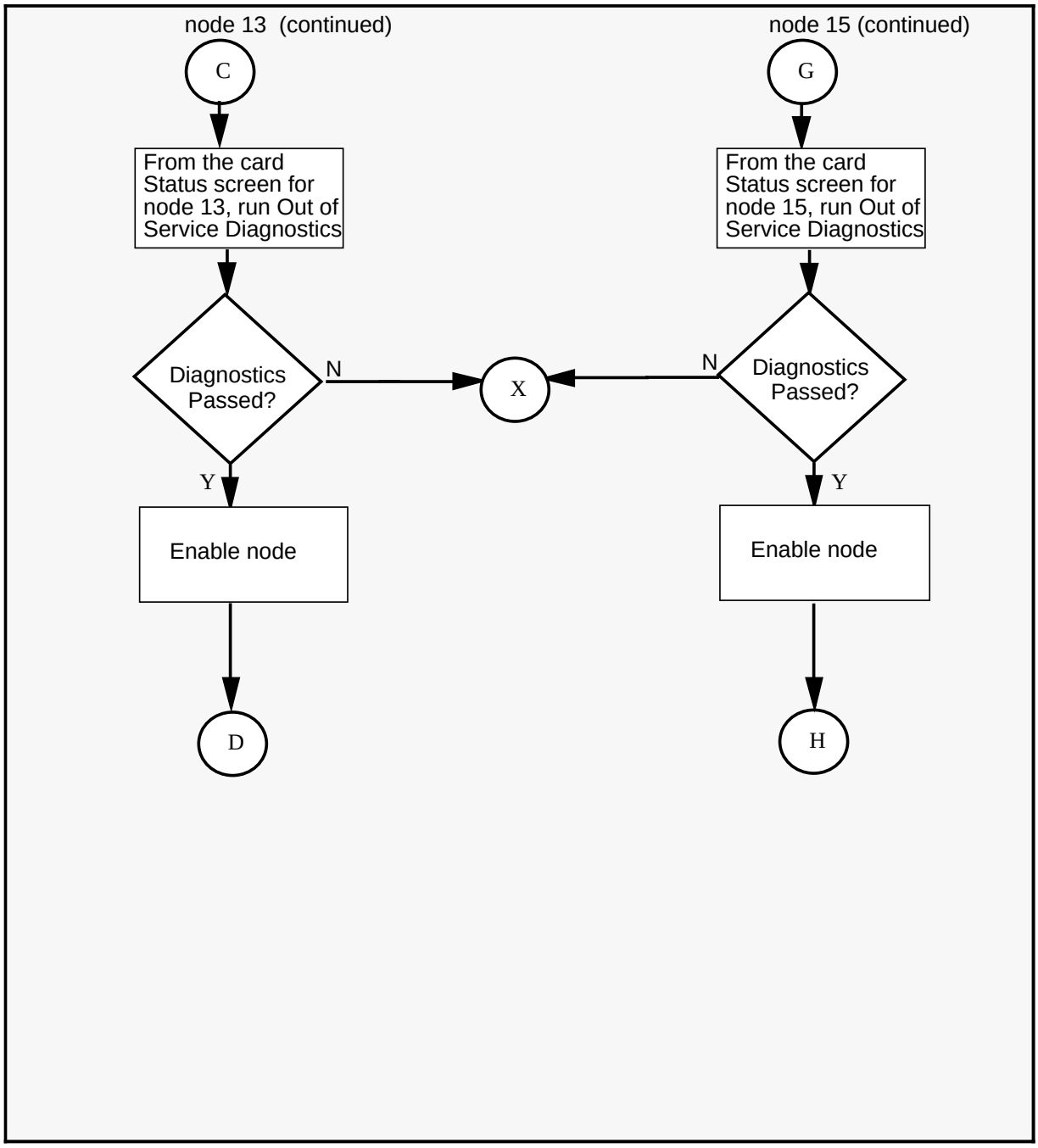
NTGX09AA (continued)
in an electronics shelf (continued)



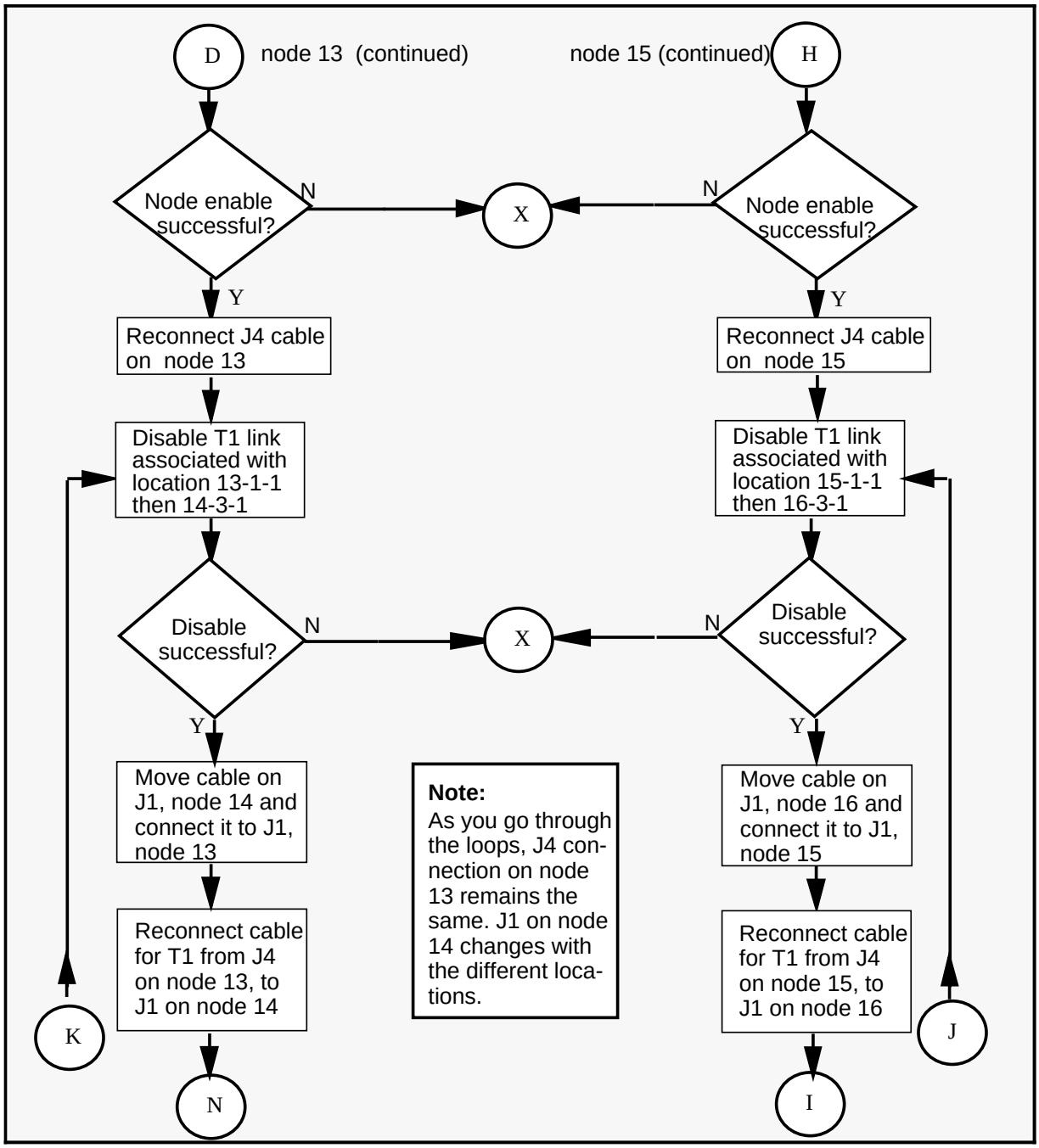
NTGX09AA (continued)
in an electronics shelf (continued)



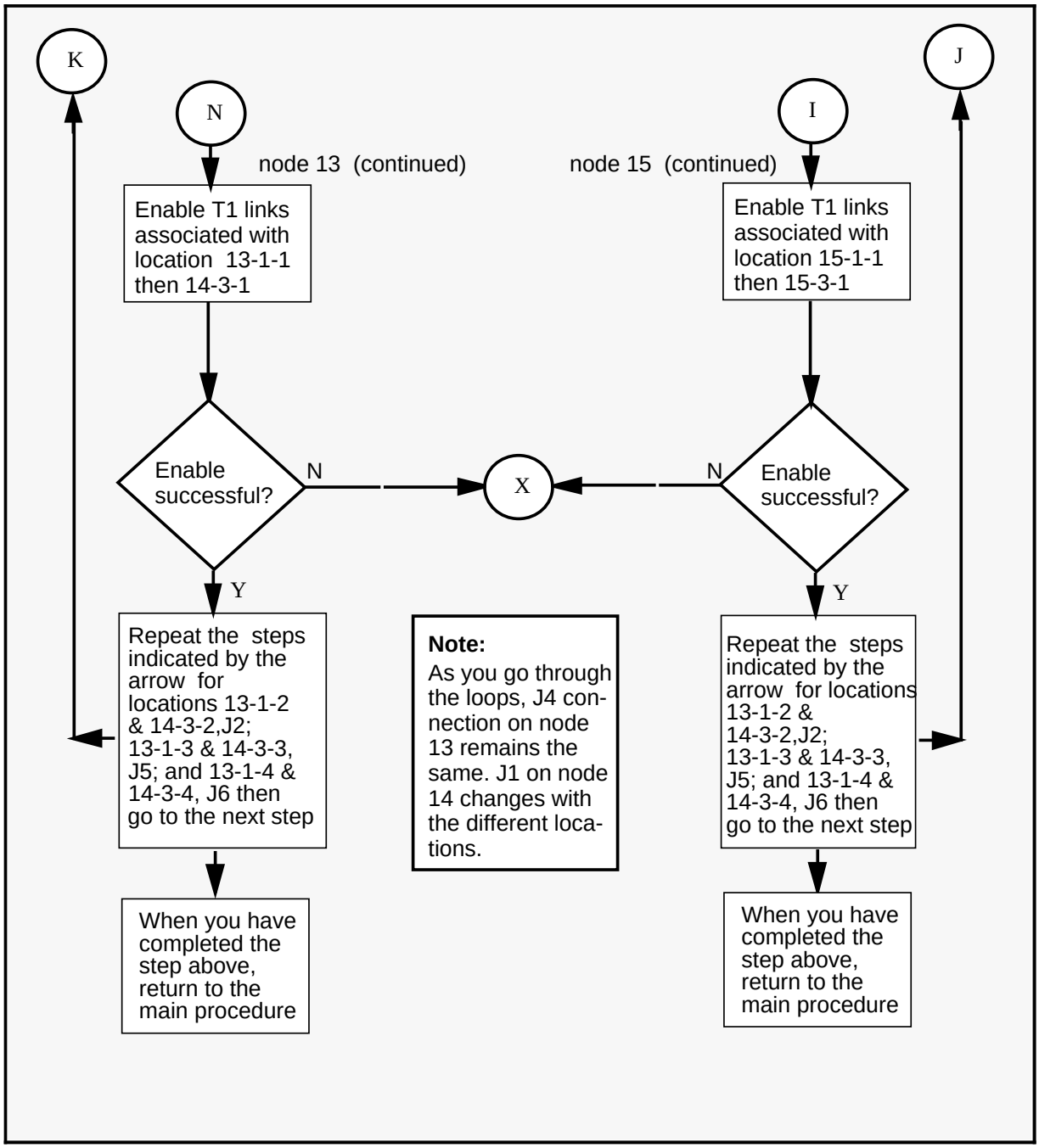
NTGX09AA (continued)
in an electronics shelf (continued)



NTGX09AA (continued)
in an electronics shelf (continued)



NTGX09AA (continued)
in an electronics shelf (continued)



NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 14 or 16 (secondary node)

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Disable the appropriate node (14 or 16) by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25.
4	Unseat the 68K card . (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
5	Perform the procedure *Replacing a DMS VoiceMail Card at the back of the cabinet* on page 3-9. When you have completed the procedure, continue with the following step.
6	Reseat the 68K card.
7	Perform OutofService Diagnostics from the Card status screen on the new card by following procedure 3-4 *Enabling and disabling cards* on page 3-28. This will take approximately 5 minutes.
8	Perform the procedure *Enabling and disabling nodes* on page 3-25 to re-enable the disabled node.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 14 or 16 (secondary node)(continued)

Step	Action
9	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
10	You have completed this procedure.
	End

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 13 (primary node*)**

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Disable the T1 links associated with locations 14-3-1 then 13-1-1 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35. Disable those links that are “InSvStandby” first and wait for the state to change to “OutofService“. This takes a few seconds. Then disable the “InService” links and wait for the state to change to “OutofService“. This may take up to five minutes, depending on the system load. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
4	After the links are reported out of service, exit from the Link Status screen using the [Exit] softkey. This takes you back to the Main Menu screen.
5	Choose the Channel Status screen and check that all channels associated with the locations 14-3-1 and 13-1-1 are out of service. If they are not, take the channels out of service by following procedure 3-7 on page 3-37. Note: Do not proceed with the procedure until all channels are out of service.

-continued-

NTGX09AA (continued) in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
6	Return to the T1 link screen from System Status and Maintenance screen. (The last step in the T1 channel procedure returns you to this screen.)
7	Consult the SPM Cross-Reference Table for the correct card location. (See Figure 3-11 on Page 3-43 for more information).
8	Disconnect the cable from J1 on node 14.
9	Disconnect the cable from J1 on node 13 and connect it to J1 on node 14.
10	Re-enable T1 link associated with location 14-3-1 by following procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35.
11	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
12	Disable the T1 links associated with locations 14-3-2 then 13-1-2 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
13	Check Channel status as described in steps 4, 5 and 6 above.
14	Disconnect the cable from J2 on node 14.
15	Disconnect the cable from J2 on node 13 and connect it to J2 on node 14.
16	Re-enable the T1 link associated with location14-3-2 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
17	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
18	Disable the T1 links associated with locations14-3-3 then 13-1-3 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
19	Check Channel status as described in steps 4, 5 and 6 above.
20	Disconnect the cable from J3 on node 14.
21	Disconnect the cable from J5 on node 13 and connect it to J5 on node 14.
22	Re-enable T1 link associated with location 14-3-3 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
23	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
24	Disable the T1 locations associated with locations14-3-4 then 13-1-4 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
25	Check Channel status as described in steps 4, 5 and 6 above.
26	Disconnect the cable from J6 on node 14.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
27	Disconnect the cable from J6 on node 13 and connect it to J6 on node 14.
28	Re-enable the T1 link associated with location 14-3-4 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
29	Disable the T1 node on which the faulty card resides by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25. Disabling the node will take approximately 5 minutes. If the node is successfully disabled, continue with the procedure. If the disable is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
30	Unseat the 68K card . (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
31	Replace the card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being replaced.
32	Reseat the 68K card.
33	Repeat step 29 in order to take the node from the Faulty state (which resulted when the 68K card was unseated) to the OutofService state so that OutofService Diagnostics can be performed on the T1 card.
34	From the Card status screen, perform OutofService Diagnostics on the T1 card by following the procedure 3-4 *Enabling and disabling cards* on page 3-28. This will take approximately 5 minutes. The node must be taken out of service in order to perform diagnostics.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
35	Enable the T1 node on which the faulty card resides by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25. Enabling the node will take approximately 5 minutes. If the node is successfully enabled, continue with the procedure. If the enable is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
36	Disable the T1 link associated with locations 13-1-1 then 14-3-1 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35. If you are unable to disable the link, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
37	Check Channel status as described in steps 4, 5 and 6 above.
38	Disconnect the cable from J1 on node 14 and connect it to J1 on node 13.
39	Reconnect the cable from J4 on node 13 to J1 on node 14.
40	Re-enable T1 links associated with locations 13-1-1 then 14-3-1 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
41	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.

-continued-

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
42	Disable the T1 link associated with locations 13-1-2 then14-3-2 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
43	Check Channel status as described in steps 4, 5 and 6 above.
44	Disconnect the cable from J2 on node 14 and connect it to J2 on node 13.
45	Reconnect the cable from J4 on node 13 to J2 on node 14.
46	Re-enable T1 links associated with locations 13-1-2 then 14-3-2 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
47	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
48	Disable the T1 link associated with locations 13-1-3 then 14-3-3 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
49	Check Channel status as described in steps 4, 5 and 6 above.
50	Disconnect the cable from J5 on node 14 and connect it to J5 on node 13.
51	Reconnect the cable from J4 on node 13 to J5 on node 14.

-continued-

NTGX09AA (end)
in an electronics shelf (end)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 13 (primary node)(continued)

Step	Action
52	Re-enable T1 links associated with locations 13-1-3 then 14-3-3 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
53	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
54	Disable the T1 links associated with locations 13-1-4 then 14-3-4 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35 .
55	Check Channel status as described in steps 4, 5 and 6 above.
56	Disconnect the cable from J6 on node 14 and connect it to J6 on node 13.
57	Reconnect the cable from J4 on node 13 to J4 on node 14.
58	Re-enable T1 links associated with locations 13-1-4 then 14-3-4 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
59	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
60	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
61	You have completed this procedure.
	End

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)**

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Disable the T1 links associated with locations 16-3-1 then 15-1-1 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35.
4	After the links are reported out of service, exit from the Link Status screen using the [Exit] softkey. This takes you back to the Main Menu screen.
5	Choose the Channel Status screen and check that all channels associated with the locations 16-3-1 and 15-1-1 are out of service. If they are not, take the channels out of service by following the procedure on page 3-37. Note: Do not proceed with the procedure until all channels are out of service.
6	After all the links associated with the link are out of service, return to the T1 link screen from System Status and Maintenance screen. (The last step in the T1 channel procedure returns you to this screen.)
7	Disconnect the cable from J1 on node 16.
8	Disconnect the cable from J1 on node 15 and connect it to J1 on node 16.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
9	Re-enable T1 link associated with location 16-3-1 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
10	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
11	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
12	Disable the T1 links associated with locations 16-3-2 then 15-1-2 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
13	Check Channel status as described in steps 4, 5 and 6 above.
14	After all channels associated with the link are out of service, disconnect the cable from J2 on node 16.
15	Disconnect the cable from J2 on node 15 and connect it to J2 on node 16.
16	Re-enable the T1 link associated with location16-3-2 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
17	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.

-continued-

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
18	Disable the T1 links associated with locations16-3-3 then 15-1-3 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
19	Check Channel status as described in steps 4, 5 and 6 above.
20	Disconnect the cable from J3 on node 16.
21	Disconnect the cable from J5 on node 15 and connect it to J5 on node 16.
22	Re-enable T1 link associated with location 16-3-3 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
23	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
24	Disable the T1 locations associated with locations16-3-4 then 15-1-4 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
25	Check Channel status as described in steps 4, 5 and 6 above.
26	Disconnect the cable from J6 on node 16.
27	Disconnect the cable from J6 on node 15 and connect it to J6 on node 16.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
28	Re-enable the T1 link associated with location 14-3-4 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
29	Go to the T1 Channel Status screen and wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
	End

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
Faulty card is in node 15 (primary node)

Step	Action
30	Disable the T1 node on which the faulty card resides by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25. Disabling the node will take approximately 5 minutes. If the node is successfully disabled, continue with the procedure. If the disable is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
31	Unseat the 68K card . (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
32	Replace the card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being replaced.
33	Reseat the 68K card.
34	From the Card status screen, perform OutofService Diagnostics on the new card by following the procedure 3-4 *Enabling and disabling cards* on page 3-28. You will be prompted for the node number. Enter <15> This procedure will take approximately 5 minutes.
35	Enable the T1 node on which the faulty card resides by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25. Enabling the node will take approximately 5 minutes. If the node is successfully enabled, continue with the procedure. If the enable is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
36	Disable the T1 link associated with locations 15-1-1 then 16-3-1 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35. If the disable is unsuccessful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
37	Check Channel status as described in steps 4, 5 and 6 above.
38	Disconnect the cable from J1 on node 16 and connect it to J1 on node 15.
39	Reconnect the cable from J4 on node 15 to J1 on node 16.
40	Re-enable T1 links associated with locations 15-1-1 then 16-3-1 by following procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35.
41	Go to the T1 Channel Status screen and wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
42	Disable the T1 link associated with locations 15-1-2 then16-3-2 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35. If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
43	Check Channel status as described in steps 4, 5 and 6 above.
44	Disconnect the cable from J2 on node 16 and connect it to J2 on node 15.
45	Reconnect the cable from J4 on node 15 to J2 on node 16.

-continued-

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
46	Re-enable T1 links associated with locations 15-1-2 then 16-3-2 by following procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35.
47	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
48	Disable the T1 link associated with locations 15-1-3 then 16-3-3 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-6 *Enabling, disabling and switching T1 links* on page 3-35.
49	Check Channel status as described in steps 4, 5 and 6 above.
50	Disconnect the cable from J5 on node 16 and connect it to J5 on node 15.
51	Reconnect the cable from J4 on node 15 to J5 on node 16.
52	Re-enable T1 links associated with locations 15-1-3 then 16-3-3 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
53	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
54	Disable the T1 links associated with locations 15-1-4 then 16-3-4 by performing procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35 . If the disable process is not successful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
55	Check Channel status as described in steps 4, 5 and 6 above.
56	Disconnect the cable from J6 on node 16 and connect it to J6 on node 15.

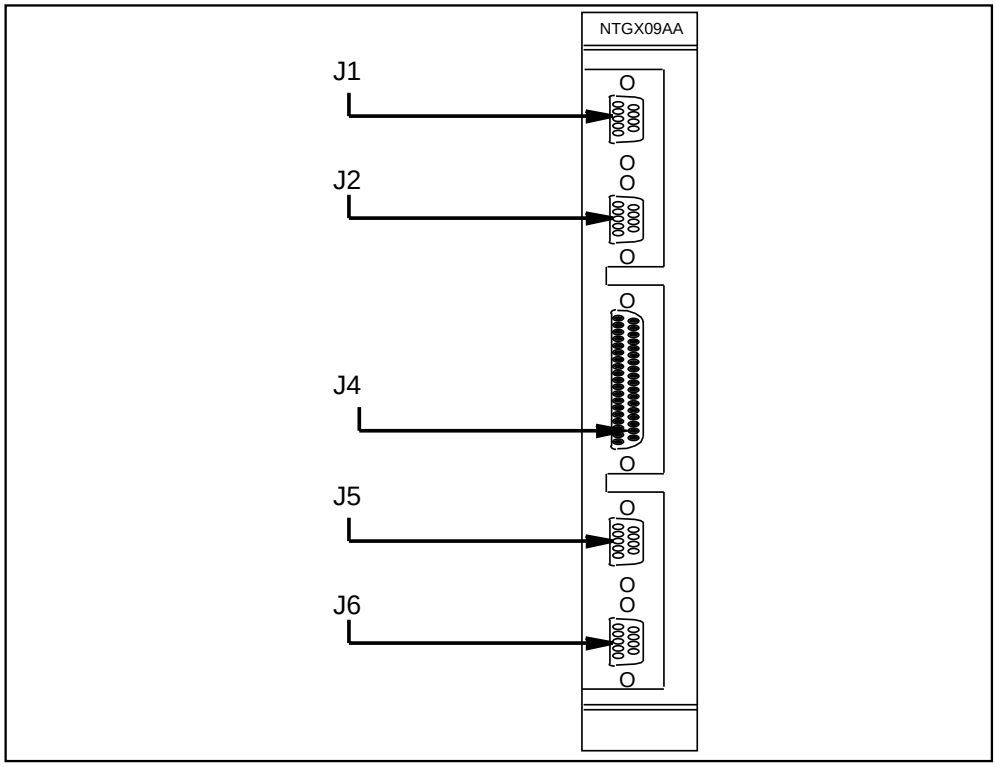
-continued-

NTGX09AA (continued)
in an electronics shelf (continued)

Replacing an NTGX09AA in an electronics shelf
***Faulty card is in node 15 (primary node*)** (continued)

Step	Action
57	Reconnect the cable from J4 on node 15 to J4 on node 16.
58	Re-enable T1 links associated with locations 15-1-4 then 16-3-4 by following procedure 3-7 *Enabling, disabling and switching T1 links* on page 3-35.
59	From the T1 Channel Status screen, wait for all the channels associated with the T1 link to become active or idle. This will take approximately five minutes.
60	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
61	You have completed this procedure.
	End

Figure 2-2
T1 transition module (rear view)



NTGX09AA (end)
in an electronics shelf (end)

NTGX10AA
in a primary electronics shelf

Application

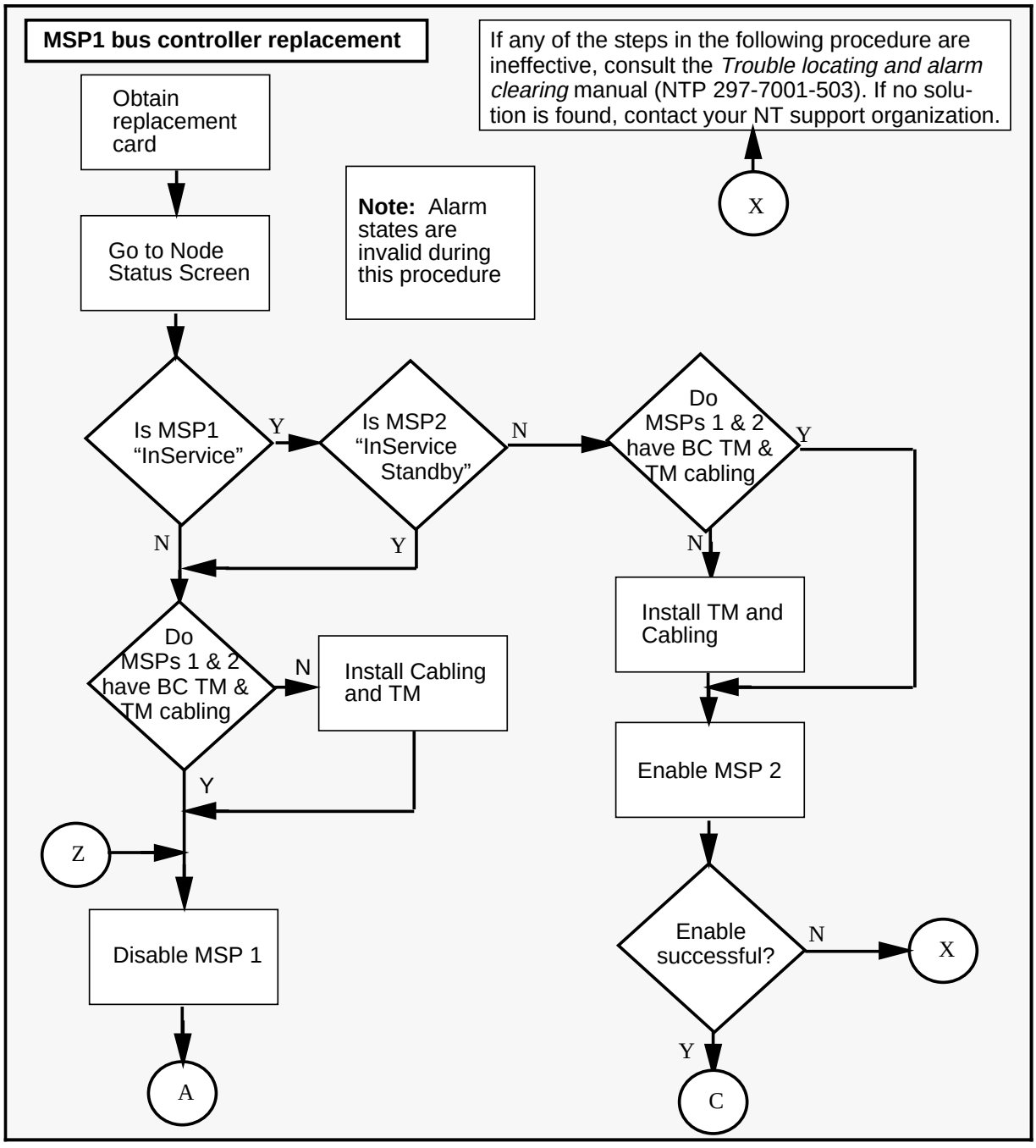
Use this procedure to replace the following card in a primary electronics shelf.

PEC	Suffixes	Name
NTGX10	AA	Bus controller circuit pack

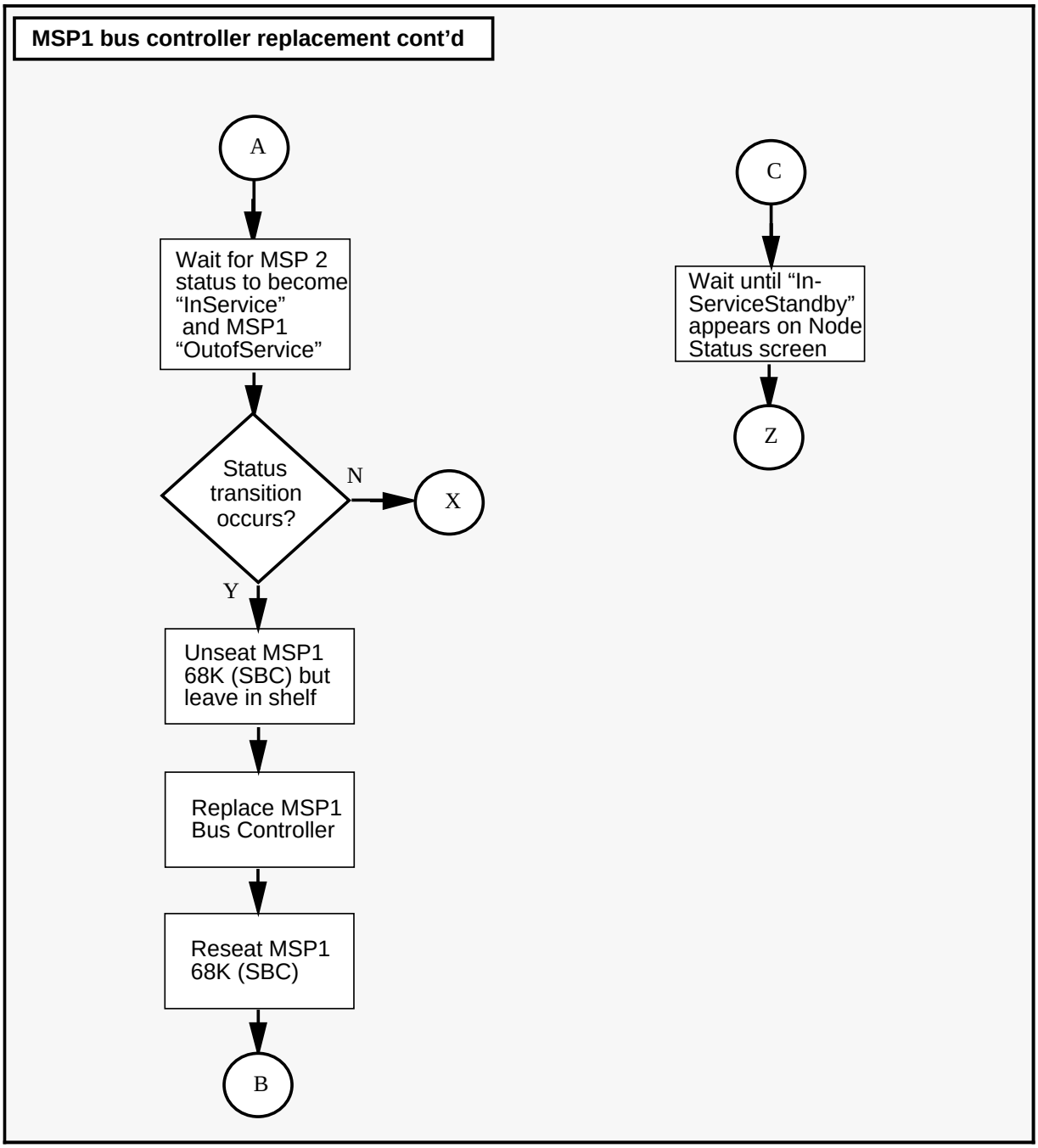
Action

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.

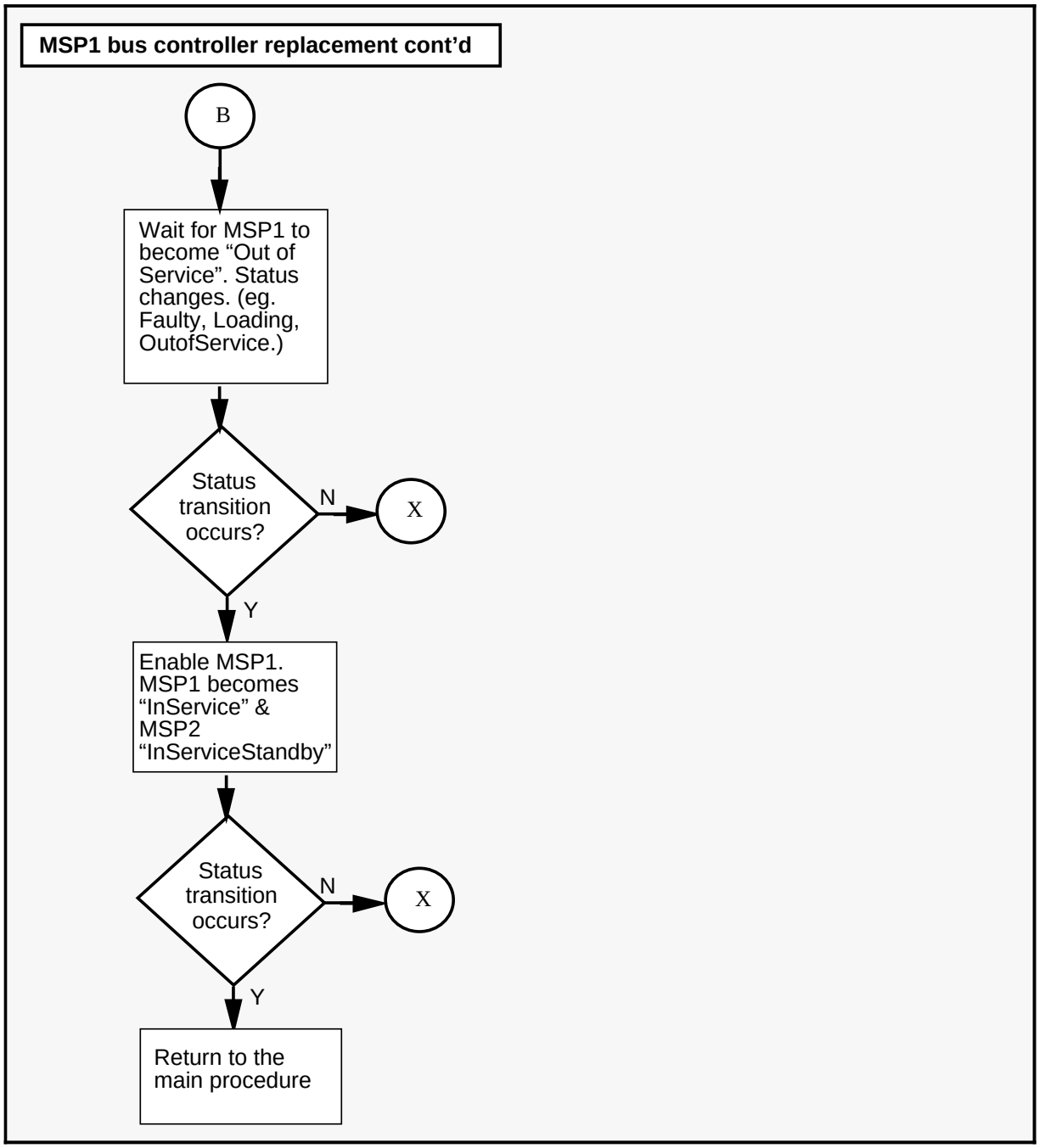
NTGX10AA (continued)
in a primary electronics shelf (continued)



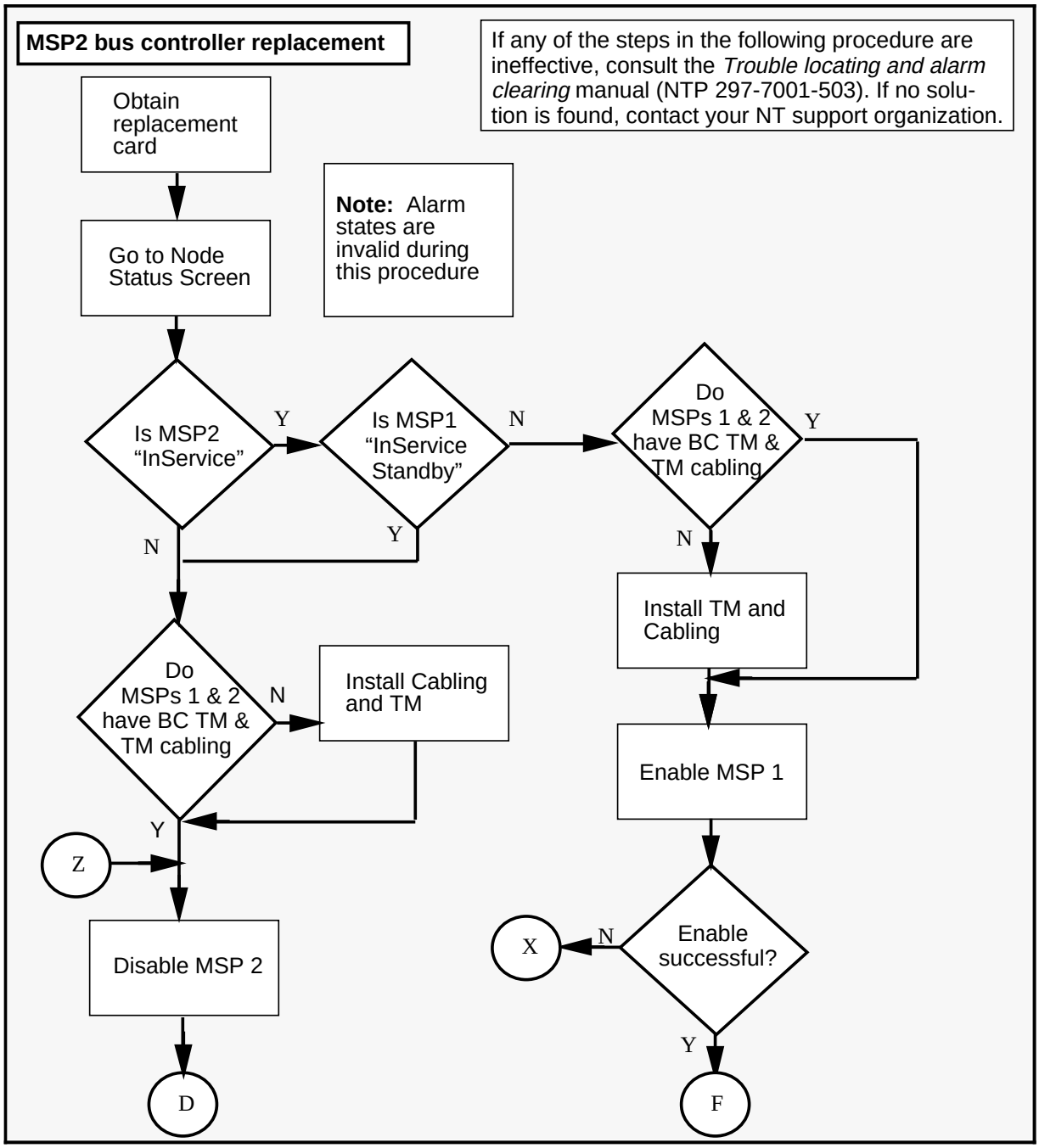
NTGX10AA (continued)
in a primary electronics shelf (continued)



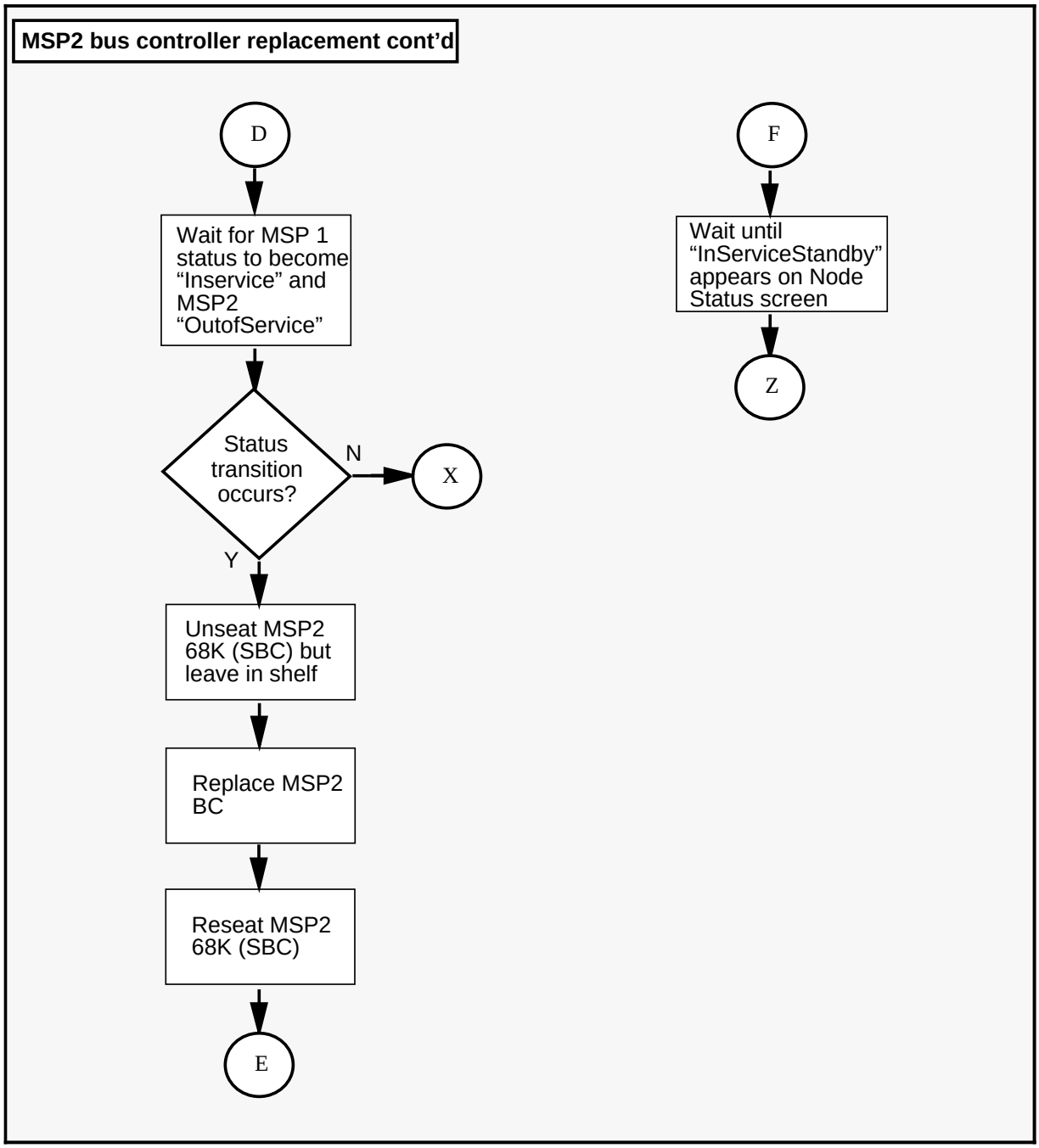
NTGX10AA (continued)
in a primary electronics shelf (continued)



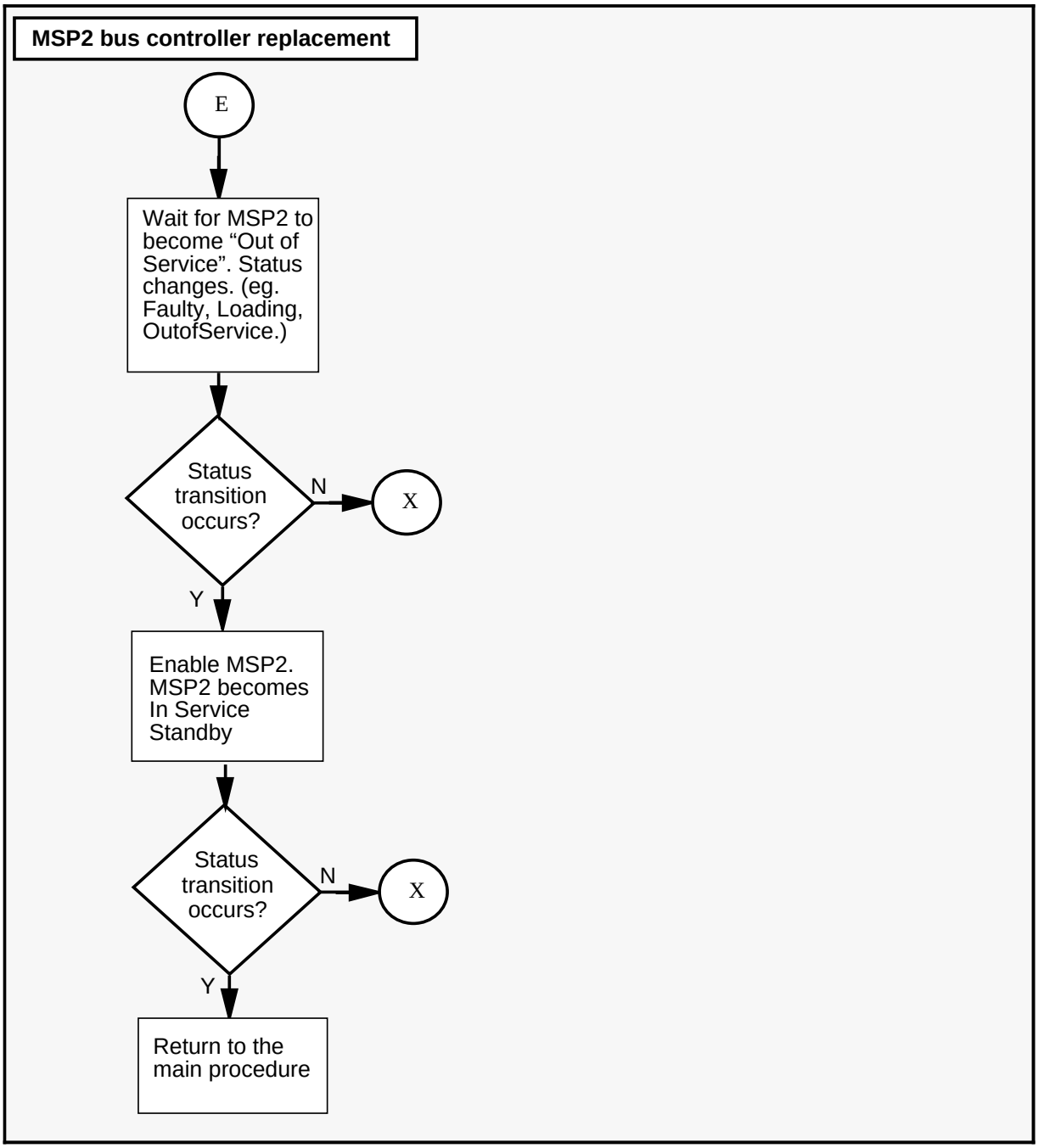
NTGX10AA (continued)
in a primary electronics shelf (continued)



NTGX10AA (continued)
in a primary electronics shelf (continued)



NTGX10AA (continued)
in a primary electronics shelf (continued)



NTGX10AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus Controller for MSP1 in a primary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	***Note:*** All alarms encountered in this procedure are invalid. Please disregard.
4	In the Node Status screen, determine the status of MSP1. - If it is “InService”, go to step 5. - If it is not “InService”, proceed to step 7.
5	From the Node Status screen, determine if MSP2 is InServiceStandby. -If it is “InService Standby”, go to step 7. -If it is not “InServiceStandby”, proceed to step 16.
6	Go to the SPM Cross reference table (see figure 3-11 on page 3-43) for the shelf and slot location of the card.
7	Determine if MSPs 1& 2 have Bus Controller TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 8. - If they do not then install cabling and TM and continue with the procedure.
8	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP1 node. The status will go through various states. For example: >Shuttingdown>Faulty>Booting>OutOfService. This process will take approximately 10 minutes.

-continued-

Replacing a Bus Controller for MSP1 in a primary electronics shelf (continued)

Step	Action
9	Wait for MSP2 status to become InService and MSP1 “OutOfService”. If this status transition does not occur consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization. Otherwise, continue following the procedure.
10	Go to the SPM Cross reference table (see figure 3-11 on page 3-43) for the shelf and slot location of the card.
11	Unseat the MSP1 68K card. (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
12	Perform procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 .
13	Reseat the MSP1 68K card.
14	Wait for MSP1 to become OutOfService. Status transits through different states. For example: Faulty > Booting> OutOfService. If this activity does not take place Go to the Card Status screen and perform out of service diagnostics by pressing the [OutofService Diagnostics] softkey. If you cannot isolate the problem, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
15	Enable the MSP1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. MSP1 status becomes “InService” and MSP2 status becomes “InServiceStandby”. This will take about five minutes. - If the re-enable is successful proceed to step 19. - If the re-enable is unsuccessful, then contact your Northern T elecom service representative for assistance.
16	Determine if MSPs 1 and 2 have BC TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 17. If MSPs 1&2 do not have BC TM and TM cabling, install TM and cabling and then continue with the procedure.

-continued-

NTGX10AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus Controller for MSP1 in a primary electronics shelf (continued)

Step	Action
17	Enable the MSP2 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the enable is successful, continue following the procedure. If it is unsuccessful then contact your Northern Telecom support organization for assistance.
18	Wait until "InServiceStandby" appears on the node status screen. When this occurs, (five to ten minutes) return to step 8 and follow the rest of the procedure.
19	Return to the main procedure.
20	For further assistance, contact the personnel responsible for the next level of support.
21	You have completed this procedure.
	End

Replacing a Bus Controller for MSP2 in a primary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	In the Node Status screen, determine the status of MSP2. - If it is “InService”, go to step 4. - If it is not “InService”, proceed to step 5.
4	From the Node Status screen, determine if MSP1 is InServiceStandby. -If it is “InService Standby”, go to step 7. -If it is not “InServiceStandby”, proceed to step 16.
5	Determine if MSPs 1& 2 have BC TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 8. - If they do not then install cabling and TM and continue with the procedure.
6	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP2 node. This process will take approximately 10 minutes.
7	Wait for MSP1 status to become “InService” and MSP2 “OutOfService”. If this status transition does not occur consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX10AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus Controller for MSP2 in a primary electronics shelf (continued)

Step	Action
8	Unseat the MSP2 68K card. (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
9	Perform procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3 .
10	Reseat the MSP2 68K card.
11	Wait for MSP2 to become “OutOfService”. Status transits through various states, for example: Faulty > Loading > OutOfService. If this activity does not take place consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
12	Enable the MSP2 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. MSP2 status becomes “InServiceStandby”. This will take about five minutes - If the re-enable is successful proceed to step 19. - If the re-enable is unsuccessful, then contact your Northern T elecom service representative for assistance.
13	Determine if MSPs 1 and 2 have Bus Controller TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 17. If MSPs 1&2 do not have BC TM and TM cabling, install TM and cabling and then continue with the procedure.
14	Enable the MSP1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the enable is successful, continue following the procedure. If it is unsuccessful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
15	Wait until “InServiceStandby” appears on the node status screen. Status transits through various states. When this occurs, return to step 8 and follow the rest of the procedure.
16	Return to the main procedure.

-continued-

Replacing a Bus Controller for MSP2 in a primary electronics shelf (continued)

Step	Action
17	For further assistance, contact the personnel responsible for the next level of support.
18	You have completed this procedure.
	End

NTGX10AA (end)
in a primary electronics shelf (end)

NTGX11AA
in a primary electronics shelf

Application

Use this procedure to replace the following card in a primary electronics shelf.

PEC	Suffixes	Name
NTGX11	AA	Bus controller transition module

Action

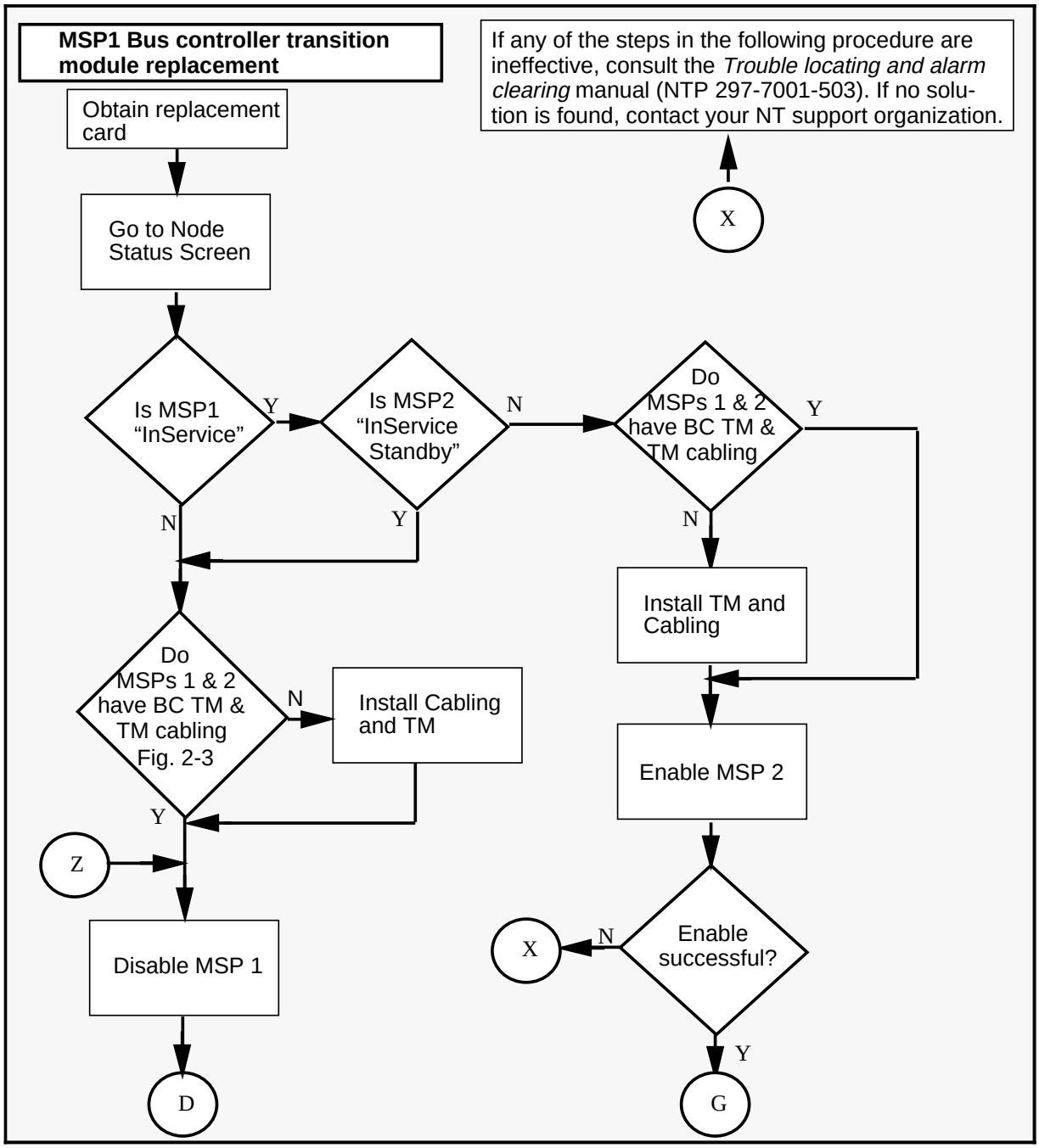
The following flowchart is a summary of this procedure. Use the instructions in the step-action table that follows the flowchart to perform the procedure.

There are two flowcharts in this procedure. The first one summarizes replacing the card on MSP1. The second summarizes replacing the card on MSP2.

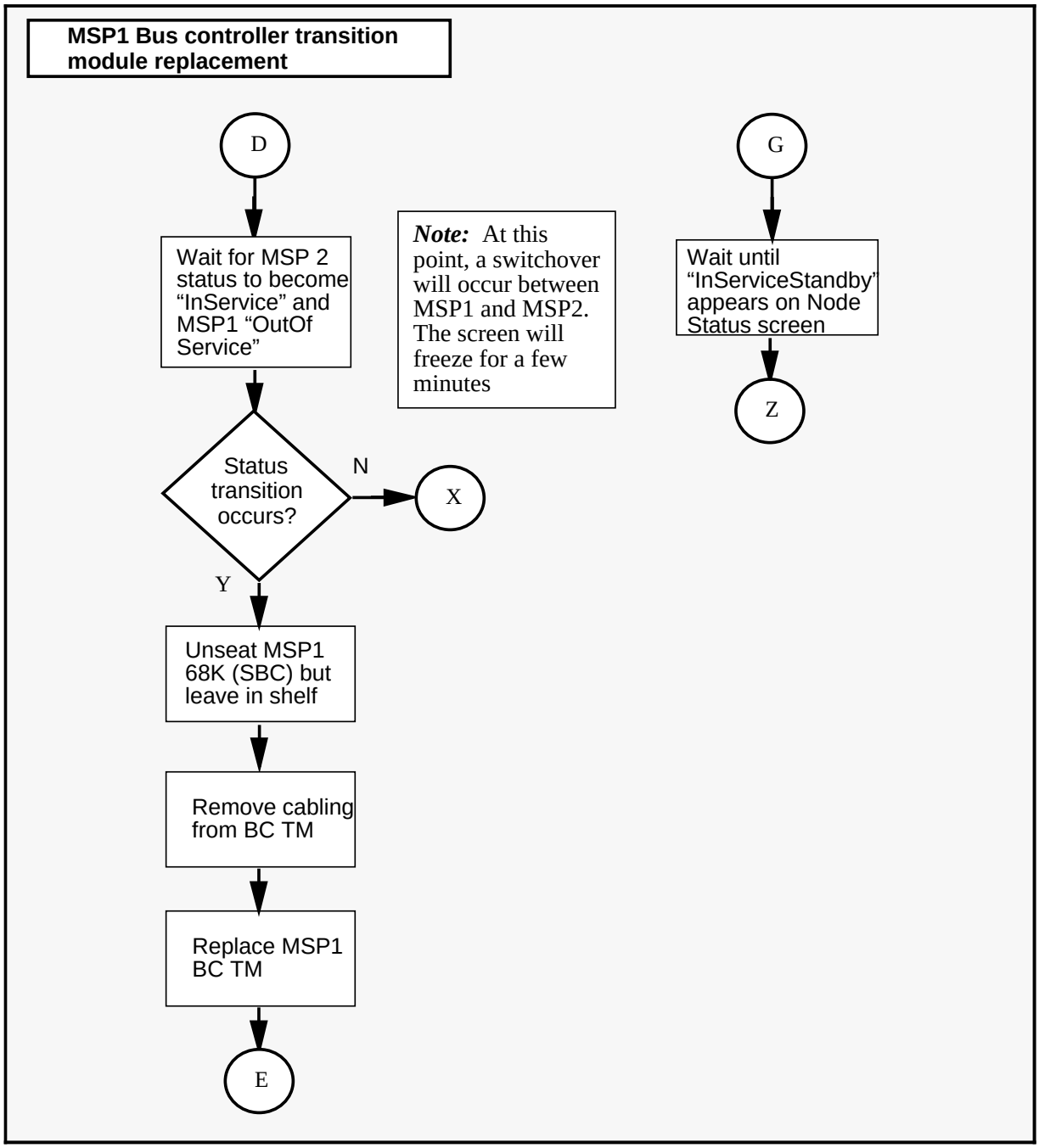
Note: 1 All Alarm states are invalid while this card is inactive.

Note: 2 Changing this card will disrupt service temporarily. It is advisable to change the card during reduced traffic periods.

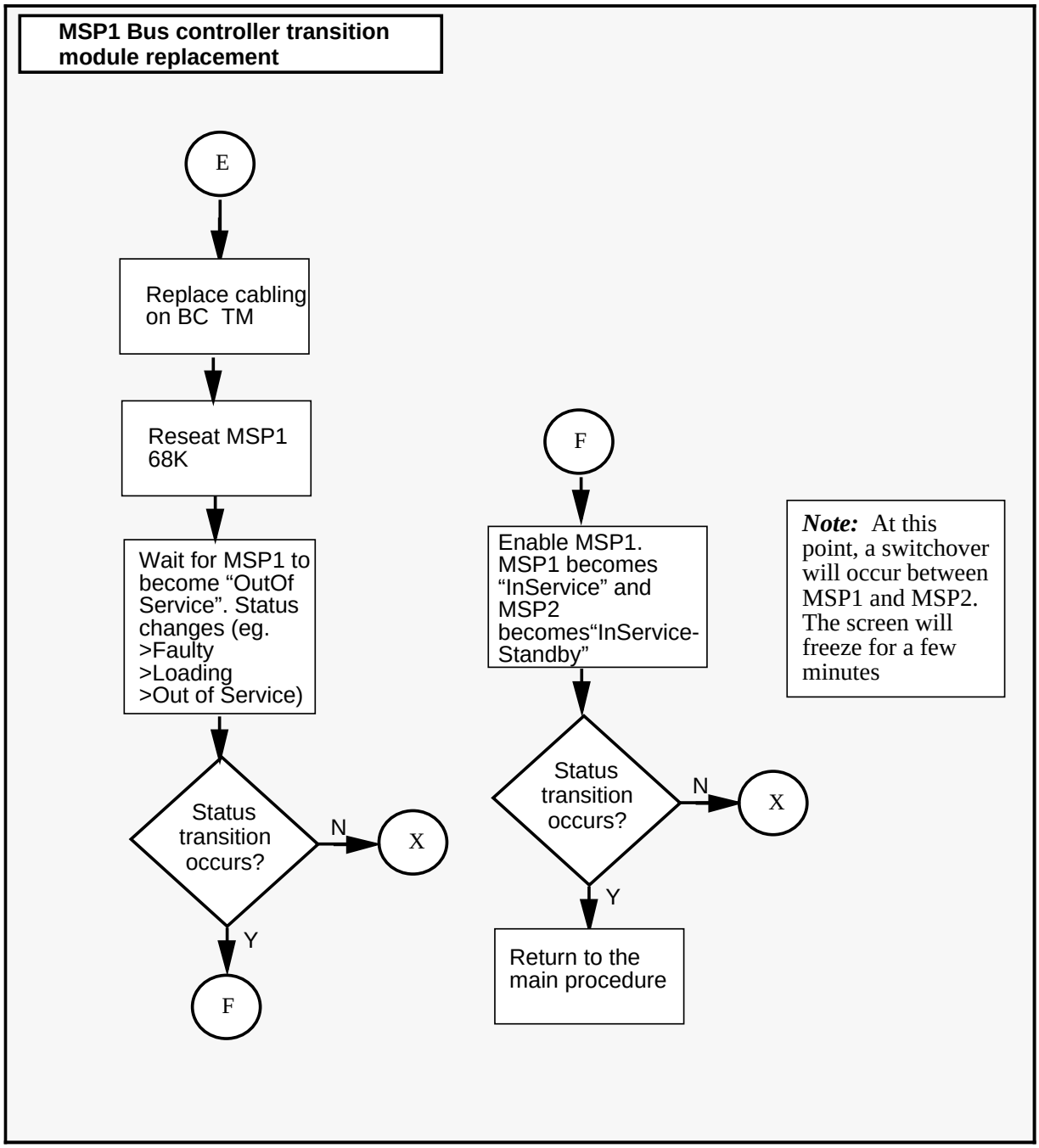
NTGX11AA (continued)
in a primary electronics shelf (continued)



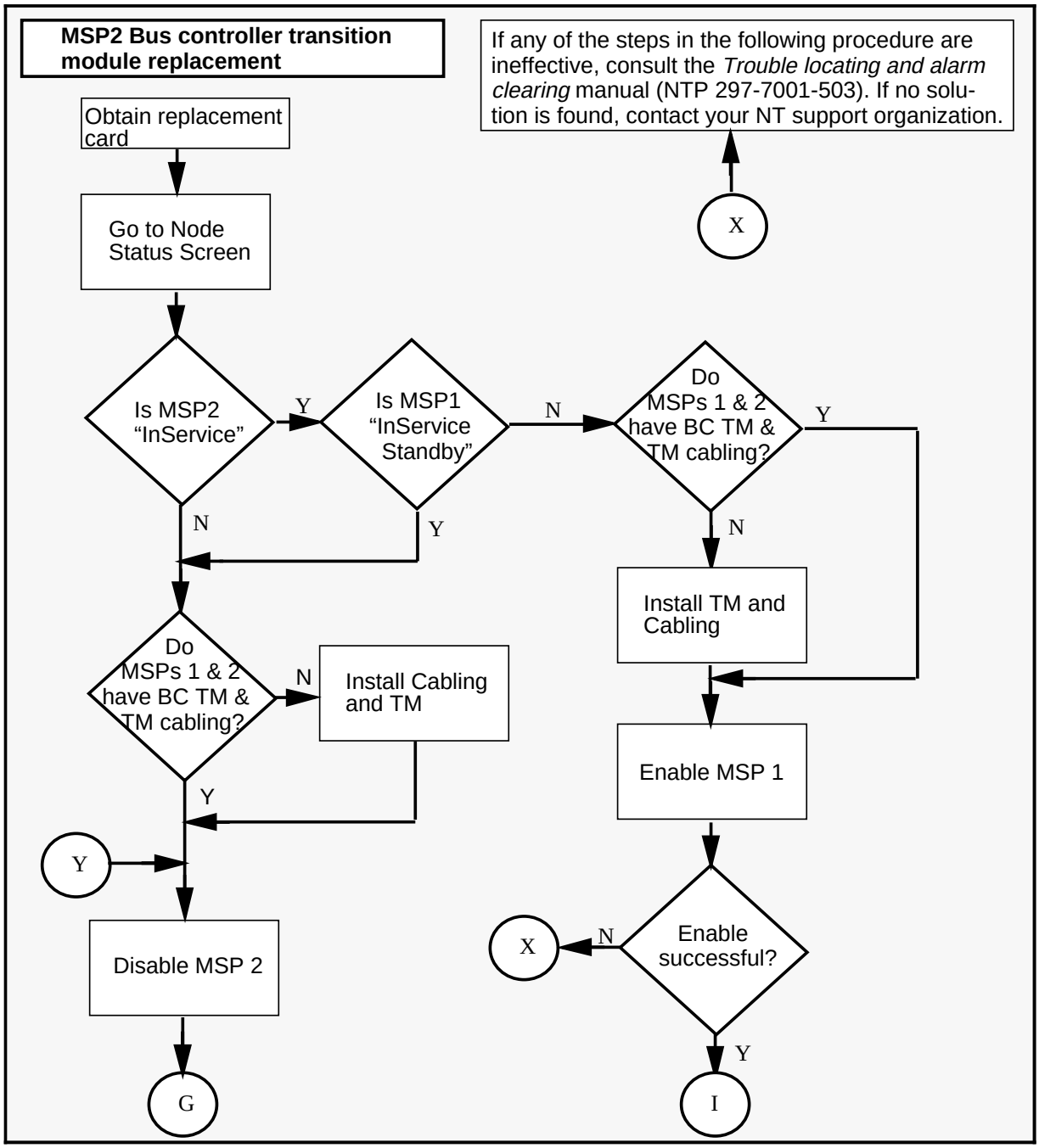
NTGX11AA (continued)
in a primary electronics shelf (continued)



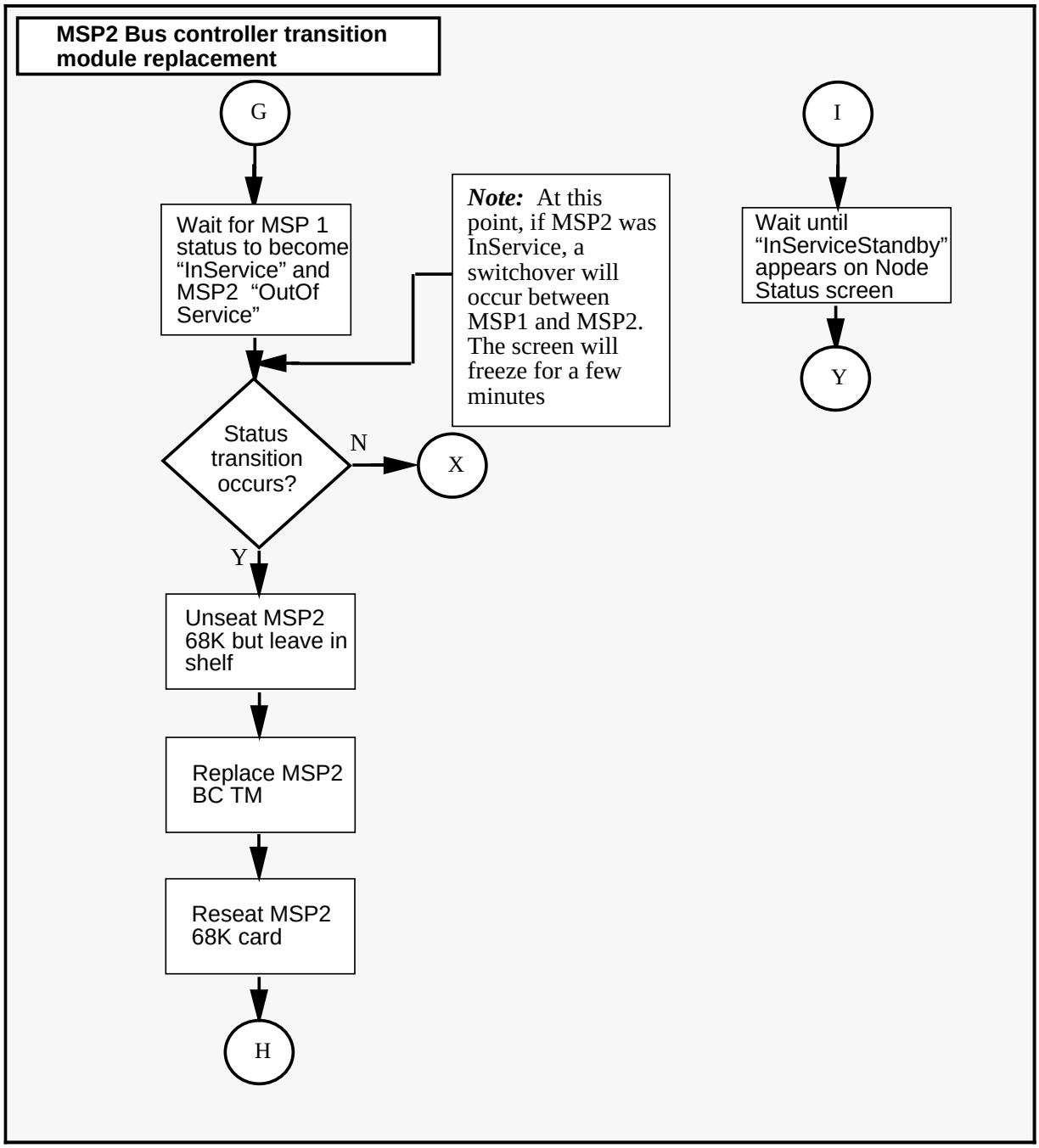
NTGX11AA (continued)
in a primary electronics shelf (continued)



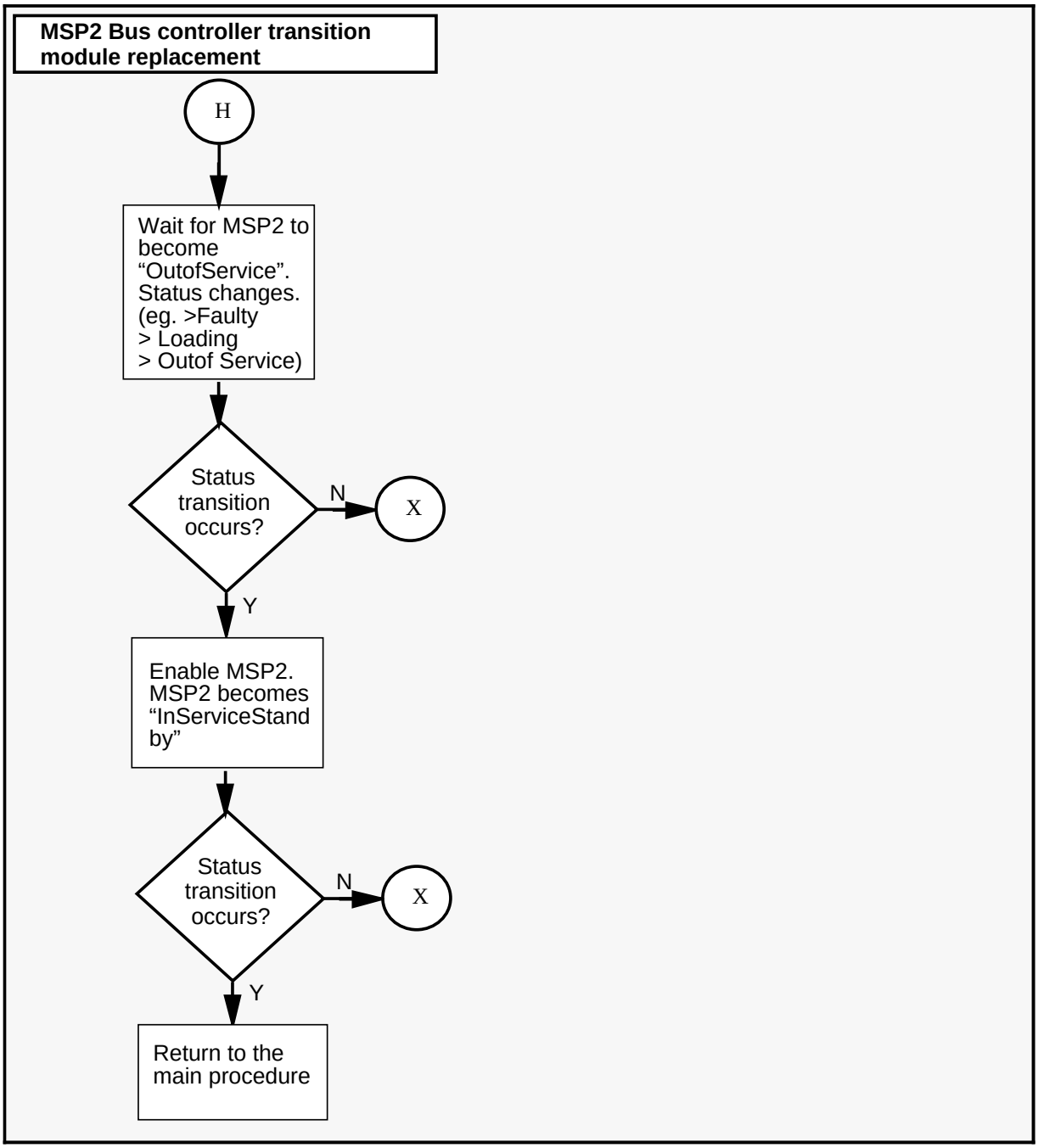
NTGX11AA (continued)
in a primary electronics shelf (continued)



NTGX11AA (continued)
in a primary electronics shelf (continued)



NTGX11AA (continued)
in a primary electronics shelf (continued)

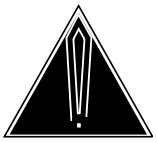


NTGX11AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus controller transition module on MSP1 in a primary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.



CAUTION
Interruption of system alarms
System alarms are invalid during this procedure.

3	In the Node Status screen, determine the status of MSP1. - If it is “InService”, go to step 5. - If it is not “InService”, proceed to step 7.
4	From the Node Status screen, determine if MSP2 is InServiceStandby. -If it is “InService Standby”, go to step 7. -If it is not “InServiceStandby”, proceed to step 16.
5	Determine if MSPs 1& 2 have BC TM and TM cabling (see Figure 2-3). - If MSPs 1&2 have BC TM and TM cabling then go to step 8. - If they do not then install cabling and TM and continue with the procedure.

-continued-

NTGX11AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus controller transition module on MSP1 in a primary electronics shelf (continued)

Step	Action
6	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP1 node. This process will take approximately 10 minutes. ***Note:*** If the faulty card is on MSP1 (node 1) replace NTGX11AA on shelf 26R, slot 09. Refer to table 1-6 in chapter one for more detail on MSP locations.
7	Wait for MSP2 status to become “InService” and MSP1 “OutOfService”. If this status transition does not occur consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
8	Unseat the MSP1 68K card. (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
9	Remove MSP1 BC TM cabling.
10	Replace MSP1 BC TM.
11	Install cable to MSP1 BC TM.
12	Reseat the MSP1 68K card.
13	Wait for MSP1 to become “OutOfService”. Status transits through various states, for example: Faulty > Loading > OutOfService. If this activity does not take place consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX11AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus controller transition module on MSP1 in a primary electronics shelf (continued)

Step	Action
14	Enable the MSP1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. MSP1 status becomes “InService” and MSP2 status becomes “InServiceStandby.” ***Note:*** At this point, a switchover between MSP1 and MSP2 will occur. The screen will freeze during this process.. - If the re-enable is successful proceed to step 20. - If the re-enable is unsuccessful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
15	Determine if MSPs 1 and 2 have BC TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 17. If MSPs 1&2 do not have BC TM and TM cabling, install TM and cabling and then continue with the procedure.
16	Enable the MSP2 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the enable is successful, continue following the procedure. If it is unsuccessful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
17	Wait until “InServiceStandby” appears on the node status screen. When this occurs, in five to ten minutes, return to step 8 and follow the rest of the procedure.
18	Return to the main procedure.
19	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
20	You have completed this procedure.

Note 1: All alarm states are invalid while this card is inactive.

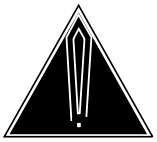
Note 2: Changing this card will disrupt service temporarily. It is advisable to change the card during reduced traffic periods.

End

Replacing a Bus controller transition module on MSP2 in a primary electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.



CAUTION
Interruption of system alarms
System alarms are invalid during this procedure.

3	In the Node Status screen, determine the status of MSP2. - If it is “InService”, go to step 5. - If it is not “InService”, proceed to step 7.
4	From the Node Status screen, determine if MSP1 is “InServiceStandby.” -If it is “InService Standby”, go to step 7. -If it is not InServiceStandby, proceed to step 16.
5	Determine if MSPs 1& 2 have BC TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 7 . - If they do not, continue with the next step.
6	Install BC TM and TM cabling.

-continued-

NTGX11AA (continued)
in a primary electronics shelf (continued)

Replacing a Bus controller transition module on MSP2 in a primary electronics shelf

Step	Action
7	Perform procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16 followed by procedure 3-3 *Enabling and disabling nodes* on page 3-25 to disable the MSP2 node. The status of the MSP will change, for example: >Shutting down>Faulty>Booting>OutofService. This process will take approximately 10 minutes. ***Note:*** If the faulty card is on MSP2 (node 2), replace the NTGX11AA on shelf 26R, slot 10. Refer to Table 1-6 in chapter one for more detail on MSP locations.
8	Wait for MSP1 status to become “InService” and MSP2 “OutOfService”. A status transition should occur if MSP was in any other state other than InSvStandby. If this status transition does not occurconsult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
9	Unseat the MSP2 68K card. (Lift the levers on the face of the card and pull the card out far enough to disengage it from the back plane. It is not necessary to remove the card from the slot.)
10	Remove MSP2 BC TM cabling (see Figure 2-3).
11	Replace MSP2 BC TM.
12	Install cable to MSP2 BC TM.
13	Reseat the MSP2 68K card.
14	Wait for MSP2 to become “OutOfService”. Status of MSP2 transits through various states, for example: Faulty > Loading > OutOfService. If this activity does not take place, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

Replacing a Bus controller transition module on MSP2 in a primary electronics shelf

Step	Action
15	Enable the MSP2 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. MSP1 status becomes “InService” and MSP2 status becomes “InServiceStandby”. If the re-enable is unsuccessful, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
16	Determine if MSPs 1 and 2 have BC TM and TM cabling. - If MSPs 1&2 have BC TM and TM cabling then go to step 19. If MSPs 1&2 do not have BC TM and TM cabling, install TM and cabling and then continue with the procedure.
17	Enable the MSP1 node following procedure 3-3 *Enabling and disabling nodes* on page 3-25. If the enable is successful, continue following the procedure. If it is unsuccessful consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
18	Wait until “InServiceStandby” appears on the node status screen. When this occurs, in five to ten minutes, return to step 8 and follow the rest of the procedure.
19	Return to the main procedure.
20	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
21	You have completed this procedure.

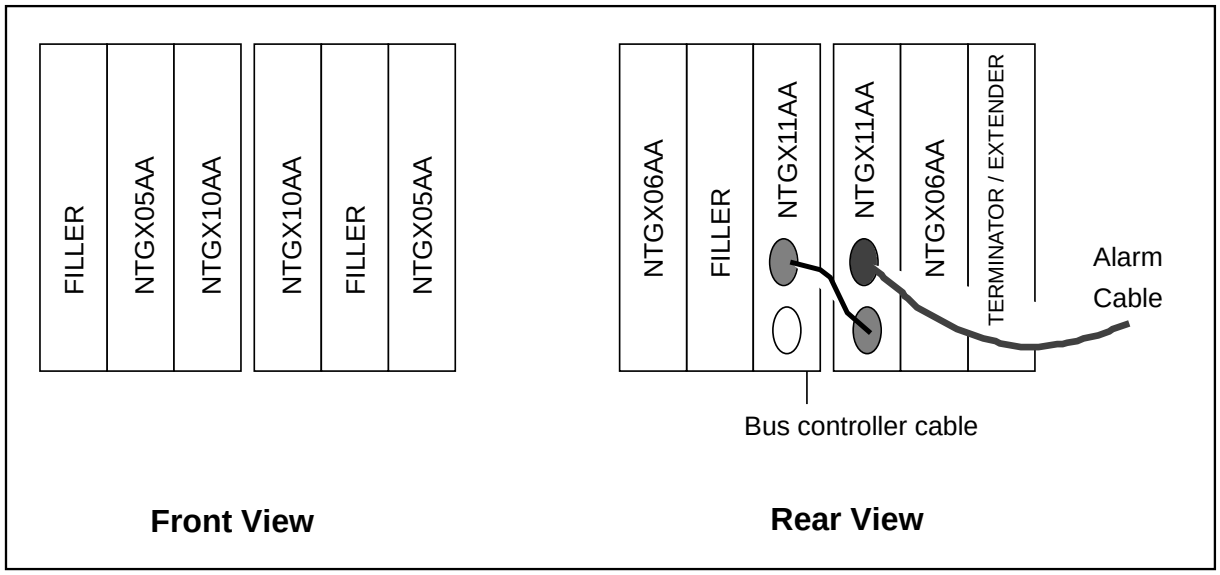
Note 1: All alarm states are invalid while this card is inactive.

Note 2: Changing this card will disrupt service temporarily. It is advisable to change the card during reduced traffic periods.

End

NTGX11AA (end)
in a primary electronics shelf (end)

Figure 2-3
Bus controller transition module cabling



NTGX12AA
in an electronics shelf

Application

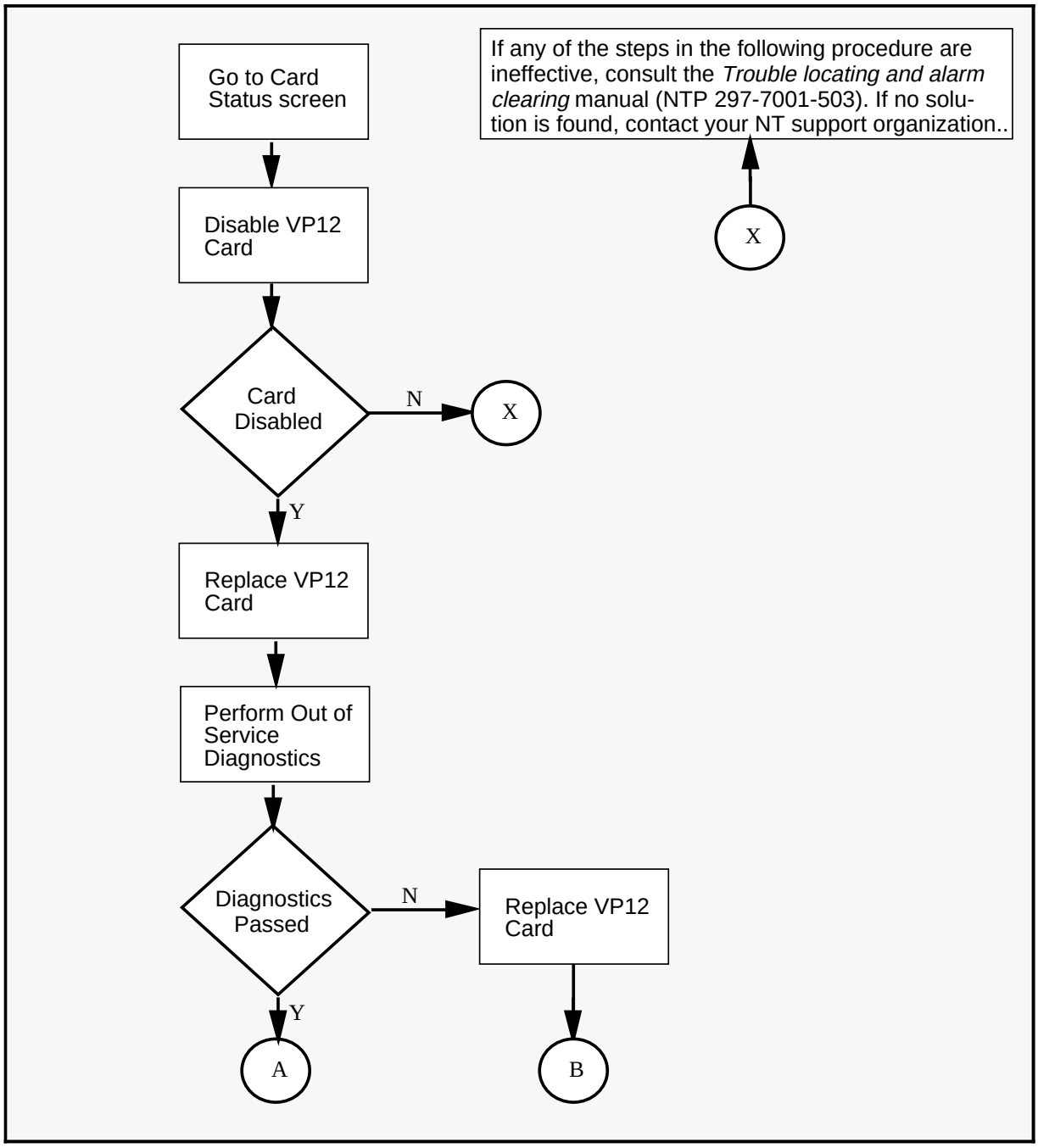
Use this procedure to replace the following card in an electronics shelf.

PEC	Suffixes	Name
NTGX12	AA	VP-12 signal processing card

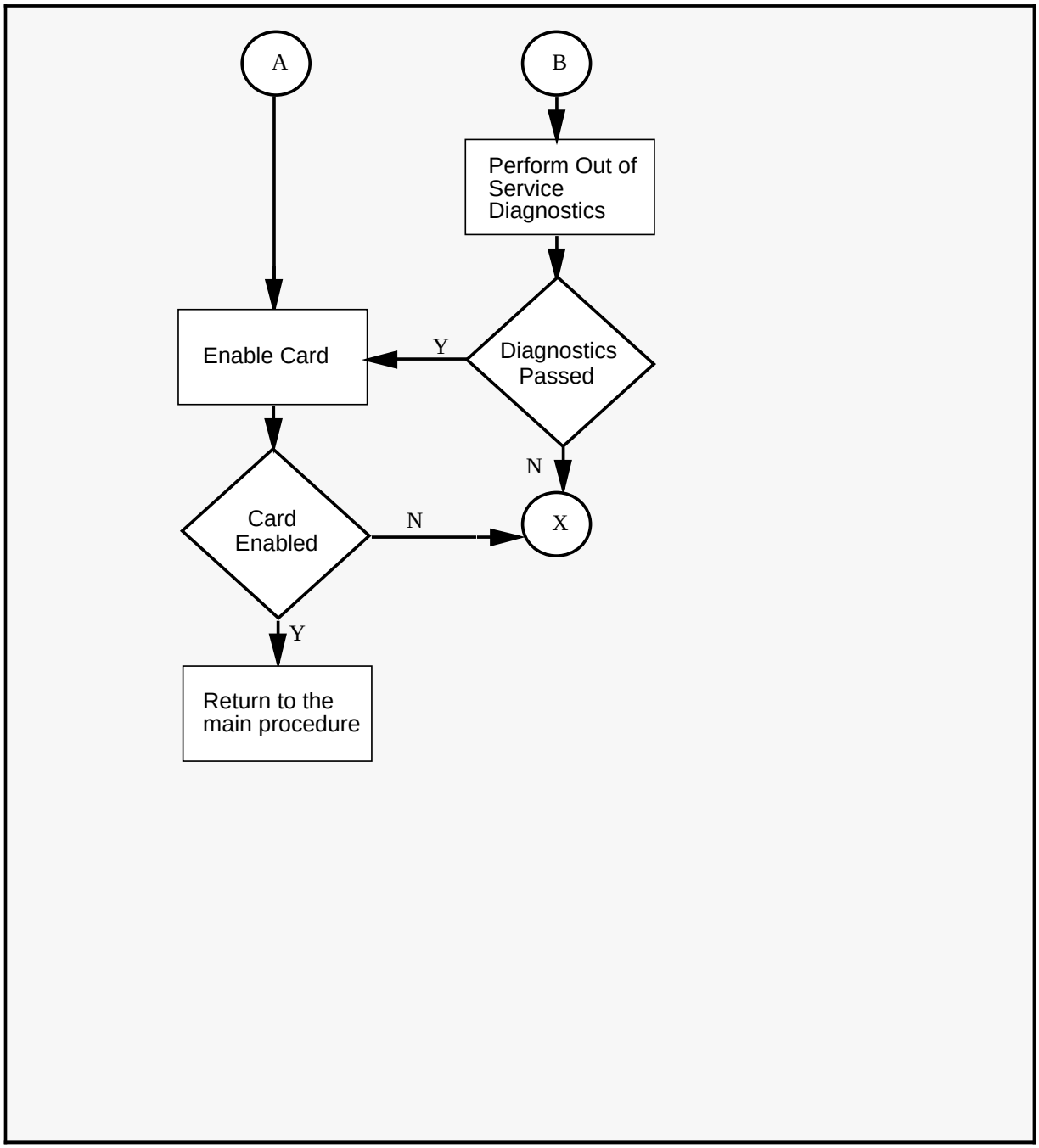
Action

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.

NTGX12AA (continued)
in an electronics shelf (continued)



NTGX12AA (continued)
in an electronics shelf (continued)



NTGX12AA (continued)
in an electronics shelf (continued)

Replacing an NTGX12AA in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Go to the Card Status screen, or perform the procedure 3-1 *Using the System Status and Maintenance menu* on page 3-16. Follow the procedure 3-4 *Enabling and disabling cards* on page 3-28 to disable the card to be replaced. Disabling the card will take approximately 1 minute.
4	Perform the procedure *Replacing a DMS VoiceMail Card at the front of the cabinet* on page 3-3 in order to replace the card.
5	From the Card Status screen, perform Out of Service Diagnostics by pressing the <OutofService Diagnostics> softkey. This will take approximately 1 minute.
6	If diagnostics pass, go to step 7. If they fail, replace the VP12 card again and return to step 4. If diagnostics fail a second time, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
7	Perform the procedure 3-4 *Enabling and disabling cards* on page 3-28 to enable the new card. If the card is successfully enabled, return to the main procedure. If the card does not enable, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.

-continued-

NTGX12AA (continued)
in an electronics shelf (continued)

Replacing an NTGX12AA in an electronics shelf (continued)

Step	Action
8	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization.
9	You have completed this procedure.
	End

NTGX12AA (end)
in an electronics shelf (end)

NTGX14AA
in a disk shelf

Application

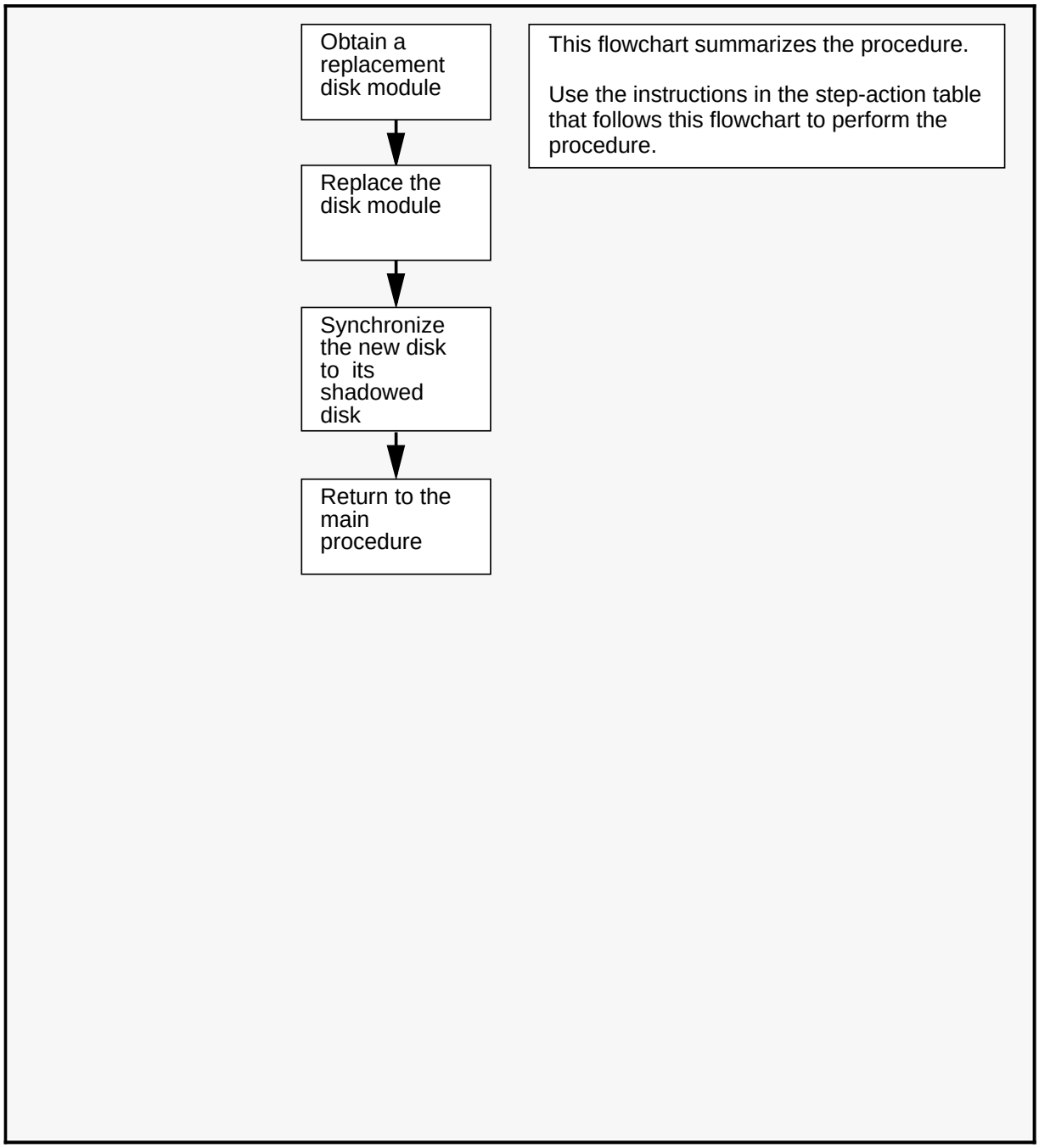
Use this procedure to replace the following module in a disk shelf.

PEC	Suffixes	Name
NTGX14	AA	1200-MB disk module

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.

NTGX14AA (continued)
in a disk shelf (continued)



Replacing an NTGX14AA in a disk shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3. Note: Care must be taken not to damage the Disk module when inserting it into its appropriate slot. Due to the card's size and weight you must hold on to it with both hands when inserting or removing it. Be sure to gently direct the card out of or into the guides, while keeping it level. When the card is about half way in or out, the safety catch at the top must be depressed in order to insert or remove it the rest of the way. Be sure to firmly seat the card when inserting. When removing, if the card jams part of the way out, support the card at the bottom front with one hand, and with the other hand, gently move the card up or down until it centers in the card guide..
4	Perform the procedure *Resynchronizing the disks* on page 3-53. Refer to Figure 2-4. To use the chart, determine the node number and the disk number of the faulty disk from the SEER. Match up the node and disk numbers with the top charts and read across to find the pack location. This is the pack you remove. **Example:** The SEER reads "...node 2> disk8...". Check the chart under node 2, disk 8. Reading across to the "Pack" column, this disk is in slot 1. Now move to the second chart at the bottom to see which disk shelf the pack is on and its location on the shelf. In this example, it is the pack on the bottom shelf, extreme right.

-continued-

NTGX14AA (continued)
in a disk shelf (continued)

Replacing an NTGX14AA in a disk shelf (continued)	
Step	**Action**
5	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization..
6	You have completed this procedure.
	End

Figure 2-4xxx
Node numbers and their corresponding disk and pack numbers

Node #	Disk #	Pack*
1	0	1
	8	2
2	0	2
	8	1
3	2	3
	4	3
	10	4
	12	4
4	2	4
	4	4
	10	3
	12	3
5	2	5
	4	5
	10	6
	12	6

* A pack can include one disk drive, two disk drives, or a disk drive and a tape unit.

Node #	Disk #	Pack*
6	2	6
	4	6
	10	5
	12	5
7	2	7
	4	7
	10	8
	12	8
8	2	8
	4	8
	10	7
	12	7
9	2	9
	4	9
	10	10
	12	10
10	2	10
	4	10
	10	9
	12	9

Node numbers for disk shelves

Electronics Shelf					
Electronics Shelf					
7	8	9	10	2	Disk Shelf
3	4	5	6	1	Disk Shelf

Node numbers for packs

NTGX14AA (end)
in a disk shelf (end)

Table 2-16xxx
Jumper settings for NTGX14AA

MAXTOR

- No jumpers are applicable

SEAGATE

- Jumper plug for Enable Motor Start: Pins 9 and 10.
- Jumper plug for Enable Parity Reporting: Pins 7 and 8.

NTGX14BA
in a disk shelf

Application

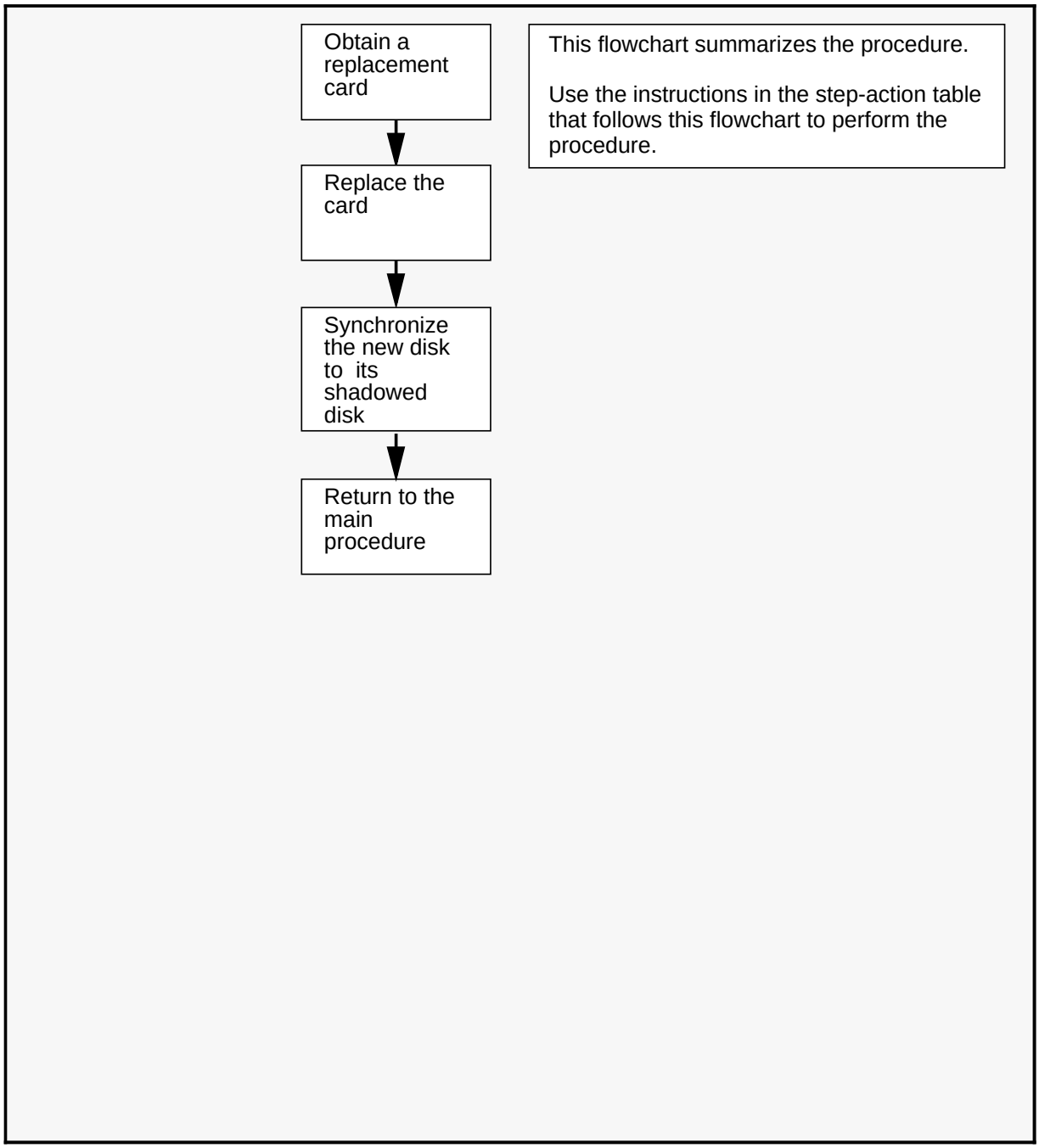
Use this procedure to replace the following module in a disk shelf.

PEC	Suffixes	Name
NTGX14	BA	Dual 1200-Mb disk module

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.

NTGX14BA (continued)
in a disk shelf (continued)



NTGX14BA (continued)
in a disk shelf (continued)

Replacing an NTGX14BA in a disk shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3. Note: Care must be taken not to damage the Disk module when inserting it into its appropriate slot. Due to the card's size and weight you must hold on to it with both hands when inserting or removing it. Be sure to gently direct the card out of or into the guides, while keeping it level. When the card is about half way in or out, the safety catch at the top must be depressed in order to insert or remove it the rest of the way. Be sure to firmly seat the card when inserting. When removing, if the card jams part of the way out, support the card at the bottom front with one hand, and with the other hand, gently move the card up or down until it centers in the card guide..
4	Perform procedure 3-12 *Resynchronizing the disks* on page 3-53. Refer to Figure 2-5. To use the chart, determine the node number and the disk number of the faulty disk from the SEER. Match up the node and disk numbers with the top charts and read across to find the pack location. This is the pack you remove. **Example:** The SEER reads "...node 2> disk8...". Check the chart under node 2, disk 8. Reading across to the "Pack" column, this disk is in slot 1. Now move to the second chart at the bottom to see which disk shelf the pack is on and its location on the shelf. In this example, it is the pack on the bottom shelf, extreme right.

-continued-

NTGX14BA (continued)
in a disk shelf (continued)

Replacing an NTGX14BA in a disk shelf (continued)	
Step	**Action**
5	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization..
6	You have completed this procedure.
	End

Figure 2-5xxx
Node numbers and their corresponding disk and pack numbers

Node #	Disk #	Pack*
1	0	1
	8	2
2	0	2
	8	1
3	2	3
	4	3
	10	4
	12	4
4	2	4
	4	4
	10	3
	12	3
5	2	5
	4	5
	10	6
	12	6

* A pack can include one disk drive, two disk drives, or a disk drive and a tape unit.

Node #	Disk #	Pack*
6	2	6
	4	6
	10	5
	12	5
7	2	7
	4	7
	10	8
	12	8
8	2	8
	4	8
	10	7
	12	7
9	2	9
	4	9
	10	10
	12	10
10	2	10
	4	10
	10	9
	12	9

Node numbers for disk shelves

Electronics Shelf					
Electronics Shelf					
7	8	9	10	2	Disk Shelf
3	4	5	6	1	Disk Shelf

Node numbers for packs

NTGX14BA (end)
in a disk shelf (end)

Table 2-17xxx
Jumper settings for NTGX14BA

MAXTOR

Drive 1

- Jumper plug for SCSI ID 2: Pins 7 and 8

Drive 2

- Jumper plug for SCSI ID 4: Pins 5 and 6

SEAGATE

Drive 1

- Jumper plug for SCSI ID 2: Pins 13 and 14

Drive 2

- Jumper plug for SCSI ID 4: Pins 15 and 16

NTGX15AA
in a primary disk shelf

Application

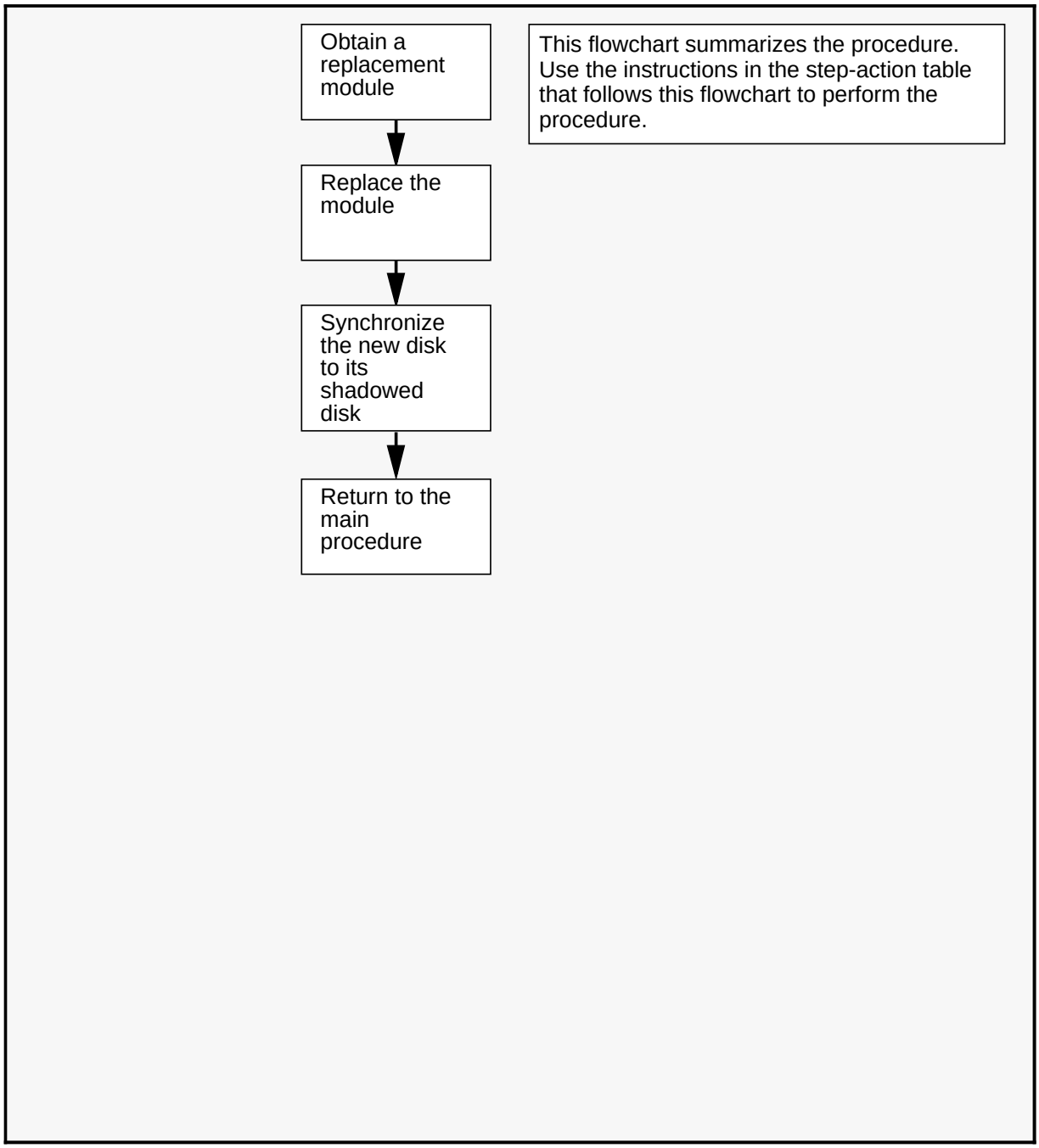
Use this procedure to replace the following module in a primary disk shelf.

PEC	Suffixes	Name
NTGX15	AA	Disk tape module

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.

NTGX15AA (continued)
in a primary disk shelf (continued)



NTGX15AA (continued)
in a primary disk shelf (continued)

Replacing an NTGX15AA in a primary disk shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform the procedure *Replacing a DMS VoiceMail Card at the front of the cabinet* on page 3-3. Note: Care must be taken not to damage the Disk Tape module when inserting it into its appropriate slot. Due to the card's size and weight you must hold on to it with both hands when inserting or removing it. Be sure to gently direct the card out of or into the guides, while keeping it level. When the card is about half way in or out, the safety catch at the top must be depressed in order to insert or remove it the rest of the way. Be sure to firmly seat the card when inserting. When removing, if the card jams part of the way out, support the card at the bottom front with one hand, and with the other hand, gently move the card up or down until it centers in the card guide..
4	Perform the procedure *Resynchronizing the disks* on page 3-53. Refer to Figure 2-6. To use the chart, determine the node number and the disk number of the faulty disk from the SEER. Match up the node and disk numbers with the top charts and read across to find the pack location. This is the pack you remove. **Example:** The SEER reads "...node 2> disk8...". Check the chart under node 2, disk 8. Reading across to the "Pack" column, this disk is in slot 1. Now move to the second chart at the bottom to see which disk shelf the pack is on and its location on the shelf. In this example, it is the pack on the bottom shelf, extreme right.

-continued-

NTGX15AA (continued)
in a primary disk shelf (continued)

Replacing an NTGX15AA in a primary disk shelf (continued)	
Step	**Action**
5	For further assistance, consult the *Trouble locating and alarm clearing manual* (NTP 297-7001-503). If no solution is found, call your Northern Telecom support organization..
6	You have completed this procedure.
	End

Figure 2-6xxx
Node numbers and their corresponding disk and pack numbers

Node #	Disk #	Pack*
1	0	1
	8	2
2	0	2
	8	1
3	2	3
	4	3
	10	4
	12	4
4	2	4
	4	4
	10	3
	12	3
5	2	5
	4	5
	10	6
	12	6

* A pack can include one disk drive, two disk drives, or a disk drive and a tape unit.

Node #	Disk #	Pack*
6	2	6
	4	6
	10	5
	12	5
7	2	7
	4	7
	10	8
	12	8
8	2	8
	4	8
	10	7
	12	7
9	2	9
	4	9
	10	10
	12	10
10	2	10
	4	10
	10	9
	12	9

Node numbers for disk shelves

Electronics Shelf					
Electronics Shelf					
7	8	9	10	2	Disk Shelf
3	4	5	6	1	Disk Shelf

Node numbers for packs

NTGX15AA (end)
in a primary disk shelf (end)

Table 2-18xxx
Jumper settings for NTGX15AA

MAXTOR

- No jumpers are applicable

SEAGATE

- Jumper plug for Enable Motor Start: Pins 9 and 10.
- Jumper plug for Enable Parity Reporting: Pins 7 and 8.

NT9X19AA
in a disk or electronics shelf

Application

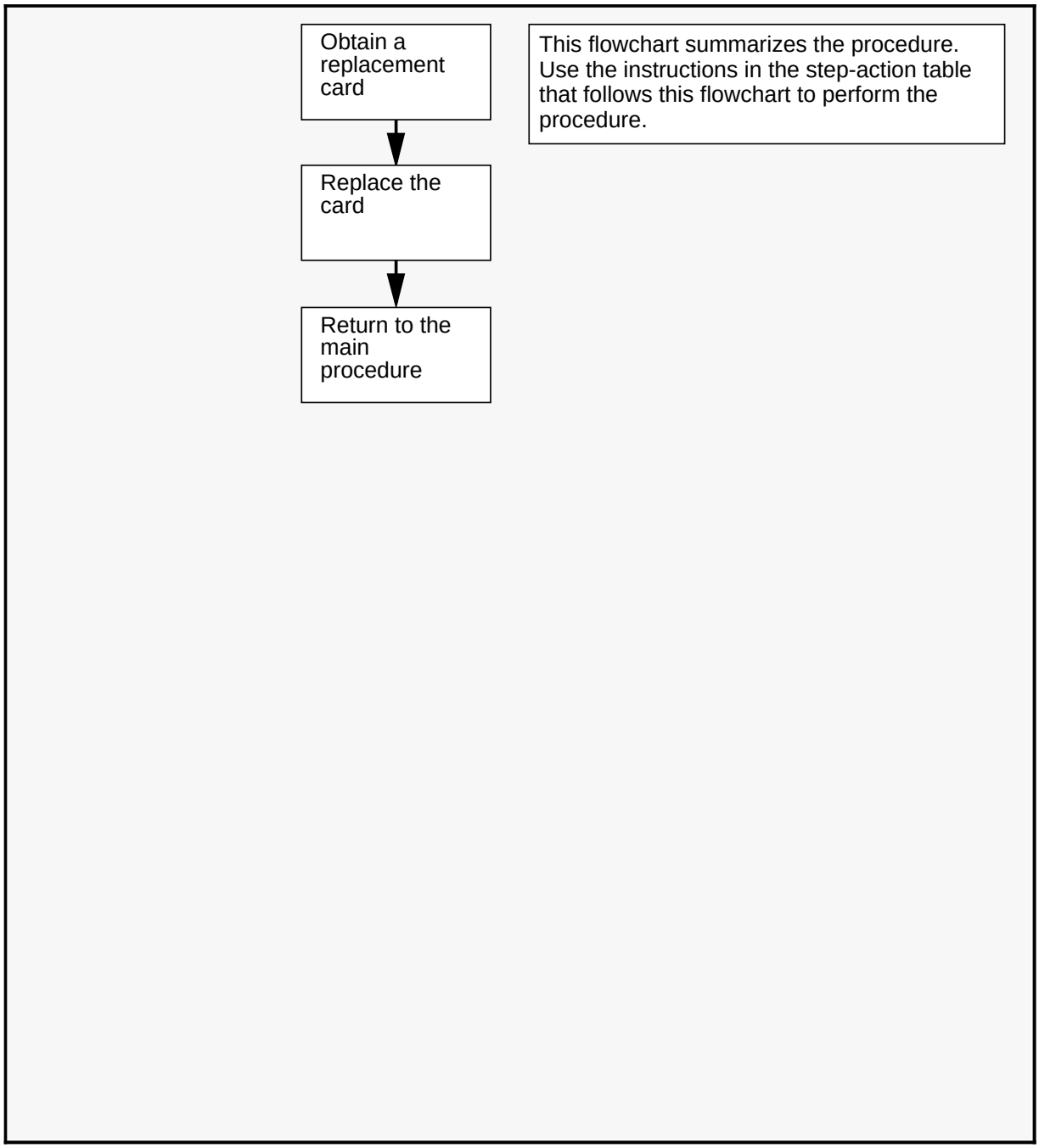
Use this procedure to replace the following card in a disk or electronics shelf.

PEC	Suffixes	Name
NT9X19	AA	Front filler (slot 32)

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.

NT9X19AA (continued)
in a disk or electronics shelf (continued)



NT9X19AA (continued)
in a disk or electronics shelf (continued)

Replacing an NT9X19AA in a disk or electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

3	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3.
4	For further assistance, contact the personnel responsible for the next level of support.
5	You have completed this procedure.
	End

NT9X19AA (end)
in a disk or electronics shelf (end)

NT9X19BB
in an electronics shelf

Application

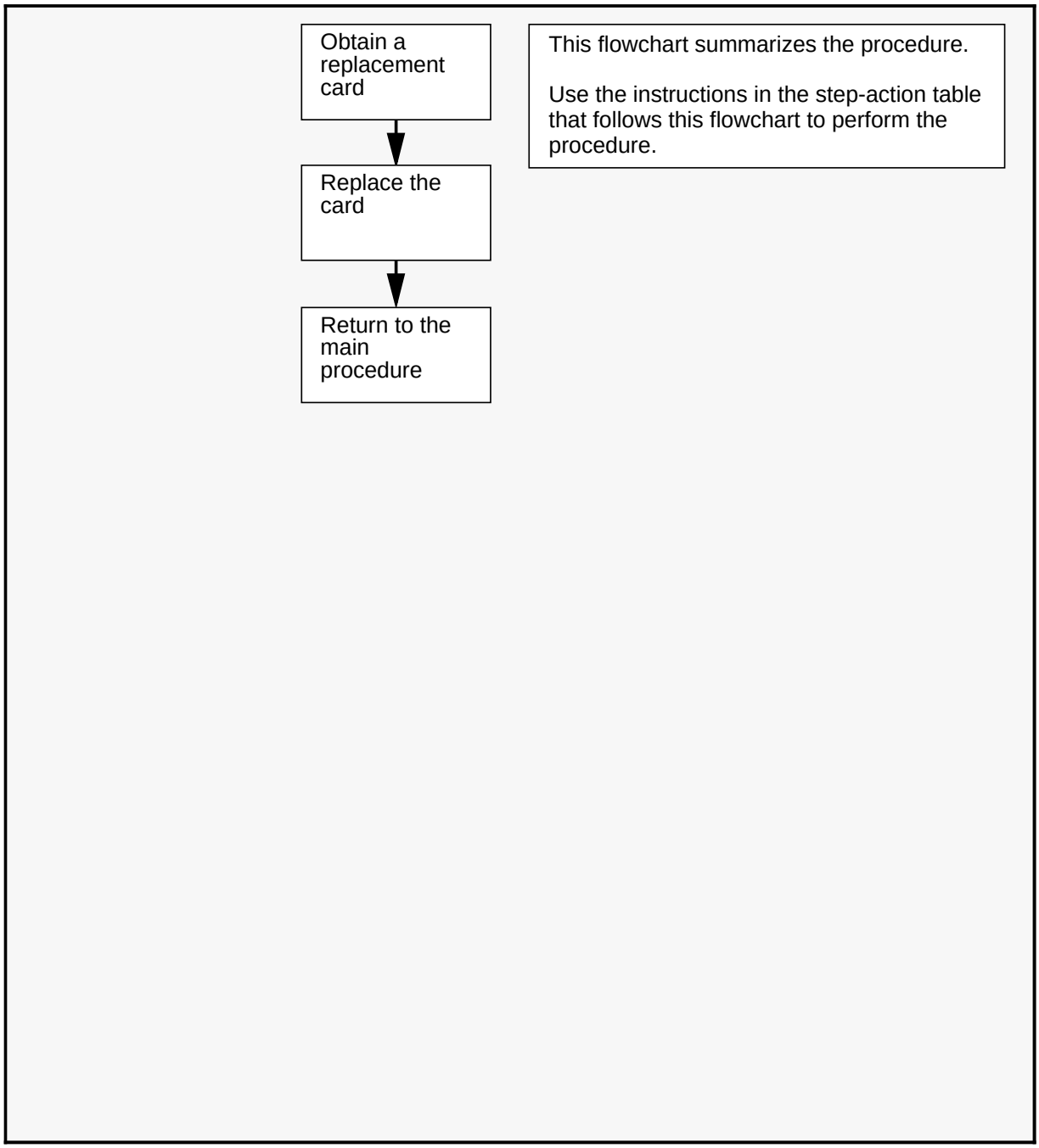
Use this procedure to replace the following card in a electronics shelf.

PEC	Suffixes	Name
NT9X19	BB	Rear filler (slot 32 disk tape)

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.

NT9X19BB (continued)
in an electronics shelf (continued)



NT9X19BB (continued)
in an electronics shelf (continued)

Replacing an NT9X19BB in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.  **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3. Note that you replace this card in the same way you replace a card at the front of the cabinet because there are no cable assemblies to disconnect/reconnect.
4	For further assistance, contact the personnel responsible for the next level of support.
5	You have completed this procedure.
	End

NT9X19BB (end)
in an electronics shelf (end)

NT9X19BC
in a disk shelf

Application

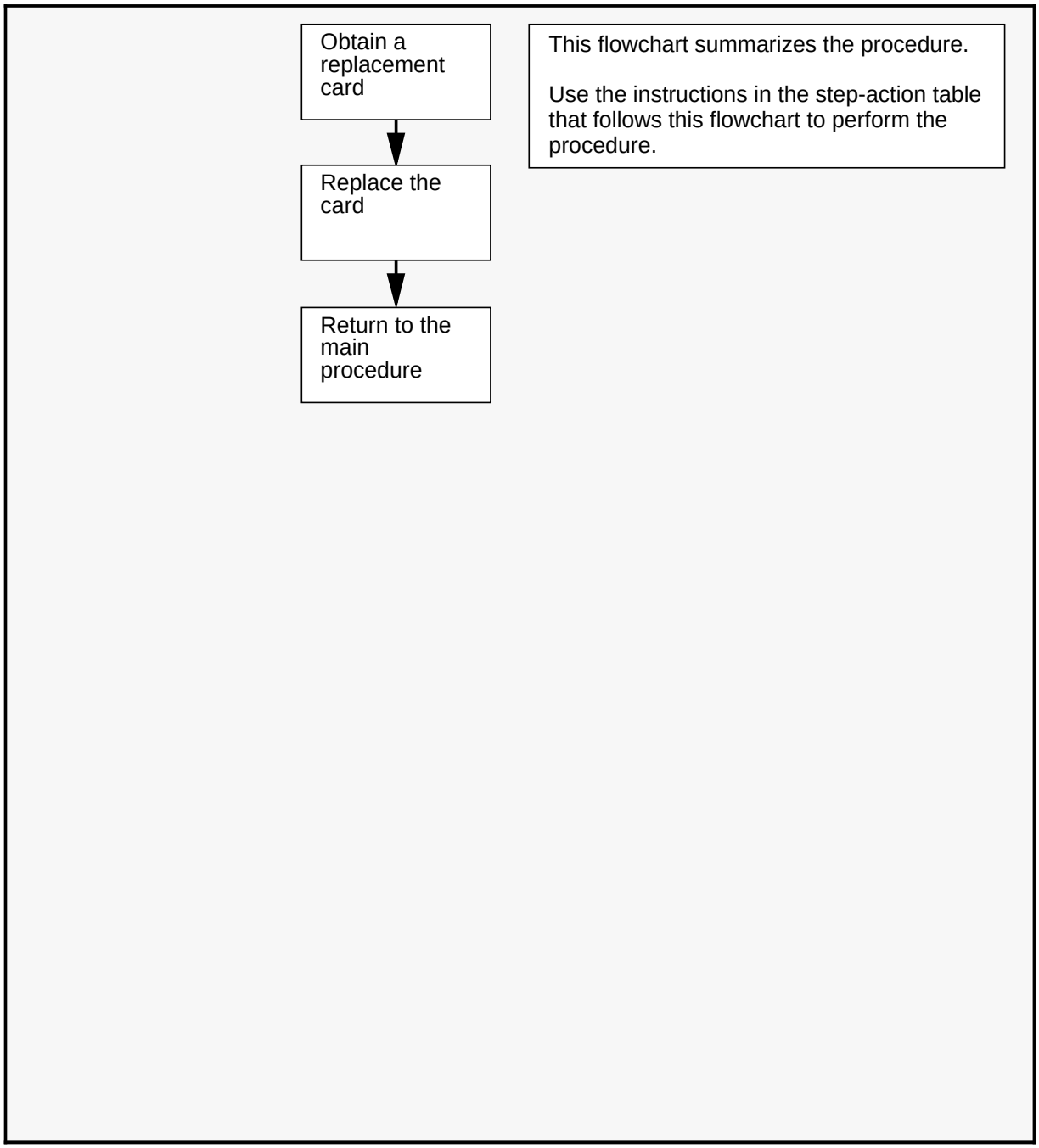
Use this procedure to replace the following card in a disk shelf.

PEC	Suffixes	Name
NT9X19	BC	Rear filler disk modules

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.

NT9X19BC (continued)
in a disk shelf (continued)



NT9X19BC (continued)
in a disk shelf (continued)

Replacing an NT9X19BC in a disk shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement card. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Perform the procedure *Replacing a DMS VoiceMail card at the front of the cabinet* on page 3-3. Note that you replace this card in the same way you replace a card at the front of the cabinet because there are no cable assemblies to disconnect/reconnect.
4	For further assistance, contact the personnel responsible for the next level of support.
5	You have completed this procedure.
	End

NT9X19BC (end)
in a disk shelf (end)

NT9X91AB
in an electronics shelf

Application

Use this procedure to replace the following module in an electronics shelf.

PEC	Suffixes	Name
NT9X91	AB	+5V/+12 power converter

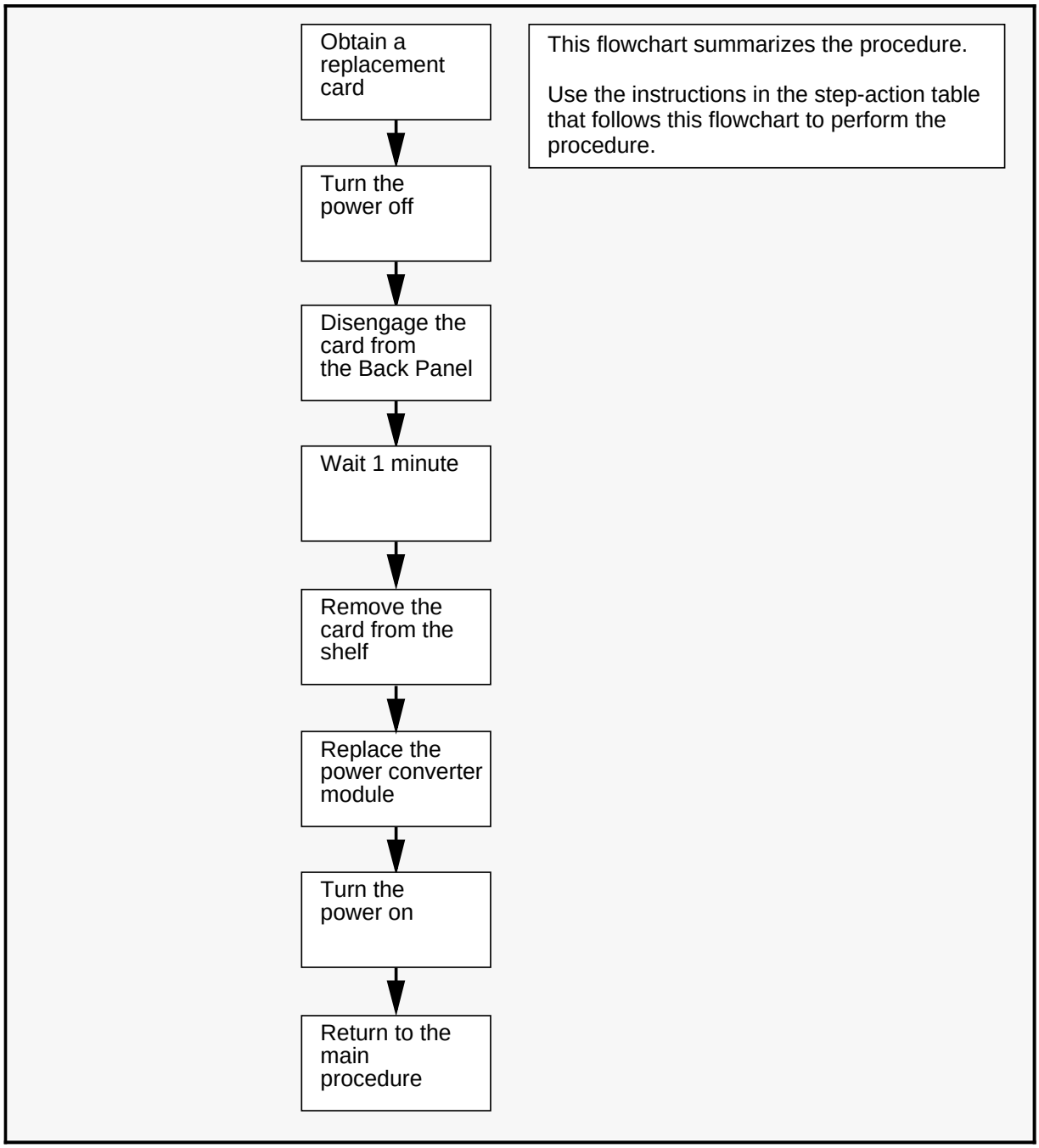
Action

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.

WARNING
Wait before removing power converter

Wait 1 minute after you power-down the power converter and disengage it from the backpanel before you remove it from the shelf.

NT9X91AB (continued)
in an electronics shelf (continued)



NT9X91AB (continued)
in an electronics shelf (continued)

Replacing an NT9X91AB in an electronics shelf

Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or service interruption.
2	Obtain a replacement module. Ensure that the replacement card has the same product engineering code (PEC), including suffix, as the card being removed.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Turn off the power switch on the front of the card.
4	Perform the procedure *Replacing a DMS VoiceMail Card at the front of the cabinet* on page 3-3.
5	Turn on the power switch on the front of the card.
6	For further assistance, contact the personnel responsible for the next level of support.
7	You have completed this procedure.
	End

NT9X91AB (end)
in an electronics shelf (end)

Card replacement common procedures

Where to find a procedure

To find the common procedure you need, look for its title in the following list and go to the page number indicated.

This chapter contains common procedures. A common procedure is a separate set of steps that you perform only if you have been directed to do so from one or more of the following maintenance procedures:

- alarm and performance monitoring
- trouble locating and clearing
- routine maintenance

WARNING
Damage to equipment or loss of service
Use the common procedures only if you have been directed to do so in an alarm clearing, trouble locating, or routine maintenance procedure. The common procedures do not contain preliminary or concluding steps. If you use these procedures independently, you may damage equipment or cause loss of service.

WARNING
Static electricity damage
Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.

Replacing a DMS VoiceMail card at the front of a cabinet

Application

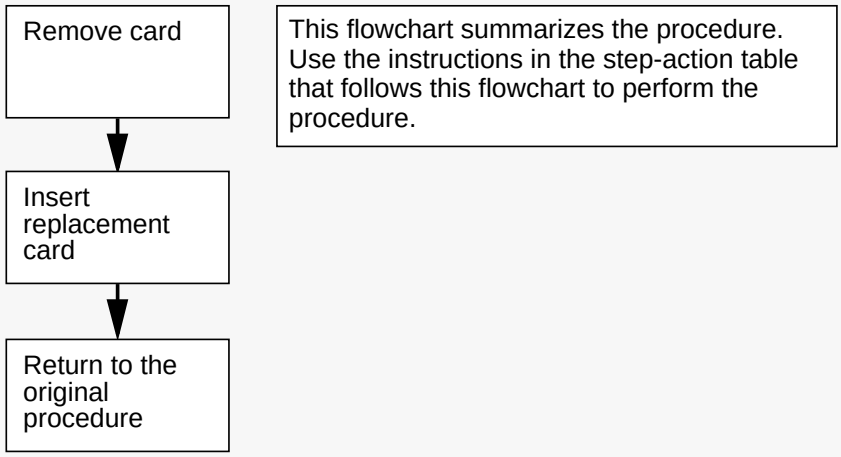
Use this procedure to replace a card in the DMS VoiceMail system.

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.

Replacing a DMS VoiceMail card at the front of a cabinet (continued)

Summary of Replacing a DMS VoiceMail card at the front of a cabinet

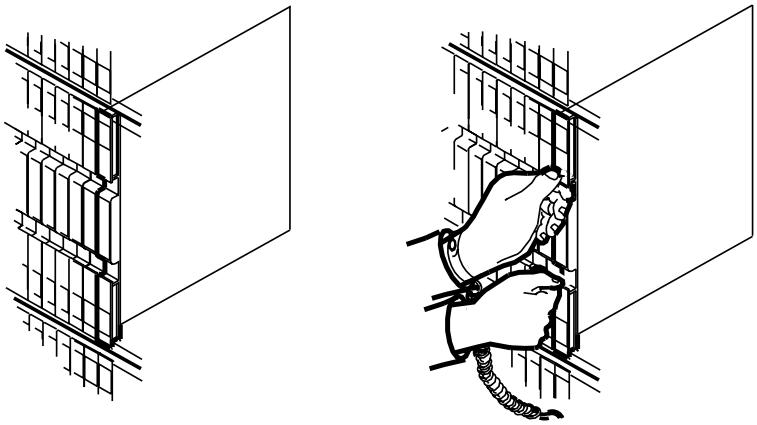


End

Replacing a DMS VoiceMail card at the front of a cabinet (continued)

Replacing a DMS VoiceMail card at the front of a cabinet

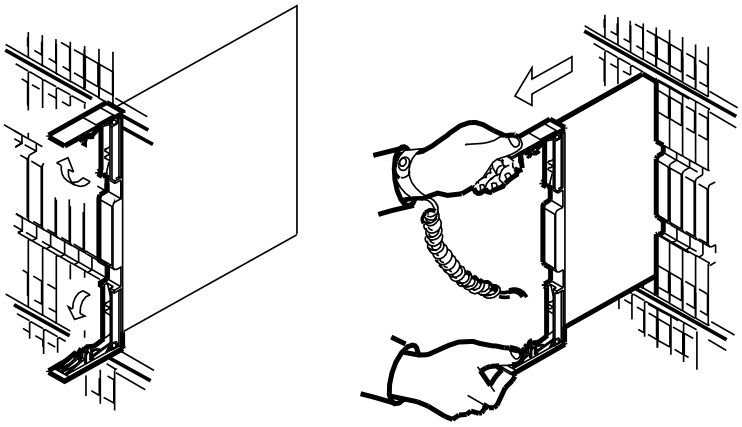
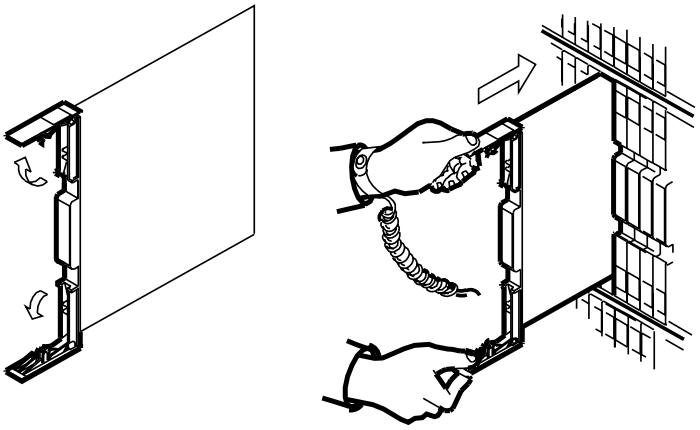
Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or loss of service.
	WARNING **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
2	Locate the card to be removed on the appropriate shelf. You can do this by going to the *SPM Cross Reference Table* (see Figure 3-11 on page 3-43) accessible through the *System Status and Maintenance Menu*.



-continued-

Replacing a DMS VoiceMail card at the front of a cabinet (continued)

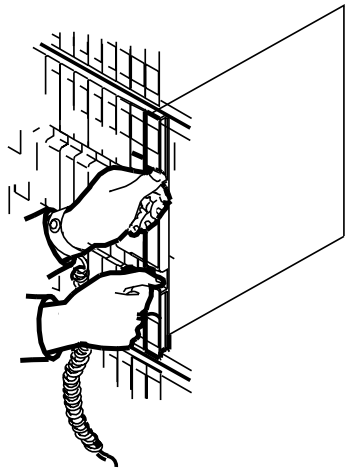
Replacing a DMS VoiceMail card at the front of a cabinet (continued)

Step	Action
3	Open the locking levers and gently pull the card towards you until it clears the shelf. 
4	Place the card you have removed in an electrostatic discharge (ESD) protective container.
5	Ensure that the replacement card has the same PEC, including suffix, as the card you just removed.
6	Open the locking levers on the replacement card. Align the card with the slots in the shelf and gently slide the card into the shelf. 

-continued-

Replacing a DMS VoiceMail card at the front of a cabinet (continued)

Replacing a DMS VoiceMail card at the front of a cabinet (continued)

Step	Action
7	Seat and lock the card. a. Using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the shelf. b. Close the locking levers. 
8	Reconnect any previously removed cables to the faceplate of the replacement card.
9	You have completed this procedure. Return to the main procedure that sent you to this procedure and continue as directed.
	End

Replacing a DMS VoiceMail card at the front of a cabinet (end)

Replacing a DMS VoiceMail card at the back of a cabinet

Application

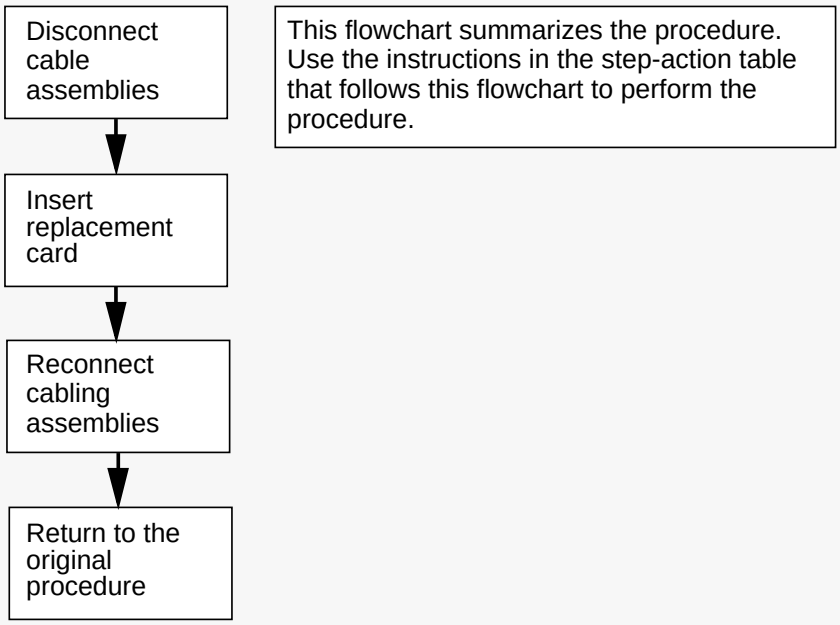
Use this procedure to replace a card in the DMS VoiceMail system.

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.

Replacing a DMS VoiceMail card at the back of a cabinet (continued)

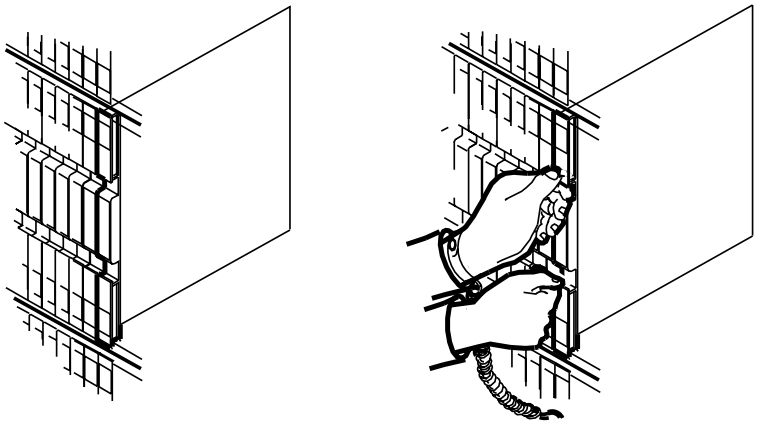
Summary of Replacing a DMS VoiceMail card at the back of a cabinet



End

Replacing a DMS VoiceMail card at the back of a cabinet (continued)

Replacing a DMS VoiceMail card at the back of a cabinet

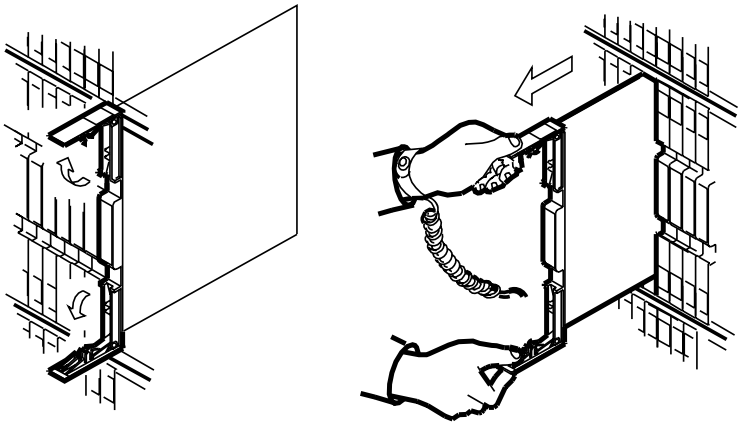
Step	Action
1	Proceed only if you have been directed to this procedure from a step in a maintenance procedure. Using this procedure independently may cause equipment damage or loss of service.
2	Remove any cables from the faceplate of the card to be replaced and note the connector numbers.
	 **WARNING** **Static electricity damage** Wear a wrist strap connected to the wrist strap grounding point on the frame supervisory panel (FSP) while handling cards. This precaution protects the cards against damage caused by static electricity.
3	Locate the card to be removed on the appropriate shelf. You can do this by going to the *SPM Cross Reference Table* (see Figure 3-11 on page 3-43) accessible through the *System Status and Maintenance Menu*.
4	Note the connector numbers and cable locations on the card before removing it.
5	Remove any cables from the faceplate of the card.
6	Open the locking levers and gently pull the card towards you until it clears the shelf. 

-continued-

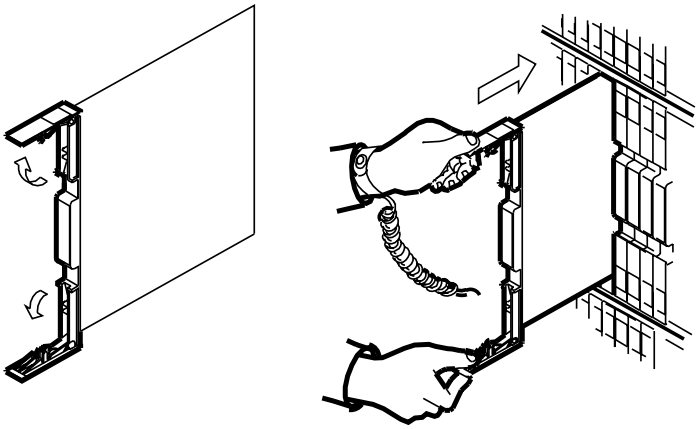
Replacing a DMS VoiceMail card at the back of a cabinet (continued)

Replacing a DMS VoiceMail card at the back of a cabinet (continued)

Step	Action
7	Gently pull the card towards you until it clears the shelf.



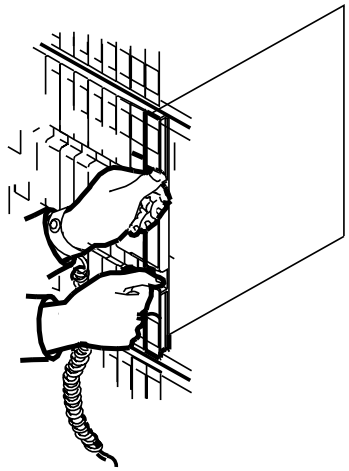
8	Place the card you have removed in an electrostatic discharge (ESD) protective container.
9	Ensure that the replacement card has the same PEC, including suffix, as the card you just removed.
10	Open the locking levers on the replacement card. Align the card with the slots in the shelf and gently slide the card into the shelf.



-continued-

Replacing a DMS VoiceMail card at the back of a cabinet (continued)

Replacing a DMS VoiceMail card at the back of a cabinet (continued)

Step	Action
11	Seat and lock the card. a. Using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the shelf. b. Close the locking levers. 
12	Reconnect any previously removed cables to the faceplate of the replacement card.
13	You have completed this procedure. Return to the main procedure that sent you to this procedure and continue as directed.
	End

Replacing a DMS VoiceMail card at the back of a cabinet (end)

Altering system status

Application

Some of the procedures in this manual require that you change the operational state of the system, a card or a channel before replacing a card. The instructions provided in this section tell you how to log on to the system and take the appropriate component of the system out of service while performing maintenance.

The System Status and Maintenance function provides monitoring and control screens through which you obtain views of the operational state of the system at a number of levels: system, nodes, cards, T1 links, SMDI links, T1 channels, DSP ports, Ethernet ports, and disks. The System Status and Maintenance functions are used in the course of routine maintenance, and allow you to take any component of the system out of service while performing maintenance. A component can be taken out of service by disabling it (forcing it out of its operational state), or by performing a courtesy disable, which progressively disables active channels as they become idle. The Courtesy Disable avoids any disruption of calls in progress. The following maintenance-related actions are described in this section:

- ***System Courtesy Down*** - is for broad maintenance activities, such as reconfiguring the CSE, which necessitates a power shutdown on the DMS Mail system.
- ***Port Courtesy Disable or Node Disable (forced)*** - the choice of which is dependent on the nature of the work to be carried out, and the state of the node (information about which is obtained through the System Status and Maintenance displays).
- ***Card Disable*** - is used before performing diagnostics on a card, such as for a card showing “Faulty” status.
- ***Courtesy Disable or (forced) Disable of DSP Ports*** - is used before performing tests on a port.
- ***Courtesy Disable or (forced) Disable of T1 Channels*** - is used before performing maintenance on a T1 channel.
- ***Disk Synchronization*** - is used after a faulty disk has been replaced with a new disk and needs to be resynchronized with its partner.

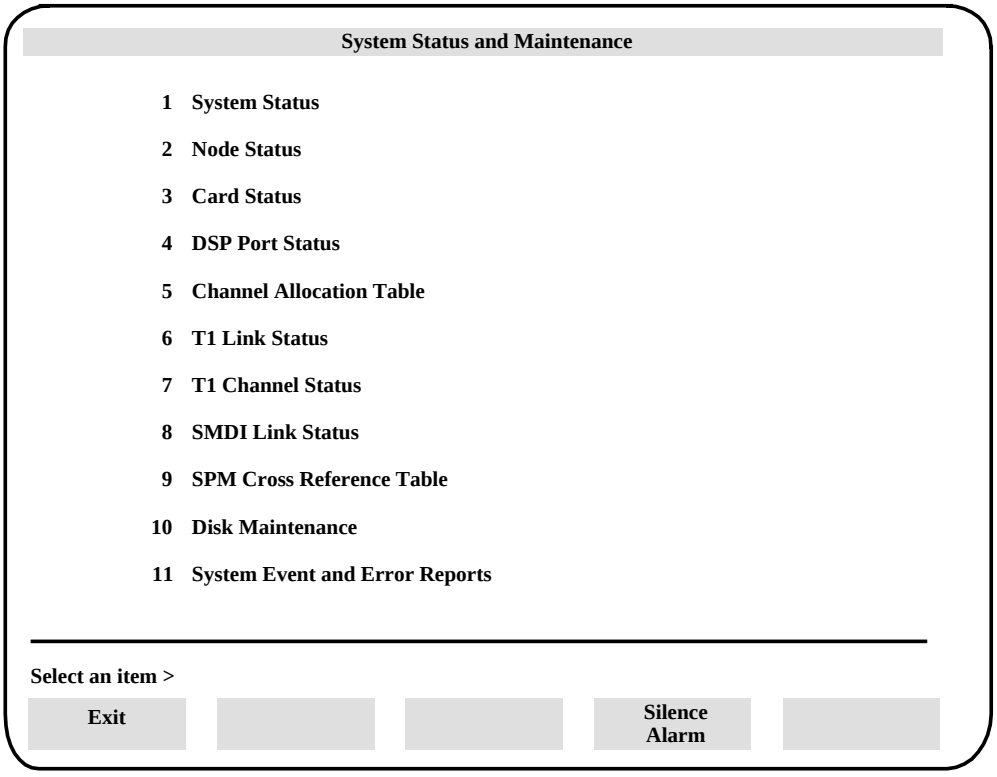
The System Status and Maintenance function also provides a facility to print SEERs, an integral part of service and maintenance activities.

Altering system status (continued)

The System Status and Maintenance menu

The System Status and Maintenance menu (Figure 3-1) provides ten or eleven options depending on system type.

Figure 3-1xxx
The System Status And Maintenance menu



Procedure 3-1
Using the System Status and Maintenance menu

Starting point : The Main Menu, <4> entered.

The System Status and Maintenance menu appears (Figure 3-1).

1 Choose an item by entering its number and pressing <Return>.

The menu corresponding to your selection appears.

See the following sections for details:

Altering system status (continued)

<1> "System Status"
<2> "Node Status"
<3> "Card Status"
<4> "DSP Port Status"
<5> "Channel Allocation Table"
<6> "T1 Link Status"
<7> "T1 Channel Status"
<8> "SMDI Link Status"
<9> "SPM Cross Reference Table"
<10> "Disk Maintenance"
<11> "System Event and Error Reports"

2 Use [Exit] to return to the Main Menu.

Altering system status (continued)

System status

The System Status screen (Figure 3-2) allows you to view the operational status of the system and courtesy down the system. This screen is identical to the System Status screen displayed from the Logon screen, with the exception being that the Logon System Status screen does not have the Courtesy Down System softkey.

Figure 3-2xxx
System Status screen

System Status and Maintenance

System Status: InService Alarm Status: Critical=Off Major=Off Minor=Off
Last Event: 60-00 PRM: All System Programs Started 4/19 16:31

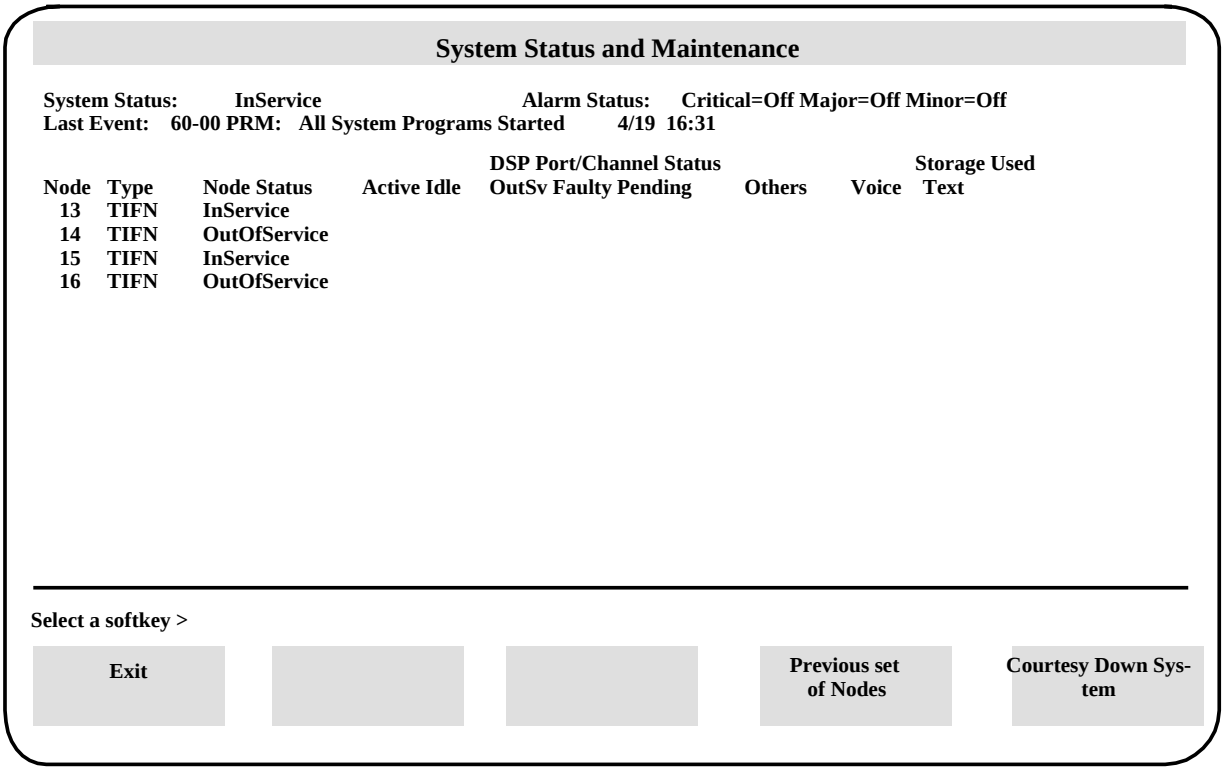
Node	Type	Node Status	DSP Port/Channel Status Active	Idle	OutSv	Faulty	Pending	Others	Storage Used Voice	Text		
1	MSP	InService										
2	MSP	InService										
3	SPN	InService	0	24	0	0	0	0		43%	5%	
4	SPN	InService	24	0	0	0	0	0		30%	24%	
5	SPN	InService	0	24	0	0	0	0		30%	32%	
6	SPN	OutOfService	6	18	0	0	0	0		17%	40%	
7	SPN	Shutting Down	0	0	12	0		11	1	48%		32%
8	SPN	Faulty	0	0	24	0		0	0	56%		35%
9	SPN	Loading	0	15	8	0		1	0	12%		10%
10	SPN	InService	0	24	0	0	0	0		26%	18%	

Select a softkey >

Exit | | | **Next set of Nodes** | **Courtesy Down System**

Altering system status (continued)

Figure 3-3j
System Status screen (continued)



The following fields are displayed in the System Status screen:

- ***System Status*** - This field displays the current system status. Y our system can be in one of the following states:
  - ***InService*** indicates that all critical programs on all nodes are operational and the system is accepting calls.
  - ***CourtesyPending*** indicates that the system is in the process of shutting down. This occurs after using the [Courtesy Down System] softkey. Incoming calls are directed to an attendant. Calls in progress are not interrupted. Each port is disabled as it becomes idle. The software remains loaded.

Altering system status (continued)

- ***CourtesyDown*** indicates that the system has shut down and is no longer operational nor accepting calls. The software remains loaded. When the system is down, the [Courtesy Down System] softkey becomes [Activate System]. When used, the system will restart and eventually return to an InService state.
- ***Loading*** indicates that the system is loading the software while booting up.

- ***Alarm Status*** - This field indicates the state of each of the following alarm categories:
  - ***Critical*** alarms indicate a service-affecting problem that requires immediate attention.
  - ***Major*** alarms indicate a service-threatening problem that may be allowed to persist (for up to 24 hours). If not attended to, the alarm will become critical.
  - ***Minor*** alarms indicate a problem that has no impact on the system or users.

  The status for each type of alarm will be one of the following:
  - ***Off*** indicates that there are no new alarms. This does not necessarily mean that there are no error conditions as alarms may have been silenced from the Logon screen, but the error conditions causing the alarm may still exist.
  - ***On*** indicates that one or more alarm situations was detected.
  - ***Unk*** indicates that status is unknown.
- ***Last Event*** - The most recent system event or error (SEER) logged.
- ***Node*** - The node to which the following measurements apply.
- ***Type*** - The type of node.
- ***Node Status*** - The status of the nodes in your system. The node types include the MSP (Multi-Server Processor), SPN (Signal Processing Node), and TIFN (Telephony InterFace Node). A node may be in one of the following states:

  Note: The status at this level does not indicate the status of a given card on the node. For more information for particular cards, go to the Card Status Screen (see p.3-26).

  - ***InService,*** indicating that node is running and accepting calls. For the MSP node, it indicates that node is running and is the active MSP node.

Altering system status (continued)

- ***Unequipped,*** indicating that the node is not defined in the hardware database. *The System Administration Tools* chapter of the *DMS VoiceMail System Administration Guide* (NTP 297-7001-301) provides details.
- ***Faulty,*** indicating that a hardware problem is detected.
- ***Loading,*** indicating that the node is currently starting up and loading software into memory. No software is running when the node is in this state.
- ***InSvStandby*** (used with the TIFN or MSP node) indicates that the node is running and is ready to take over operations for the paired redundant node.
- ***OutOfService***, indicating that the node is no longer operational, and is not accepting calls.
- ***ShuttingDown***, indicating that the node is shutting down as a result of a disable operation.
- ***Booting***, indicating an operating system is being loaded on to the node.

- ***DSP Port Status*** - These fields reflect the state of each DSP port on the associated SPN node. For each port that is in a particular state, an entry is made in the appropriate column. A DSP port may be in one of the following states:
  - ***Active,*** indicating that the port is operational and is currently in use.
  - ***Idle,*** indicating that the port is operational but not in use at the moment. The port is ready to accept calls.
  - ***OutSv,*** indicating that the associated port is not operational, and is not accepting calls.
  - ***Faulty,*** indicating that the a hardware problem has been detected in the DSP port.
  - ***Pending*** indicates that there has been a request to shut down the port. The port is still active, pending an active call being disconnected before shutting down.

Altering system status (continued)

- ***Other,*** indicating that the port is temporarily unavailable. This usually occurs while the system is booting up. The status remains as "Other" while the software is loading. Once fully loaded, the status automatically becomes "Idle" or "Active". The status may also appear as "Other" when you re-enable a port (for as long as the necessary software is loading). The status returns to "Idle" or "Active" once the port has been enabled.

- ***Storage Used*** - This field indicates the amount of voice and text storage used as a percentage of available storage on the user volume of this node. (If the disk on a node is bad, percentages are not displayed.) It is only valid for the SPN node.

Procedure 3-2xxx
Disabling the system

Starting point : The System Status and Maintenance menu, <1> entered.

The System Status screen appears (Figure 3-2).

1 Choose step 1a to courtesy down the system, or 1b to return to the System Status and Maintenance menu.

a. Use [Courtesy Down System].

[Activate System] replaces [Courtesy Down System].

The system may take some time in disabling the system since it waits for all active DSP ports on all nodes to become idle; the message "WORKING ..." will be displayed during this interval.

If the system does not become idle during a courtesy down, disable the DSP Port manually by following the procedure described under "DSP Port Status". Wait a few minutes to ensure that an in-progress call is not dropped.

The system can be re-enabled at any time during the process by using [Activate System].

If a DSP port does not re-enable, enable it by following the procedures described under "DSP Port Status".

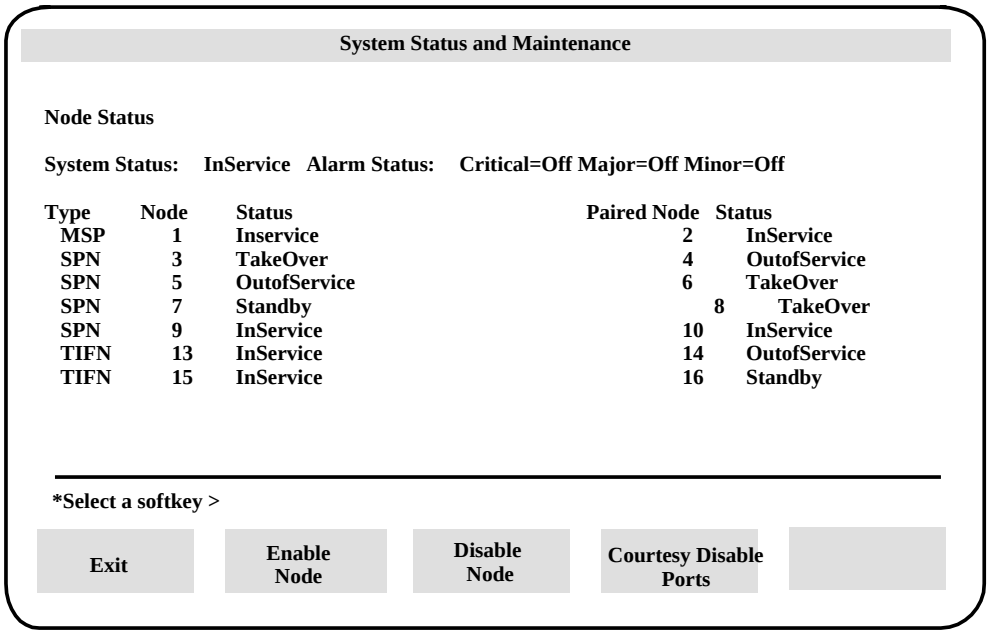
b. Use [Exit] to return to the System Status and Maintenance menu.

Altering system status (continued)

Node status

The Node Status screen (Figure 3-4) displays the operational status of the nodes in your system. The softkeys displayed on this screen are used to enable and disable nodes on the system.

Figure 3-4xxx
Node Status screen



*** "Enter the number of the node you want to enable" appears when [Enable Node] is used.**
*** "Enter the number of the node you want to disable" appears when [Disable Node] is used.**
*** "Enter the number of the node you want to Courtesy Disable Ports" appears when [Courtesy Disable Ports] is used.**

The following fields are displayed on the Node Status screen:

- ***System Status*** - This field displays the current system status. See the section "System Status" for details.
- ***Alarm Status*** - This field indicates whether there are any critical, major or minor alarms. See the section "System Status" for details.
- ***Type*** - The type of node. The three types of nodes are:
  - ***MSP*** or Multi-Server Processor
  - ***SPN*** or Signal Processing Node
  - ***TIFN*** Telephony Interface Node
- ***Node*** - The node number to which the following measurements apply.

Altering system status (continued)

- ***Status -*** The node will be in one of the following states:

  Note: The status at this level does not indicate the status of a given card on the node. For more information for particular cards, go to the Card Status Screen (see p.3-26).

  - ***InService*** indicates that the node is running and accepting calls. For the MSP node, it indicates that node is running and is in load-sharing mode with its paired redundant MSP node.
  - ***Unequipped*** indicates that the node is not defined in the hardware database. *The System Administration Tools* chapter in the Appendix describes how to modify the hardware database.
  - ***Faulty*** indicates that a hardware problem is detected.
  - ***Loading*** indicates that the node is currently starting up and loading software into memory. No software is running when the node is in this state.
  - ***InSvStandby*** (used with the TIFN and MSP node) indicates that the node is running and is ready to take over for the paired redundant node.
  - ***InSvAlarm*** indicates that one or more of the links on the node is faulty.
  - ***OutOfService*** indicates that the node is no longer operational, as a result of a forced disable.
  - ***ShuttingDown***, indicating that the node is shutting down as a result of a disable operation.
  - ***Booting*** indicates that an operating system is being loaded on to the node.

  Note: The InService status state of a TIFN node is dependant on the status of all the T1 and SMDI link handlers on that node.

  - The TIFN node will be InSvStandby only if all link handlers are in the InSvStandby state.
  - A TIFN node will be in the InSvAlarm state if any of its link handlers are in a Faulty state. Otherwise it will be InService.

- ***Paired Node -*** The number of the node which is paired with the original node.
- ***Status -*** The status of the paired node. See the above descriptions.

Altering system status (continued)

Procedure 3-3xxx
Enabling and disabling nodes

Starting point : The System Status and Maintenance menu, <2> entered.

The Node Status screen appears (Figure 3-4).

1 Choose step 1a to enable a node, 1b to disable a node, 1c to courtesy disable ports, 1d to return to the System Status and Maintenance menu.

a. Use [Enable Node].

You are prompted for the node number.

Enter the required number followed by <Return>.

Note 1: *If you have just disabled a node and are re-enabling it, wait 3 to 5 minutes after using [Disable Node] before you use [Enable Node]. This will give the system time to shutdown the node, run bootrom diagnostics, and transit the node to the OutofService state.*

Note 2: *If you enable MSP1 when it is in InSvStandy, an MSP switchover will occur.*

The system may take some time in enabling the node.

b. Before you disable either an SPN or T1 node, use [Courtesy Disable Ports]. Once the ports are disabled, press the [Disable Node] softkey.

You are prompted for the number of an in-service node.

Enter the node number followed by <Return>.

The system may take some time in disabling the node.

c. Use [Courtesy Disable Ports].

You are prompted for the number of an in-service node.

Enter the node number followed by <Return>.

The system may take some time in courtesy disabling the ports since it waits for all active DSP ports to become idle. The node itself will remain InService.

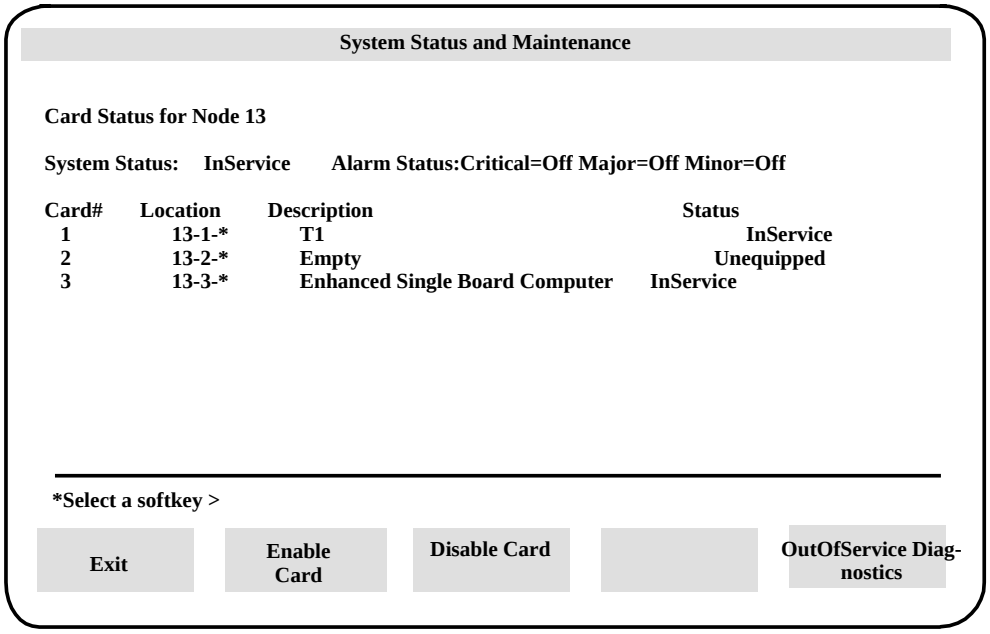
d. Use [Exit] to return to the System Status and Maintenance menu.

Altering system status (continued)

Card status

The Card Status screen (Figure 3-5) displays the operational status of the cards in your system. The softkeys displayed on this screen are used to enable and disable VP and T1 cards on the SPN and TIFN nodes and initiate diagnostics when necessary. (To disable other types of cards, use [Disable Node] on the Node Status screen.)

Figure 3-5xxx
The Card Status screen



* "Enter the number of the card you want to enable" appears when [Enable Card] is used.
* "Enter the number of the card you want to disable" appears when [Disable Card] is used.
* "Enter number of the OutofService Card for diagnostics" appears when [OutofService Diagnostics] is used.

The following fields are displayed on the Card Status screen:

- ***System Status*** - This field displays the current system status. Y our system can be in one of the following states:
  - ***InService*** indicates that all critical programs on all nodes are operational and the system is accepting calls.

Altering system status (continued)

- ***CourtesyPending*** indicates that the system is in the process of shutting down. This occurs after using the [Courtesy Down System] softkey. Incoming calls are directed to an attendant. Calls in progress are not interrupted. Each DSP port is disabled as it becomes idle. The software remains loaded.
- ***CourtesyDown*** indicates that the system has shut down and is no longer operational nor accepting calls. The software remains loaded. When the system is down, the [Courtesy Down System] softkey becomes [Activate System]. When used, the system will restart and eventually return to an InService state.
- ***Loading*** indicates that the node is currently starting up and loading software into memory. No software is running when the node is in this state.

- ***Alarm Status*** - This field indicates whether there is an error condition which would cause the alarm to activate. The status may be one of the following, for each of the alarm types (ie Critical/Major/Minor):
  - ***Off*** indicates that there are no new alarms. This does not necessarily mean that there are no error conditions as alarms may have been silenced from the Logon screen, but the error conditions causing the alarm may still exist.
  - ***On*** indicates that one or more alarm situations was detected.
  - ***Unk*** indicates that unknown status.
- ***Card Number*** - The number of each card in the selected node.
- ***Card Location*** - The physical location of each card in the selected node.
- ***Card Description*** - Function of each card.
- ***Card Status*** - The current state of each card on the selected node.
  - ***Unequipped*** indicates that either the card slot is empty but defined in hardware database or the card is in the slot but not defined in the hardware database.
  - ***Faulty*** indicates that a hardware problem has been detected for the card.
  - ***InService*** indicates that the card operational.
  - ***OutOfService*** indicates that the card has been disabled.

Altering system status (continued)

Procedure 3-4xxx
Enabling and disabling cards

Starting point : The System Status and Maintenance menu, <3> entered.

System responds: Enter the node number for card status > __
Enter specified node.
The Card Status screen appears (Figure 3-5).

1 Choose step 1a to enable a card, 1b to disable a card, 1c to activate diagnostics on an out-of-service card, or 1d to return.

a. Use [Enable Card].

Note: *Only voice processor and T1 cards can be enabled from this screen. To enable other cards use [Enable Node] in the Node Status screen. See the previous section, "Node Status".*

You are prompted for the number of an out-of-service card.

Enter the card number followed by <Return>.

The system may take some time in enabling the card. The message "WORKING ..." will be displayed during this interval.

b. Use [Disable Card].

Note: *Only voice processor cards and T1 cards can be disabled from this screen. To disable other cards use [Disable Node] in the Node Status screen.*

You are prompted for the number of the in-service card you want to disable.

Enter the card number followed by <Return>.

The system may take some time in disabling the card. The message "WORKING ..." will be displayed during this interval.

Go to the DSP Port Status screen and wait for the ports to be OutofService and Return to the Card Status Screen.

c. Use [OutOfService Diagnostics].

You are prompted for the number of an out-of-service card.

Enter the card number followed by <Return>.

The system may take some time in enabling diagnostics. The message "WORKING ..." will be displayed during this interval.

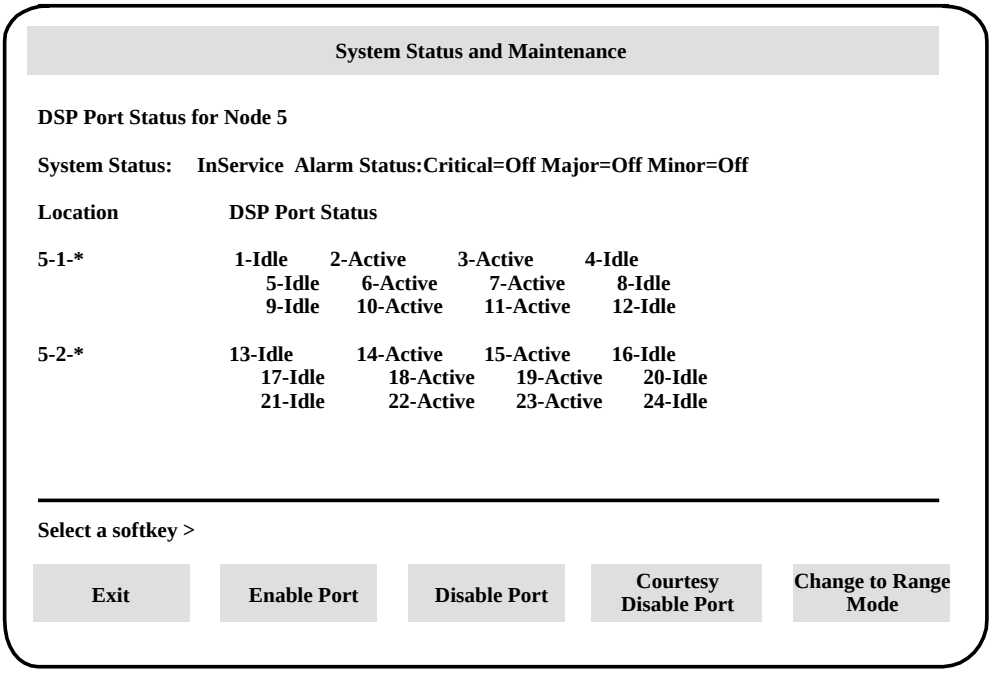
Note: *If the OutOfService Diagnostics fails the card will become faulty. If passed, the card is put into the OutOfService state.*

d. Use [Exit] to return to the System Status and Maintenance menu.

DSP port status

The DSP Port Status screen (Figure 3-6) allows you to view the operational status of the DSP ports on a node, manipulate their status, and courtesy disable individual ports when necessary.

Figure 3-6xxx
The DSP Port Status screen



The following fields are displayed on the DSP Port Status screen:

- ***System Status*** - See the description in the section “System Status”.
- ***Alarm Status*** - See the description in the section “System Status”.
- ***Location*** - The physical location (node-card) of each port on the selected node. For example, “23-Active” indicates that the 23rd DSP port on the second card of the fifth node is active.
- ***DSP Port Status*** - The current state of each DSP port.
  - ***Active*** - The DSP port is operational and in use.
  - ***Idle*** - The DSP port is operational but not currently in use.
  - ***Faulty*** - The system has detected an error in the DSP port.
  - ***OutOfService*** - The port is no longer operational, as a result of a courtesy disable or forced disable.

Altering system status (continued)

- ***POutService*** - The port is in the process of shutting down, pending an active call being disconnected. The port is still active.
- ***UnEquipped*** - The DSP port is not defined in the hardware database. For more information about modifying the hardware database, see *System Administration Tools*, NTP 297-7001-305.
- ***NoResource*** - indicates a transition state that occurs during the initial stages of software loading (after a request to enable a port). When software begins to load, the port is initially in this state, followed by Loading and finally, once the software has finished loading, Idle.
- ***Loading*** - indicates that the DSP port is currently starting up after a request to enable and that the necessary software is loading.

Procedure 3-5xxx
Enabling and disabling DSP ports in single mode

If you need to enable , disable, or courtesy disable a number of DSP ports, use the [Change to Range Mode] softkey. (See Procedure 3-6) This mode will only work for a range of ports in sequence. For example, you can disable the range of ports 3 to 7 but you cannot use this mode to disable ports 3, 5, and 7. Once you change to Range mode the softkey will toggle to [Change to Single Mode].

Starting point : The System Status and Maintenance menu, <4> entered.

The DSP Port Status screen appears (see Figure 3-6).

1 Choose step 1a to enable a DSP port, 1b to disable a DSP port, 1c to courtesy disable a DSP port, or 1d to exit the DSP Port Status screen.

a. Use [Enable Port].

You are prompted for the number of an out-of-service port.

Enter the port number followed by <Return>.

The system may take some time in enabling the DSP port. The message "WORKING ..." will be displayed during this interval.

b. Use [Disable Port].

You are prompted for the number of the first DSP port in the range of ports you want to disable.

Enter the first DSP port followed by <Return>.

The system may take some time in disabling the DSP port. The message "WORKING ..." will be displayed during this interval.

c. Use [Courtesy Disable Port].

You are prompted for the number of an in-service port. DSP port.

Enter the port number followed by <Return>.

The system may take some time in disabling the port since it waits for the port to become idle before disabling it. The message "POutService" will be displayed during this interval.

d. Use [Exit] to return to the System Status and Maintenance menu.

Procedure 3-6xxx
Enabling and disabling DSP ports in range mode

Starting point The System Status and Maintenance screen, <3> entered.

You are prompted for the node number.

1 Enter the number of the node on which the DSP port resides.

The DSP Port Status screen is displayed.

2 Choose step 2a to enable a range of DSP ports, 2b to disable a range of DSP ports, 2c to courtesy disable a range of DSP ports, or 2d to exit the DSP Port Status screen.

a. Use [Enable Port].

You are prompted for the number of the first DSP port in the range of ports you want to enable.

Enter the number of the first DSP port in the range followed by <Return>.

You are prompted for the number of the last DSP port in the range.

Enter the number of the last DSP port in the range followed by <Return>.

The system may take some time in enabling the DSP ports. The message "WORKING ..." will be displayed during this interval.

The system displays a message to inform you of the number of ports successfully enabled, and the number of ports that could not be enabled.

b. Use [Disable Port].

You are prompted for the number of the first DSP port in the range of ports you want to disable.

Enter the number of the first DSP port in the range followed by <Return>.

You are prompted for the number of the last DSP port in the range.

Enter the number of the last DSP port in the range followed by <Return>.

The system displays a message to inform you of the number of ports successfully courtesy disabled, and the number of ports that could not be courtesy disabled.

c. Use [Courtesy Disable Port].

You are prompted for the number of the first DSP port in the range of ports you want to courtesy disable.

Enter the number of the first DSP port in the range followed by <Return>.

Altering system status (continued)

You are prompted for the number of the last DSP port in the range.

Enter the number of the last DSP port in the range followed by <Return>.

The system may take some time in disabling the DSP port since it waits for the port to become idle before disabling it. The DSP port status will be OutOfService during this interval.

The system displays a message to inform you of the number of ports successfully courtesy disabled, and the number of ports that could not be courtesy disabled.

d. Use [Exit] to return to the System Status and Maintenance menu.

Altering system status (continued)

T1 link status

The T1 Link Status screen (Figure 3-7) allows you to view the operational status of the T1 link, manipulate their status, and switch links when required.

Figure 3-7xxx
The T1 Link Status screen

System Status and Maintenance

T1 Link Status

System Status: InService Alarm Status:Critical=Off Major=On Minor=Off

Link ID	Cand	Mode	Clocking Primary Connection T1 Number	T1 Location	Status	Redundant Connection T1 Number	T1 Location	Status
A	Y		1	11-1-1	InService	5	12-1-1	InService
B			2	11-1-2	InService	6	12-1-2	OutOfService
C			3	11-1-3	InService	7	12-1-3	InSvStandby
D			4	11-1-4	OutOfService	8	12-1-4	InService
E		R 9	13-1-1	InService	13	14-1-1	InService	
F			10	13-1-2	Faulty	14	14-1-2	InService
G			11	13-1-3	InService	15	14-1-3	InSvStandby
H	Y		12	13-1-4	InService	16	14-1-4	Faulty

Select a softkey >

Exit | Enable T1 | Disable T1 | Change T1 Clocking Mode | Switch Link

The following fields are displayed on the DSP Port Status screen:

- ***System Status*** - See the description in the section “System Status”.
- ***Alarm Status*** - See the description in the section “System Status”.
- ***Link ID*** - An alphabetic designation used to identify the T1 link in your system. This corresponds to the Link ID in the T1 Link Configuration screen in Hardware Administration.
- ***Cand*** - This is a read-only field. A “Y” in this field indicates that the link has been nominated as a candidate for clock referencing. A candidate is nominated from the T1 Link Configuration screen in Hardware Administration. See the section “Modifying the T1 link setup” in the “Hardware Administration” chapter for more information about clock referencing.

Altering system status (continued)

- ***Clocking Mode*** **-** The currently activated clock reference is indicated with an "R" in this field. A link is activated by using the [Change T1 Clocking Mode] softkey as described in Procedure 3-7. If none of the links are activated as the clock reference, the system is in free-run mode, meaning that the system is using the internal SPM clock.
- ***T1 Number*** **-** The specific T1 connection between the switch and the SPM. There would be two T1 connections (one redundant) associated with a T1 link.
- ***T1 Location*** **-** The location of the link in the system. This represents the node-card-span location.
- ***Status*** **-** The current state of the T1 link.
  - ***Unequipped*** **-** The link is not defined in the hardware database. For more information about modifying the hardware database, see *System Administration Tools* in the Appendix.
  - ***Faulty*** - A hardware problem has been detected on the link.
  - ***Alarm*** - An alarm has been detected on the link.
  - ***InService*** - The T1 link is fully operational and is currently accepting calls.
  - ***InSvStandby*** - The link is not currently taking calls but is ready to accept calls for the paired T1 on the same T1 link.
  - ***OutOfService*** - The link is not operational, due to a forced disable, and is not accepting calls.
  - ***Pending*** - The link is in the process of shutting down or restarting.

You may perform the following actions on T1 links:

- ***Disable T1*** **-** When a T1 link is disabled it is no longer used to accept calls. (This action is not allowed when the link status is "Unequipped".) Once the link is disabled, its status becomes OutOfService.
- ***Enable T1*** **-** This action starts up a T1 link that is currently in an OutOfService state. Once the link is fully enabled, its status becomes InService if the paired T1 is not InService, or InSvStandby if the paired T1 is already InService.
- ***Change T1 Clocking Mode*** - This action allows you to activate one of the nominated links as the clock reference. Alternatively, you can place the system in free-run mode (in which case the internal SPM clock is used instead of an external reference provider).

Altering system status (continued)

- ***Switch Link*** - This action allows you to switch from an InService T1 link to the paired InSvStandby T1. This switching is allowed only if both paired T1 are InService or InSvStandby.

  Note: Only one of the paired T1s can be InService at any one time.

Procedure 3-7
Enabling, disabling and switching T1 Links

Starting Point : The System Status and Maintenance menu, <5> entered.

The T1 Link Status screen is displayed (Figure 3-8).

1 Choose step 1a to enable a T1 link, 1b to disable a T1 link, 1c to change the T1 clock reference, 1d to switch the T1 link, or 1e to exit the T1 Link Status screen.

a. Use [Enable T1].

You are prompted for the T1 number.

Enter the T1 number followed by <Return>.

The system may take some time in enabling the link.

b. Use [Disable T1].

You are prompted for the T1 number of an in-service link.

Enter the T1 number followed by <Return>.

The system may take some time in disabling the link.

c. Use [Change T1 Clocking Mode].

You are prompted for the Link ID.

Enter the Link ID followed by <Return>. Alternatively, you can enter **Z** followed by <Return> (for free run mode).

The specified link ID becomes the new clock reference. If another link was previously activated, it is deactivated as only one link can serve as the reference. If you entered Z, a previously activated link is deactivated.

d. Use [Switch Link].

You are prompted for the Link ID.

Enter the Link ID followed by <Return>.

This changes the status of the primary and redundant links from standby to in-service and vice versa.

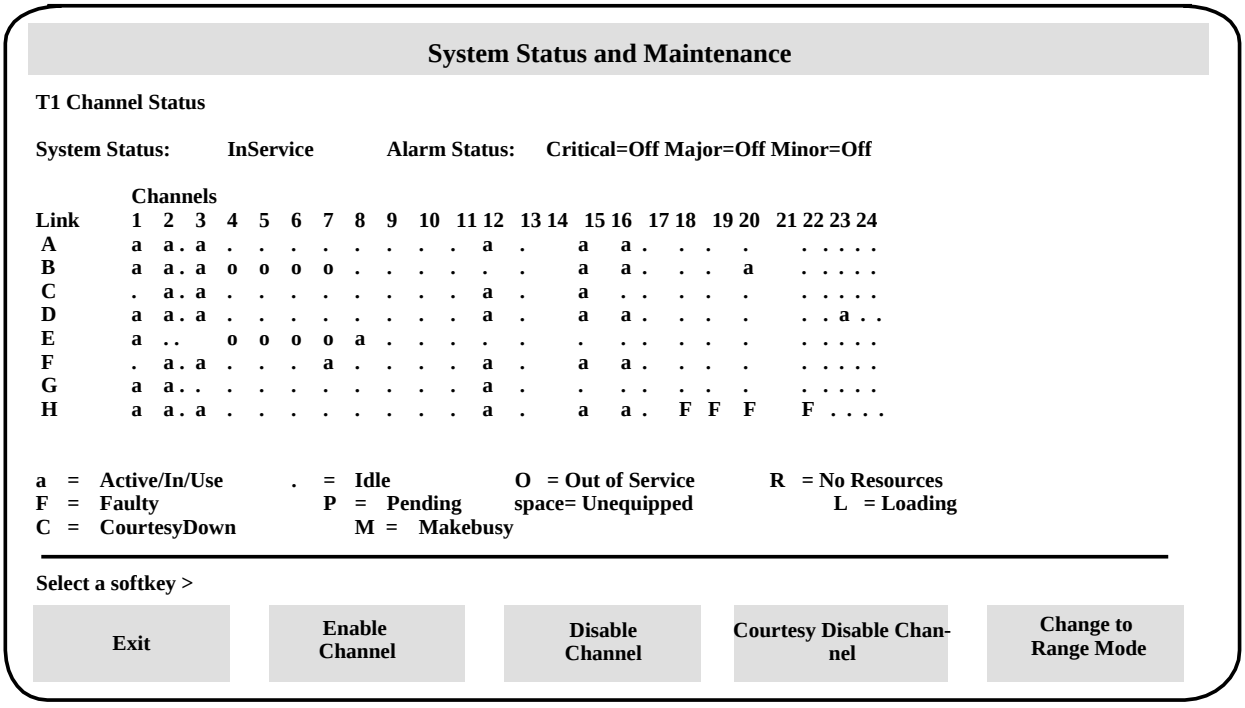
e. Use [Exit] to return to the System Status and Maintenance menu.

Altering system status (continued)

T1 channel status

The T1 Channel Status screen (Figure 3-9) allows you to view the operational status of the T1 channels in the system, manipulate their status, and courtesy disable individual channels when necessary.

Figure 3-9xxx
The T1 Channel Status screen



System Status and Maintenance

T1 Channel Status

System Status: InService **Alarm Status:** Critical=Off Major=Off Minor=Off

Link	Channels 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	a	a	a	.	.	.	.	.	.	.	.	a	.		a	a	.	.	.	.	.	.	.	.
B	a	a	a	o	o	o	o	.	.	.	.	.	.		a	a	.	.	.	a	.	.	.	.
C	.	a	a	.	.	.	.	.	.	.	.	a	.		a	.	.	.	.	.	.	.	.	.
D	a	a	a	.	.	.	.	.	.	.	.	a	.		a	a	.	.	.	.	.	.	a	.
E	a	.	.	o	o	o	o	a	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
F	.	a	a	.	.	.	a	.	.	.	.	a	.		a	a	.	.	.	.	.	.	.	.
G	a	a	.	.	.	.	.	.	.	.	.	a	.		.	.	.	.	.	.	.	.	.	.
H	a	a	a	.	.	.	.	.	.	.	.	a	.		a	a	.	F	F	F	F	.	.	.

a = Active/In/Use . = Idle O = Out of Service R = No Resources
F = Faulty P = Pending space= Unequipped L = Loading
C = CourtesyDown M = Makebusy

Select a softkey >

Exit | Enable Channel | Disable Channel | Courtesy Disable Channel | Change to Range Mode

The following fields are displayed on the T1 Channel Status screen:

- ***System Status*** - See the description in the section “System Status”.
- ***Alarm Status*** - See the description in the section “System Status”.
- ***Link*** - The ID of the T1 link. This would be an alphabetic character.
- ***Channel Status*** - The current state of each channel.
  - ***Active/In Use*** - The T1 channel is operational and in use.
  - ***Idle*** - The channel is operational but not currently in use.
  - ***OutOfService*** - The channel is no longer operational.
  - ***No Resources*** - The T1 channel is available, but there is no software associated with it (eg. when the node is busied out).

Altering system status (continued)

- ***Faulty*** - The system has detected an error in the channel.
- ***Pending*** - The channel is in the process of shutting down or restarting.
- ***UnEquipped*** - The channel is not defined in the hardware database. For more information about modifying the hardware database, see *System Administration Tools* in the Appendix.
- ***Courtesy Down*** - [Courtesy Down System] has been used.
- ***Makebusy*** - The T1 channel is put in the Makebusy state on the DMS switch.

If you need to enable, disable or courtesy disable a number of T1 channels, use the [Change to Range Mode] softkey first. (This only works with a contiguous range of channels. For example, it will work if you need to disable T1 channels 3 to 7, but not if you need to disable T1 channels 1, 3 and 7. When you to toggle to range mode, this softkey changes to [Change to Single Mode].

If you are in single mode, follow Procedure 3-8 If you are in range mode, follow Procedure 3-9.

Procedure 3-8xxx
Enabling and disabling T1 channels

Starting point : The System Status and Maintenance menu, <6> entered.

The T1 Channel Status screen appears (see Figure 3-9).

1 Choose step 1a to enable a channel, 1b to disable a channel, 1c to courtesy disable a channel, or 1d to exit the T1 Channel Status screen.

a. Use [EnableChannel].

You are prompted for the link.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of an out-of-service channel.

Enter the channel number followed by <Return>.

The system may take some time in enabling the channel. The message "WORKING ..." will be displayed during this interval.

b. Use [Disable Channel].

You are prompted for the link.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of an in-service channel.

Enter the channel number followed by <Return>.

Altering system status (continued)

The system may take some time in disabling the channel. The message "WORKING ..." will be displayed during this interval.

c. Use [Courtesy Disable Channel].

You are prompted for the link.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of an in-service channel.

Enter the channel number followed by <Return>.

The system may take some time in disabling the channel since it waits for the channel to become idle before disabling it. The message "Pending" will be displayed during this interval.

d. Use [Exit] to return to the System Status and Maintenance menu.

Procedure 3-9xxx
Enabling, disabling and switching T1 channels in range mode

Starting Point : The System Status and Maintenance menu, <6> entered.

The T1 Channel Status screen is displayed (see Figure 3-10).

1 Choose step 1a to enable a range of T1 channels, 1b to disable a range of T1 channels, 1c to switch a range of T1 channels, or 1d to exit the T1 Channel Status screen.

a. Use [Enable Channel].

You are prompted for the link ID.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of the first channel in the range of channels that you want to enable.

Enter the first channel number followed by <Return>.

You are prompted for the number of the last channel in the range of channels that you want to enable.

Enter the last channel number followed by <Return>.

The system may take some time in enabling the channels. The message "WORKING ..." will be displayed during this interval.

b. Use [Disable Channel].

You are prompted for the link ID.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of the first channel in the range of channels that you want to disable.

Enter the first channel number followed by <Return>.

Altering system status (continued)

You are prompted for the number of the last channel in the range of channels that you want to disable.

Enter the last channel number followed by <Return>.

The system may take some time in disabling the channels. The message "WORKING ..." will be displayed during this interval.

c. Use [Courtesy Disable Channel].

You are prompted for the link ID.

Enter the letter designation of the link followed by <Return>.

You are prompted for the number of the first channel in the range of channels that you want to courtesy disable.

Enter the first channel number followed by <Return>.

You are prompted for the number of the last channel in the range of channels that you want to courtesy disable.

Enter the last channel number followed by <Return>.

The system may take some time in disabling the channels since it waits for the channels to become idle before disabling them.
The message "WORKING ..." will be displayed during this interval.

d. Use [Exit] to return to the System Status and Maintenance menu.

Altering system status (continued)

SMDI link status

This screen displays the primary and redundant SMDI links in your system and their current status.

Figure 3-10xxx
The SMDI Link Status screen

System Status and Maintenance

SMDI Link Status

System Status: InService Alarm Status:Critical=Off Major=Off Minor=Off

Link ID	Primary Link SMDI Number	Primary Link SMDI Location	Primary Link Status	Redundant Link SMDI Number	Redundant Link SMDI Location	Redundant Link Status
A	1	15-1-1	InService	5	16-1-1	Standby
B	2	15-1-2	InService	6	16-1-2	OutOfService
C	3	15-1-3	InService	7	16-1-3	Standby
D	4	15-1-4	OutOfService	8	16-1-4	InService
E	9	13-1-1	Standby	13	14-1-1	InService
F	10	13-1-2	Faulty	14	14-1-2	InService
G	11	13-1-3	InService	15	14-1-3	Standby
H	12	13-1-4	InService	16	14-1-4	Faulty

Select a softkey >

Exit | Enable SMDI | Disable SMDI | | Switch Link

The following fields are displayed on the SMDI Link Status screen:

- ***System Status*** - See the description in the section “System Status”.
- ***Alarm Status*** - See the description in the section “System Status”.
- ***Link ID*** - An alphabetic designation used to identify the SMDI link in your system.
- ***SMDI Number*** - The specific SMDI connection between the switch and the SPM. There would be two SMDI connections (one redundant) associated with an SMDI link.
- ***SMDI Location*** - The location of the link in the system. This represents the node-card slot-port location
- ***Status*** - The current state of the SMDI link.

Altering system status (continued)

- ***Unequipped*** - The link is not defined in the hardware database. For more information about modifying the hardware database, see *System Administration Tools* in the Appendix.
- ***Faulty*** - A hardware problem has been detected on the link.
- ***InSvY elAlarm*** - The SMDI link is in service but has lost the modem connection.
- ***InSvRedAlarm*** - The SMDI link has lost the signaling with the DMS host.
- ***InService*** - The SMDI link is fully operational and is currently accepting calls. When the link is being started, the SMDI link status sequence is InSvYelAlarm, then InSvRedAlarm, and finally InService.
- ***InSvStandby*** - The link is not currently taking calls but is ready to accept calls for the paired SMDI on the same SMDI link.
- ***OutOfService*** - The link is not operational, due to a forced disable, and is not accepting calls.
- ***Pending*** - The link is in the process of shutting down or restarting.

You may perform the following actions on SMDI links:

- ***Disable SMDI*** - When an SMDI link is disabled it is no longer used to accept calls. (Once the link is disabled, its status becomes OutOfService.)
- ***Enable Link*** - This action starts up an SMDI link that is currently in an OutOfService. Once the link is fully enabled, its status becomes InService if the paired SMDI is not InService, or InSvStandby if the paired SMDI is already InService.
- ***Switch Link*** - This action is only possible if your system has redundant links. It allows you to switch from an InService SMDI link to the paired InSvStandby SMDI. This switching is allowed only if one SMDI link is InService and its partner is InSvStandby.

  Note: Only one of the SMDI links within a pair can be InService at any one time. (Multiple pairs can be InService at the same time.)

Altering system status (continued)

Procedure 3-10xxx
Enabling, disabling and switching SMDI Links

Starting Point : The System Status and Maintenance menu, <7> entered.

The SMDI Link Status screen is displayed (Figure 3-10).

1 Choose step 1a to enable an SMDI link, 1b to disable an SMDI link, 1c to switch the SMDI link, or 1d to exit the SMDI Link Status screen.

a. Use [Enable Link].

You are prompted for the SMDI number.

Enter the link ID followed by <Return>.

The system may take some time in enabling the link.

b. Use [Disable Link].

You are prompted for the SMDI number of an in-service link.

Enter the link ID followed by <Return>.

The system may take some time in disabling the link.

c. Use [Switch Link].

You are prompted for the Link ID.

Enter the SMDI number followed by <Return>.

This changes the status of the primary and redundant links from standby to in-service and vice versa.

d. Use [Exit] to return to the System Status and Maintenance menu.

SPM Cross Reference Table

The SPM Cross Reference Table (Figure 11) allows you to look up the card number (part number), shelf and slot for each card in the system.

Figure 3-11xxx
The SPM Cross Reference Table

System Status and Maintenance

SPM Cross Reference Table

Node	Card	Card Type	CardNumber	Shelf	Slot
1	1	Filler	NT9X19AA	26	07F
1	2	SBC	NTGX05AA	26	08F
1	3	Bus	NTGX10AA	26	09F
2	1	Bus	NTGX10AA	26	10F
2	2	Filler	NT9X19AA	26	11F
2	3	SBC	NTGX05AA	26	12F
3	1	SBC	NTGX05AA	26	30F
3	2	VP12	NTGX12AA	26	31F
3	3	VP12	NTGX12AA	26	32F
4	1	VP12	NTGX12AA	26	27F
4	2	VP12	NTGX12AA	26	28F
4	3	SBC	NTGX05AA	26	29F
5	1	VP12	NTGX12AA	26	17F
5	2	VP12	NTGX12AA	26	18F

MORE BELOW

Select a softkey >

Exit

The following fields are displayed:

- ***Node*** **-** The node on which the card resides.
- ***Card*** **-** The card number.
- ***Card Type*** **-** Examples of card types as shown in Figure 3-11 are:
  - ***SBC*** - a single board computer (also known as the 68K card).
  - ***Bus*** - high-speed bus
  - ***VP12*** - 12-channel voice processor
  - ***Filler*** **-** an empty card slot

  Other examples include the T1 transition module, 68k transition module, modem transition module, and bus controller transition module.
- ***CardNumber*** **-** The part number of the card.
- ***Shelf*** **-** The shelf on which the card is located.

Altering system status (continued)

- ***Slot*** **-** The slot in which the card resides. “F” indicates front and “R” indicates rear.

System Event And Error Reports (SEERs)

System Event and Error Reports (SEERs) collect statistics on every system event and error reported by DMS VoiceMail system software components. The reports provide information about the SEER class, SEER number, the date and time that the SEER was generated, and a description of the event or error that occurred at that time.

SEERs are mostly used by maintenance personnel for isolating system faults and repairing hardware and software problems. However, administrators should be able to read, interpret, and assess the severity of events and errors to determine if they are regular events (such as a system audit), errors which can be corrected by the administrator, or if it is necessary to alert support personnel. Once the administrator becomes familiar with SEERs it may also be possible to identify potential problems in their early stages before they become critical errors.

In order to help you judge how serious a system problem might be, SEERs have been classified according to various severity levels. These classifications are based on the impact of the operation that has failed. This reduces the risk of neglecting real problems that have been buried amongst a lot of minor problems or regular system events. When retrieving SEER information, you can therefore filter out all but the most severe problems in order to deal with them quickly.

Each SEER is put into one of the following severity classifications:

- ***Critical*** **-** indicates any service-affecting problem. A critical problem requires immediate attention, usually from a qualified technician. Examples of critical errors are system reboots, a major base feature not operating, hardware failure (where the system failed to recover from the failure), system capacity reduced below a threshold, software configuration problems, a full volume, a disk drive error.
- ***Major*** **-** indicates any service-threatening problem. Such problems do not require immediate attention, but will require attention from the administrator or technician to prevent it from becoming a critical problem. A major problem may be allowed to persist up to 24 hours. Examples of major errors are hardware failures from which the system has successfully recovered, unrecovered hardware problems in non-critical components such as tape drives or voice cards, malfunction of a minor feature such as the recording of spoken names or administrative functions, a nearly full volume, a disk drive error (when disks are shadowed), or excessive minor problems.

Altering system status (continued)

- ***Minor*** **-** indicates a problem that has no impact on the system or users of the system. No immediate attention is required on the part of the administrator or a technician. The fault can be allowed to exist for some time. However, an excessive accumulation of minor problems can in itself become a major problem.
- ***Debug*** **-** indicates unexpected software conditions which do not impact on service. This information is only of interest to DMS VoiceMail designers.
- ***Info*** **-** indicates a normal system event. Knowledge of these events is of use to the administrator as they indicate occurrences such as invalid administrator logon attempts, system time changes, disabled user mailboxes (due to password expiry/violation), successful backups, and the forwarding of non-users to voice messaging.

Each SEER can also be one of several types.

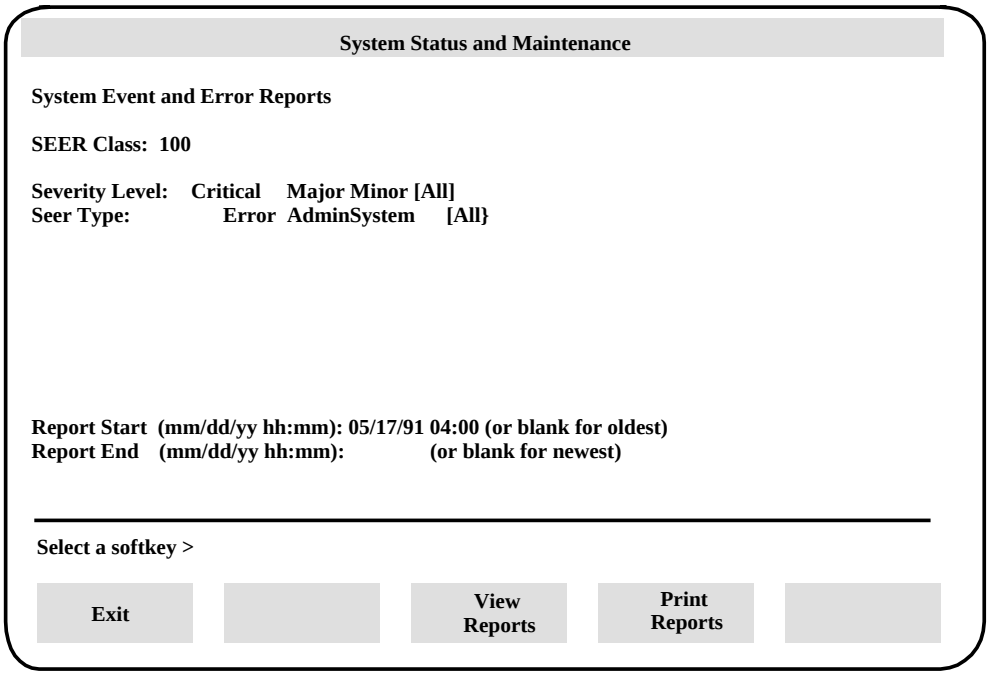
- ***Error*** **-** Indicates an error which requires the attention of a trained technician.
- ***Admin*** **-** Indicates an error which can probably be solved by the system administrator. If the administrator is unable to solve the problem, they may call a trained technician.
- ***System*** **-** Indicates a normal event that should be logged and noted, for example, a successful audit or Operational Measurement collection. This does not sound an alarm.

For a more detailed description of SEERs and their interpretation, see the *DMS VoiceMail Maintenance Messages (SEER) Manual* (NTP 297-7001-510).

The System Event and Error Reports form (Figure 3-12) allows you to set parameters for the type of report you want to generate. In this form, you are able to specify the range of SEERs that you want included in the report by indicating the class and severity level of the SEERs you wish to monitor. You can also specify the period of time that the report should cover (by entering a start and end date and time). Once the report has been generated according to the criteria you have specified in this form, you can either view it or print it out.

Note: DMS VoiceMail filters SEERs at different levels for printing from the SEER printer. This level can be set so that only those SEERs that the administrator considers important are displayed. SEER filtering is discussed in the *DMS VoiceMail Maintenance Messages (SEER)* manual (NTP 297-7001-510). To reset the SEER filtering level, contact your Regional Support Center (RSC).

Figure 3-12xxx
The System Event And Error Reports screen



The System Event and Error Reports form contains the following fields:

- ***SEER Class*** **-** This field allows you to specify the class of SEERs that you want to view or print. The SEER class is the code which identifies the type of event or error being reported. There are over 40 classes, each pertaining to a particular software component. Explanations for these codes are given in *Maintenance Messages (SEER) Manual* (NTP 297-7001-510). If you want to retrieve SEERs from all classes, leave the field blank.
- ***Severity Level*** **-** The selection you make in this field determines the SEERs that are displayed in the report by allowing you to selectively view SEERs according to their severity. For a description of the severity levels, see the introduction to this section on SEERs.
  - ***Critical*** **-** retrieves only those SEERs classified as Critical.
  - ***Major*** **-** retrieves those SEERs classified as Major and the level above, namely the Critical Severity SEERs.
  - ***Minor*** **-** retrieves those SEERs classified as Minor and the ones in the level above ie Major and Critical.

Altering system status (continued)

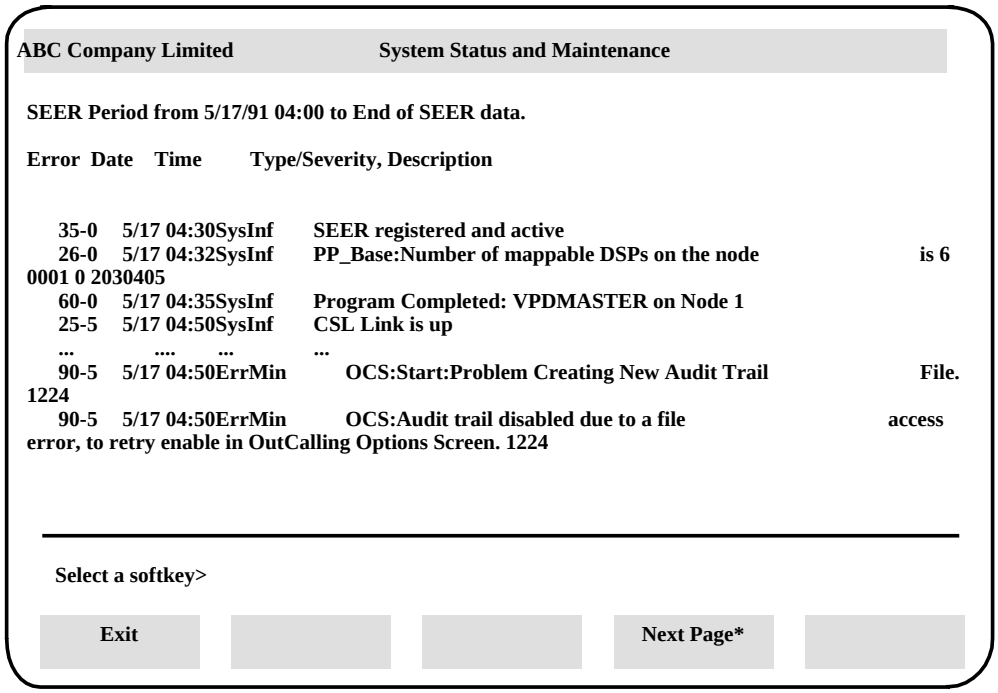
- ***All*** - causes SEERs at all levels of severity to be displayed in the report. This includes the Info level Seers.

- ***SEER Type*** - This field allows you to specify the type of SEERs that you want to view or print.The types are:
  - ***Error***-Error-level SEERs are those which may indicate a system problem, to be corrected by the administrator, possibly with the assistance of technical support. Examples of Error-level SEERs include: hardware errors; software errors; indications that a hardware error may develop.
  - ***Admin***-Administration-level SEERs are those which indicate system problems or configuration difficulties that are likely to be handled by the system administrator without external assistance (for example, a non-DMS VoiceMail user whose calls are forwarded to the DMS VoiceMail system). When the filtering level is set to Admin, the Error-level SEERs are also printed.
  - ***System***-System-level SEERs are those which indicate normal system behaviour, and others which do not require action (for example, nightly audits by the various sub-systems of DMS VoiceMail). When the filtering level is set to System, the Error- and Admin-level SEERs are also printed.
  - ***All***-When All is selected, all SEER types are printed.
- ***Report Start*** - determines the day and time at which the report starts. If this field is left blank, the report starts with the oldest SEER data currently stored in the buffer.
- ***Report End*** - determines the day and time at which the report ends. If this field is left blank, the report will include SEER data up to the last (most recent) entry currently stored in the buffer. If neither the start or end day and time are specified, all SEER data currently stored in the buffer will be included in the report.

Viewing SEER reports

Once you have filled in the System Event and Error Reports form, you can either view the report on screen or print it. If you choose to view the report, the screen illustrated in Figure is 3-13 displayed.

Figure 3-13xxx
The Report screen



***Appears when the information fills more than one screen.**

SEER reports contain the following read-only fields:

- ***SEER Period*** **-** reflects the time period that the report covers. This is determined by the entries that were made in the System Event and Error Reports form. If no start and end date were entered there, the report will display all SEER data that is currently stored in the buffer.
- ***Error*** **-** identifies the SEER. The first number indicates the report class (which identifies a particular software component). The second number indicates the report number (which specifies the report within the class, numbered from 0 to 99. This classification system is described in the introduction to the *DMS VoiceMail Maintenance Messages (SEER) Manual* (NTP 297-7001-510). If no class was specified in the System Event and Error Reports form, SEERs from all classes will be included in the report.
- ***Date & Time*** **-** indicates the date and time at which the event or error occurred in the system.
- ***Type/Severity*** **-** indicates the SEER type (Error, Admin or System) and its severity level (Critical, Major, Minor, or Info).

Altering system status (continued)

- ***Description*** **-** gives a brief explanation of the event or the cause for the error.

An alternative method of obtaining SEER information is to monitor the DMS VoiceMail SEER printer, if there is one, thus allowing you to view SEERs as they occur. To do so, SEER printing must be enabled in the General Options form (it is, by default). Although the format of the report is different from that used by the administration terminal, most of the information is the same (such as the class, number, description, and date and time). In some instances you may also see additional information at the end of the message such as:

RC xxxx

where xxxx is a number signifying a Return Code. These codes provide further information about the SEER and can be found at the back of *DMS VoiceMail Maintenance Messages (SEER) Manual* (NTP 297-7001-510).

Serv. File <filename>

where the filename refers to a voice menu or announcement service ID.

Procedure 3-11xxx
Viewing and printing SEERs

Starting point : The System Status and Maintenance menu, <8> entered.

The System Events and Error Reports form appears (Figure 3-12).

1 Enter the class of SEERs that you want to retrieve. If you want to retrieve all SEER classes, leave the *Class* field blank.

2 Select a severity level. (To view SEERs at all severity levels, select “ALL”.)

3 If you wish to specify a start and end time for the reporting period, enter the required values in the *Report Start* and *Report End* fields.

4 Choose step 4a to view the report on the terminal, 4b to print the report, or 4c to cancel.

a. Use [View Reports].

The report is displayed (Figure 3-13).

Use [Next Page] to view subsequent pages of the report.

b. Use [Print Reports].

You are prompted to make sure your printer is ready and on-line.

Altering system status (continued)

Use [Continue Printing] to continue printing, or use [Cancel Printing] at any time to stop printing. There may be some delay before control is returned to the terminal because the system waits for the printer to stop printing.

c. Use [Cancel].

The System Status and Maintenance screen appears.

Altering system status (end)

Resynchronizing the disks

Application

Use this procedure to resynchronize the disks in the DMS VoiceMail system.

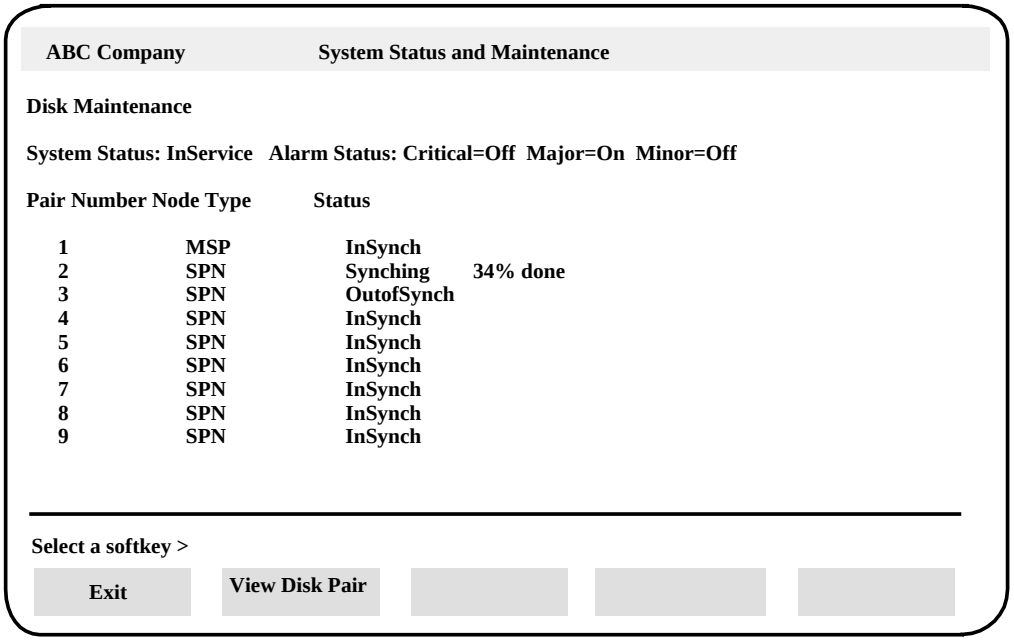
Procedure 3-12xxx
Synching a disk

Starting point System Status and Maintenance menu. (See Figure 3-1)

1 Select Disk Maintenance.

The Disk maintenance screen (Figure 3-14)will appear. For more information see the section describing the disk maintenance screen on page 3-54

Figure 3-14xxx
The Disk Maintenance screen

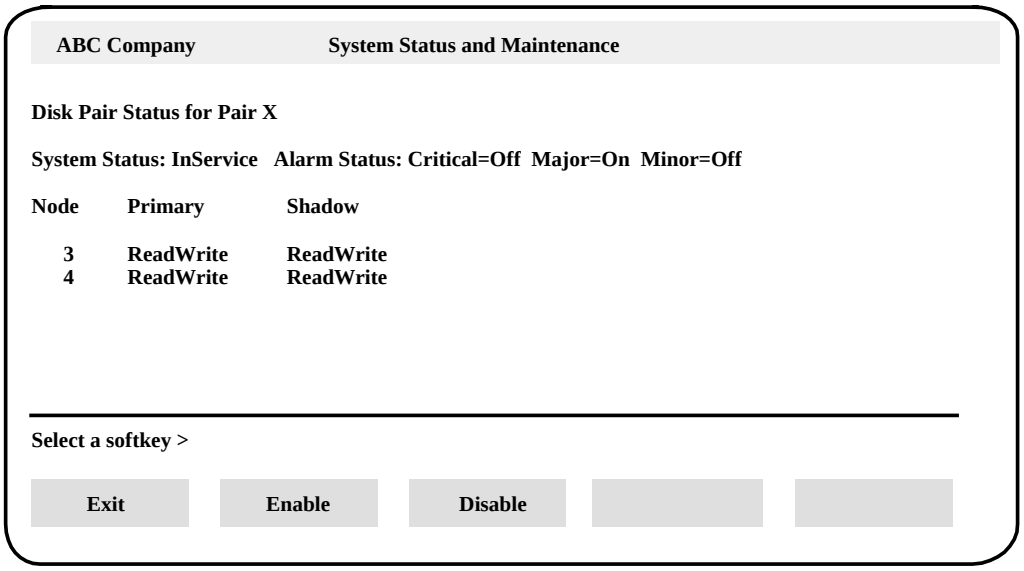


2 Press the [View Disk Pair] softkey.

The Disk pair status screen (Figure 3-15) will appear and You will be prompted for a pair number.

Resynchronizing the disks (continued)

Figure 3-15xxx
The Disk Pair Status screen



3. Enter the number of the pair you want to view/synch. For more information on the Disk pair status screen see page 3-55
4. Press the [Enable] softkey.

   You are prompted for the node number connected with the disk that needs syncing.
5. Enter the node number connected with the disk that needs syncing.

   The system determines the source of the synch by choosing the disk that is in ReadWrite mode.
6. Return to main procedure

The Disk Maintenance screen

The Disk Maintenance screen (Figure 3-14) shows the status of each disk pair in the system. The three possible states for a disk pair are “InSynch”, “Synching” and “OutofSynch”. If a SEER has alerted you to the fact that the system has automatically taken a disk out of service, check the Disk Maintenance screen to determine which pair is out of synch.

The following fields are displayed on this screen:

- ***System Status*** **-** This field displays the current system status. See the section “System Status” for a description of possible system states.

Resynchronizing the disks (continued)

- ***Alarm Status*** - This field indicates whether or not there are any Critical, Major or Minor alarm. See the section “System Status” for a description of possible alarm states.
- ***Pair Number*** - The number of each disk pair in the system.
- ***Node Type*** - The type of node on which the pair resides.
- ***Status*** - The synchronization status. A disk pair can be in one of the following states:
  - ***InSynch*** indicates that both disks are operational and in synch with each other.
  - ***Synching*** indicates that the disks are currently synching (that is, after pressing [Enable] in the Disk Pair Status screen).
  - ***OutofSynch*** indicates that one of the disks is NoAccess and consequently out of synch with its shadowed pair. This happens if the system automatically puts a bad disk in No Access or if you disable the disk in order to replace or repair it.
  - ***SynchIntrpted***indicates a disk synchronization operation was interrupted. To recover from this state, it is necessary to,
    - first run the disk synchronization utility at the tools level on one of the nodes that the disk pair belongs to.
    - run the “init” command.
    - disable and re-enable one of the nodes that the disk pair belongs to.

The Disk Pair Status screen

The following fields are displayed on the Disk pair screen:

- ***System Status*** - The current system status. See the section “System Status” for a description of possible system states.
- ***Alarm Status*** - Indicates whether there are any critical, major or minor alarms. See the section “System Status” for a description of possible alarm states.
- ***Node*** - The node on which the disk resides.
- ***Primary*** - This field indicates the status of the primary disk. A disk may be in one of the following states:
  - ***ReadWrite*** indicates that the disk is currently being read and written to. A disk that is in this state is operating normally.
  - ***NoAccess*** indicates that the disk is not being read or written to due to an error condition or a manual disable.

Resynchronizing the disks (end)

- ***SynchSource,*** during a disk synch, indicates that the disk is the source of a disk synchronization.
- ***SynchDest***, during a disk synch, indicates that the disk is the destination of a disk synchronization.

- ***Shadow -*** This field indicates the status of the shadowed disk. A disk may be in one of the following states:
  - ***ReadWrite*** indicates that the disk is currently being read and written to.
  - ***NoAccess*** indicates that the disk is not being read or written to due to an error condition or a manual disable.
  - ***SynchSource***, during a disk synch, indicates that the disk is the source of a disk synchronization.
  - ***SyncDest***, during a disk synch, indicates that the disk is the destination of a disk synchronization.

List of terms

68K card

68010 processor card. This is a card with a 12Mhz 68010 processor, SCSI interface, serial port and the capability of addressing either 6 or 8 MB of accessible RAM.

AMIS

See audio messaging interchange specification.

Audio messaging interchange specification (AMIS)

An industry standard specification that allows users of voice messaging products residing on systems of differing architectures to exchange voice messages.

Card

Card is the term for a plug-in printed circuit pack or board.

Central Office (CO)

A switching office arranged for terminating subscriber lines and provided with switching equipment and trunks for establishing connections to and from other switching offices. Synonymous with class 5 office; end office; local office. *See* office classification.

Central processing unit (CPU)

A hardware entity, located in the central control complex frame, that contains the central data processor for the DMS-100 Family,

Channel capacity

A measure of the maximum possible information rate through a channel, subject to specified constraints.

Circuit pack (CP)

In DMS-Supernode, consists of multi-layer PCB, through-hole electronic components, backpanel connector, faceplate, lock latches, and stiffeners.

Coaxial cable

A cable consisting of an outer conductor concentric to an inner conductor separated by insulating material. It can carry a much greater bandwidth than a twisted wire pair.

Cold restart

An initialization phase during which temporary storage is deallocated and cleared. All calls are dropped and the peripheral processors clear all channel assignments. *See* warm start.

CP

Call processing; circuit pack

CPE

See customer premises equipment.

Customer premises equipment (CPE)

Refers to equipment that is located on the customer's premises.

CPU

Central processing unit.

DMS

Digital Multiplex System

DMS-Bus

The messaging control component of DMS-Supernode. It consists of a pair of message switches.

DMS-link

The networking software of DMS-Supernode. it consists of open and standard protocols which enable DMS-Supernode to function in a multi-vendor environment.

DMS-Supernode

A central control complex for the DMS-100. the two major components of DMS-Supernode are the computing module and the message switch. Both are compatible with the current network module, the input/out controller, and the XMS-based peripheral modules.

DN

See directory number.

DSP

Digital Signal Processor

ETAS

Emergency Technical Assistance Service

Fault

In telephony, a detectable trouble-condition that can be reproduced at will be the system or by external means. Compare with error.

Fault detection (FD)

A signal that initiates the maintenance subsystem interaction protocol in the DMS-100 Family maintenance system.

High-level data link controller (HDLC)

The channel by which high-level control messages from the central controller are carried between the digital carrier module and remote line modules.

HDLC

High-level data link controller

IF

Interface (card)

Integrated Services Digital Network (ISDN)

A set of standards proposed by the International Telegraph and Telephone Consultative Committee (CCITT) to establish compatibility between the telephone network and various data terminals and devices. ISDN provides a path for transmission of voice, data, and images.

Interface (IF) card

A designation identifying the type of circuit card used in a network module. The IF cards provide bi-directional interfaces between the bi-phase signals on the speech links and the serial data entering the incoming formatter and leaving the outgoing formatter.

Link

- In DMS, a connection between any two nodes. *See* node.
- A four wire group of conductors providing transmit and receive paths for the serial speech or message data between components of DMS-100 Family systems. Speech links connect peripheral modules to the network modules. Message links connect network message controllers or input/output controllers to the central message controller.

Link protocol

A set of rules for data communication over a data link. Link protocols exist for transmission codes, transmission nodes, and for data control and recovery procedures.

Link interface unit 7 (LIU7)

The LIU7 is a peripheral module that processes messages entering and leaving a link peripheral processor (LPP) through an individual signaling data link.

Link peripheral processor (LPP)

The LPP is an equipment frame that contains peripheral modules, such as LIU7s, EIUs, and an LMS.

Local message switch (LMS)

The LMS controls messaging between LIU7s, EIUs, and other application processors in a link peripheral processor (LPP). The LMS also controls messaging between the LPP and the DMS Bus.

Log system

Used by the DMS software to record (that is, log) the occurrence of all significant events (for example, equipment failure), and then report the events to operating company personnel.

Maintenance and administrative position (MAP)

The MAP provides a man-machine interface between operating company personnel and the DMS-100 Family switch. It consists of a visual display unit and keyboard, a voice communications module, test facilities, and MAP furniture.

Maintenance noise limit (MNL)

A transmission noise level that, if exceeded, requires maintenance action, but is not high enough to affect service.

Maintenance time

Time used for hardware maintenance. This includes both preventive and corrective maintenance. Contrast with available time.

Meridian digital centrex (MDC)

A special DMS business services package that utilizes the data-handling capabilities of DMS-100 Family offices to provide a centralized telephone exchange service. It is formerly known as the integrated business network (IBN).

Meridian Mail user interface (MMUI)

It is Northern Telecom’s proprietary voice messaging user interface.

MNL

Maintenance noise limit

MMUI

See Meridian Mail user interface.

Modem

Contraction of modulator/demodulator; a device that modulates and demodulates signals for transmission and reception, respectively, over communication facilities. A modem is used to permit digital signals to be sent out over analog lines. Synonymous with data set.

Module

- The basic building block of software structure. A module consists of interface and implementation sections.
- A discrete hardware package, designed for use in conjunction with other components.

MSP

See multiserver processor.

Multiserver processor (MSP)

A node running multiserver programs in a multinode environment on the service peripheral module.

Network

- An organization of stations capable of intercommunication but not necessarily on the same channel.
- Two or more interrelated circuits.
- A combination of terminals and circuits in which transmission facilities interconnect user stations directly.
- A combination of circuits and terminals serviced by a single switching or processing center.
- An interconnected group of computers or terminals.
- (NET) The network module frame of the DMS-100 Family system.

Network administration system

A stand-alone computer that is involved in operation, administration and maintenance of ISDN services. The NAS uses data on service and system operation to generate files that contain information on alarms, accounting, billing, and network operation.

Network module

The basic building-block of the DMS-100 Family switching network. The NM accepts incoming calls and, using connection instructions from the central control complex, connects them to the appropriate outgoing channels. Activities in the NM are controlled by the network message controllers.

Node

The terminating point of a link. Node is a relative term; its meaning depends entirely on the context within which it is used. For example, a circuit may be a node in the context of another circuit within a module; the module itself may be a node in the context of another component of the network, and so forth.

Noise

Unwanted electrical signals, introduced by circuit components or natural disturbances, which tend to degrade the performance of a communications channel; any unwanted background signal on a circuit, caused by system design limitations, by improper alignment, or by interference from an outside source, divided into classes.

Northern Telecom practice (NTP)

A document that contains descriptive information about the DMS-100 Family hardware and software modules, and performance oriented practices for testing and maintaining the system. NTPs are supplied as part of the standard documentation package provided to an operating company.

NT

Northern Telecom

NTP

Northern Telecom practice

Operational measurements (OM)

The hardware and software resources of the DMS-100Family switches that control the collection and display of measurements taken on an operating system. OMs organize the measurement data and manage its transfer to displays and records on which maintenance, traffic, accounting, and provisioning decisions are based.

PBX

Private branch exchange

Peripheral Equipment

Equipment which works in conjunction with a communication system or a computer but is not part of it. In the DMS-100 Family of switches, it is a general term applied to peripheral modules.

PE

Peripheral equipment

Port

In DMS, the point at which a speech or message link is connected to a peripheral module, network module, input/output controller, or central message controller.

Private branch exchange (PBX)

A private telephone exchange, either automatic or attendant-operated, serving extensions in an organization and providing access to the public network.

Product engineering code (PEC)

An eight-character code that provides a unique identification for each marketable product manufactured by Northern Telecom Ltd.

PEC

Product engineering code

Redundancy

The components of a message that may be ignored or eliminated without loss of essential information.

Redundancy check

A check employing systematically inserted redundant data.

Reset terminal

A terminal for DMS-Supernode, used to initial re-boot activities and monitor the state of the system. The reset terminal can be either a local terminal or a remote terminal connected through dataset equipment.

Restart

To re-establish the process of executing a routine after a program or data error or machine malfunction. Restarting usually involves returning to checkpoints placed at appropriate intervals such that, in the event of a failure, a job can be resumed without starting at the beginning of the run. A restart has a severity associated with it that reflects the importance of the resources being reset.

SCSI

Small Computer System Interface

SEER

See System Event and Error Report (SEER)

Service peripheral module (SPM)

A voice processing server used to provide voice messaging and related services for residential and business subscribers of DMS-100 or other central office switches.

Shelf

A container for drawers, cards, or both.

Simplified message desk interface (SMDI)

An interface feature that enables a DMS-100 switch to communicate with a message desk. If provides the directory number of the called station, the calling station number (if available), and the reason for the call being forwarded to a message desk. In addition, it provides the message desk with the ability to activate or deactivate the message waiting indication for any station able to forward calls to the desk.

SPM

See service peripheral module.

System Event and Error Report (SEER)

A report that identifies both normal system events and errors generated by system hardware and software.

System Log (SYSLOG)

The log containing a selection of reports from various logs following a reload-restart. SYSLOG is the only log whose contents survive reload-restarts; thus it is useful if the reload was unintentional.

SMDI

Simplified message desk interface

SYSLOG

System log

Telephony interface node (TIFN)

A node that is used to interface between incoming telephony lines and place the communications on the MMail bus of the service peripheral module.

Terminal

- The point of origination or termination in a communications network.
- Any device capable of sending and/or receiving information over a communication channel.
- Also, in DMS, the smallest unit of address space within the input/output system.

TIFN

See telephony interface node.

Transition Module (TM)

A short circuit pack, based on the standard circuit pack. The TM carries the cable interfaces and/or local service functions such as local clock sources and bus terminations, located on the back of DMS-Supernode shelf.

TM

Transition module

VMUIF

See Voice Messaging user interface forum.

Voice Messaging user interface forum (VMUIF)

The call answering interface that has been defined by the Voice Messaging user interface forum.

Voice Processor-12 (VP12) card

A twelve-port card that is used in the service peripheral module for voice processing.

VP12

See Voice Processor-12 card.

Warm restart

An initialization phase during which temporary storage is deallocated and cleared. Transient calls are dropped while calls in the talking state continue. *See* cold restart.

DMS-100 Family

DMS VoiceMail

Card Replacement Procedures

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