297-1001-453

DMS-100 Family

North American DMS-100

Netwrok Management System Reference Manual

TL13 Standard 11.03 September 2000

NORTEL NETWORKS™

How the world shares ideas.

DMS-100 Family

North American DMS-100

Netwrok Management System Reference Manual

Publication number: 297-1001-453
Product release: TL13
Document release: Standard 11.03
Date: September 2000

Copyright © 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1993, 1999, 2000 Nortel Networks,
All Rights Reserved

Printed in the United States of America

NORTEL NETWORKS CONFIDENTIAL: The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

Information is subject to change without notice. Northern Telecom reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

DMS, MAP, NORTEL, NORTEL NETWORKS, NORTHERN TELECOM, NT, and SUPERNODE are trademarks Northern Telecom.

Publication history

September, 2000

NA014 Standard 11.03. Rereleased to capture SR CM50319.

April, 2000

NA012 Standard 11.02. Corrected CPSTAT display.

November, 1999

NA012 Standard 11.01. The major revisions are:

- updates for feature 59011119, *Flexible Network Management Reroutes*
- updates generated by command verification
- updates generated by technical content review
- general cleanup (conversion of feature product engineering codes (PEC) to functionality order codes, correction of erroneous NTP references, removal of references to cancelled NTPs, etc.)

The updates generated by command verification and technical content review affect every chapter of this document and are too numerous to detail here.

Contents

About this document xi
When to use this document xi
How to check the version and issue of this document xi
References in this document xi
What precautionary messages mean xii
How commands, parameters, and responses are represented xiii
Input prompt (>) xiv
Commands and fixed parameters xiv
Variables xiv
Responses xiv

1 Introduction 1-1
General 1-1
Command format conventions 1-2
References 1-3
Prerequisite references 1-3
Informative references 1-3

2 Network Management system description 2-1
General 2-1
Feature packages for NWM 2-1
NWM interfacing facilities 2-2
Maintenance and Administration Position (MAP) 2-2
Teleprinters (TPR) 2-2
Operational measurements (OM) 2-2
Status board lamp display 2-4

3 Network Management features 3-1
General 3-1
Automatic Control (AutoCtrl) 3-2
Dynamic Overload Control 3-3
PPLN (Preplanned Control) 3-6
AOCR (Automatic Out-of-Chain Reroute) 3-6
Automatic Congestion Control (ACC) 3-6
Selective Incoming Load Control (SILC) 3-7
Group Control (GrpCtrl) 3-7
DRE (Directional Reservation Equipment) 3-7
PRE (Protective Reservation Equipment) 3-7
CANT (Cancel To) 3-8

CANF (Cancel From) 3-8
SKIP (Skip) 3-8
ITB (Incoming Trunk Busy) 3-9
International Trunk Override (ITO) 3-9
STR (Selective Trunk Reservation) 3-10
FRR (Flexible Reroute) 3-11
TASI (Time Assignment Speech Interpolation) 3-12
CBK (Code Blocking) 3-14
PRP (Preroute Peg) 3-16
HTRF (Hard-To-Reach Flag) 3-17
RADR (Receiver Attachment Delay Recorder) 3-17
Reroute Control (RteCtrl) 3-18
RRTE (Reroute) 3-18
International Code Control (IntCCtrl) 3-18
HTRP (Hard-to-Reach Peg) 3-18
Data schema table RADR 3-18
OM group RADR 3-19
RADR display 3-19
DTSR deactivation 3-19
DTSR (Dial Tone Speed Recording) 3-20
Priority of NWM Controls 3-20
General 3-20
Group control priority 3-20
Auto control priority 3-20
Code control priority 3-21
Route control priority 3-21

4 Controls associated with Network Management 4-1

General 4-1
MASSCALL (Mass Calling) 4-1
PREPEG (Preplanned Pegging) 4-2
REROUT (Rerouting) 4-2
LLC (Line Load Control) 4-2
TNP (Toll Network Protection) 4-2
ESP (Essential Service Protection) 4-3
ESP in XPMs 4-3
Quantity of essential lines (ELN) 4-4
Remote Make Busy By Scan Point Control 4-5
CCISTNWM (CCIS Trunk Network Management) 4-7
SDOC (Selective Dynamic Overload Control) 4-9
INWATS OSO (Originating Screen Office) NWM 4-10
DCR (Dynamically Controlled Routing) 4-10
DCR routes vs FHR routes 4-11
NP communication 4-12
DCR mode status 4-12
DCR and other NWM controls 4-13
DCR data schema tables 4-13
Other DCR data schema tables 4-14
Route lists 4-15
DCR extension blocks 4-15

DCR operational measurements 4-16
DCR logs 4-16
DCR network scenario 4-16
Adding offices to the DCR network 4-19
DCR–related nonmenu commands 4-20
EA (Equal Access) NWM 4-20

5 Monitoring CPU realtime usage 5-1
Description of capabilities 5-1
Reporting CPStatus measurements 5-1
Setting up to use the CPStatus tool 5-1
Operational Measurements (OM) 5-1
Datafill 5-2
Data schema datafill responses 5-2
Operation of the CPStatus tool 5-3
Realtime CPU usage 5-3
Types of measurements 5-4
Call attempts per hour 5-5
Call processing occupancy 5-5
CPU utilization by non–call processing functions 5-5
Remaining CPU realtime 5-5
Overload thresholds 5-6
Engineering threshold 5-6
Display of CPStatus tool measurements 5-6
CPStatus MAP display 5-6

6 Network Management MAP levels 6-1
MAP level hierarchy 6-1
NWM subsystem MAP displays 6-1
Status display menus 6-6
NWM MAP level status displays 6-7
Access to the NWM MAP level 6-9
Usage Notes 6-9
NWM menu commands 6-9
AUTOCTRL command 6-10
CODECTRL command 6-10
DCRMOCH command 6-10
DCRSEL command 6-12
DISPLAY command 6-12
GRPCTRL command 6-13
INTCCTRL command 6-14
PAGE command 6-14
QUIT command 6-14
RTECTRL command 6-14

7 Automatic Control (AutoCtrl) commands 7-1
Access to the AutoCtrl MAP level 7-1
AutoCtrl Commands 7-2
APPLY command 7-2
DISABLE command 7-3

ENABLE command 7-5
LIST command 7-6
PAGE command 7-10
REMOVE command 7-10

8 Group Control (GrpCtrl) commands 8-1
Access to the GrpCtrl MAP level 8-1
GrpCtrl commands 8-2
APPLY command 8-2
LIST command 8-8
PAGE command 8-12
REMOVE command 8-12
SELECT command 8-13

9 Code Control (CodeCtrl) commands 9-1
CodeCtrl commands 9-2
Operation of ACODE Controls 9-2
APPLY command 9-3
LIST command 9-9
PAGE command 9-12
REMOVE command 9-12

10 Route control (RteCtrl) commands 10-1
RteCtrl commands 10-1
APPLY command 10-2
LIST command 10-3
PAGE command 10-6
REMOVE command 10-6

11 International code control (IntCCtrl) commands 11-1
IntCCtrl commands 11-1
APPLY command 11-2
LIST command 11-4
PAGE command 11-6
REMOVE command 11-6

12 Network management CI commands 12-1
General 12-1
MASSCALL command 12-1
Syntax 12-2
Responses 12-3
Usage Notes 12-3
Example 1 12-3
Example 2 12-4
PREPEG command 12-5
Syntax 12-5
Responses 12-6
Usage Notes 12-6
Example 12-6

REROUT command 12-7
Syntax 12-7
Responses 12-7
Usage Note 12-7
Example 12-7

13 Line Load Control (LLC) command 13-1
Responses 13-2

14 Toll Network Protection (TNP) command 14-1
Syntax 14-1
Responses 14-2

15 Essential Service Protection (ESP) command 15-1
Syntax 15-1
Responses 15-2
Example 15-2

Appendix A Network management commands A-1

Appendix B Network management data schema B-1

List of terms C-1

About this document

When to use this document

How to check the version and issue of this document

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

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

The last two digits indicate the issue. The issue number increases each time the document is revised and rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297–8991–001.

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 and how documentation for your product is organized, check the release information in *Product Documentation Directory*, 297–8991–001.

References in this document

The following documents are referred to in this document:

- 297–1001-122, *Alarm System description*
- 297–1001–129, *Input/Output System Reference Manual*
- 297–1001–300, *Basic Administration Procedures*
- 297–1001–318, *Service Problem Analysis Administration Guide*
- 297–1001–513, *Input/Output Devices Man–Machine Interface Description*

- 297-1001–520, *Maintenance System Man–Machine Interface Description*
- 297–1001–590, *Input/Output Devices Maintenance Guide*
- 297–1001–593, *External Devices Maintenance Guide*
- 297–1001–595, *Trunks Maintenance Guide*
- 297–5151–010, *Common Channel Signaling 7 (CCS7) Product Guide*
- 297–8xxx–350, *Translations Guide*
- 297–8xxx–351, *Customer Data Schema Reference Manual*
- 297–8xxx–814, *Operational Measurements Reference Manual*
- 297–8xxx–820, *Log Report Reference Manual*
- 297–8xxx–855, *Office Parameters Reference Manual*
- 297–8991–001, *Product Documentation Directory*
- 297–8991–002, *Cancellation Cross Reference Directory*
- 297–8991–024, *Commands Reference Manual*
- PLN–5001–001, *SuperNode Technical Specification*
- PLN–8991–004, *Provisioning Guide*

What precautionary messages mean

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

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

Examples of the precautionary messages follow.

ATTENTION
Information needed to perform a task

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

DANGER
Possibility of personal injury

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

WARNING
Possibility of equipment damage

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

CAUTION
Possibility of service interruption or degradation

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

How commands, parameters, and responses are represented

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

Input prompt (>)

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

```
>BSY
```

Commands and fixed parameters

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

```
>BSY CTRL
```

Variables

Variables are shown in lowercase letters:

```
>BSY CTRL ctrl_no
```

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

Responses

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

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

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

1 Manually busy the CTRL on the inactive plane by typing

>BSY CTRL ctrl_no

and pressing the Enter key.

where

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

Example of a MAP response:

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

1 Introduction

General

Network Management (NWM) is the monitoring and control of telephone switching networks to ensure the maximum flow of traffic under adverse or overload conditions. Adverse conditions include periods of equipment failure, damage, or maintenance. Overload conditions occur when the demand for service from the switching office exceeds the ability of its trunk groups or common control equipment, or both, to provide satisfactory service.

In response to failures or overloads in the network, NWM controls can be used to temporarily change the processing or routing of calls. NWM controls can be applied at any time, either manually by network management personnel or automatically by switch software. With NWM controls, traffic in the network can be controlled in realtime (automatic controls) or in near realtime (manual controls).

NWM features provide commands to alter the flow of traffic through a switch or its connecting offices. The sequences of commands and responses that are available for network management are referred to as the command interface (CI). This NTP covers NWM features and their CI.

The NWM information in this NTP applies to the DMS-100, DMS-200, and DMS-300 switches. The content of this NTP is organized as follows:

- descriptions of the features in the NWM basic and enhanced feature packages, including the priority of feature controls
- descriptions of features associated with NWM, but not part of NWM software
- descriptions of the CI commands for the following:
  - — activation and monitoring of NWM features in the basic and enhanced feature packages.
  - — activation and monitoring of features associated with NWM

Network management controls can be classified into the following categories:

- *protective controls*, which block or cancel telephone traffic attempting to enter the network or switch, or prevent traffic from being routed on specific trunk groups
- *expansive controls*, which reroute traffic to less loaded offices. Expansive controls change the availability of routes a call can take, increasing the probability that a call reaches its destination.

Generally, HPC (High Probability of Completion) calls are exempt from protective controls and subject to expansive controls.

Network management controls can be divided into the following classes:

- *Automatic controls*, which detect internal overload conditions, alert connecting switches regarding the congestion, and respond to overload signals from other switches. Automatic controls can activate trunk group controls or route controls when predefined thresholds are reached.
- *Trunk group (TG) controls*, which do the following:
  - — limit the amount of traffic accepted from specific trunk groups
  - — limit the amount of traffic offered to specific trunk groups
  - — increase the number of available routes for a call
- *Code controls*, which restrict the number of calls made to a particular destination code
- *Route controls*, which modify internal route lists in the switch
- *Line load controls*, which prioritize the handling of line originations

Command format conventions

In this NTP, a uniform system of notation is used to illustrate system commands and responses. The convention shows the order in which command elements are entered, the punctuation, and the options. Where the conventions are not used, an explanation is given in the text.

Table 1-1 (Sheet 1 of 2)

Convention	Explanation
Uppercase characters or special characters	Represents constants, commands, or keywords that the system accepts as entered
Lowercase characters	Represents user- or system-defined parameters. Definitions are given for each parameter.

Table 1-1 (Sheet 2 of 2)

Convention	Explanation
Square brackets [ ]	Enclose optional parameters. A vertical list enclosed in square brackets means that any one of the listed parameters can be selected.
Bolded parameter	Represents a default parameter. If no parameter is entered, the system enters the default parameter.
Underscores connecting character strings	Indicates that the connected character strings are to be treated as a single item. Example: pm_type.
Lowercase n	Represents a number form 0 to 9
Lowercase a	Represents an alpha character from A to Z
Lower case h	Represents a hexadecimal number (0 to H)

References

References listed as prerequisites are essential for an understanding of this NTP. Those listed as informative contain detailed information concerning other items mentioned in this document, but are not essential. Individual references to NTPs are inserted at the appropriate places in the text.

Prerequisite references

The following table lists required references.

Table 1-2

Number	Title
PLN-5001-001	SuperNode Technical Specification

Informative references

The following table lists informative references.

Table 1-3 (Sheet 1 of 2)

Number	Title
297-1001-122	Alarm System Description
297-1001-129	Input/Output System Reference Manual
297-1001-300	Basic Administration Procedures
297-1001-318	Service Problem Analysis Administration Guide

Table 1-3 (Sheet 2 of 2)

Number	Title
297-1001-513	Input/Output Devices Man-Machine Interface Description
297-1001-520	Maintenance System Man-Machine Interface Description
297-1001-590	Input/Output Devices Maintenance Guide
297-1001-593	External Devices Maintenance Guide
297-1001-595	Trunks Maintenance Guide
297-5151-010	Common Channel Signaling 7 (CCS7) Product Guide
297-8xxx-350	Translations Guide
297-8xxx-351	Customer Data Schema Reference Manual
297-8xxx-814	Operational Measurements Reference Manual
297-8xxx-820	Log Report Reference Manual
297-8xxx-855	Office Parameters Reference Manual
297-8991-001	DMS-10 and DMS-100 Product Documentation Directory
297-8991-002	Cancellation Cross Reference Directory
297-8991-824	Commands Reference Manual
PLN-8991-104	Provisioning Guide

Note 1: Descriptions of network management data schema tables are found in the *Customer Data Schema Reference Manual*, 297-8xxx-351.

Note 2: Log messages (reports) are described in *Log Report Reference Manual*, 297-8xxx-820.

Note 3: Operational Measurement (OM) groups are described in *Operational Measurements Reference Manual*, 297-8xxx-814.

Note 4: External alarms are described in *Alarm System Description*, 297-1001-122 and *External Devices Maintenance Guide*, 297-1001-593.

In the preceeding table, 8xxx represents the product computing module load (PCL), for example, 8001 (LEC/LECB, U.S. Stand-alone DMS-100/200. For a list of PCL identifiers in NTP numbers, refer to Chapter 1 of *Product Documentation Directory,* 297-8991-001.

2 Network Management system description

General

In controlling and controlled (subtending) offices, traffic conditions are adjusted by automatic and manual network management (NWM) controls. The controls measure, monitor, and manipulate the flow of traffic. The controls are provided for the following:

- to prevent the spread of traffic overloads
- to use all available network circuits
- to give priority to the types of traffic with the highest probability of completion
- to give priority to a specific number of calls when all available circuits are in use.

The automatic and manual controls use the following:

- protective control, which blocks traffic from reaching the network
- expansive control, which reroutes traffic to other less loaded offices

Automatic controls are triggered by traffic loads reaching preset thresholds. Other controls are activated manually. All NWM controls are activated through a user interface.

Feature packages for NWM

The basic NWM feature packages are part of order code BAS00003 (BAS Generic). Not all NWM features are provided by this package. Some NWM features are optional.

Feature packages that are not included in the basic and enhanced NWM packages are described in Chapter 2.

NWM interfacing facilities

NWM interfacing facilities display the status of the trunk circuits and network performance. NWM facilities also allow activation of NWM controls. NWM interfaces include the following input/output devices (IOD):

- Maintenance and Administration Position (MAP)
- Teleprinters (TPR)
- status board lamp display.

Maintenance and Administration Position (MAP)

The MAP is the main interface to the DMS–100 System. By observing the displays of NWM data, the network manager can determine what action is required to clear or minimize abnormal conditions in the network. The MAP displays include NWM command menus and operational measurements (OM) (See Figure 2-1). The menu items and data displays of the NWM MAP levels are described in Chapter 2.

Note 1: The term "menu" in this document refers to "MAP level, menu, and status displays" unless otherwise specified. The term "level" refers to a value for a parameter unless otherwise specified.

Note 2: The term "display" refers to "status display" or "response to a command entry.

Note 3: For more information on the MAP, refer to *Maintenance System Man–Machine Interface Description*, 297–1001–520.

Teleprinters (TPR)

A teleprinter (TPR) provides NWM with scheduled hard–copy printouts of selected reports. The printer can be located remotely from the MAP. The principles of routing reports to output devices are described in *Iput/Output System Reference Manual*, 297–1001–129, and the scheduling of OM report printouts is described in *Basic Administration Procedures*, 297–1001–300.

Operational measurements (OM)

OMs can be displayed at the MAP by accessing the OM system at the CI level. Since NWM menus are readily available for immediate network control, the OM data may be accumulated in hardcopy form on a teleprinter. (See *Operational Measurements Reference Manual*, 297–8xxx–814)

OM reports that are relevant to NWM summarize measurements that are taken by the OM system at scheduled intervals. These reports are directly associated with the OM group names listed in Table 2-1.

Outputs for the OM groups are scheduled by the OM management tables for example, OMPRT and OMTAPE. OM register counts in any OM group can

be obtained by entering the CI command OMSHOW. For the description of the OM groups, refer to *Operational Measurements Reference Manual*, 297–8xxx–814. For the description of the OM system, refer to *Basic Administration Procedures*, 297–1001–300.

Table 2-1 Groups for OM reports (Sheet 1 of 2)

OM group	Description
ANN	Recorded Announcements
AVOFZ	AUTOVON
CBK	Code Block Group
CP	Call Processing
CP2	Call Processing
CPUSTAT	Central Processing Unit (CPU) Status
DCRDEST	Dynamically Controlled Routing (DCR) Destination Group
DCRLINK	DCR Link Group
DCRICTRK	DCR Incoming Trunk Group Base Group
DCRMISC	DCR Miscellaneous Group
DTSR	Dial Tone Speed Recording
ESP	Essential Service Protection
EXT	Extension Block
GCBK	Global Code Blocking
GPRP	Global Preroute Peg
ICBK	International Code Block Group
IHTRP	International Hard–To–reach Code Point Group
IPRP	International Pre–Route Point Group
HPCBASIC	High Probability of Completion Basic
MACHACT	Machine Activity
MACHONG	Machine Congestion Group
NWMFRRCT	NWM Flexible Reroute Counts Group

Table 2-1 Groups for OM reports (Sheet 2 of 2)

OM group	Description
NWMFRRTG	NWM Flexible Reoute Trunk Groups Group
NWMSILC	NWM Selective Incoming Load Control Group
NWMTGCNT	NWM Trunk Group Count Group
OFZ	Office Traffic Summary
OFZ2	Office Traffic Summary
PRP	Pre–Route Point Group
RADR	Receiver Attachment Delay Recorder
RCVR	Receiver Service Circuits
RRTE	Reroute Feature
SITE	Traffic and Dial Tone Speed Recording for Remote Sites
TRK	Trunk Groups OM Group

Status board lamp display

The status board lamp display is not a part of the DMS system. However, it provides the NWM system with a lamp display indicating the status of selected trunk groups. Data schema tables NWMCLLI, NWMSD, and NWMSDPT are used to assign the signal distribution (SD) points to trunk groups. A status board lamp illuminates if all trunks in the trunk group are busy. The lamp extinguishes when a trunk becomes available in that group.

Status board lamps are connected to SD points that are associated with the Common Language Location Identifier (CLLI) of the trunk groups. A maximum of 1792 SD points can be assigned to each trunk group. A maximum of 512 trunk groups can have a total of 7 SD points each. Therefore, a total of 3584 SD points is available (7x512 = 3584). If an SD type is assigned as trunk–group–busy (TGB) in table NWMSD, up to 32 CLLIs can be datafilled in table NWMSDPT. When all of the trunks that are assigned to all 32 CLLIs in table NWMSDPT are busy, the SD point is triggered, and therefore the status board lamp lights.

Note: All the CLLIs that are datafilled in table NWMSDPT must overflow all the CLLIs in table NWMSD.

Status board lamps can be assigned on a cluster basis. This approach identifies trunk groups that are busy in the cluster area according to the following:

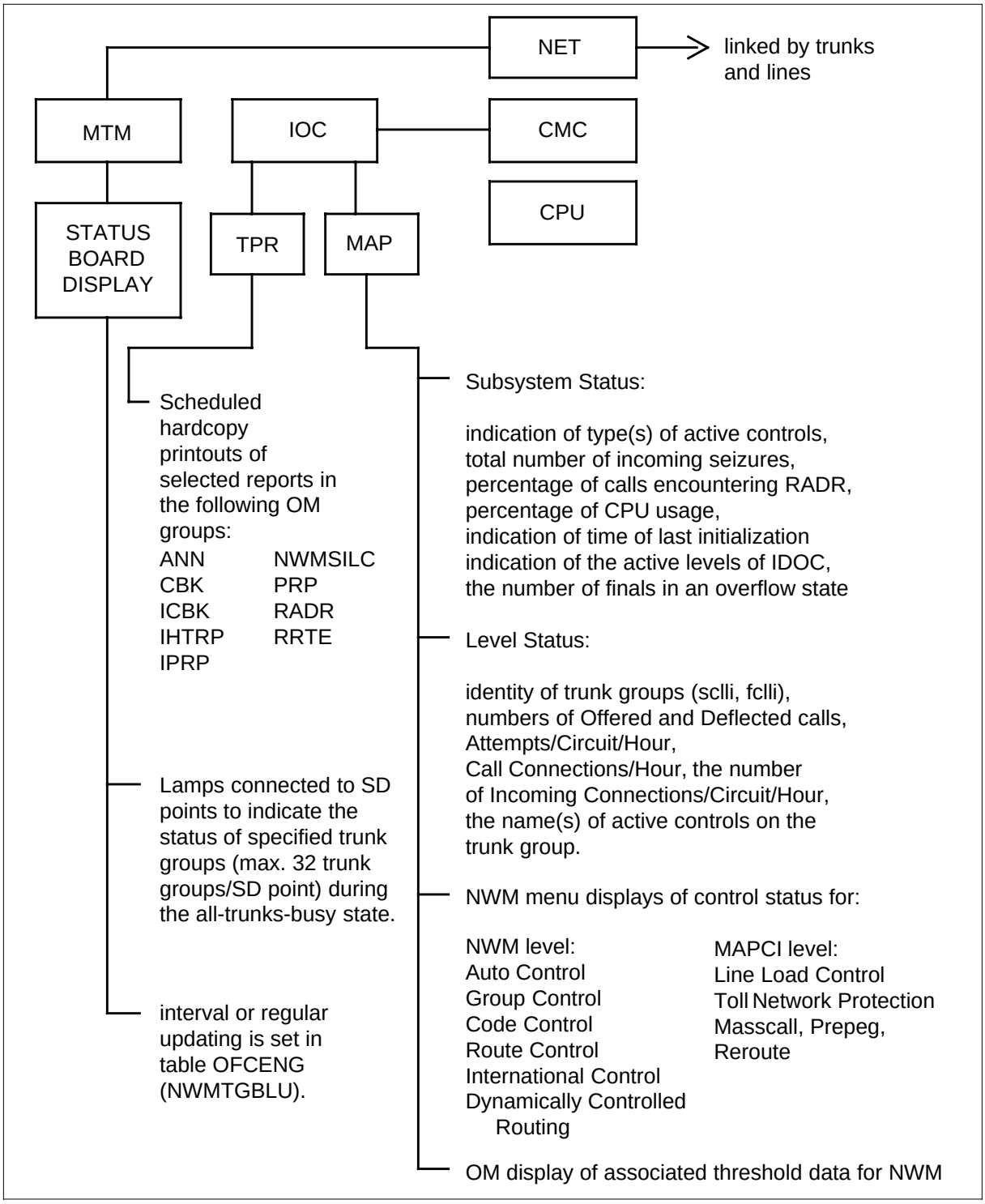
1. hierarchy
2. Numbering Plan Area (NPA) boundaries
3. operating company organizational boundaries.

The status board lamp display is updated periodically. The intervals can be changed by setting office parameter NWMTGBLU in table OFCENG. The interval is set by the operating company in increments of ten seconds with a default value of 2 minutes. For example, if NWMTGBLU is set to 12, then there are 12x10 = 120 seconds between updates.

The status board lamp display can be arranged to provide overload indicators for NWM surveillance. The following indicators have the same function as display headers of the NWM menu level displays of the MAP:

- Multifrequency (MF) receiver queue threshold–exceeded lamp
- Call Processing Unit (CPU) capacity threshold–exceeded lamp
- warm or cold restart (optional).

Figure 2-1 Summary functions of Network Management interfaces



3 Network Management features

General

The controls for network management (NWM) are applied and removed by commands at various NWM MAP levels. For more information on NWM MAP levels (menus), refer to Chapter 6. Each NWM control is associated with a number of features that are provisioned to meet office engineering requirements. Although this document describes NWM features, all NWM features are not necessarily present in a given office. Table 3-1 lists the available NWM features in order code BAS00003 (BAS Generic). The features are described individually after the table.

Table 3-1 NWM features and controls (Sheet 1 of 2)

Abbreviation	Feature name	Associated MAP level
IDOC	Internal Dynamic Overload Controls	Automatic Control (AutoCtrl)
PPLN	Preplanned Control	
AOCR	Automatic Out-of-Chain Reroute	
SDOC	Selective Dynamic Overload Control	
SILC	Selective Incoming Load Control	
DRE	Directional Reservation Equipment	Group Control (GrpCtrl)
PRE	Protection Reservation Equipment	
CANT	Cancel To	
Note: Mass Calling, if present in the software, is applied when the CBK or HTRF parameters are entered at the CodeCtrl MAP level.		

Table 3-1 NWM features and controls (Sheet 2 of 2)

Abbreviation	Feature name	Associated MAP level
CANF	Cancel From	
SKIP	Skip Control	
ITB	Incoming Trunk Busy	
ITO	International Trunk Override	
STR	Selective Trunk Reservation	
FRR	Flexible reroute	
TASI	Time Assignment Speech Interpolation	
CBK	Code Blocking	Code Control (CodeCtrl)
PRP	Preroute Peg Count	
HTRF	Hard-to Reach Flag	
RADR	Receiver Attachment Delay Recorder	
RRTE	Reroute Control	Reroute Control (RteCtrl)
CBK	Code Blocking	International Code Control (IntCtrl)
PRP	Preroute Peg Count	
HTRP	Hard-to-Reach Peg Count	

Note: Mass Calling, if present in the software, is applied when the CBK or HTRF parameters are entered at the CodeCtrl MAP level.

The IDOC, PPLN, AOCR, and SDOC controls are applied automatically, based on specified thresholds. These controls can also be applied manually from the CI MAP level. For IDOC, PPLN, and AOCR, manually applied controls override automatically applied controls.

Automatic Control (AutoCtrl)

The following paragraphs describe the automatic controls.

Dynamic Overload Control

Dynamic Overload Control (DOC) automatically transmits signals to connecting offices when switching congestion is detected. DOC signals are sent as encoded Common Channel Interoffice Signaling Number 6 (CCIS6) messages (See CCISTNWM (CCIS Trunk NWM) in Chapter 4) or as ON/OFF signals. Encoded DOC messages are used when CCIS6 network connectivity is available. ON/OFF DOC signals are associated with multi-frequency or dial-pulse signalling. Connecting offices respond to DOC signals by reducing the traffic sent to the congested switch by applying the appropriate level of trunk group controls.

The DOC components are as follows:

- Internal DOC (IDOC) generates a signal to alert connecting offices regarding an internally detected overload condition.
- Remote DOC or Preplanned Control (PPLN) activates trunk group controls in response to overload signals from connecting offices, to reduce the traffic sent to the connecting offices.

In this document, Remote DOC is called Preplanned Control. The NWM menu and display fields show PPln.

There are three levels of DOC signals that correspond to three thresholds for switch loading. These levels are as follows:

- Level 1 is triggered when the MF receiver queue length exceeds a preset threshold.
- Level 2 is triggered when central processing unit (CPU) occupancy exceeds a preset threshold.
- Level 3 is triggered by a dead system (usually a restart).

The threshold values are datafilled in the data schema tables that correspond to each control.

Depending on the specific trunk group controls used by PPLN, an HPC (high probability of completion) call is either subject to or exempt from PPLN. For more details, refer to the descriptions of trunk group controls in this chapter (CANT, CANF, SKIP, DRE, PRE, and STR).

IDOC (Internal Dynamic Overload Control)

IDOC is an automatic control that reacts to traffic overload conditions. Traffic conditions are scanned by IDOC once a minute. When the IDOC scan in the controlling DMS office detects internal congestion, the office transmits a continuous control signal to activate controls in connecting offices. IDOC signals are transmitted or removed automatically by the DMS-100 as it detects overload conditions occurring above and below the various IDOC thresholds.

To prevent this control from automatically affecting transmission, each IDOC control can be manually disabled. However, IDOC controls are normally enabled.

Note: If filtering is defined in data schema table NWMIDOC, the reaction time is delayed.

Levels 1, 2, and 3 may be separately applied or deactivated, either automatically or manually. The decision to apply or remove IDOC levels 1, 2, or 3 is made automatically once every minute. All NWM displays show the updates (described in Table 6-1).

For CCIS6 trunks, IDOC levels 1, 2, and 3 correspond to Machine Congestion (MC) levels 1, 2, and 3.

Thresholds for activating and deactivating IDOC levels 1 and 2 are defined in table NWMIDOC. IDOC level 3 has no threshold (and notable entry) since it is activated when one of the following occurs:

- the system requires a restart
- the CC stops sending sanity messages to independent peripheral modules (PM).

The durations of the IDOC thresholds are set by the entries in tables NWMIDOC, NWMSD, and NWMSDPT. The SD points that transmit IDOC signals are assigned by entries in tables NWMSD and NWMSDPT. Table NWMSD specifies SD groups and table NWMSDPT specifies SD points for each SD group. Each SD group can contain up to seven SD points (0 to 6). Tables NWMSD and NWMSDPT must be datafilled before table NWMIDOC.

Some SD points can be wired to the status board lamp display assembly, which then provides indications of the length of the MF receiver waiting queue or the percentage of CPU occupancy, or both.

Level 1 is automatically activated when the number of incoming MF calls waiting for a receiver exceeds the on-threshold (ONTHLD) value for ONFILTER time, as assigned in table NWMIDOC. This level is deactivated if the number waiting for a receiver falls below the value assigned for off-threshold (OFFTHLD, which is less than ONTHLD) for OFFILTER time.

Level 2 can be applied independently of IDOC level 1 and is automatically activated if the percentage of time devoted to call processing by the CPU is greater than ONTHLD for ONFILTER time (see the header CPU in Figure 6-2) This level is deactivated when the call-processing usage is less than OFFTHLD for OFFILTER time.

Level 3 is activated automatically if the DMS office loses call processing ability (for example, during a restart). Prior to a scheduled restart, Level 3 can be applied manually so that traffic from connecting offices can be diverted. This reduces the number of calls affected by the restart. Once the restart initialization is complete, level 3 is deactivated automatically by SDOC3 signals. Automatic transmission of IDOC 3 signals is controlled by office parameter SDOC3_ENABLE in table OFCOPT. To manually activate IDOC levels, Refer to „Autocontrol commands in Chapter 7.

Note: SDOC3 should not be confused with the parameter SDOC of the AutoCtrl menu (See „Selective Dynamic Overload Control in Chapter 4).

SDOC3CUTOFF Transmission of IDOC 3 signals is coupled with the dead system alarm (DSA) hardware. To prevent erroneous transmission of IDOC 3 during alarm testing, the SD point called SDOC3CUTOFF causes the link between IDOC 3 and the DSA to be broken. SDOC3CUTOFF is controlled automatically by the alarm test commands. Warning and advisory messages are displayed at the external (EXT) alarms submenu at the MTC MAP level, so that SDOC3_ENABLE is not sent during a DSA simulation. If the enhanced DSA detects no call processing by the CPU, the EXT alarm display shows NCPALARM, an audible alarm occurs, and SDOC3 signaling is sent. See *Alarm System Description*, 297-1001-122 for more information on the DSA, including commands TSTDSALM and SETSC.

The provisioning of the SDOC3CUTOFF SD point requires one of the following signal distribution cards:

- NT2X57AA
- NT2X57AB
- NT3X82AA
- NT3X82AB

The SD point is defined in tables ALMSDGRP and ALMSD. Enhanced DSA is defined in table OFCENG by office parameter ENHANCED_DEAD_SYSTEM_ALARM.

Machine Congestion Enhancements makes it possible to trigger Machine Congestion (MC) Level 1 and Level 2 conditions through either Multi-Frequency (MF) Queue Length or Central Processing Unit (CPU) Occupancy thresholds defined in table NWMIDOC. MC1 and MC2 conditions can be triggered by either MF Receiver Queue length or by CPU Occupancy.

SDOC (Selective Dynamic Overload Control)

Selective Dynamic Overload Control (SDOC) applies to CCIS6 trunk groups only. For all practical purposes, SDOC is identical to PPLN (Preplanned Control).

PPLN (Preplanned Control)

PPLN is an automatic control that applies remote DOC in response to a signal from a connecting office. PPLN consists of preplanned controls that are activated by scan points or by commands. A maximum of 256 Preplans, each containing a maximum of 32 trunk group controls can be activated. A control can be defined separately for each group. Preplans associated with scan points can be deactivated by a command at any time.

The association between preplans and trunk group controls is assigned in tables NWMPPLN and PREPLANS. To set up preplans to be activated by scan points, tables NWMSC and NWMSCPT must be datafilled. To activate PPLN manually, refer to "AutoCtrl Commands" in Chapter 7.

AOCR (Automatic Out-of-Chain Reroute)

AOCR is an automatic control that provides extended routing for calls that overflow their in-chain final trunk groups. Extended routing is possible only if idle capacity exists in the designated out-of-chain route. At five minute intervals, AOCR checks if idle capacity exists in the potential out-of-chain (alternate) route. As the last in-chain trunk groups are occupied, AOCR (when active) uses a specified alternate route (AR). AOCR automatically specifies a reroute if the overflow rate on a given trunk group exceeds a threshold, while the overflow rate on the second group does not exceed a second threshold. The thresholds are assigned in table NWMAOCR.

A maximum of 64 AOCR can be assigned in table NWMAOCR. Table NWMAOCR and subtable NWMRROUT of table REROUTE must be datafilled prior to the activation of the controls by NWM. To activate AOCR, refer to the description of AutoCtrl MAP level commands in Chapter 7.

Note: If any other type of NWM control is active on the trunk group, AOCR is not applied. If any other automatic control is already active, it is overridden by AOCR.

Automatic Congestion Control (ACC)

ACC is an enhanced version of DOC. ACC adds an Automatic Congestion Level (ACL) parameter to the ISUP portion of the Common Channel Signaling Number 7 (CCS7) messages sent by DMS switches. During periods of congestion, the congested switch adds the ACL parameter indicating the level of congestion with every release (REL) message it sends to connected switches. Connected switches that receive notification of congestion implement NWM controls to regulate traffic to the congested switch.

The initiation of NWM controls by ACC is handled exactly the same way as for DOC. When a switch receives notification that a connected switch is congested, PPLN controls are applied. Depending on the particular trunk group control that is activated by PPLN, an HPC call is either subject to or exempt from PPLN. For more details, refer to the descriptions of trunk group controls in this chapter (CANT, CANF, Skip, DRE, PRE, and STR).

Selective Incoming Load Control (SILC)

SILC is used to reduce incoming traffic on MF trunks from offices that are not equipped to respond to DOC signals.

HPC call recognition is not supported on incoming MF trunks.

Group Control (GrpCtrl)

The following paragraphs describe group controls.

DRE (Directional Reservation Equipment)

DRE is a group control that gives priority to incoming traffic on a selected incoming two-way trunk group by reserving a number of idle trunks in the group. When the number of idle trunks in the selected trunk group is equal to or less than the specified value, alternate-routed (AR) and direct-routed (DR) originating traffic is skip-routed. Skip-routing is also referred to as route-advance.

DRE is applied in levels to regulate the amount of control. These levels are directly associated with the number of trunks in a trunk group to be reserved. The levels range from 1 to 63.

Once DRE is activated and the level threshold is reached, all traffic (direct- and alternate-routed) offered to the two-way group is skip-routed. Originating traffic that would be carried on the trunks is skip-routed until the number of idle trunks in the group is greater than the selected level. To activate DRE, refer to the description of GrpCtrl MAP level commands in Chapter 8.

DRE is not applied to HPC-marked calls.

PRE (Protective Reservation Equipment)

PRE is a group control that functions similar to DRE by skip-routing traffic, but acts only on AR traffic offered to a selected two-way or outgoing one-way trunk group. This control prevents AR traffic from using a trunk group when the number of idle trunks in that group falls below a predetermined level. DR traffic is allowed full access.

PRE reduces AR traffic during periods of heavy usage on a trunk group. To activate PRE, specify a level from 1 to 63. When PRE is activated and the number of idle trunks in the group reaches or falls below this level, all AR

traffic on the trunk group is skip-routed. To activate PRE, refer to the description of GrpCtrl MAP level commands in Chapter 8.

PRE is not applied to HPC-marked calls.

CANT (Cancel To)

CANT is a group control that limits traffic attempts offered to one-way outgoing or two-way trunk groups. Activation of CANT blocks a percentage of the traffic offered to a particular trunk group, and routes the traffic to one of the following treatments:

- No Circuit Announcement (NCA)
- Emergency Announcement 1 (EA1)
- Emergency Announcement 2 (EA2).

CANT can be used to control either a percentage of AR traffic exclusively or all AR traffic and a percentage of DR traffic. The level of control can be manually set in the range of 1 to 100 percent. To activate CANT, refer to the description of GrpCtrl MAP level commands in Chapter 8.

CANT is not applied to HPC-marked calls.

CANF (Cancel From)

CANF is a group control that prevents overflow traffic from selected one-way outgoing or two-way trunk groups from continuing to the next group within the route list. CANF prevents the overflow traffic of a trunk group from continuing to its next group within the route list of trunks. CANF is similar to CANT in that it blocks a preset level from both direct- and alternate-routed (DR + AR = DAR) traffic. The blocked calls are routed to treatments NCA, EA1, or EA2. The level of control can be manually set in the range of 1 to 100 percent. To activate CANF, refer to the description of GrpCtrl MAP level commands in Chapter 8.

If the level of control is set to 100 percent, CANF is applied to HPC-marked calls. If the level of control is set to less than 100 percent, CANF is not applied to HPC-marked calls.

CANF is often used in combination with reroute controls to prevent a looping condition in which the same trunk groups are repeatedly attempted.

SKIP (Skip)

SKIP is a group control that limits a percentage of DR or AR traffic that is offered to selected outgoing trunk group(s). SKIP skip-routes the traffic of a specified group to the next trunk group in the routing chain. The level of control varies from 1 to 100 percent. If all the trunk groups in the routing chain

are exhausted, the call is sent to treatment. To activate SKIP, refer to the description of GrpCtrl MAP level commands in Chapter 8.

If the level of control is set to 100 percent, SKIP is applied to HPC-marked calls. If the level of control is set to less than 100 percent, SKIP is not applied to HPC-marked calls.

ITB (Incoming Trunk Busy)

ITB is a group control that restricts incoming attempts by selectively removing from service (making busy) a percentage of incoming trunks that have the remote-make-busy capability. This control can be applied to any trunk group, but is restricted to those incoming or two-way trunk groups that are equipped for remote-make-busy. Trunk groups are defined for remote-make-busy in field REMBSY of table TRKSGRP.

> ***Note:*** ITB does not record the number of trunks set NWMBsy by the Remote Make Busy feature (see Remote Make Busy by Scan Point Control in Chapter 4).

The level of control can be manually set in the range of 1 to 100 percent. This percentage applies to the number of working trunks in the incoming trunk group and excludes the offline trunks. The NWM MAP display shows the level of ITB control under the header ITB (See Figure 6-2)

NWM may query an incoming trunk group if the group is listed in table CLLIMTCE. The display indicates the following:

- number of trunks in the group
- numbers of maintenance-busy and NWM-busy (NWMBsy) trunks
- percentage level setting and the calculated number of trunks that have been set to NWMBsy.

The number of incoming trunks in the NWMBsy state is periodically adjusted to compensate for trunks being returned to or removed from service. This keeps the percentage setting constant. To change the percentage level of ITB, refer to the description of GrpCtrl MAP level commands in Chapter 8.

International Trunk Override (ITO)

ITO is a group control that, when applied to a previously selected trunk group, allows all calls originating from the trunk group to be unaffected by restrictive NWM controls (code controls and group controls applied by the operator to the dialled digits or the outgoing trunk group). For more information, refer to Chapter 8.

ITO is available in DMS-300 loads only.

The following NWM group controls are overridden if ITO is applied:

- DRE
- PRE
- CANT
- CANF
- SKIP
- STR

The International code control that is overridden by ITO is CBK.

STR (Selective Trunk Reservation)

STR is a group control for trunks that is an extension of DRE and PRE to include hard-to-reach (HTR) codes (for example, a phone number used for a phone-in radio quiz show). STR cannot be activated on the switch unless office parameter NWM_STR_CNTL in table OFCOPT is set to Y.

STR monitors an outgoing trunk group and controls the number of idle trunks in the group by blocking traffic. The following types of traffic are controlled by STR:

- DR
- AR
- HTR DR
- HTR AR

Two thresholds are used to activate and deactivate STR control on an outgoing trunk group. These thresholds, Level 1 and Level 2, define idle trunk levels for a trunk group. When the number of idle trunks in the controlled trunk group drops to somewhere between the Level 1 and Level 2 thresholds, a preset percentage of outgoing traffic is blocked. This is called Level 1 control. If the number of idle trunks in the cotrolled trunk group drops below the Level 2 threshold, a percentage of traffic associated with the Level 2 threshold is blocked. (See Table 3-2).

The types and amounts of traffic controlled by STR Level 1 and Level 2 controls are summarized in Table 3-2.

Table 3-2 STR controls

	Direct-routed traffic		Alternate-routed traffic	
Level	**non-HTR**	**HTR**	**non-HTR**	**HTR**
1	not applicable	Y	not applicable	Z
2	X	75%	100%	100%
Note: X, Y, and Z represent manually applied blockage percentages				

Threshold Levels 1 and 2 specify the number of idle (unoccupied) trunks below which blocking is triggered. Level 1 must be equal to or greater than Level 2. The range of values is 0 to 63 trunks. Levels 1 and 2 and the percentage of blocking are activated by the APPLY command at the GrpCtrl MAP level (See Chapter 9).

STR is applied from the GrpCtrl MAP level, or by the CI command MASSCALL. See GrpCtrl commands in Chapter 8 and MASSCALL commands in Chapter 12.

STR is not applied to HPC-marked calls.

FRR (Flexible Reroute)

Flexible Reroute enhances NWM controls by making it possible to dynamically reroute telephone traffic when necessary. Prior to this feature, it was necessary to change datafill before reroutes could be made. FRR makes it possible for the network manager to reroute traffic without modifying datafill. As a result, traffic control can be activated quickly and when needed; FRR allows network managers to respond immediately and effectively to traffic overload and congestion within the network. To activate FRR, refer to the description of GrpCtrl MAP level commands in Chapter 8.

FRR is an expansive trunk group control. An FRR control involves the following trunk groups:

- The first trunk group, the in-chain route, is the trunk group FRR is applied to (also referred to as the „controlled trunk group).
- Calls that cannot be carried over the controlled trunk group are offered to the second trunk group, the VIA route. The VIA route must always be a standard route (standard digit manipulation).

When a trunk group for a call is selected from the standard pretranslator (table STDPR) and an FRR control is applied to that trunk group, the following restrictions apply:

- The HTR code control does affect the call when the HTR code control is applied against the calls area code, non-area code, or country code digits.
- If the call is rerouted across an NPA boundry, the NPA is not prefixed onto the outgoing called party number.

The Flexible Network Management Reroutes feature (59011119) enhances FRR controls by using an office route table (OFRT, OFR2, OFR3, OFR4) to provide an alternate routing scheme, so that all selectors are supported (selectors N, ST, T etc.). Instead of specifying trunk groups as the VIA routes in NWM commands, an office route table and a route reference are identified as a trunk groups VIA route.

For DMS-300 loads, if feature package NTXU26AA is inluded, Other Licensed Operator (OLO) parameter is included in the group control (GrpCtrl MAP level) parameters for the FRR control.

TASI (Time Assignment Speech Interpolation)

TASI is a group control that is used by the DMS-300 Gateway switch. (DMS-300 office CCIS6 or CCITT6 do not use TASI.) TASI sets up more calls than the physical number of wires would otherwise allow. TASI multiplexes analog voice channels on the following trunk types:

- TASI-only trunks, which carry traffic only when the TASI system is in service
- TASI-and-through trunks, which may carry traffic whether the TASI system is in or out of service.

TASI blocks the initiation of calls on TASI trunks without interfering with calls in progress. TASI is automatically active (cannot be applied manually), but can be listed or removed manually from the GrpCtrl MAP level (See Chapter 8).

TASI equipment interfaces with the DMS-300 through a control unit called the Dynamic Load Control (DLC) (see Figure 3-1). Each DLC can have up to 16 TASI-only and up to 16 TASI-and-through trunk groups. Up to 60 DLC can be interfaced. The identification number of each DLC unit is listed in table TASIB.

Each DLC automatically transmits three different signals indicating that controls are required by the DMS-300 to limit, control, or restrict the new traffic originating on one or both of the two trunk group types.

The three control signals are transmitted to the Central Control (CC) through a TASI terminal under the following conditions:

- incoming traffic exceeds a preset threshold in the TASI system
- the TASI system is due to be taken out of service for maintenance
- a TASI system warm or cold restart occurs.

Setting the state of the TASI terminals is done by the field STATE in table TASIB. Incoming and outgoing terminals are associated with each DLC such that TASI can be activated only on trunks that are set to an idle state in table TASIB. The states of both terminals are simultaneously updated, and are always in a matched state.

The locations of scan and SD points are also assigned in table TASIB. Scan and SD points are used to associate the following trunk states:

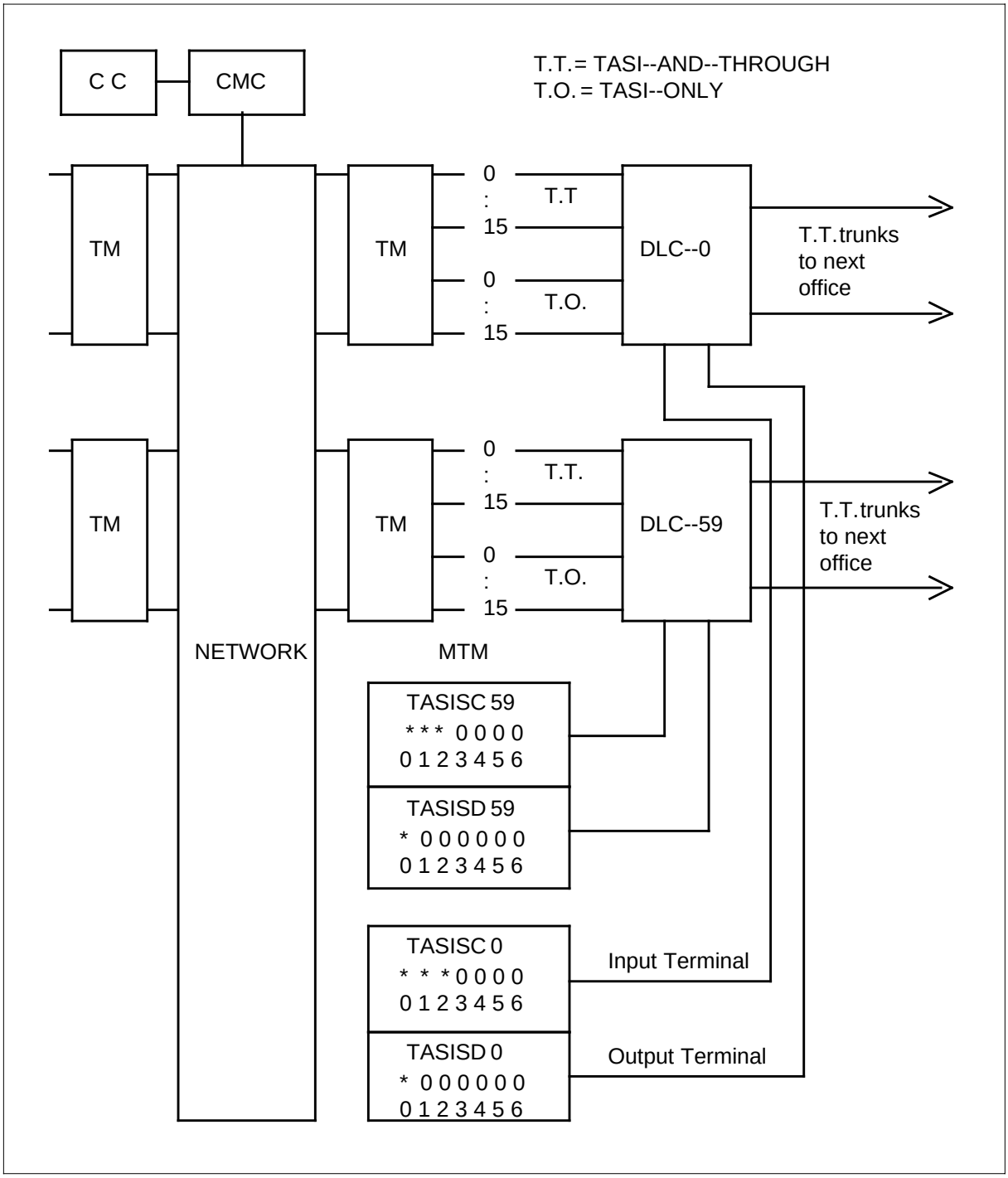
- scan point 0 for Inhibit
- scan point 1 for Maintenance Release
- scan point 2 for TASI Out
- SD point 0 for TASI-only Clear.

> ***Note:*** If the circuitry for the TASI system is distributed through as many maintenance trunk modules (MTM) as possible, maximum use of TASI is ensured at all times. That is, each set of scan and SD circuits should be on separate MTM.

The scan and SD terminals are associated with the CLLI TASISC and TASISD respectively. Both of these must be listed in table CLLIMTCE. The terminal states are changed through the TTP MAP level (particularly the TTP commands POST, BSY, and RTS). The effect of these commands on TASI trunk circuits is the same as on other DMS-300 trunk circuits.

The TASI time interval determines how often the TSI CLEAR signal is sent to the DLC unit and how often it is reset. The interval is set by office parameter TASINTVL in table OFCVAR. The range is 1 to 60 minutes, with a default value of 3 minutes.

Figure 3-1 Block diagram of DLC interface to DMS-300



CBK (Code Blocking)

CBK is a code control that limits a specified level of traffic from entering a network, based on the destination code. CBK is defined as either percentage of

blocked calls, or gap, which is the time interval between completed calls. The specified percentage of blocked calls ranges from 1 to 100. The blocked traffic is routed to treatment EA1, EA2, or NCA.

The system generates the NWM603 log when the CBK code control with call gapping is applied or removed.

CBK is not applied to HPC-marked calls.

CBK does not function in European loads.

CBK can be applied to any valid directory number (DN) with 1 to 18 digits. The following are examples of code types usually blocked:

- three digit codes:
  - XXX Country Code (CCODE)
  - NPA Area Code (ACODE)
  - NXX Non-Area Code (NAC)
- five digit codes:
  - 10XXX Prefix Code (PFX)
- six digit codes:
  - NPA + NXX (= ACODE + NAC)
- seven digit codes:
  - NXX+ XXXX (subscriber number)
- ten digit codes:
  - NPA + NXX + XXXX (ACODE + subscriber number)

The codes are chosen based the source (area) of call congestion.

CCODE digits range from 1 to 4 and are entered in table CCTR (or table CCTRNSL for DMS-300). When changing or removing a tuple in table CCTR, the CCODE controls that are active on the switch must first be deactivated. A cold restart removes code controls from CCODE.

CBK that is applied to any destination code that is based on a serving number plan area (SNPA) or prefix code. The capability to block a destination code from more than one SNPA is provided. During a given time period, a maximum of 256 codes of any combination of code types (CCODE, ACODE, NAC, or PFX) and digits can be blocked. Offices containing Engineering and

Administrative Data Acquisition System (EADAS) allow a maximum of 64 codes to be blocked.

Note: If the PRP (Preroute Peg Count) control is activated at the same time as CBK, the maximum allowable CBK controls is 256 or 64 minus the number of activated PRP controls.

CBK does not function when routed directly through table STDPRTCT using selector T.

The Serving Translation Scheme (STS) is a three-digit code, used for translations purposes, which is a key into table HNPACONT when the SNPA field is set to N. SNPA is a three-digit code, used as an area code, which is a key into table SNPANAME. The ranges of values are as follows:

- SNPA: 100 to 999
- STS: 000 to 999.

Since the STS range of values includes the SNPA range, the following NWM display information is shown as SNPA/STS:

- data display headers
- data display field responses
- command parameters

SNPA and STS are datafilled in table HNPACONT. SNPA/STS is entered in table HNPA in sets of 16. When another SNPA or STS is required, the next set of 16 is available, and only those sets use up memory data store. The first 16 entries in table HNPACONT are valid SNPA. Only these values can be used in tables LENLINES, IBNLINES, VIRTGRPS, TRKGRP, DN, and WRDN. An STS is not a valid SNPA.

SNPA affects the information field of OM groups CBK and ICBK.

CBK is activated from the CodeCtrl or IntCCtrl MAP levels, or by the CI command MASSCALL. To activate CBK, refer to the description of CodeCtrl commands in Chapter 9, IntCCtrl Commands in Chapter 11, or the MASSCALL command in Chapter 12.

PRP (Preroute Peg)

PRP is a code control for studying traffic levels routed to specified destination codes. PRP pegs all calls to destination codes CCODE, ACODE, NAC, or PFX, but does not block any. PRP is used to indicate when CBK controls should be activated. The maximum allowable number of PRP codes that can be activated is 256, except for offices containing EADAS. EADAS allows a maximum of 64 codes.

The system generates the NWM601 log when the PRP code control is applied or removed.

PRP does not function when routed directly through table STDPRTCT using selector T.

PRP does not function in European loads.

Activation of PRP affects OM groups PRP and IPRP.

PRP is activated by the CodeCtrl or IntCCtrl MAP level commands, or by the CI command PREPEG. To activate PRP, refer to the description of CodeCtrl commands in Chapter 9, IntCCtrl Commands in Chapter 11, or the PREPEG command in Chapter 12.

HTRF (Hard-To-Reach Flag)

HRTF is a code control that allows NWM to flag certain codes as hard-to-reach (HTR). HTRF works in conjunction with the STR control (See Table 3-2).

The system generates the NWM602 log when the HTRF code control is applied or removed.

The HTR codes are checked at the time that a trunk is selected and a percentage of traffic is blocked. An HTR code is a one- to twelve-digit destination code. These destination codes have the same format as those supported for CBK, except for greater than 12-digit destination codes. HTR destination codes also include the STS code. Refer to the description of CBK for a description of STS.

HTRF does not apply to DMS-300.

To activate HTRF, refer to the description of CodeCtrl MAP level commands in Chapter 9.

RADR (Receiver Attachment Delay Recorder)

The RADR feature (part of BASE0001, BASE)) is not directly associated with NWM MAP level controls. RADR tests switch congestion by generating test receiver requests in order to measure the following:

- number of calls attempting to attach to a specified receiver type
- time interval between the request and the actual connection of the receiver

Scanning for the attachments occurs every half-second, and the NWM status display is updated every minute. The RADR header is described in Table 6-1 in Chapter 6. The RADR display field is common to all NWM MAP displays (See Figure 6-2).

Reroute Control (RteCtrl)

The following paragraphs describe reroute controls.

RRTE (Reroute)

RRTE is the route control that allows a percentage of traffic to be rerouted from a designated route list to a different route list in the routing chain. This function is referred to as out-of-chain routing. The RRTE level setting ranges from 1 to 100 percent.

A maximum of 1024 reroute numbers can be entered in table REROUTE, ranging from 0 through 1023. Each reroute number can point to a maximum of 16 combinations of routes and control level settings (defined in subtable NWMRROUT). Only one of these combinations at a time can be active.

The initial datafill and subsequent changes that may be required for tables REROUTE and NWMRROUT are done by Data Modification Order (DMO).

NWM can use the Reroute Control command to temporarily override the reroute value set in subtable NWMRROUT. The Reroute control is applied or removed from the RteCtrl MAP level or reroute commands. To activate RRTE, refer to the description of RteCtrl MAP level commands in Chapter 10 or the REROUT command in Chapter 12.

International Code Control (IntCCtrl)

The following paragraphs describe international code controls.

HTRP (Hard-to-Reach Peg)

HTRP provides peg counts on suspect HTR destination codes. There is no blocking by HTRP. HTRP is used only at the International Code Control (IntCCtrl) MAP level. When an HTR code is dialed, peg counts on attempted calls, outpulsed digits, and completed calls oocur. HTRP pegs only calls to HTR destination codes CCODE, ACODE, NAC, or PFX.

The associated OM group is IHTRP. Peg counts can be displayed by the CI command OMSHOW, or the IntCCtrl MAP level command LIST. To activate HTRP, refer to the description of IntCCtrl MAP level commands in Chapter 11.

Data schema table RADR

The upper and lower thresholds for the rate at which the RADR feature tests the origination and the attachment are datafilled in table RADR. In the NWM MAP display, the RADR field shows the percentage of requests within the last minute that delay longer than the lower threshold.

Other receiver types are tested by RADR, but the RADR display for NWM is always for MF receivers (value RCVRMF). The receiver types are datafilled in

tables RECEIVER and RADR (field RADKEY). To display the RADR for other receivers, use the command OMSHOW RADR.

OM group RADR

OM group RADR maintains simultaneous but separate counts for each receiver type available to the operating company. RCVR OM are affected by receivers listed in table RECEIVER. Receivers other than RCVRMF in field RADKEY are tested simultaneously, but to display their respective RADR data, use the command OMSHOW for OM group RADR, or schedule reporting in the OM management tables. Standard threshold OM values usually entered in table RADR are 3 seconds (RADLDLYT) and 7 seconds (RADUDLYT). RADUDLYT should always be greater than RADLDLYT for non data values other than zero.

The RADR test program is disabled for a receiver type by either setting field RADCALLR to 0 (zero) or by deleting the tuple. A value other than 0 in RADCALLR activates RADR for all receivers listed in field RADKEY.

The time delay between RADR tests is set in field RADTESTC. Short delays can interfere with call processing, since RADR processes run at the same priority. The formula to calculate the rate of tests is 3600 seconds divided by the lower boundry of 3600 after it is divided by the value in field RADCALLR. For example, if the usual rates of 1800 and 900 for RADCALLR are not chosen, and RADCALLR is set at 1100, then

RADTESTC

= 3600 / (3600 / 1100)= 3600 / 3.27 (rounded to 3)= 1200 tests per hour.

Once field RADKEY is datafilled with at least one receiver type, OM group RADR pegs the following:

- actual number of test calls
- number of test requests that took longer than the lower delay threshold
- number of test requests that took longer than the higher delay threshold.

RADR display

When RADR for MF receivers is disabled, the NWM MAP level system status display continues to show the last calculated percentage before RADR was suspended. The menu does not update until either of the following occurs:

- field RADCALLR is changed to data other than zero
- the next dump of RADR OM from the active to the holding class.

DTSR deactivation

During system degradation, the Dial Tone Speed Recording (DTSR) feature is automatically deactivated if register RCVQOVFL of OM group RCVR is overflowed. To prevent deactivation, office parameter

DTSR_AUTO_DEACTIVATION_ENABLE in table OFCENG must be disabled. After fifteen minutes, when receivers of any kind become available, DTSR is reactivated. Logs DTSR100 and DTSR101 are generated whenever DTSR is deactivated or activated, respectively.

DTSR (Dial Tone Speed Recording)

Activating RADR for line receivers can affect OM groups DTSR and SITE and cause dial tone delay for the subscriber. The RADR and DTSR features both require receivers for testing. Therefore, when both are active simultaneously, they may interact by competing for the same receivers. For the descriptions of OM groups RADR, DTSR, and SITE, refer to *Operational Measurements Reference Manual*.

Priority of NWM Controls

General

NWM controls can be activated according to a set priority. The activation of one control can override the prior activation of another control. Manual controls override automatic controls. The controls that are managed from each NWM MAP level have an order of priority.

Group control priority

When more than one group control is activated on outgoing traffic, the order of priority from highest to lowest is as follows:

1. FRR - Immediate Reroute (IRR)
2. DRE
3. PRE
4. CANT
5. SKIP
6. STR
7. hunt for idle trunk
8. FRR - Regular Reroute (RRR)
9. CANF.

Auto control priority

The controls of the AutoCtrl MAP level are independent of each other, and therefore, have no order of priority. However, there are limitations for automatic control interactions. If any other type of NWM control is active on the trunk group, AOCR is not applied. If any other automatic control is already active, it is overridden by AOCR.

Code control priority

The order of priority for code controls is as follows:

1. ACODE/NAC

If multiple controls can be applied against a single call, the most specific control is applied first. If the call is not blocked by the first control, the next most specific control is applied to the call. This process continues until the call is blocked or all controls have been applied.

1. CCODE

   CCODE controls are applied down to the country code level only; additional digits in the called number are ignored. This implies that there can only be one active control against a country code.

2. PFX

   If more than one control can be applied against an Equal Access call, only the most specific control is applied to the call.

3. Multiple

   - If multiple controls are applied against a single destination code, all of the controls are applied against a call.
   - The combined maximum number of PRP and CBK codes that can be simultaneously active is 256, except for offices containing EADAS. EADAS allows only 64 codes to be simultaneously active.

Route control priority

The RteCtrl MAP level has only one control, and therefore, has no order of priority.

4 Controls associated with Network Management

General

The controls described in this chapter may not be part of order code BAS00003 (BAS Generic). The controls described in this chapter can be activated or deactivated from an NWM MAP level or from the CI level. Whenever the MASSCALL, PREPEG, REROUT, and DCR controls are activated or deactivated, the NWM MAP displays are updated accordingly.

MASSCALL (Mass Calling)

MASSCALL limits traffic offered to specific DN whenever an excessive number of calls is routed to it, for example, by a radio talkshow, call–in contest, etc. The Mass Calling number can be in the same switching system or from another switching system. The count that is displayed by the command MASSCALL LIST is generated from the counts for OM group CBK, and therefore, is updated for each OM transfer period.

Mass Calling involves the following NWM controls:

- CBK blocks a percentage of traffic, based on called digits. For more information, refer to "CBK (Code Blocking)" in Chapter 3. The level of blocking can be established by the operating company and entered from the CodeCtrl MAP level. Up to 256 codes can be specified, except in offices containing EADAS, where only up to 64 codes can be specified. Peg counts are provided on a per–code basis for calls that are blocked.
- STR specifies that a number of trunks from a group are reserved for non–Mass Calling codes. For more information refer to "STR (Selective Trunk Reservation)" in Chapter 3. The reserved group of trunks serves as a separate group with its own routing chain for routing calls to Mass Calling numbers only.
- Mass Calling can be controlled by using the STR group control along with the HTR code control.

Note: The number of mass calls that are deflected or overflowed are counted, but the total number of successful calls is not counted.

Mass Calling is applied or removed from the CodeCtrl and GrpCtrl MAP levels, or by CI commands. For more information, refer to the description of GrpCtrl MAP level commands in Chapter 8, CodeCtrl MAP level commands in Chapter 9, or the MASSCALL command in Chapter 12..

PREPEG (Preplanned Pegging)

PREPEG applies PRP controls using the same parameters as the PRP control in the CodeCtrl MAP level. PREPEG is used at the CI level without accessing an NWM menu (See Figure 6–3). For more information on the PRP control, refer to "PRP (Preroute Peg)" in Chapter 3. For more information on the PREPEG command, refer to "PREPEG command" in Chapter 12.

REROUT (Rerouting)

REROUT applies route controls by using a selection of the same parameters as the RRTE control at the RteCtrl MAP level. REROUT is used at the CI level without accessing an NWM menu (See Figure 6–3). For more information on the RRTE control, refer to "RRTE (Reroute)" in Chapter 3. For more information on the REROUT command, refer to "REROUT command" in Chapter 12.

LLC (Line Load Control)

LLC limits the amount of traffic handled by DMS–100 and DMS–100/200 offices by allowing only specially designated lines to originate calls. Other originating calls do not obtain dial tone. LLC has no effect on terminating calls.

All lines connected to a DMS–100 switch are designated as essential or non–essential. Service Orders (SO) can be used to designate Essential Lines (ELN) by entries in field OPTLIST of table LENLINES. When LLC is activated, only ELN are allowed to originate calls. A non–essential line is routed to lockout when it originates. When LLC is removed, all lines in the lockout state are returned to service.

LLC (order code BAS00003) is not part of the NWM group of controls. LLC is not administered from a NWM MAP level. LLC is a control that is manually applied from the CI level. For more information on LLC, refer to Chapter 13.

TNP (Toll Network Protection)

TNP limits outgoing toll calls (operator–assisted or direct–dial) to lines that have been designated as toll–essential–service (TES). TES lines are assigned in field OPTLIST of table LENLINES. All TES lines must also be designated as ELN (Essential Lines).

TNP (order code BAS00003) is not part of the NWM group of controls. TNP is not administered from an NWM MAP level. TNP is a control that is applied from the CI level. For more information on TNP, refer to Chapter 14.

ESP (Essential Service Protection)

ESP gives priority to traffic using essential lines. There is no traffic threshold that triggers ESP; activating ESP gives priority service to essential lines. Essential Lines (ELN) are identified in field OPTLIST of tables LENLINES and IBNLINES.

Priority is given to calls originating from essential lines over calls originating from non–essential lines. All calls are stacked in an originations queue by central control (CC) or by an Extended Peripheral Module (XPM). Originations must obtain a Call Condense Block (CCB) in order to enter the originations queue. If ESP is active and a CCB is unavailable, the essential line 'steals' the 'oldest' non–essential line origination in the originations queue. (See Figure 4–1.) The non–essential lines receive slightly delayed dial tone service. Lines with a 'stolen' CCB are handled by the Guaranteed Dial Tone (GDT) feature in the peripherals, which re–originates for the line.

ESP is given to ELNs by CC on a Directory Number (DN) basis, while in XPMs, ESP is given on a per loop basis. There is no effect on 500 or 2500 telephone sets, however, an Electronic Business Set (EBS) with a DN assigned as an ELN, all keys on that EBS receive preferential service on that XPM.

ESP in XPMs

Line data in the XPM is sent by CC as a static data update when a line is assigned ELN service. The flow of messages in an XPM has the following priority from highest to lowest:

1. termination messages
2. ELN originations
3. trunk originations
4. line originations
5. GDT (guaranteed dial tone) re–originations.

Termination messages are for calls already in progress.

When a CCB is not available for an ELN, the origination is denied. If the line is for an EBS, the hook state is recorded, but the origination is denied and the subscriber must re–originate.

The message queue in the XPM's terminal processor has the following priority from highest to lowest:

1. trunk reports
2. calls in progress
3. ELN originations
4. trunk originations
5. line originations
6. processing of a switch of activity (SwAct).

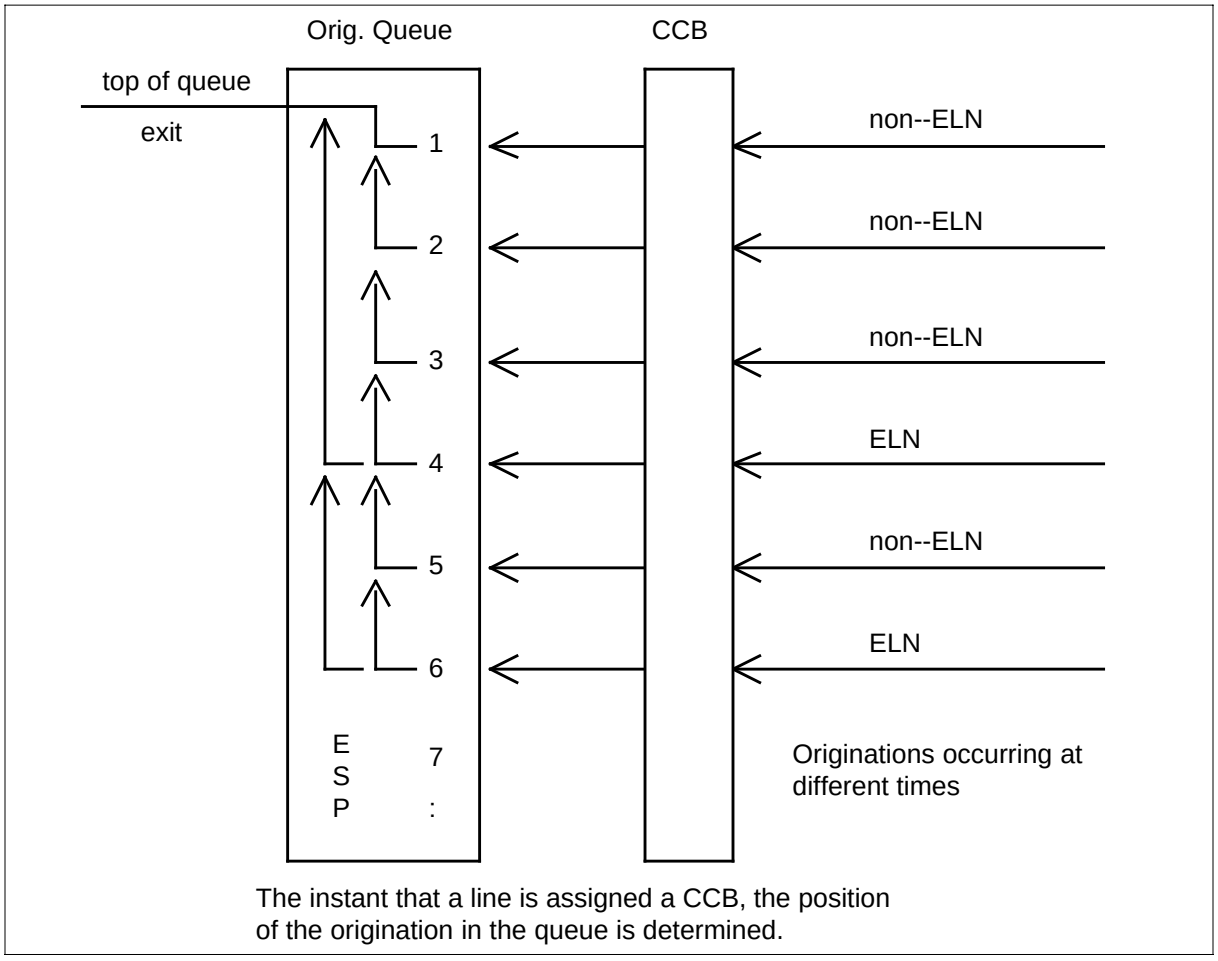
Quantity of essential lines (ELN)

Users of essential lines who do not receive immediate dial tone should wait until dial tone occurs. If the originations queue has only essential line originations, then other incoming essential line originations are delayed. For this reason, the quantity of essential lines in the office should not exceed the quantity of CCBs. The quantity of CCBs is set using office parameter NCCBS in table OFCENG.

Because the quantity of lines having ELN affects the rate at which dial tone is given, it is recommended that not more than 10% of all the lines in an office or on any one Line Concentrating Device (LCD) be datafilled with ELN. Exceeding this limit reduces the effectiveness of ESP and could result in longer delays for dial tone for both ELN and non–ELN lines.

The quantity of ELN lines also affects OMs for Dial Tone Speed Recording (DTSR).

Figure 4-1 Essential line (ELN) precedence in originations queue



ESP (order code BAS00003) is not part of the NWM menu controls and does not function on the basis of traffic thresholds. ESP is active by default, but can be manually suspended and reactivated from the CI level by the ESP command (See Chapter 15).

Activation of ESP causes the following:

- incrementing of ELN activities in OM group ESP
- changes to the incrementing for OM group DTSR.

Remote Make Busy By Scan Point Control

The Remote Make Busy By Scan Point Control feature (order code BAS00003) removes outgoing and two–way trunks or trunk groups from service. When the state of the associated scan point changes from normal, trunks are removed from service. The result is to set the trunks to the NMBsy (Network Management Busy) state.

Trunks that are engaged in call processing or maintenance testing first complete their current action. Trunks affected by this feature remain out–of–service even after a warm or cold restart.

The Remote Make Busy by Scan point Control feature uses NWM tables, but is not dependent on the NWM feature packages. In tables NWMSC and NWMSCPT, the operating company assigns the following:

- a scan group identification to each NT0X10AA scan card (NWMSC)
- specific trunks or trunk groups to each scan point (NWMSCPT)
- a normal card state (0 or 1) for each scan point (NWMSCPT).

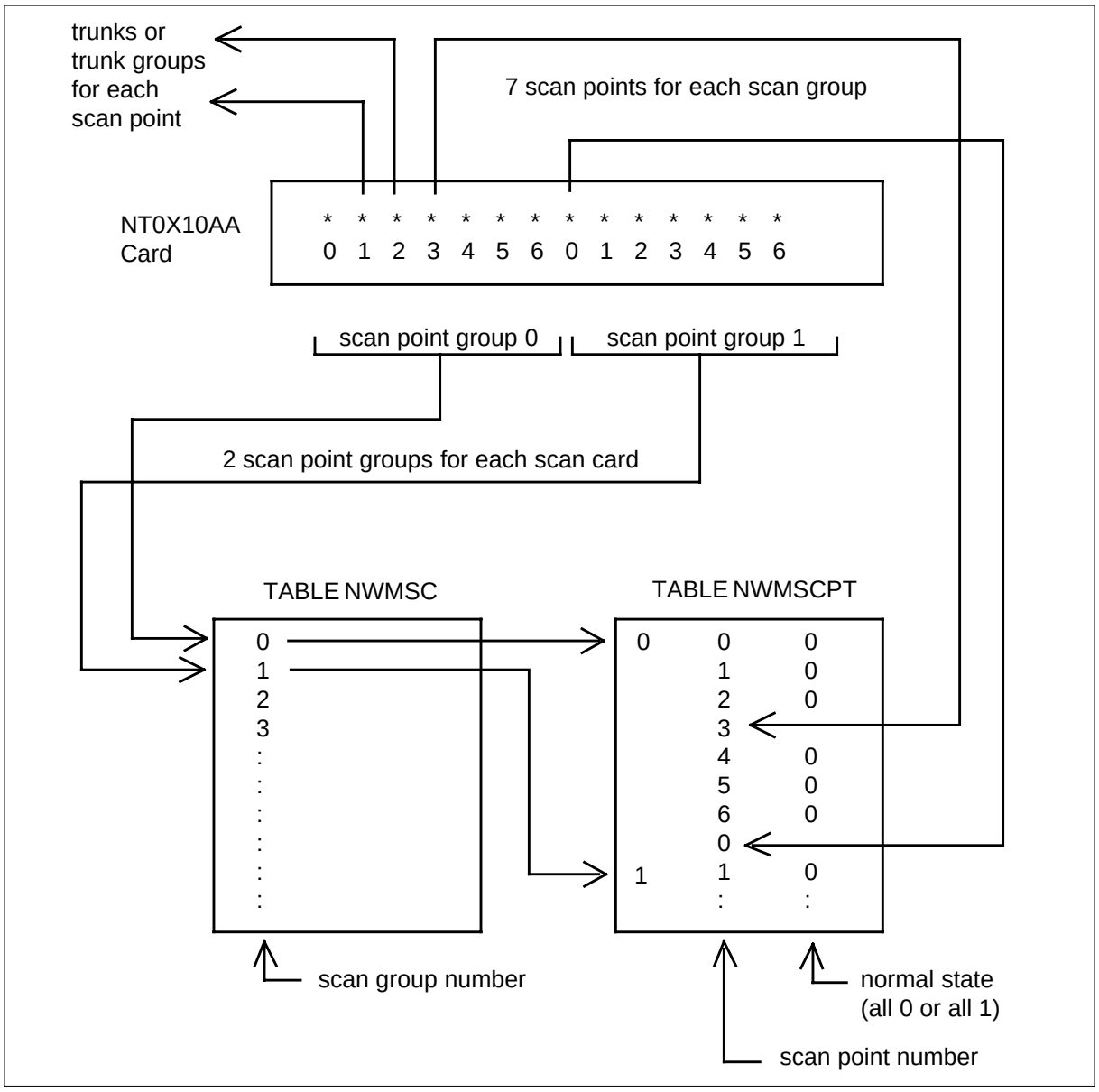
NT0X10AA miscellaneous scan cards are used. Each card has 14 scan points subdivided into 2 groups as shown in Figure 4–2.

By querying the data in table NWMSCPT, trunks that are set NMBsy by the Remote Make Busy by Scan point Control feature can be identified. NWM commands cannot change the NMBsy state if the scan point control has removed the trunks from service. All NMBsy trunks are identified as one of the following:

- being removed from service by Scan Point Control tables
- having active NMB controls set from an NWM menu.

The NMBsy trunks are returned to service when the office that has the Remote Make Busy by Scan point Control feature switches off the feature.

Figure 4-2 Correlation of scan point ssignment



CCISTNWM (CCIS Trunk Network Management)

CCISTNWM is an interface between the DMS–100 DOC system and the Common Channel Interoffice Signaling No. 6 (CCIS6) system.

The Message Switch and Buffer (MSB) of the CCIS6 system (MSB6) is the interface between DMS–100 software and the CCIS6 Network. All messages pass through the MSB6. If Central Control (CC) requires a restart, the MSB6 automatically sends signals within 5 seconds.

CCIS6 uses DOC which consists of two components, IDOC and RDOC (Remote DOC), where:

- IDOC detects local switch overloads and transmits appropriate DOC signals to connecting offices
- RDOC receives DOC signals from connecting offices and activates traffic controls on the CCIS6 trunk groups serving those offices. (RDOC is called PPLN for DMS–100)

For a description of DOC, refer to "Dynamic Overload Control" in Chapter 3.

Table NWMIDOC is also used for CCISTNWM. The CCIS6 version of the IDOC signals transmits four CCISTNWM signals named as follows:

- BDOC1 - Broadcast Dynamic Overload Control level 1
- BDOC2 - Broadcast Dynamic Overload Control level 2
- BDOC3 - Broadcast Dynamic Overload Control level 3
- RDOC1 - Remove Dynamic Overload Control.

BDOC1 and BDOC2 are transmitted once a minute for the duration of the traffic overload. BDOC3 is automatically transmitted at the beginning of all restarts. Both BDOC3 and RDOC1 are transmitted only once under the following conditions:

- BDOC3 when a restart is required or the CC stops sending sanity messages to independent Peripheral Modules (PMs)
- RDOC1 when traffic congestion decreases lower than the threshold for IDOC level 1.

Note: All IDOC signals are deactivated by a restart. After a restart, RDOC1 is transmitted through the CCIS6 Network.

The CCIS6 version of RDOC receives the following CCISTNWM signals:

- DOC0 Dynamic Overload Control level 0
- DOC1 Dynamic Overload Control level 1
- DOC2 Dynamic Overload Control level 2
- DOC3 Dynamic Overload Control level 3
- IGDOC Ignore Dynamic Overload Controls
- ENDOC Enable Dynamic Overload Controls.

A parallel exists between the operation of RDOC for NWM and for CCISTNWM. For NWM, table NWMSCPT associates scan points with Preplan controls defined in tables NWMPPLN and PREPLANS. When a scan

point is triggered, the associated PPLN is activated automatically. For CCISTNWM, table CCSDOC associates CCIS6 trunk groups with Preplan controls defined in tables NWMPPLN and PREPLANS. When a DOC signal is received for a CCIS6 trunk group, the associated Preplan control is activated.

SDOC (Selective Dynamic Overload Control)

The CCIS6 version of RDOC controls is called SDOC. For the description of RDOC, refer to "Dynamic Overload Control" in Chapter 3. SDOC is activated automatically by receiving a DOC signal, or manually from the AutoCtrl MAP level. For more information on SDCO, refere to the description of AutoCtrl MAP level commands in Chapter 7. For SDOC, trunks are associated with PPLN controls datafilled in table CCSDOC.

For CCISTNWM, instead of inputting scan point numbers in table NWMSCPT to indicate which PPLN controls are activated on reception of a DOC signal, CCSDOC uses a CLLI and PPLN control number. Table CCSDOC specifies trunk group controls for the trunk groups which can receive DOC signals. Trunk group entries in table CCSDOC have three references to controls in table PREPLANS, one reference each for all three DOC levels. The CLLI in table CCSDOC must match the CLLI in table PREPLANS.

Field CCS of table NWMPPLN indicates whether each PPLN is referenced by entries in table CCSDOC or NWMSCPT. Table NWMPPLN cannot be edited if table PREPLANS has active PPLN controls.

More than one SDOC control can be manually activated on a trunk group. The cumulative effect of multiple active SDOC controls is the same as manual application of the corresponding group controls. For SDOC, unlike the other automatic DOC controls (IDOC, PPLN, and AOCR), there is no restriction preventing automatic SDOC (that is, a received DOC signal) from overriding manual SDOC.

When a DOC signal is received for a CCIS6 trunk group, all other SDOC levels are automatically deactivated for that trunk group, and the appropriate SDOC level is automatically applied according to the received DOC signal. The interactions between SDOC levels are as follows:

- DOC0 signals override all other SDOC levels, and no traffic restriction occurs.
- Activation of DOC levels 1, 2, or 3 activates a two minute timer; if another DOC signal is not received during this time, SDOC controls are automatically deactivated.
- Reception of IGDOC disables DOC1 and 2, and deactivates DOC3.
- Reception of ENDOC enables DOC1 and DOC2 and there is no restriction preventing ENDOC from re–enabling manually disabled controls.

CCISTNWM also controls Group Signaling Congestion (GSC) directed from the MSB6. Reception of a GSC activates the group control SKIP on the trunk group identified in the GSC. SKIP DAR at 100% remains active for 10 seconds and then is automatically deactivated by CCISTNWM.

INWATS OSO (Originating Screen Office) NWM

The CCIS Incoming Wide Area Telephone Service (INWATS) Originating Screen Office (OSO) limits traffic flow by code blocking six–digit (NPA-NXX) or ten–digit (NPA-NXX-YYYY) codes. The blocking of ten–digit codes has priority over six–digit codes. Code blocking for CCIS6 OSO occurs by automatic or manual call gapping controls. Automatic call gapping differs from manual call gapping as follows:

- blocks only 800-NXX or 800-NXX-YYYY digits
- remains active for five minutes
- does not distinguish the Serving Numbering Plan Area (SNPA) of the call.

CCIS6 INWATS calls are associated with the digits 800-NXX-YYYY by assignment of INWC in field CODETYPE of subtable HNPACODE. In table OFCENG, office parameter INWATS_CCIS_OSO_ENABLE must be set to Y to enable CCIS OSO. Disabling this office parameter does not block INWATS calls. Changing table OFCENG does not require a cold restart.

Table INWSNPA determines the SNPA of the call and checks for active NWM controls against the called number. When a trunk group has INWATS traffic for more than one NPA, table INWSNPA converts the 800 digits into 00x, where x is 0 to 9. If more than ten entries is required in table INWSNPA, office parameter NUM_OF_CCIS_INWATS_BLOCKS in table OFCENG defaults to thirty extension blocks. Changing this parameter requires a cold restart.

To activate INWATS call gapping, refer to the descriptions of AutoCtrl MAP level commands in Chapter 7 and CodeCtrl level commands in Chapter 9.

DCR (Dynamically Controlled Routing)

DCR is available to offices with order code DCR00001 (DCR DCR). DCR reserves idle trunks in trunk groups so that routes for overflowing traffic that is separated by one or two links from an originating toll switch can be provided. At ten second intervals, each switch with the DCR feature sends its idle trunk and trunk overflow data to a processor. Processing a 'snapshot' of the entire network of offices with DCR is done by the Network Processor (NP). The NP then creates a recommendation for each call that overflows a trunk group.

The recommendation is based on the following:

- detection of switch overload according to CPU usage
- detection of a dead system because of the following:
  - — no communication exists between the switch and the NP
  - — no outgoing DCR calls were initiated by the switch in one ten second cycle
- traffic volume as reported by the OM system
- trunk group status as indicated by overflows
- the fixed and alternate routes that are assigned in the DMS routing tables.

The DCR data varies according to the settings and thresholds of other NWM controls (See "DCR and Other NWM Controls" in this chapter).

The recommendation for each overflowed call includes the following:

- selecting a tandem DCR route
- selecting a non–tandem DCR route
- blocking the call
- continuing with non–DCR routing.

Routes are chosen by the NP according to the route lists that are assigned for DCR in various data tables.

DCR routes vs FHR routes

When DCR is inactive or not present in an office, the routing of call traffic for NWM occurs based on Fixed Hierarchical Routing (FHR). FHR (basic NWM functionality) sends overflow traffic along routes that are pre–assigned in data schema tables in a fixed sequence. If the first route in a sequence is busy, then the call overflows to consecutive routes, one at a time, until a route is available. If all alternate routes in the sequence are busy, the call is blocked.

An office that is designated in table DCROPT as a member of the DCR network of offices is referred to as a DCR office. If a call that is originated in a DCR office and is destined for a toll switch that involves more than two links (that is, two offices), then the call is given FHR on the first links and DCR on the last two links.

FHR resumes traffic control if DCR is disabled by one of the following:

- restart of the switch
- cancellation of the DCR mode in table DCROPT
- manually using the command DCRMOCH of the NWM MAP level

- the ten second cycle that records the quantity of disrupted NP messages up to a threshold
- the fifteen minute audit that updates the NP for a change of DCR mode or DCR trunk configuration.

Disrupted messages are treated as if they were not sent. When a switch reverts to FHR due to a communication problem, the NP automatically tries a predetermined number of times to re–establish communication.

For a switch that is used as a tandem in a DCR call, the direct routes to the toll destination switch are attempted even if there are direct routes to the end destination. If the direct routes overflow, then the call is blocked to avoid looping within the DCR network. The nearest DCR switch to every local switch (that is, non–DCR switch) becomes an entry/exit for calls routed from the local switch.

NP communication

NP communication to DMS switches occurs by the Remote Operations (RO) of the Network Operations Protocol (NOP) system. An RO is a task that is requested by one processor to be performed by a remote processor. The ROs for DCR occur through DATAPAC X.25 protocol. The flow of ROs may be monitored from the NOP level of the MAP.

The NP immediately handles changes to the number of trunks in existing links without needing to disable and then re–enable DCR in the switch. The NP does not automatically verify the consistency of trunk connection data between switches (for example, the number of trunks in a two–way group). This verification can be done by switch maintenance personnel.

Changes to the number of trunks in a non–DCR trunk group are not reported to the NP because they do not affect DCR trunk configuration.

DCR mode status

There are two modes of switch operation when the DCR feature is present: DCR and FHR. When DCR is active, there is one of two modes of operation: tandem or non–tandem. In the active DCR mode, all calls become DCR calls with ensured routing. When DCR is suspended, the switch is automatically in the FHR mode.

DCR can be activated in a toll office if office parameter NUM_DCR_EXT_BLKS in table OFCENG is set to a value other than zero, in the range 1 to 32 000. This range represents the total number of available extension blocks in an office; a maximum of 100 to 200 should be sufficient for DCR. The value of NUM_DCR_EXT_BLKS can be changed during a cold restart.

To change the switch operation mode from FHR to DCR, enter the command DCRMOCH at the NWM menu or the CI level. For a description of DCRMOCH command, refer to Chapter 6. If the DCR feature is present in an office, the NWM menu display shows the header DCR with a status field to indicate the activity of DCR. The header appears on the continuous system status display of all NWM menus (See Table 6–1 in Chapter 6).

DCR and other NWM controls

DCR routing in a toll switch can be affected by the active NWM routing controls of a local office. Local controls may also affect the counts for trunk availability and overflow, which the NP uses to calculate the tandem recommendations, and which are incremented by the DCR OM groups. When DCR is active, the following NWM controls can affect the NP counts:

- DRE
- CANT
- CANF
- SILC
- RRTE
- PRE
- AOCR
- STR
- SKIP.

Depending on traffic conditions and the desired traffic control, DCR can be activated or deactivated by the CI command DCRMOCH from any NWM menu.

DCR data schema tables

The route of a call through a switch or series of switches is changed by DCR according to route lists that are datafilled in the following data schema tables:

- DCROPT
- DESTKEY
- DESTNODE
- FNPACONT
- HNPACONT
- OFRT
- TKTONODE.

TableDCROPT controls the DCR modes of activity. It allows the switch to use the FHR mode even if a DCR mode is active. The office can choose, with the DCRMOCH command or by datafill in table DCROPT, to allow or prevent the NP from making the switch a DCR nontandem node. The office is always allowed to use the FHR mode. Table DCROPT also displays the current switch operating mode in tuples FHR, DCRTANDEM, and DCRNONTANDEM. These tuples indicate if the switch can operate in the DCR tandem or the DCR nontandem mode. These modes of DCR activity do not affect the DCR routing in the DCR switch, but they do affect the choice of DCR tandems by the NP.

TableDESTKEY stores all DCR destinations including those that involve more than two links from the DCR switch.

TableDESTNODE contains only the DCR destinations that are accessible within one or two links chosen by DCR. Field DIRRTE has the following route selectors:

- S, for standard route
- T, for table name route.

Route lists that are referenced in field DIRRTE by selector T are valid only if they contain routes with the S, MN, TS, and NQ selectors. With selector T, extension blocks are required.

It is possible to delete a tuple from table DESTNODE even if the DCR destination is referenced in one of the RTEREF tables or subtables. Editing table DESTNODE cannot be done when the switch is in the DCR mode or during an office image dump. Editing is possible when the switch is operating in the FHR mode and communication with the NP has not begun. When DCR is reactivated, the added or removed switches are included in the next NP snapshot.

TableTKTONODE includes the CLLI of the incoming and two–way trunk groups that originate from DCR offices. These are referred to as DCR trunks. Field IC_FROM indicates the trunk group from which a DCR occurred.

Other DCR data schema tables

The route selector DCRT for DCR routing of the second link of a DCR call is datafilled in the following tables:

- FNPACONT
- HNPACONT
- OFRT.

Route lists

To set up the tandem and nontandem route lists for DCR, the following sequence of datafill entries must occur in the corresponding data schema tables:

DCRT destination FHR routes NODE routes FHR alternate routes.

An assigned route selector discriminates calls that use the switch as a DCR tandem. The call is blocked if the second link of the selected route (as recommended by the NP) is unavailable. If no direct routes exist for the DCR destination, then one of the following DCR conditions is occurring:

- The DCR destination involves two links. The call follows the NP recommendation according to table DESTNODE. A DCR destination is determined to involve two links if the destination is set in table DESTNODE and field DIRRTE has the value NIL.
- The DCR destination involves more than two links. The call is offered to the DCR network but the first link(s) are fixed routed (according to FHR) until there are two links to the DCR destination. Therefore the route in table DESTNODE is skipped and the subsequent FHR routes are attempted. A DCR destination involves more than two links if a destination is not specified in table DESTNODE.

The route selector in these tables is specified in field DCRT with a variable for the DCR destination. The route selector must be placed at the top of the route list whenever the destination of the call involves one link from the switch.

A call that is incoming on a DCR trunk and that uses an office as a DCR tandem is identified with the DCRT destination route. Routing to the appropriate DCR destination proceeds according to field DIRRTE (direct route) of table DESTNODE. If all the routes of the DIRRTE list are in use, then the call is blocked. If the office is not used as a DCR tandem, the DCRT destination route (of a DCR call) is not used.

FHR direct routes are always attempted before the NP recommendation. Therefore, the FHR routes should be specified after field DCRT.

Route selecting by the route selector NODE should follow the FHR field. The NODE selector uses table DESTNODE to initiate the NP tandem recommendation (when a DCR mode is active).

FHR alternate routes are used for destinations that involve more than two links from the DCR office, or whenever an active DCR mode is disabled.

DCR extension blocks

A special extension block is attached to each DCR call when the selector T is used in field DIRRTE. It preserves routing information that can be accessed

after the route list of DIRRTE is exhausted. Therefore, the call data is reconstructed and the exception route list (field EXCEPRTE) in table DESTNODE is used as a backup.

DCR can be activated in a toll office if office parameter NUM_DCR_EXT_BLKS of table OFCENG is set to a value other than zero in the range 1 to 32 000.

If DCR extension blocks are not available for a call, then the following occurs:

- The call is routed to the treatment NOSR (No Software Resources).
- OM register DCRLINK_FRSTLOFR and subsequent registers are not incremented for tandem calls on the first link.
- OM registers DCRICTRK_DCRTAND and DCRLINK_SCNDLOFR and subsequent registers are not incremented for tandem calls on the second link.

The registers of OM group EXT are incremented whenever DCR extension blocks are used.

DCR operational measurements

DCR activities are incremented by the following OM groups:

- DCRDEST
- DCRLINK
- DCRICTRK
- DCRMISC
- EXT.

When DCR is inactive, the OM groups do not increment. For more information on DCR OMs, refer to *Operational Measurements Reference Manual*.

DCR logs

The Logs that record DCR activities are as follows:

- The DCR100 log is generated (with a minor alarm) to indicate the reason the switch is removed from the DCR network.
- The DCR101 log is generated to indicate the reason a DCR change of mode occurred.

DCR network scenario

Using Figure 4–3 as an example of a DCR network setup, the following sequence of datafilling would occur.

The following datafill could be used in DCR tables for office A:

```
TABLE DESTKEY
 INP
 DESTNAME
    W
    Z
    B
    T
    C
    D

TABLE DESTNODE
 INP
 %%  KEY    DIRRTE     NPREC  EXCEPRTE
     W          NIL
     Z          S  CLLIAZ
     B          S  CLLIAB
     T          T  OFRT  49
     C           NIL
 QUI

TABLE TKTONODE
INP
  CLLI
  CLLIAZ
  CLLIAB
  CLLIAT


TABLE OFRT
INP
49 S  D CLLIAT1
   S  D CLLIAT2
```

The following route lists are recommended for office A, assuming FHR routes must be used before other routes if a direct route exists when a call is not incoming on DCR trunk.

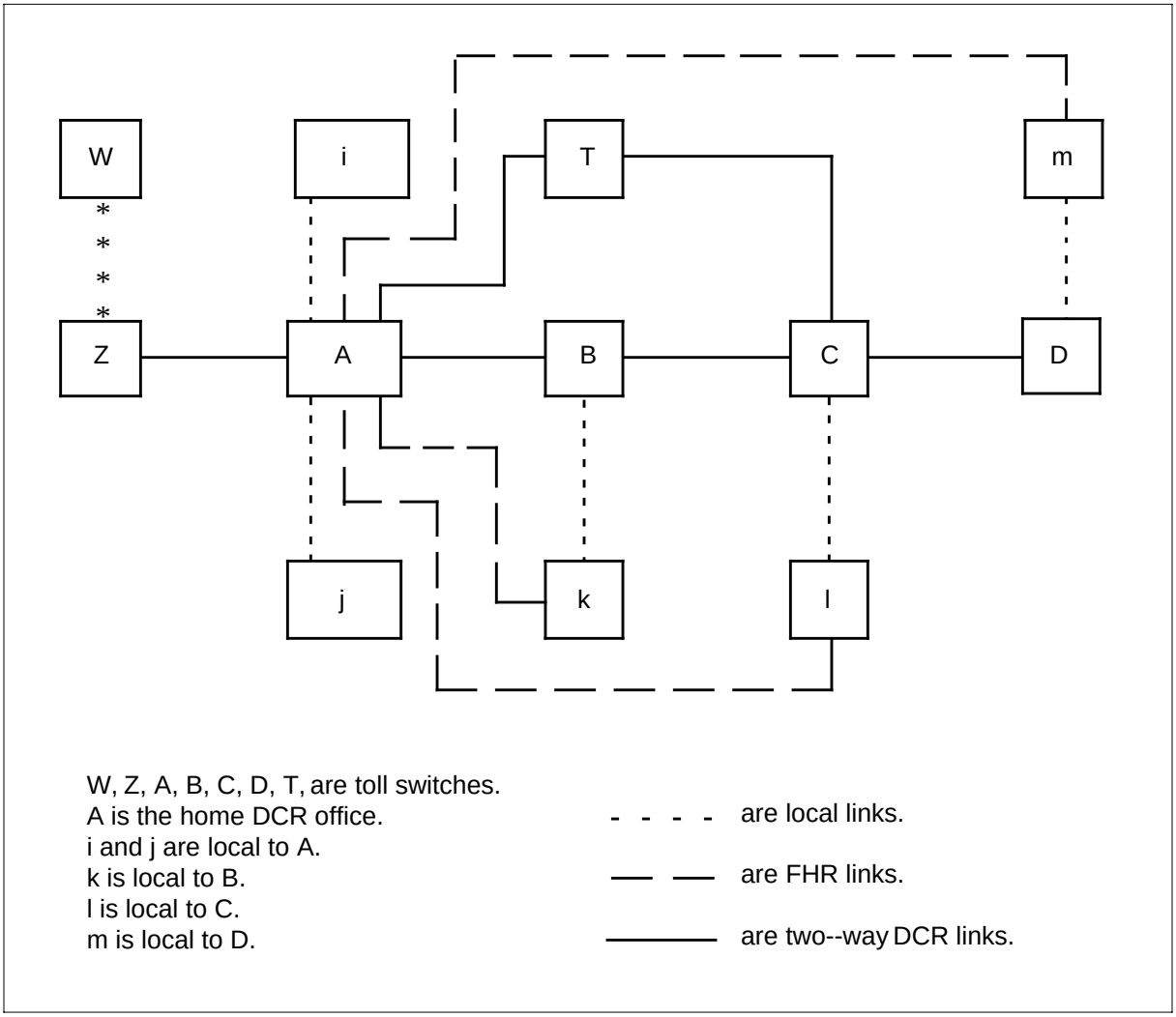
Table 4-1 (Sheet 1 of 2)

For calls destined to j:		**For calls destined to B:**	
1	S D CLLIAj	20	DCRT B
			S D CLLIAB
			NODE B
			S D CLLIAT1
			S D CLLIAT2
For calls destined to C:		**For calls destined to D:**	
30	NODE C	40	NODE D
	S D CLLIAT1		S D CLLIAB
	S D CLLIAT2		
Note: Calls from Z must be sent directly to route list 30 by the Standard Pretranslation or Class of Service screening.		***Note:*** Calls from Z must be sent directly to route list 40 by the Standard Pretranslation or Class of Service screening.	

Table 4-1 (Sheet 2 of 2)

	S D CLLIAB		
For calls destined to T:		**For calls destined to k:**	
5	DCRT T	6	DCRT B
	S D CLLIAT1		S D CLLIAk
	S D CLLIAT2		S D CLLIAB
	NODE T		
	S D CLLIAB	or offer the call to DCR:	
		7	DCRT B
			S D CLLIAk
			ST 20
For calls destined to l:		**For calls destined to m:**	
9	S D CLLIl	12	S D CLLIAm
	ST 30		S T 40
Note: Calls from Z must be sent directly to route list 30 by the Standard Pretranslation or Class of Service screening.		***Note:*** Calls from Z must be sent directly to route list 40 by the Standard Pretranslation or Class of Service screening.	

Figure 4-3 DCR network setup example



Adding offices to the DCR network

The following method for adding switches to the DCR network is recommended:

1. Define the switch to be added in the NP (including CLLI, DATAPAC Address, etc.). No actions are taken by the NP regarding the added switch until the switch is activated by the DCRMOCH command.
2. For any DCR switch for which the added switch is a destination, the following must be done:
   a. Remove the switch from DCR
   b. Update the DCR destination list in table DESTNODE

c. Provide the following route references to the new destination:

   i. existing (old) route reference

   ii. new route reference including the DCR NODE selector.

   Until the new switch is added to DCR, the old route reference should be used.

d. Add the switch to DCR from the NP administration position.

e. The automatic priming sequence collects the updated destination list and connectivity data from the switch. The NP then enables the switch to become a DCR node, and begins sending recommendations to the switch. The NP sends a CONTINUE as the recommendation for the added switch since that switch is not yet activated for DCR. This recommendation is not used by the switch, since the old route reference is still in use.

f. Step 2 is to be performed one switch at a time for additions, so that the DCR network is preserved.

3. When all affected switches have updated their destination lists and re–entered the DCR mode of operation, the added switch can be activated to participate in DCR. The added route reference in each affected switch is then made available to DCR.

DCR–related nonmenu commands

The TRAVER (tranlation verification) command can be used for DMS–200 offices that have the DCR feature. TRAVER identifies and displays the route of an incoming call on a DCR trunk according to settings in the route list tables. TRAVER also identifies DCR routing for route selectors DCRT and NODE, regardless of the switch operating mode (DCR or FHR).

EA (Equal Access) NWM

EA offices with order code BAS00003 (BAS Generic) are provided with NWM code blocking controls. Code blocking (CBK) is available for Inter–LATA or international carriers.

Code controls can be applied using the APPLY CBK command at the CodeCtrl MAP level. Calls are blocked according to the percentage of incoming calls or their rate of occurrence.

Code blocking or call gapping controls may limit the flow of traffic through interchange carriers (IC) and international carriers (INC). The combinations of digits that are affected by code controls are as follows:

- Ignoring IC/INC Prefix limits calls to North American Numbering Plan (NANP) codes according to the destination digits, regardless of the prefix code.
- IC/INC Prefix Only limits calls to destination codes or to presubscribed interchange carriers (PIC) according to the its??? prefix code. Code controls can be applied to a set of prefix digits that is associated with EA calls, for example, 0ZZ or YXX in the access tandem (AT).
- IC/INC Prefix and Destination Digits limits traffic to NANP or international codes according to both the prefix and destination codes, regardless of EA. This applies to calls with the following digit sets:
  - 10XXX + NPA
  - 10XXX + NPA + NXX
  - 10XXX + Country Code.

Prefix blocking is applied from the AutoCtrl or the CodeCtrl menus. To activate blocking by Prefix codes, refer to the description of AutoCtrl level commands in Chapter 7 and CodeCtrl level commands in Chapter 9.

5 Monitoring CPU realtime usage

Description of capabilities

With order code TEL00001 (TEL Telecom Layer func), the CPStatus tool measures the percentage of the following:

- all CPU utilizations (including call processing occupancy)
- CPU realtime available for call processing.

The information generated by the CPStatus tool indicates switch performance against the switch threshold for capacity, also referred to as the engineering level.

Reporting CPStatus measurements

The CPStatus measurements are reported as follows:

- by specified operational measurements (OMs)
- in the continuous system status display at the NWM level of the MAP
- as a response to the nonmenu CI command CPSTAT at any MAP level
- as a response to the menu command CPSTATUS at the MTC MAP level.

Setting up to use the CPStatus tool

The CPStatus tool is activated by the following:

- activating the associated OMs
- the datafill described in the "Datafill" section

Operational Measurements (OM)

OM group BRSTAT calculates switch capacity and average work times for the accumulated utilizations over the last OM transfer period. The calculations are used to display utilizations at the NWM and CPStatus MAP levels.

Note: OM group BRSTAT replaces OM group CPUSTAT

OM groups AVOFZ, OFZ, and OTS are used to calculate the quantity of call attempts per hour, depending on the traffic OMs used by an office. The

measurement is displayed under the CATMP/HR header of the MAP display by the command CPSTAT or CPSTATUS.

Datafill

Before datafilling for the CPStatus tool, ensure that the logs for the ACTIVITY tool are inactive.

Office parameter CPSTATUS_SWITCHABLE in table OFCENG determines whether the CPStatus tool can be activated. The logs for the ACTIVITY tool must be inactive before office parameter CPSTATUS_SWITCHABLE can be changed.

Office parameter CPSTATUS_ON in table OFCVAR determines whether the CPStatus tool is active on a switch that has office parameter CPSTATUS_SWITCHABLE set to Y (yes). If office parameter CPSTATUS_ON is set to N (no), the field under the CPU header of the continuous system status display at the NWM level of the MAP receives its measurement from the OM group MACHACT and the OM group CPUSTAT displays zeroes (no measurements).

> ***Note:*** Although the OM group MACHACT is "zeroed" for the CPStatus tool, the percentage of CPU usage can still be calculated by data collection process of MACHACT. If office parameter CPSTATUS_ON is set to Y (yes), the CPU field of the NWM level display receives its measurement from the CPStatus tool.

Since the status displays of the NWM level are dynamic, when changing office parameter CPSTATUS_ON, wait at least one minute for the display(s) to update. When the parameter is changed, the CPU field displays `**` until valid data is collected for the next minute after the parameter change.

Office parameter CC_ENGLEVEL_WARNING_THRESHOLD in table OFCENG designates the percentage of call processing CPU usage at which a switch becomes overloaded. The default value is 100%.

Office parameter GUARANTEED_TERMINAL_CPU_SHARE in table OFCENG designates the devices that are to receive preferred CPU realtime when the switch reaches full capacity.

Data schema datafill responses

When changing the value of office parameter CC_ENGLEVEL_WARNING_THRESHOLD, the following response can occur:

```
*ERROR* : VALUE OUTSIDE VALID RANGE (0 TO 83%)
```

If this response occurs, datafill a valid range.

When changing the value of office parameter CPSTATUS_ON, the following response can occur:

```
*ERROR* :OFFICE IS NOT SWITCHABLE
```

Office parameter CPSTATUS_ON cannot be changed to Y (yes) unless office parameter CPSTATUS_SWITCHABLE also has the value Y (yes).

When changing the value of office parameter CPSTATUS_SWITCHABLE, one of the following responses can occur:

```
*ERROR* :ACTIVITY MUST BE OFF TO CHANGE THIS PARM
```

The logs of the ACTIVITY software tool must be deactivated before changing the value of office parameter CPSTATUS_SWITCHABLE.

```
*ERROR* :CPSTATUS MUST BE ON BEFORE THIS OFFICE MAY
BECOME NON_SWITCHABLE
```

Office parameter CPSTATUS_ON must have the value N (no) before office parameter CPSTATUS_SWITCHABLE can be changed to N (no).

Operation of the CPStatus tool

The CPStatus tool monitors switch performance against the capacity threshold or engineering level of the switch. This is done by measuring all CPU occupancies and calculating the CPU capacity available for call processing.

The CPStatus tool should not be run at the same time as other system tools (for example, ACTIVITY, ANALYSIS, TIMECALL, TCALLCT, and SYSCT). The results generated by other tools are not likely to be affected by simultaneous operation with the CPStatus tool. The CPStatus data may be affected by simultaneous operation.

Realtime CPU usage

The CPStatus measurements require no more than 1% of the total CPU realtime at full capacity. The error factor (%) for a given usage value is

```
0.5 + (0.03)(usage value)
```

The smallest error is 0.5% for call processing when CPU usage is 2% and the largest error is 3% for call processing when total CPU usage reaches 83%.

Note: The CPStatus measurements are not taken from the data provided by the ACTIVITY and the ANALYSIS tools.

The measurements taken for CPStatus are based on the percentage of processing time in the CPU. The kinds of processes are generically categorized by the system according their function. A scheduler for the system decides when the processes run, based on the type of function. Some processes are run more often than others. The total amount of CPU realtime is distributed in between the scheduler and the functions. When CPStatus is active and CPU usage is at full capacity, the distribution is as follows:

7%
scheduler (including CPStatus activity)

1%
system processes

11%
Input/Output interrupts 11% + 68% = total call68%call processing work processing occupancy (77%)(caused by traffic)

3%
processes required by work for the Dynamic Network Controller (DNC)

2%
maintenance work (up to 8%, taken from call processing if needed)

2%
guaranteed terminal (up to 16%, taken from call processing according to the setting for office parameter GUARANTEED_TERMINAL_CPU_SHARE in table OFCENG.)

3%
the OM system

3%
background and audit functions

0%
idle and audit functions

Types of measurements

To indicate how much of the capacity of Central Control (or Message Switch) is used, the types of measurements are as follows:

- quantity of call attempts per hour
- amount of CPU realtime used for call processing
- amount of CPU realtime used by processes other than call processing
- amount of CPU realtime available for use by call processing
- overload thresholds
- engineering threshold at which call processing occupancy is exceeded for a switch.

The total utilization is approximately 100 percent of the CPU realtime, which is the full capacity of the switch.

Call attempts per hour

The quantity of call attempts per hour is measured by the OM registers that are used by the ACTIVITY tool. The values of the OM registers are calculated as follows:

```
CCH ={norig + (65535 x norig2) + alorig + (65535 x
alorig2) + nin + (65535 x nin2) + ocini + ocmccs +
ronatt} × 60
```

The value of CCH is measured over the last minute.

Call processing occupancy

Call processing occupancy is expressed as a percentage of total CPU realtime. Any call processing tasks performed for other functions are included.

CPU utilization by non–call processing functions

The amount of CPU realtime used by processes other than call processing is based on the following (other) scheduler functions:

- the scheduler
- system processes
- maintenance processes
- processes for DNC
- the OM system
- guaranteed terminal
- background and audit functions
- idle and audit functions

Remaining CPU realtime

The amount of realtime remaining for use by call processing is the portion of total CPU realtime that is not already used by call processing and non–call processing classes. This number indicates how much CPU realtime remains, as well as how close to capacity the switch is operating.

Overload thresholds

The overload threshold is triggered by the system using one or both of the following methods:

- Over the last minute, the quantity of 1 and 2 ignored messages is greater than 40 (applicable only to offices that have the CC overload controls). The information is acquired from the following OM groups:
  - — CP (register ORIGDENY, one message ignored)
  - — CP2 (register INEFDENY, two messages ignored).
- Over the last minute, a 5–second interval elapsed in which there was always call processing work to do (applicable to all offices).

Note: The severity of the overload is determined by the Grade Of Service (GOS) measurements (for example, dial tone delay).

Engineering threshold

The threshold at which call processing occupancy is exceeded for a switch is set by office parameter CC_ENGLEVEL_WARNING_ THRESHOLD in table OFCENG. The status display indicates whether the current call processing occupancy is above or below the threshold, but not how much above or below the threshold the switch is running. Under the CPU header of the NWM MAP display, the value displayed is the percentage of CPU utilization. Under the ENGLEVEL header of the display generated the commands CPSTAT and CPSTATUS, the value under the CPU header is identified as being ABOVE or BELOW the threshold.

Display of CPStatus tool measurements

The measurements generated for the CPStatus tool are displayed at the MAP when the following occurs:

- the nonmenu command CPSTAT is entered at any MAP level
- the CPStatus MAP level is accessed from the MTC MAP level by entering the menu command CPSTATUS

CPStatus MAP display

CPSTAT command

When the nonmenu (CI) command CPSTAT is entered, a display like the following appears:

```
CATMP/HR UTIL ENGCATMP MAXCATMP COMPLEX ENGLEVEL CCOVRLD IDLE
       0   0%       --       --       --     BELOW     OFF  YES

SCHED  FORE MAINT   DNC AUXCP    OM GTERM   BKG  NETM  SNIP
 117%   24%   60%    0%    4%   11%    0% 1078%    0%    5%
```

where

CATMP/HR
is the quantity of call attempts per hour. The value isincremented by OM group AVOFZ, OFZ, or OTS. Themeasurement depends on the traffic OMs used by the officeand is calculated using the same method the ACTIVITYand ANALYSIS tools use.

UTIL
is the total percentage of CPU realtime used for call processing

ENGCATMP
is the expected maximum call attempts per hour with guaranteed grade of service

MAXCATMP
is the expected maximum call attempts per hour without guaranteed grade of service

COMPLEX
is the maximum capacity of the office versus the capacity of a standard office

ENGLEVEL
indicates whether the value under header CPUTIL has exceeded the threshold assigned by office parameter CC_ENGLEVEL_WARNING_THRESHOLD. The possible values are ABOVE and BELOW.

CCOVRLD
indicates whether the CC is overloaded. The possible values are ON or OFF. The value ON indicates that overload controls by the CC (or CM) were active within the last minute. The value OFF indicates that the CC controls were not active within the last minute.

The value is incremented by OM group CP2, register OVRLD which counts the minutes during which CC overload was reached in the OM transfer period, that is, the minutes the value under CCOVRLD is ON.

IDLE
indicates whether there was idle CPU time in the last minute. The possible values are Y (yes) and N (no).

SCHED
is the percentage of CPU realtime used by the scheduler

FORE
is the percentage of CPU realtime used by the foregroundsystem processes

MAINT
is the percentage of CPU realtime used by the maintenancefunctions

DN
Cis the percentage of CPU realtime for processes used by theDynamic Network Controller (DNC)

AUXCP
is the percentage of CPU realtime used by the AUXCP class versus the value allocated (assigned by office parameter AUXCP_CPU_SHARE in table OFCENG)

OM
is the percentage of CPU realtime used by the OM system

GTERM
is the percentage of CPU realtime used by the guaranteedterminal devices (assigned by office parameterGUARANTEED_CPU_TERMINAL_SHARE in tableOFCVAR)

BKG
is the percentage of CPU realtime used by the background and audit functions

NETM
is the percentage of CPU realtime time used by the NETM (network maintenance) class versus that allocated/expected

SNIP
is the percentage PU realtime used by the SNIP class versus that allocated/expected

Updating of the display occurs in the BKG or GTERM class, depending on the type of terminal (for example, MAP or printer). When the switch is running close to capacity, the update may occur faster on a guaranteed terminal.

CPSTATUS command

When the menu command CPSTATUS is entered, the following display appears:

```
CATMP/HR UTIL ENGCATMP MAXCATMP COMPLEX  ENGLEVEL CCOVRLD IDLE
   nnnnnnn  nn%    nn%  nnnnnnnn    xxx  englevel  ccovrld xxx
```

Information about the CPU realtime usage is displayed. The headers are the same as those described for the CPSTAT command, except that ENGPARM is excluded.

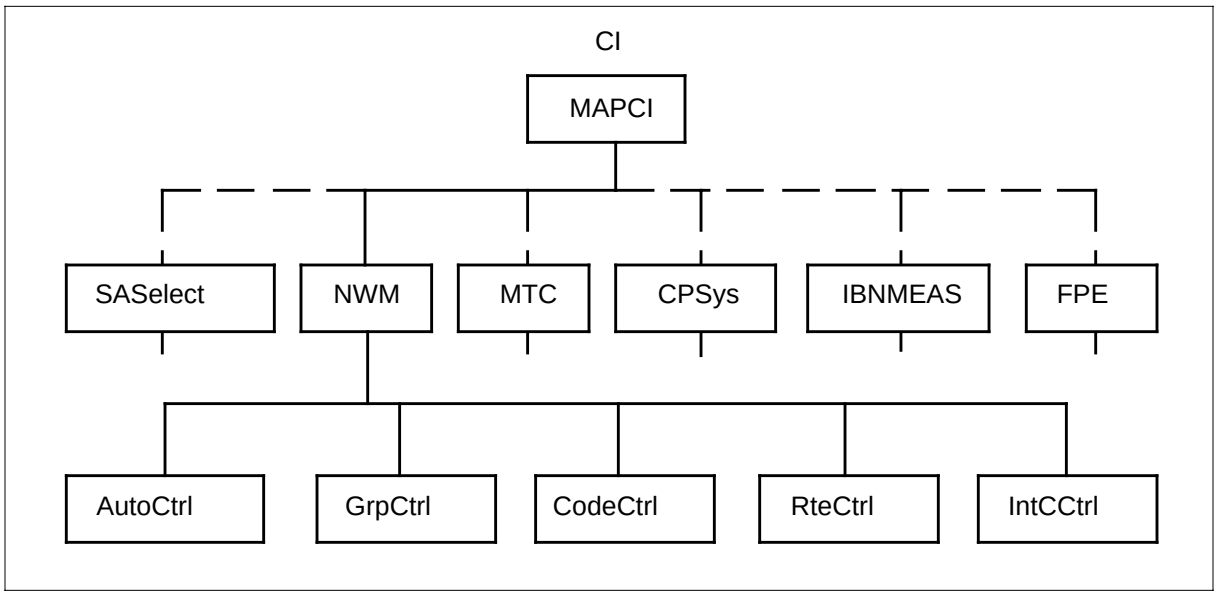
Usage notes The data is updated once a minute.

6 Network Management MAP levels

MAP level hierarchy

Network Management (NWM) information at the MAP is organized into a hierarchical series of levels, starting at the Command Interpreter (CI) level (See Figure 6-1). The CI level is accessed automatically when a user logs on at a Maintenance and Administration Position (MAP). At the CI level, the command MAPCI accesses the next lower level. From the MAPCI level, you can access other NWM levels as shown in Figure 6-1. That is, you can access the AutoCtrl, GrpCtrl, CodeCtrl, RteCtrl, and IntCCtrl MAP levels.

Figure 6-1 MAP level hierarchy for NWM

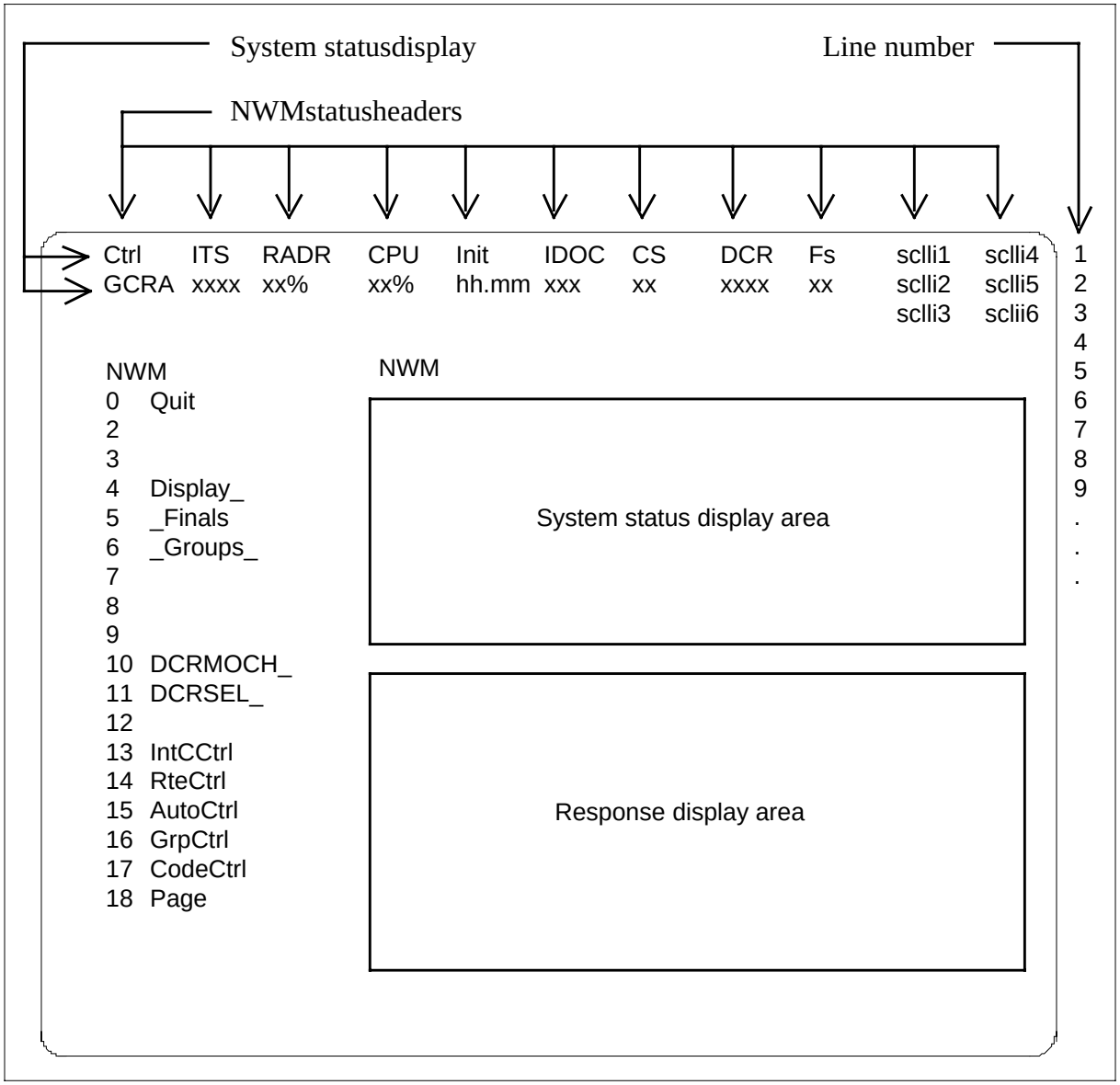


NWM subsystem MAP displays

In the NWM MAP display (See Figure 6-2), lines 1 and 2 are retained at all NWM MAP sublevels. These lines always show the system status for various NWM facilities and controls.

Note: The term "display" refers to "status display" or "response to a command entry".

Figure 6-2 Network Management (NWM) MAP display



The system status display information is updated every minute to reflect changing traffic. The display is updated immediately when controls are applied or removed. On line 2, data fields of up to six characters are provided under

each header. The data is displayed as mnemonic codes that indicate the status of the associated subsystem.

Table 6-1 Fields in the NWM MAP display (Sheet 1 of 4)

Field name	Value	Description
Ctrl	G, C, R, A, a, .	Indicates which of the NWM controls are active. The value contains four of the six possible entries, where • G indicates Group Controls (GrpCtrl) is active • C indicates Code Controls (CodeCtrl) is active • R indicates Route Controls (RteCtrl) is active • A indicates Automatic Controls (AutoCtrl) is active • a indicates Automatic Controls is disabled • . (dot) folowing the control identifier (G, C, or R) indicates the control is inactive For example, G.Ra indicates the following: • Group Controls is inactive • Route controls is active • Automatic Controls is disabled Four dots means that all controls are inactive.
ITS	0 to 9999	Indicates the total number of seizures including abandons and failures during the last minute of incoming trunk seizures
RADR	0 to 99%	Indicates the percentage of test calls for MF (multifrequency) receivers during the last minute whose delay time exceeded the the lower RADR threshold. For more information, refer to the description of RADR (Receiver Attachement Delay Recorder) in Chapter 3

Table 6-1 Fields in the NWM MAP display (Sheet 2 of 4)

Field name	Value	Description
CPU	0 to 99%	Indicates the portion of the last minute in which the Central Processing Unit (CPU) was executing call processing or higher priority tasks. The value in this field is taken from CPOCC register of OM group CPUSTAT or is calculated from the classes of OM group MACHACT. The value does not include usage for input/output interrupt processing. The commands CPSTAT and CPSTATUS display information on the occupancy of CPU realtime. For more information on the CPSTATUS software tool, refer to Chapter 5. For more information on OM groups MACHACT and CPUSTAT, refer to *Operational Measurements Reference Manual*.
Init	hh:mm	Indicates the time of any office initialization (warm or cold restart) during the past 30 minutes, where hh = 00 to 23 (hours) and mm = 00 to 59 (minutes).
IDOC	3, 2, 1, .	Indicates the active levels of Internal Dynamic Overload Control (IDOC) in the sequence shown, where activation occurs for the following: • level 3, when an office loses processing ability • level 2, when the percentage of time used to set up CPU call processing exceeds the preset threshold • level 1, when the number of incoming MF calls waiting for a receiver exceeds the on-threshold value • . (dot) when the level is inactive. That is, there is no IDOC congestion.

Table 6-1 Fields in the NWM MAP display (Sheet 3 of 4)

Field name	Value	Description
CS	Y, .	Y (yes) indicates that Centralized Automatic Message Accounting (CAMA) is suspended. A dot (.) indicates that CAMA is not suspended. If neither CAMA or Traffic Operator Position System (TOPS) is is loaded in the switch, the value is a dot. In switches that have provision for ANI failures or are not equipped for Automatic Number Identification (ANI), calls are routed to a CAMA operator who obtains the calling number for billing purposes. Office parameter CAMA_SUSP_CALLS_ALLOWED in table OFCENG selects which types can proceed without billing charges or operator intervention. When CS is activated, all CS calls are pegged in the CS field and all other operator calls are routed to reorder or to a treatment.
DCR	FHR, TND, NTND	Identifies the mode of operation of the switch as one of the following: • Fixed Hierarchical Routing (FHR) • DCR operating as a tandem (TND) switch • DCR operating as a nontandem (NTND) switch Only one mode can be active, even if parameter BOTH of command DCRMOCH has been entered to allow the switch to participate in either DCR mode. For more details, refer to the description of DCR in Chapter 4 and the description of the DCRMOCH command in this chapter. If the DCR feature is not present, none of the values are displayed.
Fs	0 to 99	Indicates the total number of final trunk goups (Finals) in an overflow condition. Only short common language location identifiers (SCLLI) with associated scan detector (SD) points are pegged for Finals (Fs) in Overflow. An SD point must be assigned for each final SCLLI to be displayed. Up to 32 SCLLI can be specified in table NWMSDPT.

Table 6-1 Fields in the NWM MAP display (Sheet 4 of 4)

Field name	Value	Description
sclli	sclli	Indicates the last six SCLLI (sclli 1 through sclli 6) with an overflow greater than zero. If more than six SCLLI are in the Fs state, the most recently entered SCLLI are displayed. The column to the left is filled first, starting at the top (refer to Figure 6-2). ***Note:*** Unless the SCLLI are entered in table NWMSDPT, the Fs SCLLI are not displayed.

Status display menus

Each NWM MAP level has a list of commands (menu) and various system status displays. At each MAP level, the menu commands provide the following capabilities:

- query functions or change operation of the switch functionality that is associated with that level
- access another level in the hierarchy

At each level, the left side of the MAP display shows the command menu. The menu lists the commands and parameters that can be entered at that level. Figure 6-3 lists the commands at the NWM level and the associated sublevels.

An underscore following a menu item indicates a parameter is required as part of the input. An underscore preceding a menu item indicates that the item is an optional parameter for a required parameter. For example, in Figure 6-4, `Display_` requires `_Finals` or `_Groups.`

Menu commands can be entered with one of the following:

- the number associated with the menu item (plus parameters, if any)
- the entire command string

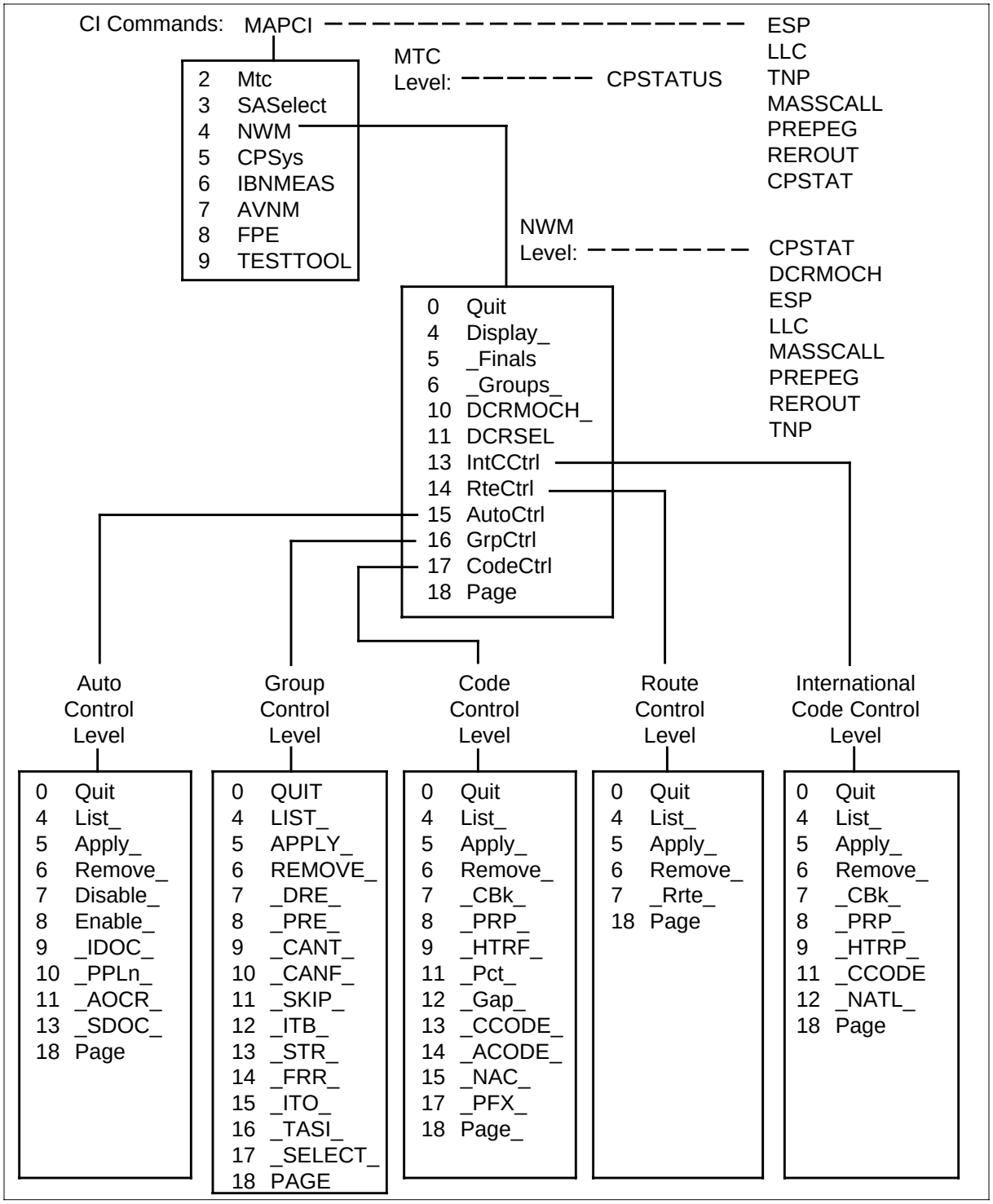
Note: When responding to a command prompt, the entered number must be preceded by a blank space if it matches a menu item number.

The menu display area contains a different set commands at each NWM MAP level. The response display area echoes entered commands. The commands entered affect the fields of the system status display area. The displays and command responses at various NWM MAP levels are described on the following pages. All responses described in the following pages appear in the NWM system status display and the response display areas.

NWM MAP level status displays

The NWM MAP level is shown in Figure 6-4. The first three lines of the MAP display are used for system status display information. These lines provide an overview of the traffic handling capability of the DMS switch. The lower lines show the menu on the left side and the display information related to the system status display (first three lines) on the right side.

Figure 6-3 NWM Menu Levels



Access to the NWM MAP level

To access to the NWM menu and MAP level, enter the following command string at the Command Interpreter (CI) level:

```
>MAPCI;MTC;NWM
```

Usage Notes

1. A cold restart deactivates all NWM controls. Only SDOC automatically resets during a restart.
2. Command parameters that are listed in the menu, but are not available on the switch or in a particular software load, generate the response: CONTROL NOT POSSIBLE.
3. If incorrect command syntax is entered, the CI prompts the user for the correct input. To cancel a command, use the ABORT command.

NWM menu commands

Figure 6-3 lists all commands available to NWM, including the NWM menu. The NWM menu is shown in Figure 6-4.

Figure 6-4 Example MAP display for the command DISPLAY FINALS

```
Ctrl  ITS   RADR  CPU  Init   IDOC  Cs  DCR  Fs  sclli1  sclli4
GCRA  xxxx  xx%   xx%  hh.mm  xxx   x   xxxx xx  sclli2  sclli5
                                                 sclli3  sclli6

NWM
0  Quit         display finals
2               Finals
3               SCLLI  CLLI        Ofrd Ovf     ACH CCH ICCH CCS Defl
4   Display_    RAL214 RALNC030214  234  40 17%  35  28   20 135   17
5   _Finals                        Ctrls
6   _Groups_
7
8
9
10  DCRMOCH_
11  DCRSEL_
12
13  IntCCtrl
14  RteCtrl
15  AutoCtrl
16  GrpCtrl
17  CodeCtrl
18  Page
```

Note: IntCCtrl (menu item 13) is present only in DMS-200/300 and DMS-300 offices.

AUTOCTRL command

The AUTOCTRL command accesses the AutoCtrl (Automatic Control) MAP level from the NWM MAP level. The AutoCtrl MAP display shows the numbers and types of active and disabled automatic controls. The data is updated whenever an automatic control is applied, removed, enabled, or disabled. The AutoCtrl commands are described in Chapter 7.

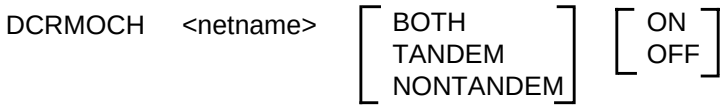
CODECTRL command

The CODECTRL command accesses the CodeCtrl (Code Control) MAP level from the NWM MAP level. The CodeCtrl MAP display shows the number of active code controls. The displayed data is updated whenever a control is applied or removed. The CodeCtrl MAP level is described in Chapter 9.

DCRMOCH command

The DCRMOCH command enables or disables DCR (dynamically controlled routing) tandem/nontandem participation.

Syntax



where

netname
specifies the network name

BOTH
specifies that the switch is to participate in both thetandem and the nontandem modes for DCR

TANDEM
specifies that the switch is to participate in only thetandem DCR mode

NONTANDEM
specifies that the switch is to participate in only thenontandem DCR mode

ON
enables the switch to participate in the DCR mode

OFF
disables the switch from participating in the DCR mode,that is, enables the FHR mode

Responses

The following table provides explanations for responses to the DCRMOCH command.

Table 6-2

Response	Explanation
CANNOT ENABLE TANDEM MODE UNTIL NP ACKNOWLEDGES PREVIOUS MODE CHANGE REQUEST	Only one mode change at a time can be completed. If the currently active DCR mode is disabled by the DCRMOCH command, or by changing datafill in table DCROPT, then the mode cannot be enabled until the NP acknowleges the disabling.
CANNOT ENABLE NON TANDEM MODE UNTIL NP ACKNOWLEDGES PREVIOUS MODE CHANGE REQUEST	
DCR ROUTING IS DISABLED ... FHR ROUTING RESUMES	When both DCR modes are disabled by command input or by changing datafill in table DCROPT, the FHR mode is activated.
TANDEM AND NON TANDEM ARE BOTH DISABLED	Disabling the specified mode(s) is confirmed and FHR is activated.
NON TANDEM MODE IS DISABLED	
TANDEM MODE IS DISABLED	
NON TANDEM MODE IS ENABLED	Enabling of the specified mode(s) is confirmed. One or both responses may be given.
TANDEM MODE IS ENABLED	

Usage Notes

1. DCRMOCH changes to the DCR mode only if parameter NUM_DCR_EXT_BLKS of table OFCENG is set with a value other than zero.
2. The command DCRMOCH can be entered at any NWM MAP level.
3. When DCR is deactivated, then FHR is automatically activated.
4. The nonmenu command TRAVER can be used for DCR. It is described in "DCR–related nonmenu commands" Chapter 4.

DCRSEL command

The DCRSEL command selects a network to monitor.

Syntax

DRRCSEL <netname>

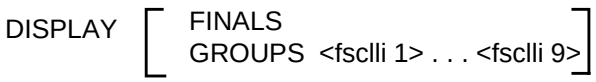
where

netname
specifies the network name

DISPLAY command

The DISPLAY command shows the counts for trunk groups. The DISPLAY command is available at all NMW MAP levels.

Figure 6-5 Syntax



where

FINALS
shows the traffic-related peg count, usage data, and the group controls that are active for all trunk groups designated as final in table NWMCLLI. Each row represents one trunk group (for example, the short CLLI RAL214 and its full CLLI RALNC030214. If the DISLAY command is entered, and there are more than ten final groups, the PAGE command sets up the next page of finals. The entry under the Fs header in the display is continually updated (See the description of the Fs header in Table 6-1).

GROUPS
displays the trunk group data header for trunk groups specified in table CLLIMTCE.

fsclli
identifies the trunk group(s) to be displayed for parameter GROUPS. Up to nine full CLLI, short CLLI, or any combination of the two may entered at a time, though table CLLIMTCE may have more than nine entries. If the entered string matches both a short CLLI and a full CLLI, the system selects the trunk group whose short CLLI is matched.

Responses

```
SCLLI   CLLI OFRD   OVF  ACH   CCH   ICCH  CCS DEFL

CTRLS:
```

The following table provides explanations for responses and for the values associated with the field identifiers in the response to the DISPLAY command. See also Figure 6-4.

Table 6-3

Response	Explanation
TRUNK TYPE INVALID	An incorrect trunk type has been added.
SCLLI	Identifies the final or selected SCLLI, for example, RAL214
CLLI	Identifies the full CLLI for the short CLLI (SCLLI)
OFRD	The peg count for calls offered (OFRD) access to the trunk group. The count includes calls deflected by NWM.
OVF	The overflow (OVF) count for the identified trunk. The display includes the percentage of the total OVF count.
ACH	The number of outgoing call attempts per circuit per hour (ACH) in the trunk group
CCH	The number of outgoing connections per circuit per hour (CCH) in the trunk group
ICCH	The number of incoming connections per circuit per hour (ICCH) in the trunk group
CCS	Traffic usage in Hundred Call-seconds per hour (CCS). The value displayed includes both incoming and outgoing usage.
DEFL	The number of calls deflected (DEFL) from the trunk group by any trunk group control
CTRLS	The identity of up to three controls that are active, for example, DRE. If an asterisk (*) follows the third control identifier, more than three controls are active. The field is blank if no controls are active.
Note: The values in table NWMCLLI for OVF, ACH, and CCH initiate printouts. These values are also used by table OMREPORT.	

GRPCTRL command

The GRPCTRL command accesses the GrpCtrl (Trunk Group Control) MAP level from the NWM MAP level. The GRPCTRL MAP display shows the

number of trunk groups that have active controls applied to them. The data is updated whenever a control is applied or removed. The Trunk Group Control commands are described in Chapter 8.

INTCCTRL command

The INTCCTRL command has the same function as the CODECTRL command except that it applies to DMS-200/300 and DMS-300 switches. The INTCCTRL command displays data for the active code controls of trunks, where Country Code (CCODE) blocks outgoing or transit international calls, and National Code (NATL) blocks incoming international calls. The data is updated every time a control is applied or removed. The IntCCtrl (International Code Control) MAP level is described in Chapter 11.

PAGE command

The PAGE command prints or displays the next page of data. The PAGE command and its function are common to all NWM MAP levels.

Responses

The following table provides explanations for responses to the PAGE command.

Table 6-4

Response	Explanation
`NO LIST DONE YET`	The PAGE command does not display data until the LIST command is entered. No controls are listed as active, so page displays the field identifiers with blank fields.
`NO MORE CONTROLS`	All data has already been displayed.
`NO MORE FINALS`	The displayed data is complete even if the data field is blank. If more data is to be displayed, it appears on following screens.
`SCLLI CLLI OFRD OVF ACH` `CCH ICCH CCS DEFL CTRL`	For each of the four control MAP levels, the field identifiers for the response to the PAGE command change.

QUIT command

The QUIT command, which is available at all MAP level levels, returns the MAP display to the previous level.

RTECTRL command

The RTECTRL command accesses the RteCtrl (Route Control) MAP level from the NWM MAP level. The RteCtrl MAP display shows data for the reroute controls that are currently active. The reroutes are initially specified in

the routing subtable RTEREF and NWM table REROUTE. The Reroute Control commands are described in Chapter 10.

7 Automatic Control (AutoCtrl) commands

Access to the AutoCtrl MAP level

The AutoCtrl MAP level and menu is accessed from the NWM MAP level by entering the command AUTOCTRL. At the AutoCtrl MAP level, commands are available to list, apply, remove, disable, or enable automatic controls. (See Figure 7–1)

Figure 7-1 AutoCtrl MAP display

```
Ctrl  ITS   RADR  CPU  Init   IDOC  CS  DCR  Fs  sclli1  sclli4
GCRA  nnnn  nn%   nn%  hh.mm  nnn   n   nnnn nn  sclli2  sclli5
                                                 sclli3  sclli6


0  Quit_     AutoCtrl
2                          IDOC   PPln  AOCR
3            Active        321    0     0
4  List_     Disabled      31     0     0
5  Apply_
6  Remove_   AUTOCTRL:
7  Disable_
8  Enable_
9  _IDOC_
10 _PPln_
11 _AOCR_
12
13 _SDOC_
14
15
16
17
18 Page
```

Selective Dynamic Overload Control (SDOC) applies to CCIS6 trunk groups only. For all practical purposes, SDOC is identical to PPLN (Preplanned Control).

AutoCtrl Commands

The status displays are updated every time a control is applied, removed, disabled, or enabled. The NWM130 log is generated whenever AUTOCTRL commands are activated or deactivated. See Table A-1 for a comparison of the syntax of all NWM menu commands. The following pages contain descriptions of the AutoCtrl MAP level commands.

APPLY command

The APPLY command manually activates the specified automatic control.

Figure 7-2 Syntax

```
APPLY <ctrl> <index>
```

where

ctrl
is IDOC, PPLN, AOCR, or SDOC the same types of controls as those for the LIST command

index
is 0 to 255. Refer to the description of the LIST command for more details.

Responses

The following table provides explanations for responses, user actions for responses, and system actions for the APPLY command.

Table 7-1

Response	Explanation
CONTROL NOT POSSIBLE	The specified control cannot be activated. For PPLN and AOCR, only one control at a time can be activated.
User action: Ensure that valid values are datafilled in table PREPLANS before another PPLN is activated. If you still cannot activate the control, another control is preventing activation. Use the LIST command to display active controls, then determine which control is assigned priority by activating or deactivating controls.	
OK	The specified control is activated.
System action: The display fields are updated as each control is activated.	

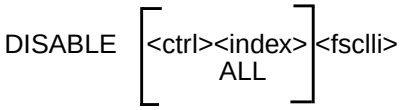
Usage Notes

1. For CCIS6 trunks, the commands APPLY and REMOVE control the trunk group(s) specified in table CCSDOC.
2. Until an IDOC level is deactivated by the REMOVE command, the level number (1, 2, or 3) remains in the continuous system status display for all MAP levels of NWM.

DISABLE command

The DISABLE command removes specified controls from automatic activation.

Figure 7-3 Syntax



where

ctrl
is IDOC, PPLN, AOCR, or SDOC, the same types of controls as those for the command LIST.

index
is 0 to 255. Refer to the description of the LIST command for more details

fsclli
is a full or short CLLI representing a trunk group. SCLLI are assigned in table CLLIMTCE. For SDOC, FSCLLI controls a single trunk group. If the entry matches both a short CLLI and a full CLI, the system selects the trunk group whose short CLLI is matched.

ALL
specifies all the controls

Responses

The following table provides explanations and user actions for responses to the DISABLE command.

Table 7-2

Response	Explanation
CONTROL NOT POSSIBLE	The control cannot be activated or disabled.
User action Ensure that valid values for the command parameters are entered. If you still cannot activate the control, another control is preventing activation. Use the LIST command to display active controls, then determine which control is assigned priority by activating or deactivating controls.	
OK	The specified control is disabled
System action All data field headers update after each control is disabled. When the LIST command is used, the display shows which controls are disabled.	

Usage Notes

1. Although only one PPLN at a time can be activated, more than one can be listed in table PREPLANS, and more than one can be disabled. This does not apply to AOCR; only the active AOCR can be disabled.
2. When a control is active, changes to a control group (fclli to which PPLN has been applied) in table PREPLANS are not allowed. With a control active., if you attempt to change the control in table PREPLANS, the message PREPLAN ACTIVE - CHANGE NOT ALLOWED is generated.

Example

Even though a control is not active, it can be disabled with the following sequence of commands.

Enter the following command:

```
>APPLY PPLN 1
```

Response:

```
CONTROL NOT POSSIBLE
```

The 1 is not a value in table PREPLANS. Enter the following command:

```
>DISABLE PPLN 1
```

Response:

```
OK
```

Even though PPLN 1 is not active in this example, it can be disabled. If the value of 1 is datafilled in table PREPLANS and the PPLN 1 is reapplied, PPLN 1 is still disabled. Otherwise, when an acceptable PPLN value is chosen, for example, by entering the following command:

```
>APPLY PPLN 2
```

Response:

```
OK
```

The response means that number 2 trunk group of table PREPLANS activates remote DOC. When PPLN 2 is also disabled the following response appears:

```
            IDOC    PPLN    AOCR    SDOC
Active       0       1       0       0
Disabled     0       2       0       0
```

Even though PPLN 2 is shown as being active, it is disabled. The 2 in the PPLN header field is the total number of disabled PPLN, unlike the IDOC field where the number indicates a level.

To display which PPLN are active and disabled, enter the following command:

```
>LIST PPLN ALL
```

Response:

```
PPLN                                          Page 1 of 1
    Index       Disable     State       Source
    1           Y           Off
    2           Y           On          MANUAL
```

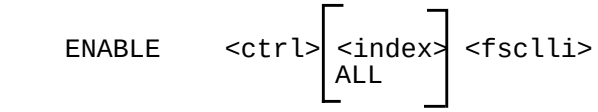
To cancel the disabling, enter the following command

```
>ENABLE PPLN ALL
```

ENABLE command

The ENABLE command returns automatic operation to specified controls that were previously disabled.

Figure 7-4 Syntax



where

ctrl
is IDOC, PPLN, AOCR, or SDOC the same types of controls as those for the LIST command

index
is 0 to 255. Refer to the description of the LIST command for more details

ALL
includes all the controls that are disabled

fsclli
is a full or short CLLI representing a trunk group. SCLLI are assigned in table CLLIMTCE. For SDOC, FSCLLI controls a single trunk group. If the entry matches both a short CLLI and a full CLI, the system selects the trunk group whose short CLLI is matched.

Responses

The following table provides explanations of responses, user actions for responses, and system actions for the ENABLE command.

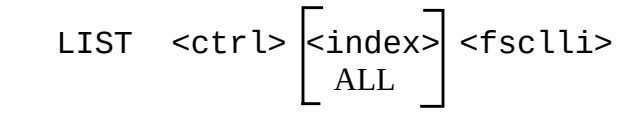
Table 7-3

Response	Explanation
CONTROL NOT POSSIBLE	An invalid value has been entered or the control of the specified index is not disabled.
User action: Enter valid values as parameters. Use the LIST command to display active controls, then determine which control is assigned priority.	
OK	The control is enabled (no longer disabled). If the control had been previously applied, it would be activated as specified by the APPLY command.
System action: There is no header field for ENABLE since the number in the Disabled field is reduced accordingly. If the enabled control is not active, the entry in the Disabled field under the OACR header is zero and the entry under the Ctrl header in the system status display is GCRA for an active AutoCtrl command.	

LIST command

The LIST command displays the active and disabled automatic controls for the specified type of control.

Figure 7-5 Syntax



where

ctrl
is one of the following automatic controls:

IDOC (Internal Dynamic Overload Control)

PPLN (Preplan Number Control)

AOCR (Automatic Out-of-Chain Reroute)

SDOC (Selective Dynamic Overload Control) SDOC applies to CCIS6 trunks only.

index
is a value for the type of automatic control. The ranges of values are as follows:

1 to 3 for IDOC

0 to 255 for incoming PPLN signals from other switches

0 to 63 for AOCR, based on the percentage overflow

1 to 3 for SDOC.

fsclli
is a full or short CLLI representing a trunk group. SCLLI are assigned in table CLLIMTCE. For SDOC, FSCLLI controls a single trunk group. If the entry matches both a short CLLI and a full CLI, the system selects the trunk group whose short CLLI is matched.

ALL
is used instead of the index value to list all the specified controls.

Responses

The following table provides explanations for responses to the LIST command and for the values associated with the field identifiers in the response to the to the LIST command.

Table 7-4

Response	Explanation
CONTROL NOT ACTIVE	The specified control is not active. A control can be shown as disabled before it is activated.
INVALID SHORT CLLI	For CCIS6 trunks, the SCLLI is entered in table CLLIMTCE. This applies to all trunks.
NO CONTROLS ACTIVE	For CCIS6 trunks, SDOC is not active.
NO MORE CONTROLS	No controls are active. The LIST command has been repeated or the LIST ALL command was entered with no controls active.
NO TRUNK GROUP SELECTED	Parameter sclli is not optional for SDOC.
INDEX DISABLE STATE SOURCE	Descriptions of the data under these headers follow.
INDEX	The index number for the type of automatic control specified
DISABLE	Y (yes) or N (no) to indicate whether the specified automatic control is disabled
STATE	Indicates whether the specified automatic control is ON or OFF
SOURCE	Identifies the origin of the trunk group control as one of the following: • AUTO - automatically applied • MANUAL - applied using NWM commands • CCIS - for CCIS trunks of CCISTNWM

Example

When the LIST command parameters are used, data changes are immediately shown in the status display. This applies to all NWM MAP levels. The

following display example indicates that IDOC level 2 has been turned off manually:

```
         IDOC   PPln   AOCR   SDOC
 Active   321    0      0      0
 Disabled 2      0      0      0
```

In the example above, all IDOC are Active, but IDOC level 2 is disabled and therefore inactive. To list the IDOC enter the following command:

>LIST IDOC ALL

Response:

```
PPLN                                  Page 1 of 1
   Index    Disable   State   Source
   1        N         On      AUTO
   2        Y         Off     MANUAL
   3        N         On      AUTO
```

The LIST IDOC ALL command gives the status of the field values shown in the display. In the NWM subsystem status display, the value under the Ctrl header is GCRa instead of GCRA (See Figure 7-1) and the value under the IDOC header is a dot (.). This indicates that the inactive automatic control is one of the IDOC levels.

To deactivate the controls enter the followingcommand:

>REMOVE IDOC ALL

Response:

```
OK
```

To list the IDOC, enter the following command

>LIST IDOC

Response:

```
IDOC                            Page 1 of 1
    Index  Disable  State  Source
    2      Y        Off
```

ALL is the default and applies to all controls (such as IDOC) on the AUTOCTRL menu.

Although no IDOC is now active in the example, the disabling of IDOC level 2 still applies. As long as IDOC 2 is disabled, it cannot be reactivated either manually or automatically. It must be enabled manually before activation can

occur. The AUTOCTRL display field for disabled IDOC 2 would then appear as follows:

```
          IDOC   PPln  AOCR  SDOC
Active     0      0     0     0
Disabled   2      0     0     0
```

The IDOC headers in the status displays are updated to show a dot (.) under each. Also, when the interval for the display updates ends, the value under Ctrl header in the system status display is GCRa instead of GCRA. To activate IDOC level 2, enter the following command:

```
>ENABLE IDOC 2
```

Response:

```
OK
```

Even though IDOC 2 is listed as disabled and is not listed as active, it can be enabled. The value under the Ctrl header of the system status display would then be GCRA instead of GCRa, indicating that at least one automatic control is active and none are disabled.

PAGE command

The PAGE command prints or displays the next page of data.

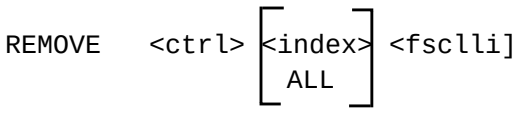
Response

The next screen of data is displayed with values under the display headers.

REMOVE command

The REMOVE command manually deactivates a specified control or all controls. It releases the manual control(s) to allow automatic reactivation.

Figure 7-6 Syntax



where

ctrl
is IDOC, PPLN, AOCR, or SDOC, the same types of controls as those for the command LIST.

index
is 0 to 255. Refer to the description of the LIST command for more details

ALL
includes all controls specified by ctrl

Responses

The following table provides explanations of responses and system actions for the REMOVE command.

Table 7-5

Response	Explanation
`CONTROL NOT POSSIBLE`	A control must be applied before it can be removed.
`OK`	The specified control is deactivated.
System action: The display fields are updated as each or all of the controls are removed (deactivated).	

Usage Note

For CCIS6 trunks, the commands APPLY and REMOVE control the trunk group(s) specified in table CCSDOC.

8 Group Control (GrpCtrl) commands

The maximum number of trunk groups that can be controlled simultaneously by Network Management (NWM) controls is 256.

Access to the GrpCtrl MAP level

The GrpCtrl MAP level and menu is accessed from the NWM MAP level by the entering the command GRPCTRL. At the GrpCtrl MAP level, commands are available to list, apply, or remove group controls on selected trunk groups (See Figure 8-1).

Figure 8-1 GrpCtrl MAP display

```
Ctrl  ITS   RADR  CPU  Init   IDOC  Cs  DCR  Fs  sclli1  sclli4
GCRA  xxxx  xx%   xx%  hh.mm  xxx   x   xxxx xx  sclli2  sclli5
                                                 sclli3  sclli6

GrpCtrl        GrpCtrl  Selected Group:RAL214  RALNC030214  IC
0  QUIT_       DRE  PRE  CanT  CanF  Skip  ITB   STR  FRR
2               32   25    11    17     9    7    41    0
3
4   LIST_      GRPCTRL:
5   APPLY_
6   REMOVE_
7  _DRE_
8  _PRE_
9  _CANT_
10 _CANF_
11 _SKIP_
12 _ITB_
13 _STR_
14 _FRR_
15 _ITO_
16 TASI
17 SELECT
18 PAGE
```

The ITO option is available in DMS–300 loads only.

TASI (menu item 16) is activated only on a DMS–300. Similarly, the heading TASI appears only on a DMS–300 switch; the value represents the number of active controls. The DMS–300 has TASI controls instead of STR controls.

GrpCtrl commands

The status displays are immediately updated whenever a control is applied or removed. See Table Table A-1 for a comparison of the syntax of all NWM menu commands. The following pages contain descriptions of the GrpCtrl MAP level commands.

APPLY command

The APPLY command adds the specified control to the selected trunk group. The trunk group must first be specified by the SELECT command.

Syntax

```
APPLYDRE<level>
      PRE   <level>
      CANT<dr_pct><ar_pct><ann>
      CANF<dr_pct><ar_pct><ann>
      SKIP  <dr_pct><ar_pct>
      ITB   <Level>
      STR   <lev1>[<lev2>][<LEVEL>]
      FRR <dr_pct> <ar_pct> <ctrlopt> <olo1>
 [....<olo16>]

 [<htropt>]    [<eaopt>]
 [<cicropt>]<viaopt>
      ITO
      BRC   <pct_inc><pct_og>[<num_pr>]
```

where

DRE to BRC

specifies the type of control to be applied . The valid entries are as follows

- DRE (Directional Reservation Equipment)
- PRE (Protective Reservation Equipment)
- CANT (Cancel To)
- CANF (Cancel From)
- SKIP (Skip)
- ITB (Incoming Trunk Busy)
- STR (Selective Trunk Reservation)
- FRR (Flexible Reroute)

- ITO (International Trunk Override) - When applied to a trunk group, ITO overrides protective NWM group control (GrpCtrl) and International code control (IntCCtrl) restrictions.
- BRC (Bidirectional Trunk Group Reservation Controls)
- TASI (Time Assignment Speech Interpolation) - DMS–300 only

level
specifies the number of reserved trunks in a trunk group. the range of values is 1 to 63. For ITB and STR, the level field specifies the percentage of traffic to be affected by the control

dr_pct
is 0 to 100, to specify the percentage of direct–routed traffic to be controlled. Values can be specified in increments of one.

ar_pct
is 0 to 100, to specify the percentage of alternate–routed traffic to be controlled. Values can be specified in increments of one.

ann
is EA1, EA2, or NCA, to specify the announcement to whichblocked calls are connected

Level
is 1 to 100

lev1, lev2
is 0 to 63

LEVEL
is 0 to 100

ctrl_opt
specifies the Immediate Reroute (IRR), Regular Reroute (RRR), or Table Reroute (TRR) control. The TRR option provides the capability to reroute traffic to an office route table (OFRT, OFR2, OFR3, OFR4). If the TRR option is used, VIAOFC must be entered as the VIA option (via_opt).

olo
specifies the OLO (Other Licensed Operator). OLOs are selected from table POECNM or the entry is ALL. If the entry is ALL, the control is applied to all OLOs. The OLO parameter applies to DMS–300 switches only.

htr_opt
An entry of HTR specifies that only those calls identified as hard–to–reach are affected. Omission of HTR specifies that all calls regardless of hard–to–reach status, are affected.

ea_opt
EA specifies that Equal Access calls are affected. NEA specifies that calls other than Equal Access are affected. ALL specifies that both EA and NEA calls are affected. ALL is the default.

cicr_opt
An entry of CICR specifies the Cancel In–Chain Return (CICR) control. CICR specifies that calls rerouted by the FRR control should be sent to treatment once the out–of–chain route list for those calls is exhausted. Omission of the CICR specifies that calls rerouted by FRR should not be sent to treatment once the out–of–chain route list is exhausted. Instead, these calls are returned to the next route in the in–chain route list.

via_opt
An entry of VIA specifies that a list of Common Language Location Identifiers (CLLIs) is affected. The list specifies the sequence of out–of–chain routes in which calls affected by the FRR control are directed. One to seven FSCLLI can be specified to carry calls rerouted by the FRR. Enter a valid trunk group name (these can be found in table CLLIMTCE). If the FSCLLI entry matches both a short and a full CLLI, the short CLLI name is selected.

fclli
is the full or short CLLI representing the trunk group

ALL
specifies all trunk groups

pct_inc
is 0 to 100

pct_og
is 0 to 100

num_pr
is 0 to 2047

Responses

The following table provides explanations for responses, user actions for responses, and system actions for the APPLY command.

Table 8-1 (Sheet 1 of 2)

Response	Explanation
`BOTH DR AND AR PERCENTS CANNOT BE 0`	Values of zero were specified for both dr_pct and ar_pct fields when applying a CANT, CANF, or SKIP control.
User action: Enter a value other than zero in the dr_pct or ar_pct field.	

Table 8-1 (Sheet 2 of 2)

Response	Explanation
CONTROL NOT POSSIBLE	The control is not permitted for the trunk group or a different control is already active.
User action: Ensure that valid values are entered for parameters. If you still cannot activate the control, another control is preventing activation. Use the LIST command to display active controls, then determine which control is assigned priority. (See usage note 2.)	
NO TRUNK GROUP SELECTED	The SELECT command must be used before the APPLY command.
OK	The selected control is applied.
System action Display fields are updated as each control is applied.	
STR LEVEL 2 MUST BE LESS THAN STR LEVEL 1	For STR, Lev2 must be less than Lev1, where • Lev1 is 0 to 63 • Lev2 is 0 to 63 • Level is 0 to 100
Invalid OLO	The selected OLO does not exist in table POECNM.

Usage notes

1. The SELECT command must always be used before the APPLY (and REMOVE) command.
2. The priority of Group Control activation is listed in "Priority of NWM" section in Chapter 3.
3. TASI is not relevant to the APPLY command since TASI is automatically active. Manual deactivation of TASI is effective for as long as the time interval specified in office parameter TASINVTL in table OFCVAR. The range for TASINTVL is 1 to 60 minutes.
4. The percent sign (%) does not need to be entered for any of the NWM commands.
5. For some controls, the NWM system prompts for the ann value if one is not supplied.
6. A CI error message indicates that Ann (given the value EA1) is not a parameter of SKIP.
7. FRR control (ctrl) options IRR and RRR can be applied manually (APPLY FRR command) or automatically (table AUTOCTRL). The TRR

option can only be applied manually. The NWM107 log is generated to report the use of the FRR control with the TRR option. For more details, refer to the description of the NWM107 log in *Log Report Reference Manual*.

Example for usage note 5

If you enter the command **APPLY CANT DAR 10**, the response is `Enter (Ann)` If you enter **EA2** at the prompt, the system recognizes the Ann option and responds with `OK`.

The command is now executed fully. A 1 is shown under the CanT header in the display. To display the effect of the CANT control on the selected trunk group, enter the following command:

```
>LIST CANT ALL
```

Response:

```
CanT                                                  Page 1 of 1
 SCLLI    CLLI           DR_Pct   AR_Pct   Ann    Source
  RAL214   RALNC030214    10%      50%      EA2    MANUAL
```

Note: RAL214 was previously selected by the SELECT command.

Example for usage note 6

If you enter the command **APPLY SKIP 25 12 EA1**, the response is `EITHER INCORRECT OPTIONAL PARAMETER(S) OR TOO MANY PARAMETERS`

Other examples

There are two methods of applying Flexible Reroute (FRR) control to a trunk group using the APPLY command. These two methods are as follows:

- single line entry
- field prompt entry

With the **single line entry** method, the command and control parameters are entered on the same line at the GrpCtrl MAP level, as shown in the following example inputs:

```
>APPLY FRR 100 0 RRR VIA OTMF1

>APPLY  FRR  100  100  IRR  VIA  OTMF1

>APPLY  FRR  50  100  RRR  HTR  NEA  CICR  VIA  OTMF1  OTDP1
```

Note: The FRR parameters must be entered in the order shown, otherwise the result may be the exclusion of parameters from the control applied.

With the **field prompt method**, the command and the control to be applied are entered on the same line at the GrpCtrl MAP level. The remaining parameters are then entered at the prompts. The remaining parameters include dr_pct), ar_pct, IRR, RRR, HTR, EA, NEA, ALL, CICR, VIA, and fsclli1 through fsclli7.

Example of first input:

```
>APPLY FRR
```

Note 1: When using the prompt method, enter parameters on the same line as the parameter IRR or RRR to have them included in the control.

Note 2: The numerical values entered for the parameters dr_pct and ap ar_pct are preceded by an underscore. This underscore denotes a blank space that must precede numerical values to avoid having them interpreted as GRPCTRL menu items.

Response:

```
Enter: <DRPct><ARPct><CTRLOPT>(<HTROPT>)(<EAOPT>)
(<CICROPT>)<VIA><FSCLLI1 - FSCLLI7>
```

Next input:

```
> _100
```

Response:

```
Enter:
<ARPct><CTRLOPT>(<HTROPT>)(<EAOPT>)(<CICROPT>)
<VIA><FSCLLI1 - FSCLLI7>
```

Next input:

```
> _20
```

Response:

```
Enter: <CTRLOPT>(<HTROPT>)(<EAOPT>)(<CICROPT>)
<VIA><FSCLLI1 - FSCLLI7>
```

Next input:

```
>IRR HTR EA CICR
```

Response:

```
Enter:  VIA OTMF1 OTDP1
```

>APPLY FRR

Response:

```
Enter: <DRPct><ARPct><CTRLOPT>(<HTROPT>)(<EAOPT>)
(<CICROPT>)<VIA><FSCLLI1 - FSCLLI7>
```

Next input:

> _100

Response:

```
Enter:
<ARPct><CTRLOPT>(<HTROPT>)(<EAOPT>)(<CICROPT>)
<VIA><FSCLLI1 - FSCLLI7
```

Next input:

> _20

Response:

```
Enter: <CTRLOPT>(<HTROPT>)(<EAOPT>)(<CICROPT>)
<VIA><FSCLLI1 - FSCLLI7>
```

Next input:

>IRR

Response:

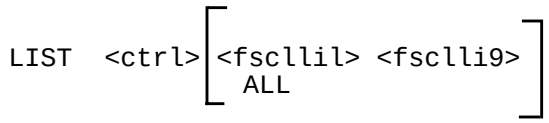
```
Enter: <VIA><FSCLLI1 - FSCLLI7>
```

>VIA OTMF1 OTDP1

LIST command

The LIST command lists the trunk groups with the specified type of control. The LIST command functions in the same manner as the LIST command in the AutoCtrl MAP level.

Figure 8-2 Syntax



where

ctrl is one of the following controls:

- DRE
- PRE
- CANT
- CANF
- SKIP
- ITB
- STR
- FRR
- TASI (DMS–300 only)
- ITO
- BRC
- BSSKIP

fsclli
is a Full or Short CLLI representing a trunk group. SCLLI is assigned in table CLLIMTCE. Up to nine full CLLIs, short CLLIs, or any combination of the two may be entered. If the entry matches both a short CLLI and a full CLLI, the system selects the trunk group whose short CLLI is matched.

ALL
includes all FSCLLI specified by ctrl.

Responses

The following table provides explanations for responses, user actions for responses, and system actions for the LIST command.

Table 8-2 (Sheet 1 of 2)

Response	Explanation
CONTROL NOT ACTIVE	The specified control is not active.
TRUNK GROUP INVALID	The trunk group is not listed in table CLLIMTCE.
SCLLI CLLI DR_PCT AR_PCT LEVEL LEV1 LEV2 PCT ANN NTRKS CALCBSY NBSY NWMBSY OPTIONS SOURCE	Depending on the entry for parameter ctrl, a combination of headers shown is displayed:
SCLLI	Up to six characters entered in table CLLIMTCE to represent a specific trunk group short CLLI
CLLI	The full CLLI for the short CLLI
DR_PCT	Indicates the percentage of direct–routed traffic to be rerouted cancelled, or skipped
AR_PCT	Indicates the percentage of alternate–routed traffic to be rerouted cancelled, or skipped
LEVEL	Indicates the percentage of traffic to be rerouted, cancelled, or skipped
LEV1	Identifies the first idle trunk threshold for STR
LEV2	Identifies the second idle trunk threshold for STR
PCT	Is the percentage (0 to 100) of hard–to–reach traffic to be controlled by STR when the idle trunk level of a trunk group falls between Lev1 and Lev2.
ANN	Identifies one of three treatments (announcements) to which calls are deflected when a group control is applied. The treatments are as follows: • EA1 - Emergency announcement 1 • EA2 - Emergency announcement 2 • NCA - No circuit announcement
NTRKS	The number of trunks in a group, excluding unequipped and offline trunks

Table 8-2 (Sheet 2 of 2)

Response	Explanation
CALCBSY	The number (0 to 9999) of Calculated Busy trunks that are NWM busy
NBSY	The number (0 to 9999) Actually Busy trunks in a trunk group. The number includes all types of busy, for example, MBsy or NWBsy.
NWMBSY	The number of trunks in a group that have been made busy for NWM. The number does not include trunks affected by the Remote Make Busy Scan Point Control feature.
OPTIONS	Identifies the optional parameters specified with the FRR control
SOURCE	Identifies the origin of the trunk group control as one of the following: • AUTO - automatically applied • MANUAL - applied using one of the control commands • CCIS - for the CCIS6 trunks of CCISTNWM • EADAS applied by the EADAS/NM system

Examples

Since the LIST ctrl command has a different header response for each control, the following are the exceptions:

1. For the following command:

   >LIST SKIP ALL

   The response is as follows:

```
Skip                                                  Page 1 of 1
 SCLLI  CLLI          DR_Pct    AR_Pct    Ann    Source
 RAL214 RALNC030214   50%       50%              MANUAL
```

   For trunk group RAL214, 50% of DR traffic and 50% of AR traffic is skipped. The control was set manually. Ann is not an optional parameter to SKIP, so the ANN field is blank.

2. For the following command:

   >LIST ITB ALL

The response is as follows:

```
ITB                                                  Page 1 of 1
 SCLLI  CLLI              Level NTrks CalcBsy NBsy NWMBsy
Source
 Ral214 RalnC030214        1%    1      0    1     0  Manual
```

The system display header ITB also has a 1 under it.

3. For the following command:

```
>LIST  STR  ALL
```

The response is as follows:

```
STR                                              Page 1 of 1
 SCLLI      CLLI          Lev1    Lev2    Pct   Source
 RAL214     RALNC030214      5       3    100%  MANUAL
```

For STR only, Lev1 and Lev2 are the two thresholds for applying this group control to the specified trunk groups. Pct indicates the percentage of total blockage (See x% in Table 3–2). ALL is not a default for STR.

PAGE command

The PAGE prints or displays the next page of data.

Responses

The following table provides explanations for responses to the PAGE command.

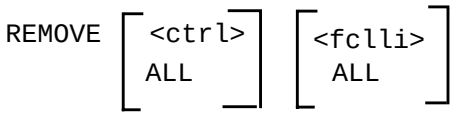
Table 8-3

Response	Explanation
NO MORE CONTROLs	The current page is the last page of controls.
SCLLI CLLI LEV1 LEV2 PCT SOURCE	The screen of data generated by the STR command displays data under the headers shown.
SCLLI CLLI LEVEL NTRKS CALCBSY NBSY NWMBSY SOURCE	The screen of data generated by the ITB command displays data under the headers shown.
SCLLI CLLI LEV SOURCE	The screen of data generated by the DRE and PRE commands display data under the headers shown.
SCLLI CLLI DR_PCT AR_PCT ANN SOURCE	The screen of data generated by the CANT and CANF commands display data under the headers shown.

REMOVE command

The REMOVE command removes a control from a selected trunk group, or all trunk groups.

Figure 8-3 Syntax



where

ctrl
is the type of control. Refer to the description of the LIST command for a list of control types.

ALL
includes all the trunk groups, regardless of the previouslyselected controls. ALL overrides the SELECT command.

fclli
is the full or short CLLI representing a trunk group (ITO, DMS–300 loads only)

ALL
specifies all trunk groups with ITO

Responses

The following table provides explanations of responses and system actions for the REMOVE command.

Table 8-4

Response	Explanation
NO TRUNK GROUP SELECTED	The SELECT command must be used before the REMOVE command.
OK	The control for the selected trunk group is deactivated. If the control is not active when the REMOVE command is entered, the response does not change.
System action Display fields are updated as each control is applied or all controls are applied.	

Usage Note

The SELECT command must always be entered before the REMOVE (and APPLY) command.

SELECT command

The SELECT command specifies the trunk group to be acted upon by the APPLY or REMOVE commands and displays the current control status of the FSCLLI.

Syntax

```
SELECT <fsdi>
```

where

fsclli
is a full or short CLLI representing a trunk group. The FSCLLI is defined in data schema table CLLIMTCE. If the entry matches both a short CLLI and a full CLLI, the system selects the trunk group whose short CLLI is matched.

Responses

The following table provides explanations of responses and user actions for the SELECT command.

Table 8-5

Response	Explanation
CONTROL NOT POSSIBLE	The specified FSCLLI is not datafilled in table CLLIMTCE.
User action Use the DISPLAY FINALS command to display the FSCLLI. If the FSCLLI is not displayed, datafill the FSCLLI in table CLLIMTCE.	
SCLLI CLLI OFRD OVF ACH CCH ICCH CCS DEFL CTRL	Refer to the description of the DISPLAY GROUPS <fsclli> command in in the NWM commands in Chapter 6.
TRUNK GROUP INVALID	An invalid CLLI or short CLLI has been entered.
TRUNK TYPE INVALID	
User action Use the DISPLAY FINALS command to display the FSCLLI. If the FSCLLI is not displayed, datafill the FSCLLI in table CLLIMTCE.	

Usage Note

The SELECT command must be entered before the APPLY or REMOVE command.

Example

To select trunk group RALCN030214 (FCLLI), enter the following command:

```
>SELECT RALCN030214
```

Response:

```
SCLLI   CLLI           OFRD  Ovf     ACH  CCH  ICCH  CCS   Defl
 RAL214  RALNC030214      10   10 **   40     0    4   60      0
                        Ctrls:
```

Since the Ovf field shows a high count and the Defl field a low count, the network manager should consider applying at least one control.

```
>SELECT RAL214
```

Response:

```
SCLLI   CLLI           OFRD  Ovf     ACH  CCH  ICCH  CCS   Defl
 RAL214  RALNC030214      10  1-14% ** 40   24     4   60      3
                        Ctrls:
```

With SKIP applied to the traffic, the number of overflowed calls (in field Ovf) decreases, while the number of deflected calls (in field Defl) increases.

If more than six Controls are active, the Ctrls field shows the first six plus a bullet.

The percentage value in the Ovf field is derived as follows: Ovf divided by OFRD times 100 to get 1/10x100, or 10% overflow.

9 Code Control (CodeCtrl) commands

The CODECTRL MAP level is accessed from the NWM MAP level by entering the command CODECTRL. CodeCtrl commands are available to list, apply, or remove code controls on specified code types (See Figure 9-1).

Figure 9-1 CodeCtrl MAP display

```
Ctrl  ITS  RADR  CPU  Init    IDOC   CS   DCR   Fs  sclli1  sclli4
GCRA  xxxx xx%   xx%  hh.mm   xxx    x    xxxx  xx  sclli2  sclli5
                                                  sclli3  sclli6


CodeCtrl       CodeCtrl
0  Quit_       CBkC  CBkA  CBkN  CBkP  PRPC  PRPA  PRPN  PRPP
2                25    12    65    10     8    15    20    10
3
4  List_
5  Apply_      HTRFC  HTRFA  HTRFN  HTRFP
6  Remove_        2      7     20     10
7  _CBk_
8  _PRP_       CODECTRL:
9  _HTRF_
10
11 _Pct_
12 _Gap_
13 _CCODE_
14 _ACODE_
15 _NAC_
16
17 _PFX_
18 PAGE
```

The subheaders and subheader suffixes under the CodeCtrl header represent the following:

- C = country code (CCODE)
- A = area code (ACODE)

- N = non–area code (NAC)
- P = prefix code (PFX)
- CBk = code blocking
- PRP = preroute peg count
- HTRF = hard–to–reach flag

Note 1: PFX (menu item 17) and the headers with suffix P are present only for EA (equal access) offices with order code BAS00003 (BAS Generic).

Note 2: The sum of the field values for CBk and PRP is as follows:

CBk + PRP = 256 maximum (except in offices that contain EADAS, where the sum of the field value is CBk + PRP = 64 maximum)

CodeCtrl commands

The status displays are immediately updated whenever a control is applied or removed. Without accessing the CodeCtrl MAP level, the CBk control can be applied by entering the CI (nonmenu) command MASSCALL and the PRP control can be applied by entering the CI command PREPEG. See Table A-1 for a comparison of the syntax of all NWM menu commands and Table B-1 for a list of all the CI (nonmenu) commands.

Operation of ACODE Controls

If the NPA (numbering plan area) digits of the ACODE control match the SNPA (serving numbering plan area) in table HNPACONT against which the control is being applied, the control is implemented internally as an LCODE control with the NPA removed from the destination string. Thus, if an ACODE control on the number string 919-991 is applied against SNPA 919, the control is implemented internally as an LCODE control against 991. This change is transparent at the MAP interface and at the EADAS/NM interface.

As an additional example, assume that a DMS office contains the following entries in Table HNPACONT: 919 and 704. Table 9-1 describes how different ACODE controls in the office affect different traffic.

Table 9-1 ACODE examples (Sheet 1 of 2)

ACODE control	919 customer dials	919 encounters control	704 customer dials	704 encounters control
919	919-	yes	919-	yes
919 -991	991-991-	yes (See note)	919-991-	yes
Note: this type of call is blocked if table HNPACODE retranslates on the office code. That is, the translation selector is HNPA 0.				

Table 9-1 ACODE examples (Sheet 2 of 2)

ACODE control	919 customer dials	919 encounters control	704 customer dials	704 encounters control
919-991	991-	yes	991-	no
704	704-	yes	704-	yes
704-991	704-991-	yes	704-991-	yes (See note)
704-991	991	no	991-	yes
201	201-	yes	201-	yes
201-991	201-991	yes	201-991	yes

Note: this type of call is blocked if table HNPACODE retranslates on the office code. That is, the translation selector is HNPA 0.

In the preceding examples, the control appears as an ACODE control at the command interface.

If multiple controls can be applied against a single call, the most specific control is applied first.

For DMS–200/300 and DMS–300, the equivalent to the Code Control (CodeCtrl) MAPlevel is the International Code Control (IntCCtrl) MAP level (See "IntCCtrl commands" in Chapter 11). The IntCCtrl controls function the same, but different names and parameters are used to distinguish IntCCtrl controls from others.

APPLY command

The APPLY command adds the specified code control(s).

Figure 9-2 Syntax

```
APPLY CBK<blocktype> PCT <type> <code> <level>
                     GAP <type> <code> <gap>
 [<ann>     ]
 [<snpa/sts>]
 [  ALL     ]

 PRP<type> <code> [<snpa/sts>]
                  [ ALL      ]

 HTRF  <type> <code> [<snpa/sts>]
                     [  ALL     ]
```

where

CBK
specifies the code blocking control

blocktype
is PCT or GAP (CBK only)

type
is CCODE, ACODE, NAC, or PFX; the same code types as those of the LIST command

code
is a 1 to 18 digit number (1 to 4 for CCODE). The number can be entered with or without quotation marks (for example, '727' or 727).

level
is 1 to 100 percent blockage (CBK only)

gap
is 0 to 600 seconds, in increments of tenths of seconds, that GAP is activated (CBK only)

ann
is EA1, EA2 or NCA; the same treatments as those of theLIST command (CBK only)

snpa/sts
is a three–digit code with values identical to those of the LIST command The ranges are 100 to 999 (SNPA) and 000 to 999 (STS). These values can be entered with or without single quotation marks. This field does not apply to CCODE or PFX code types.

ALL
indicates that the specified control is to be applied to allNPAs defined in the office.

PRP
specifies the preroute peg count control

HTRF
specifies the hard–to–reach flag control

Note: The command syntax for the various control parameters and their data fields do not necessarily indicate STS as part of the SNPA.

Responses

The following table provides explanations for responses to the APPLY command.

Table 9-2

Response	Explanation
`Cannot apply HTRF when CBK active.`	When both HTRF and CBK apply to the same codes, only one control can be activated on those codes
`Carrier number not defined in OCCINFO`	The carrier number specified by 10XXX is not defined in table OCCINFO.
`Code already has active control.`	More than one of the specified controls is not allowed.
`Code blocking by CC not applicable.`	Although parameter CCODE is listed, it cannot be applied because it has no effect.
`Insufficient digits` or `Invalid digits`	The code digits are incorrect or the single quotation marks have been omitted. The destination code lacks the '10', '0', or '9501' digits of the prefix code.
`No DDO software in office.`	When attempting to block a CCODE, the subsystem for Direct Dialing Overseas (DDOSUB) was not available
`Not an equal access office`	The office does not have equal access capability.
`OK`	The control is active.
`Too many controls active`	The number of controls active has exceeded the 256 limit or 64 limit (See Note 2 after Figure 9–1). The 64 limit applies to offices that contain EADAS.
`Valid SNPA needed`	Based on datafill in table HNPACONT, the SNPA/STS has not been supplied or is incorrect for controls with ACODE or NAC.

Usage Notes

1. Gapping values must be activated from the least to the most specific, with a range of 0 to 600 seconds, in increments of one–tenth of a second. Gapping values must also be enclosed in single quotation marks when used with the APPLY command. In addition, a decimal must always be used when a gapping value is specified (for example, '50.0'). The number

of eligible call gaps depends on the number of HNPA (home numbering plan area) in the office.

2. Some APPLY command parameters do not allow SNPA/STS values. SNPA/STS must be specified for ACODE and NAC (See Example 2).
3. A prefix code control can only be applied in Equal Access (EA) offices. Both the digit collection method and translations restrict the number of digits that can be blocked for an Equal Access call. The prefix code blocking is performed when sufficient digits have been received from the peripheral to determine a LATA status as specified in table LATAXLA for the digits being dialed. For more information see example 8.
4. If more than one control can be applied against an Equal Access call, only the most specific control is applied.
5. The command APPLY CBK blocks a percentage of traffic or gaps the calls destined for a given code and routes this traffic to one of the specified treatments.
6. For ACODEs, if the NPA against which the control is being applied matches the NPA in the destination code, the NPA is removed from the destination code for that particular entry.
7. The APPLY PRP or APPLY HTRF command pegs all calls to a given code, but blocks none. A percentage of HTRF traffic is blocked if the STR control is active.
8. Mass Calling (if present in the software) is applied when CBK or HTRF parameters are entered.
9. Tables CCTR and CCTRNSL cannot be edited until all CCODE controls are deactivated. For example, CCODE 44 cannot be deleted from table CCTR until the command LIST indicates that all CCODE 44 controls are inactive. Attempts to edit the table may generate the following response:

   ```
   CODE CONTROL IN EFFECT - NO MODIFICATIONS ALLOWED
   ```

   Quit the table and enter the CodeCtrl MAP level to cancel the appropriate controls.
10. NAC control applies to any call. The number of digits dialed for NAC control is not considered. ACODE control applies only to 10–digit calls.
11. Code controls are supported on calls translated through table HNPACONT (North American translations) only.
12. When you apply a code control with the ALL option, remove that control with the ALL option of the REMOVE command.
13. Before the ALL option of the APPLY command can work on each NPA that the office serves, you must remove the controls that you apply on a single serving numbering plan area/serving translations scheme (SNPA/STS). If you apply a code control against a single SNPA/STS, that

SNPA/STS cannot change to ALL without the removal of the original control.

14. You cannot apply a code control against a prefix code that is not in that office. You cannot remove a current office prefix code if a code control against the prefix code is present.

Example 1

For the APPLY command, the optionality of SNPA/STS varies according to parameter CCODE, ACODE, NAC, or PFX. If you enter the following command string:

```
>APPLY PRP CCODE '33'
```

the response is `OK`.

More than one PRP cannot be applied, and SNPA/STS is optional. All CCODEs with tuple 33 are counted, but not blocked. If you enter the following command string

```
>APPLY PRP CCODE '33' 819
```

the response is `OK`.

The 819 is an SNPA and is not optional for ACODE. All of the traffic offered to area code 33 that originates from area code 819 is counted.

Example 2

Parameter SNPA is not optional for application of CBK, ACODE, and NAC. If you enter the following command string:

```
>APPLY CBK PCT ACODE '613' 10 NCA '222
```

the response is `VALID SNPA/STS OR 'ALL' ARE NEEDED`.

A valid SNPA code might be 819 instead of 222. If 819 were used, the command string would mean that a random 10 percent of all calls offered to area code 613 that originated from area code 819 are blocked and sent to NCA treatment.

Example 3

To flag all calls to CCODE 33 as hard–to–reach, enter the following command string:

```
>APPLY HTRF CCODE '33
```

Example 4

To apply a percentage of code blocking on the digits 621-1234 for maximum blocking from subscribers with area code 613 and send the calls to the no circuit announcement, enter the following command string:

```
>APPLY CBK PCT NAC '6211234' 100 NCA '613
```

Example 5

To apply a percentage of code blocking on the digits 613-621-1234 for maximum blocking from subscribers with area code 613 and send the calls to the no circuit announcement, enter the following command string:

```
>APPLY CBK PCT ACODE '6136211234' 100 NCA '613
```

If dialing 6211234 from within the 613 NPA, the call is blocked.

Example 6

To apply a gapping control on the prefix digits 10222, with the gap set to 100 seconds and with a no circuit announcement, enter the following command string:

```
>APPLY CBK GAP PFX '10222' 100 NCA
```

The control is applied so that only one call for all 10222 destinations is allowed to complete every 100 seconds. The "no circuit" announcement is given to uncompleted calls.

Example 7

To apply call gapping that involves control of both the originator and the destination, enter:

```
>APPLY CBK GAP ACODE '613' 50 NCA '919
```

The command applies call gapping to area code 613 so that only one subscriber every 50 seconds dialing from NPA 919 is allowed to complete the call.

Example 8

The following is an example of applying a prefix code control in an Equal Access (EA) office.

```
10XXX-NPA-NXX-XXXX

10121-314-333-4881
```

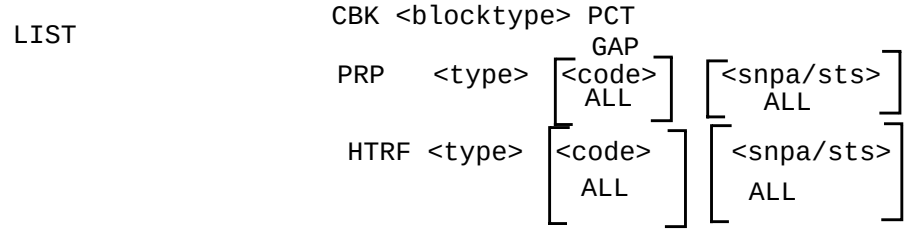
```
Digits are received in the following order (dependent on our
office)
--------------------------
1) 10121-314
2) 333
3) 4
4) 881

Table LATAXLA
--------------------------
LATA1 3143 INTER INTER STD

Code Blocking on:
--------------------------
10121 thru 10121-314-333

Will block called number:
--------------------------
10NXX-NPA-NXX-XXXX
10121-314-333-4881

Code Blocking on:
--------------------------
10121-314-333-4881

Will not block called number:
--------------------------
10NXX-NPA-NXX-XXXX
10121-314-333-4881
```

Note: Equal Access identifies the LATA status after collecting the 10NXX-NPA-NXX, therefore this call is not blocked because Equal Access translations is complete. To block this number you must datafill table LATAXLA with 3143334.

LIST command

The LIST command displays the peg count and the control parameters in effect (for a specified control and code type).

Figure 9-3 Syntax



where

CBK
specifies code blocking control

blocktype
is PCT or GAP

PRP
specifies preroute peg count control

HTRF
specifies hard–to–reach flag control

type is one of the following code types:

- CCODE (country code)
- ACODE (area code)
- NAC (non-area code)
- PFX (prefix code)

code
is a 1 to 18 digit number (1 to 4 for CCODE), except for seven–digit numbers, the number can be entered with or without quotation marks (for example,'727' or 727)

ALL
specifies all codes

snpa/sts
is a three–digit code, where the SNPA code range is 100 to 999 and the STS range is 000 to 999

ALL
indicates that the specified control is to be listed for all NPAs defined in the office

Note: SNPA is not applicable to CCODE or PFX codes.

Responses

The following table provides explanations for responses to the LIST command.

Table 9-3 (Sheet 1 of 2)

Response	Explanation
`Control not active`	The specified control is not active.
`Digits Level Ann Peg SNPA/STS Gap`	The headers for the response to the LIST command are shown. Each of the headers has data under it. This data is described below.

Table 9-3 (Sheet 2 of 2)

Response	Explanation	
	Digits	A number from 1 to 18 that indicates the number of digits for the code by which calls are blocked or counted
	Level	A number from 1 to 100 that indicates the blocking percentage that is set on the blocked code.
	Ann	The treatment the calls are routed to: NCA, EA1, or EA2.
	Peg	A number from 0 to 9999 that indicates the number of times a code is blocked or counted.
	SNPA/STS	A three–digit code that indicates the area code of the serving office to which the control appllies. SNPA/STS values are not relevant for CCODE. The ranges are as follows: • SNPA: 100 to 999 • STS: 0 to 999 ***Note:*** Log reports NWM110, NWM111, and NWM112 are generated for blocked and counted SNPA, STS, and PFX.
	Gap	The time period between completed calls. The range is 0 to 600 seconds in increments of one–tenth of a second.

Usage Notes

1. Although the display headers include a letter to indicate the control type (C, A, N, or P), the control and type are entered separately.
2. If there is more than one SNPA/STS in the office and the ALL parameter is not specified, the SNPA/STS parameter must be specified.

Example 1

SNPA/STS is not optional for all control types. If you enter the following command string:

```
>LIST CBK PCT ACODE ALL
```

An example response is as follows::

```
CBk ACODE                                        Page 1 of 1
 Digits          Level   Ann   Peg   SNPA
 8192221112        10%   EA2     2    613
 8192221113        15%   NCA     3    613
```

SNPA is not optional for CBK ACODE or NAC, and is not relevant for CCODE. The APPLY command for the first set of digits has specified that 10% of all calls for 819-222-1112 from SNPA 613 are to be routed to treatment EA2. The display shows that 2 calls have been routed to treatment.

Example 2

The headers in the following display are the same for all control parameters for the LIST command, but PRP and HTRF have no data in the Level and Ann fields and HTRF has zeros in the Peg field. If you enter the following command string:

```
>LIST PRP CCODE ALL displays
```

An example of a response is as follows::

```
PRP CCODE                              Page 1 of 1
 Digits          Level   Ann   Peg   SNPA44
   44                          0
   44                          0
```

PAGE command

The PAGE command prints or displays the next page of data.

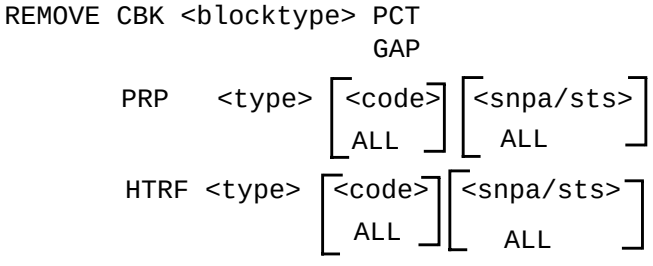
Responses

The next screen of data is displayed with values for these display headers. The headers are the same as those indicated by the command LIST.

REMOVE command

The REMOVE command deactivates one or ALL codes of the specified ctrl types.

Figure 9-4 **Syntax**



where

CBK
specifies code blocking control

blocktype
is PCT or GAP

PRP
specifies preroute peg count control

HTRF
specifies hard–to–reach flag control

- CCODE (country code)
- ACODE (area code)
- NAC (non-area code)
- PFX (prefix code)

code
is a 1 to 18 digit number (1 to 4 for CCODE). The number can be entered with or without quotation marks (for example,'727' or 727)

ALL
specifies all codes

snpa/sts
is a three–digit code, where the SNPA code range is 100 to 999 and the STS range is 000 to 999

ALL
indicates that the specified control is to be listed for all NPAs defined in the office. The range of acceptable SNPA/STS code values remains 000 to 999.

Responses

The following table provides explanations for responses to the REMOVE command.

Table 9-4 (Sheet 1 of 2)

Response	Explanation
`Carrier numbers not defined in CCINFO.`	The carrier number specified by 10XXX is not defined in table OCCINFO.
`Control not active.`	The specified control already is inactive. The REMOVE command does not deactivate a control unless it is active.

Table 9-4 (Sheet 2 of 2)

Response	Explanation
`Insufficient digits`	The code digits are incorrect or the single quotation marks have been omitted. The destination code lacks the '10' of the 10XXX prefix code.
`Not an equal access office`	The office does not have Equal Access capability.
`OK`	The previously applied code controls have been deactiveated.

Example

To remove percentage code blocking on the digits 621-1234 from any subscriber within area code 613, enter the following command string:

```
>REMOVE CBK PCT NAC '6211234' 613
```

10 Route control (RteCtrl) commands

The RteCtrl MAP level is accessed from the NWM MAP level by entering the command RTECTRL. RteCtrl MAP level commands are available to list, apply, or remove controls on specified reroutes (see Figure 10-1). Routes must have been entered in the routing subtables RTEREF and OFRT/OVR and in the NWM table REROUTE.

Figure 10-1 RteCtrl MAP display

```
Ctrl  ITS   RADR    CPU   Init   IDOC  Cs  DCR   Fs sclli1  sclli4
GCRA  xxxx   xx%    xx%   hh.mm   xxx   x   xxxx xx sclli2  sclli5
                                                  sclli3  sclli6


 RteCtrl      RteCtrl
 0  Quit_      Rrte
 2             nnnn
 3
 4  List_     RTECTRL:
 5  Apply_
 6  Remove_
 7  _Rrte_
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18 Page
```

RteCtrl commands

Without accessing the RteCtrl MAP level, reroute controls can be applied with the CI (nonmenu) command REROUT. The function and parameters for the

REROUT commands and the RteCtrl MAP level are the same (See „REROUT commands in Chapter 12).

See Table 16-1 in Appendix A for comparison of the syntax of all NWM menu commands, and Table 16-2 in Appendix B for a list of all the CI commands.

APPLY command

The APPLY command adds a reroute control or controls.

Figure 10-2 Syntax

```
APPLY    RRTE <rrtno>    <rrtsub>    [<level>]
```

where

RRTE
specifies that the reroute control is to be activated

rrtno
is 0 to 1023, the same range of values as the LIST command.

rrtsub
is 0 to 15, the same range of values as the LIST command.

level
is 1 to 100 percent, the amount of control to be applied. If the level is not specified, the command string defaults to the value entered in table REROUTE.

Responses

The following table provides explanations for responses and system actions for the APPLY command.

Table 10-1

Response	Explanation
`Invalid control index`	The parameters are invalid or in the wrong order.
`OK`	The control is applied to the route number.
System action:	
The display fields are updated as each control is applied.	

Note: In any reroute subtable, only one RrtSub at a time can be activated.

Example

To display the assigned reroute control enter the following:

>**TABLE OFRT;POS 25**

Response:

```
POS 25SDHULLPQ1077X0TRRTE 2SDHULLPQ1055X2
```

The calls overflowing CLLI HULLPQ1077X0 are rerouted to reroute number 2 when Reroute Control is activated. To see what percentage of traffic is rerouted, enter subtable NWMRROUT by entering the following command:

>**TABLE REROUTE**

>**LIST ALL**

Example response:

```
TOP RRTNONWMRROUT 0(    3) 1(    3) 2(    2) 3(    1)
4(     1) BOTTOM
```

>**POS 2SUB**

The 2 applies to table REROUTE.

Example response:

```
2  15  OFRT  17
```

>**TABLE OFRT;POS 17**

Example response:

```
S  D  MTRLPQ2071X1
```

Once Reroute control number 2 is activated, 15% of all calls routed by OFRT number 25 and overflowing the first CLLI are rerouted to OFRT number 17. The rest of the calls try to terminate on HULLPQ1055X2.

To cancel a table query, enter QUIT or 0 (zero).

LIST command

The LIST command displays data associated with either the active reroute number defined by RrtNo, or all active reroute numbers.

Figure 10-3 Syntax

where

RRTE
specifies reroute control.

rrtno
is 0 to 1023 for the range of the reroute numbers that are active. The active route numbers are defined in table REROUTE.

ALL
lists all route numbers with reroute control active. ALL is not the default parameter.

Responses

The following table provides explanations for responses to the LIST command.

Table 10-2 (Sheet 1 of 2)

Response	Explanation	
`Control not active`	The specified control is not active.	
`RRTNO RRTSUB Level NewRoute Peg Source`	The headers for the response to the LIST command are shown. Each of the headers has data under it. This data is described below.	
	RRTNO	A number from 0 to 1023 that indicates the range of reroute numbers that are active.
	RRTSUB	A number from 1 to 15 that indicates the reroute subtable index for the active reoute defined in table NWMRROUT.
	Level	A number from 0 to 100 that indicates the percentage of traffic that is diverted to the new route defined in table OFRT/OVR

Table 10-2 (Sheet 2 of 2)

Response	Explanation	
	NewRoute	Identifies the new route as entered in table NWMRROUT. The new route consists of field TBLNM and the index (IDX) entered in TBLNM with the following values: • OFRT IDX for DMS-200 • OVR IDX for DMS-300 OFRT is Office Route in TBLNM OVR is OVR0 to OVR9 in TBLNM IDX is 0 to 255
	Peg	A number from 0 to 9999 that indicates the number of times that the reroute has been activated
	Source	Indicates the origin of the reroute as one of the following: • AUTO (automatically applied) • MANUAL (applied by reroute control) • CCIS for the CCIS6 trunks of CCISTNWM

Example

Enter the following command string:

>LIST RRTE ALL

Example response:

```
RrtePage 1 of 1RrtNoRrtSubLevelNewRoutePegSource12
10% OFRT 280MANUAL21  15% OFRT 170MANUAL40  50%
OFRT1190MANUAL
```

Note: NewRoute data is located in table NWMRROUT.

PAGE command

The PAGE command prints or displays the next page of data.

Responses

The next screen of data is displayed with values for these display headers. The headers are the same as those generated by the LIST command.

REMOVE command

The REMOVE command removes a reroute control or controls.

Figure 10-4 **Syntax**

where

RRTE
specifies that the reroute control is to be deactivated.

rrtno
is 0 to 1023, the same range as for the LIST command.

ALL
specifies that reoute control is to be applied to all active RrtNo.

Responses

The following table provides explanations for responses to the REMOVE command.

Table 10-3

Response	Explanation
`Control not active.`	The specified control already is inactive. The REMOVE command does not deactivate a control unless it is active.
`OK`	The system has deactivated the control.
System action	
Display fields are updated as each or all of the controls is removed.	

11 International code control (IntCCtrl) commands

The IntCCtrl MAP level is accessed from the NWM MAP level by entering the command INTCCTRL. IntCCtrl MAP level commands are available to list, apply, and remove code controls for the DMS–200/300 and DMS–300 (See Figure 11-1).

Figure 11-1 IntCCtrl MAP level

```
Ctrl  ITS   RADR  CPU  Init   IDOC Cs  DCR  Fs  sclli1  sclli4
GCRA  xxxx   xx%  xx%  hh.mm   xxx  x  xxxx xx  sclli2  sclli5
                                          sclli3  sclli6

IntCCtrl       IntCCtrl
0  Quit_       CBkC  CBkN        PRPc   PRPN
2                 0     0           0      0
3
4   List_      HTRFL HTRFN       HTRPC  HTRPN
5   Apply_                           0      0
6   Remove_
7  _CBK_       INTCCTRL:
8  _PRP_
9  _HTRF_
10  _HTRP_
11 _Pct_
12 _Gap_
13  _CCODE_
14 _NATL_
15
16
17
18 Page
```

IntCCtrl commands

The status displays are immediately updated every time a control is applied or removed. The commands of the IntCCtrl menu are similar to those of the

CodeCtrl MAP level. See Table 16–1 in appendix A for a comparison of the syntax of all NWM MAP level commands.

OM groups ICBK, IPRP, and IHTRP are used to distinguish between Code Controls and International Code Controls for peg counts.

APPLY command

The APPLY command activates International Code controls.

Figure 11-2 Syntax

APPLY <ctrl> <blocktype> <type> <direction> <olo> <userclass> <country_code> <national_code> <level> <gap_level> <ann>

where

ctrl
is CBK, PRP, HTRP, or HTRF, the same controls as those ofthe command LIST.

blocktype
is PCT or GAP (for CBK only)

type
is CCODE or NATL, the same code types as those of the command LIST. NATL applies to DMS–300 and the DMS–300 portion of DMS–200/300 offices.

direction
is Incoming, Outgoing, Transit, or Outtrans.

olo
specifies an OLO (Other Licensed Operator). The entry for OLO is selected from from table POECNM or is ALL. If ALL is entered, CBK is activated for all OLOs. This parameter applies to DMS–300 switches only.

userclass
is OPER, SUBS, or ALL.

country_code
is a 1 to 16 digit number specified in table OVNTRNSL to identify the called country. Except for seven–digit numbers, the number must be entered with quotation marks (for example, '727'). Both CBK and PRP can be applied to the same code.

national_code
is a 1 to 18 digit number specified in table OVNTRNSL to identify the city code and the overseas number code. Both CBK and PRP can be applied to the same code.

level
is 1 to 100 percent blockage (for CBK only)

gap_level
is a number from 0 to 900 to specify the time in tenths of a second between calls to a specified digit combination. A gap of one second would be entered as '1.0', and is enclosed by quotation marks.

ann
is EA1, EA2, or NCA, the same treatments as those of the LIST command (CBK only)

Responses

The following table provides explanations for responses to the APPLY command.

Table 11-1

Response	Explanation
`Insufficient digits` or `Invalid digits`	The code digits are incorrect or the single quotation marks have been omitted.
User action: Check tables CCNAMES and CCTRNSL for a valid CCODE.	
`OK`	The control is active.
System action Display fields are updated as each control is applied.	
`Invalid OLO`	The selected OLO does not exist in table POECNM. If the APPLY CBK command is used with an OLO datafilled in table POECNM and a second APPLY CBK command, with the same parameters and parameter values and an OLO entry of ALL is entered, the second command is rejected. The second command is rejected if the order of command entry is reversed.

Example

To determine valid CCODE codes, enter table CCTRNSL and enter the LIST ALL command.

Response:

```
TABLE: CCTRNSL
 LIST
 TOP
        CCNAMES  DISD  UPDISD  TCC   TMTORRTE    LONGHAUL
 ____________________________________________________________
 CC00        44     0       0   44          N           Y
 CC00        39     0       0    9          N           Y
 CC01       044     0       0  044          N           Y
 QUIT
```

The values under the TCC (True CC) header are valid for parameter code, as with 60 in the following command:

```
>APPLY CBK PCT CCODE OUTGOING ALL '60' 50 EA1
```

To query the active CBK CCODE controls, enter the following command:

```
>LIST CBK
```

Response:

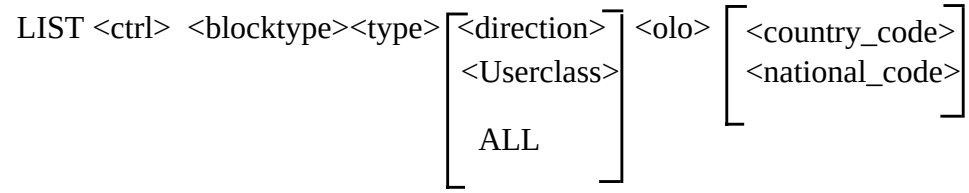
```
CBk CCODE                                   Page 1 of 1
 Digits                                          Peg
 44                           50%      EA1        0
```

LIST command

The LIST command displays the peg count and the controls in effect for a specified control and code type.

Figure 11-3 Syntax

```
LIST <ctrl>  <blocktype><type> [<direction>] <olo> [<country_code>]
                               [<Userclass>]        [<national_code>]
                               [ALL        ]
```



where

ctrl

ctrl is one of the following code controls:

- CBK (Code Blocking)
- PRP (Preroute Peg)
- HTRP (Hard–to–Reach Pegging)
- HTRF (Hard–to–Reach Flagging)

blocktype
is PCT, GAP, or ALL (for CBK only)

type
type is one of the following code types:

- CCODE (Country Code)
- NATL (National Code)

direction
is Incoming, Outgoing, Transit, or ALL.

olo
specifies an OLO (Other Licensed Operator). The OLO is selected from from table POECNM or is ALL. If an OLO from table POECNM is selected, the information for that OLO is displayed. If ALL is entered, the controls activated for all OLOs are displayed. This parameter applies to DMS–300 switches only.

userclass
is OPER, SUBS, or ALL.

country_code
is a 1 to 16 digit number specified in table OVNTRNSL to identify the called country. Except for seven–digit numbers,,the number must be entered with quotation marks (for example, '727'). Both CBK and PRP may be applied to the same code.

national_code
is a 1 to 18 digit number specified in table OVNTRNSL to identify the city code and the overseas number code. Both CBK and PRP may be applied to the same code.

ALL
is for all of the separate codes.

Responses

The following table provides explanations for responses to the LIST command.

Table 11-2 (Sheet 1 of 2)

Response	Explanation
`Control not active`	The specified control is not active.
`Digits Level Ann Peg Attempt Outpulse Answer`	The headers for the response to the LIST command are shown. Each of the headers has data under it. This data is described below.

Table 11-2 (Sheet 2 of 2)

Response	Explanation	
	Digits	A number from 1 to 18 that indicates the number of digits for the code by which calls are blocked or counted
	Level	A number from 1 to 100 that indicates the blocking percentage that is set on the blocked code
	Ann	The treatment the calls are routed to: NCA, EA1, or EA2
	Peg	A number from 0 to 9999 that indicates the number of times a code is blocked for PRP
	Attempt	The number of attempted HTR calls
	Outpulse	The number of outpulsed HTR calls
	Answer	The number of outpulsed HTR calls completed
`Invalid OLO`	The selected OLO does not exist in table POECNM.	

Usage Notes

1. Although the display headers include a letter to denote the ctrl type (C or N) the ctrl and type are entered separately.
2. CCODE applies to DMS–300, and the DMS–300 portion of DMS–200/300 offices.
3. CCODE and NATL are used by DMS–200/300 and DMS–300 switches.

PAGE command

The PAGE command prints or displays the next page of data..

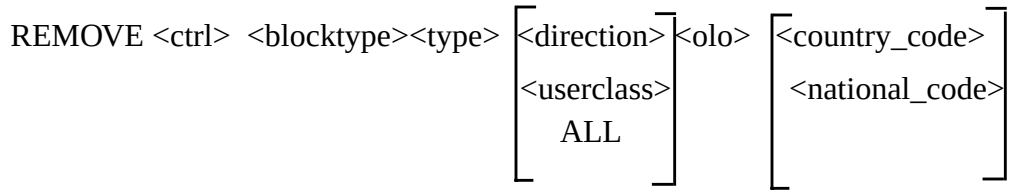
Responses

The next screen of data is displayed with values for the display headers. The headers are the same as those indicated by the command LIST.

REMOVE command

The REMOVE command deactivates one or all codes of the specified ctrl types.

Figure 11-4 Syntax



where

ctrl
is CBK, PRP, HTRF, or HTRP, the same types of controls as those for the LIST command

blocktype
is PCT, GAP or ALL

type
is CCODE or NATL, the same types of code as those for the LIST command

direction
is Incoming, Outgoing, Transit, or ALL

olo
specifies an OLO (Other Licensed Operator). The entry for OLO is selected from table POECNM or is ALL. If ALL is entered, CBK is removed for all OLOs. This parameter applies to DMS–300 switches only.

userclass
is OPER, SUBS, or ALL

country_code
is a 1 to 16 digit number specified in table OVNTRNSL to identify the called country. Except for seven–digit numbers, the number must be entered with quotation marks (for example, '727').

national_code
is a 1 to 18 digit number specified in table OVNTRNSL to identify the city code and the overseas number code

ALL
includes all of the specified controls

Responses

The following table provides explanations for responses to the REMOVE command.

Table 11-3

Response	Explanation
`Control not active.`	The specified control already is inactive. The REMOVE command does not deactivate a control unless it is active.
`OK`	The previously applied code controls have been deactiveated.
System action Display fields are updated as each or all controls are deactivated.	
`Invalid OLO`	The selected OLO does not exist in table POECNM. If the REMOVE CBK command is used with an OLO datafilled in table POECNM and a second REMOVE CBK command, with the same parameters and parameter values and an OLO entry of ALL is entered, the second command is rejected. The second command is rejected if the order of command entry is reversed.

12 Network management CI commands

General

The following nonmenu (CI) commands provide the DMS–100 the equivalent to Network Management for DMS–200 offices:

- MASSCALL
- PREPEG
- REROUT

The commands listed above apply various NWM controls without accessing a NWM MAP level (menus). Each command uses the same parameters as those used with the NWM MAP level commands (See Figure 6–3 in Chapter 6), except that ALL is not the default parameter and Interexchange Carrier codes (PFX) cannot be used. See Table A-2 in Appendix A for a list of all the CI (nonmenu) NWM commands.

MASSCALL command

The MASSCALL command applies mass calling control. The MASSCALL command has same parameters as the CBK, STR, and HTRF controls of the CodeCtrl and GrpCtrl menus (See Figure 6–3). Mass Calling activates CBK, HTRF, or STR without accessing the CodeCtrl menu. CBK call gapping is named CGAP for MASSCALL only.

Note: Controls cannot be applied, removed, or listed based on Interexchange Carrier codes (PFX) when using MASSCALL Commands.

Syntax

```
MASSCALL  LIST     CBK<type><code>  <snpa/sts>
                                ALL       ALL

               HTRF<type><code>  <snpa/sts>
                           ALL       ALL
               STR<fsclli>
                      ALL

               CGAP<type><code>  <snpa/sts>
                       ALL           ALL

          APPLY  CBK<type><code> <level> <ann>  <snpa/sts>
                                                   ALL

               HTRF<type><code>  <snpa/sts>
                                    ALL
               STR<fsclli><lev1>[ <lev2> ]  [ <LEVEL> ]

               CGAP<type><code>  <gap> <ann>   <snpa/sts>
                                                   ALL

       REMOVE CBK<type><code>  <snpa/sts>
                                  ALL
               HTRF<type><code>  <snpa/sts>
                  ALL    ALL

               STR<fsclli>
               ALL

               CGAP<type><code>  <snpa/sts>
                  ALL    ALL
```

where

type
is CCODE, ACODE, NAC, or PFX.

code
is a 1 to 18 digit number (1 to 4 for CCODE). The number can be entered with or without quotation marks (for example, '727' or 727).

ALL
indicates that the specified control should be listed, applied, or removed from all codes defined in the office

snpa/sts
is a three–digit code, where the Serving Numbering Plan Area (SNPA) code range is 000 to 100, and the Serving Translation Scheme (STS) has a range of 000 to 999. The number must be entered with quotation marks (for example, '393')

ALL
indicates that the specified control is listed for all Numbering Plan Areas (NPAs) defined in the office

fsclli
is the full or short Common Language Location Identifier (CLLI) of the trunk group in which control is applied

ALL
specifies that STR control is listed or removed from all controlled trunk groups

level
is 1 to 100 percent, the amount of control to be applied

ann
is NCA, EA1, or EA2, the same treatments as those for the APPLY CBK command

lev1
is 0 to 63

lev2
is 0 to 63

LEVEL
0 to 100

gap
is 0 to 600 seconds, in increments of tenths of seconds, that GAP is activated (CBK only)

Note: ALL is not the default when using MASSCALL Commands.

Responses

All responses are the same as those for the equivalent NWM level commands.

Usage Notes

1. Since MASSCALL does not access a menu, that part of the command syntax must be entered for each use of the NWM controls.
2. MASSCALL is unaffected by STS. If a control has been previously applied and an STS (which is not a valid SNPA) is specified, then the corresponding command MASSCALL LIST ALL results in a blank in the SNPA field for that control.
3. The command APPLY STR level defaults to 100%.

Example 1

The following example shows how HTRF ACODE can be used.

Enter the following command:

```
>MASSCALL APPLY HTRF ACODE '8192221118'
```

Response:

```
OK
```

```
>MASSCALL APPLY HTRF ACODE '8192221111' 613 LIST HTRF ACODE
```

Response:

```
Digits               PEG     SNPA
 8192221118           0       613
 8192221111           0       613
```

Note: SNPA is optional for CCODE (the system ignores it), but not for ACODE and NAC.

Example 2

The following example shows how STR can be used.

Enter the following command:

```
>MASSCALL APPLY STR CARNC040222 1 1 50
```

Response:

```
OK
```

Enter the following command:

```
>MASSCALL APPLY STR RAL214 2 1
```

Response:

```
OK
```

A percentage of traffic on both CARNC040222 and RAL214 trunk groups is blocked. A blank for the percentage field defaults to 100%.

Enter the following command:

Response:

```
>MASSCALL LIST STR ALL
```

Response:

```
SCLLI    CLLI           Lev1   Lev2   Pct    Source
 CAR222   CARNC040222    1      1      50%    MANUAL
 RAL214   RALNC030214    2      1      100%   MANUAL
```

ALL is not a CI default for NWM commands.

PREPEG command

The PREPEG command lists, applies, or removes preroute peg count control. The PREPEG command uses the same parameters as the LIST PRP, APPLY PRP, and REMOVE PRP commands of the CodeCtrl MAP level (See Figure 6–3). The PREPEG command activates PRP controls without accessing the NWM MAP levels.

Note: Preroute peg count control cannot be applied, removed or listed based on Interexchange Carrier codes (PFX) when using PREPEG Commands.

Syntax

```
PREPEGLIST      <type>   <code><snpa/sts>
               ALL  ALL

      APPLY    <type>  <code><snpa/sts>
                  ALL

      REMOVE <type>  <code><snpa/sts>
               ALL  ALL
```

where

type
is CCODE, ACODE, NAC, or PFX

code
is a 1 to 18 digit number (1 to 4 for CCODE). The number can be entered with or without quotation marks (for example, '727' or 727).

ALL
indicates that the specified control be listed, applied to, or removed from all codes defined in the office

snpa/sts
is a three–digit code, where the SNPA code range is 000 to 100 and the STS range is 000 to 999. The number must be entered with quotation marks (for example '393').

ALL
indicates that the specified control is to be listed for all NPAs defined in the office

Note: ALL is not the default when using PREPEG Commands.

Responses

All responses are the same as those for the respective NWM menu commands.

Usage Notes

1. Since PREPEG does not access a menu, that part of the command syntax must be entered for each use of the NWM controls.
2. PREPEG is unaffected by STS. If a control has been previously applied and an STS (which is not a valid SNPA) is specified, then the corresponding command PREPEG LIST ALL has a blank in the SNPA field for that control.

Example

SNPA is not optional for ACODE or NAC, although shown as an option. Note the responses in the following command example sequence.

Enter the following command:

```
>PREPEG APPLY CCODE '8192221111
```

Response:

```
OK
```

Enter the following command:

```
PREPEG APPLY NAC '8192221113
```

Response:

```
Valid SNPA/STS or 'ALL' needed
```

Enter the following command:

```
PREPEG LIST CCODE ALL
```

Response:

```
Digits PEGSNPA81922211110
```

REROUT command

The REROUT command lists, applies, or removes network management reroute controls. The REROUT command uses the same parameters as the LIST RRTE, APPLY RRTE, and REMOVE RRTE commands of the RteCtrl MAP level (See Figure 6–3). The REROUT command lists, activates, or removes reroute controls without accessing NWM MAP levels.

Syntax

```
REROUTLIST    <rrtno>
               ALL

      APPLY   <rrtno><rrtsub>[<level>]

      REMOVE   <rrtno>
                    ALL
```

where

LIST
invokes the LIST command

rrtno
is 0 to 1023 and specifies the range of reroute numbers that are active

APPLY
invokes the APPLY command

rrtsub
is 0 to 1023 and specifies the reroute subtable index for the active route. This index is datafilled in table NWMRROUT

level
is 0 to 100 and specifies the percentage of traffic diverted to the new route defined in table OFRT/OVR

REMOVE
invokes the REMOVE command

Responses

All responses are the same as those for the respective NWM MAP level commands.

Usage Note

Since the REROUT command does not access a menu, that part of the command syntax must be entered for each use of the NWM controls.

Example

The following sequence of commands and responses illustrates the use of REROUT command parameters.

Enter the following command:

```
>REROUT LIST ALL
```

Response:

```
CONTROL NOT ACTIVE
```

The control is not active. To activate the control, enter the following command:

```
REROUT APPLY 2 2 50
```

Response:

```
INVALID CONTROL INDEX
```

The response means the 2 is not a valid value in table REROUTE. Choose a valid value or enter table REROUTE to change the possible values. To activate reroute number 1, enter the following command:

```
REROUT APPLY 1 1 50
```

Response:

OK

Enter the following command:

```
REROUT APPLY 1 2 70
```

Response:

OK

To list all reroutes, enter the following command:

```
REROUT LIST ALL
```

Response:

```
Rrte                                    Page 1 of 1
 RrtNo   RrtSub   Level  NewRoute  Peg  Source
     1        2     70%  OFRT  28    0  MANUAL
```

The response indicates that subroute 2 of Route 1 is manually activated to divert 70% of the traffic offered to the route list to route 28. No diversions are counted.

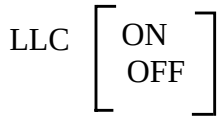
The 1 1 50 is not listed because consecutive command applications override the previous values.

13 Line Load Control (LLC) command

Line Load Control (LLC) can be activated or deactivated as follows:

- with a CI (nonmenu) command
- at the MAPCI MAP level (unlisted command)
- at the MTC MAP level (unlisted command)
- at any NWM MAP level (unlisted command)

Figure 13-1 Syntax



where

ON

locks out all lines that are not designated as ELN in field OPTLIST of table LENLINES. To ensure nonessential lines cannot originate calls, the LLC ON command sets a critical alarm, and generates a log.

OFF

restores originating service to lines previously locked out by the LLC ON command, replaces the critical alarm with a no–alarm state, and generates a log.

The LLC ON command limits the amount of traffic handled by a DMS–100 office by allowing only designated lines to originate calls. The LLC command has no effect on terminating calls. LLC provides the DMS–100 office with DMS–200 capability.

Responses

The following table provides explanations for responses and system actions for the LLC command.

Table 13-1

Response	Explanation
`LINE LOAD CONTROL IS ON`	LLC is activated. This response is generated when the LLC ON command is successful or the LLC command is entered without a parameter.
System action: The sytem generates an `LLC100` log and posts a critical alarm.	
`LINE LOAD CONTROL IS OFF`	LLC is deactivated. This response is generated when the LLC OFF command is successful or the LLC command is entered without a parameter.
System action: The system generates an `LLC101` log and indicates that LLC is inactive.	

14 Toll Network Protection (TNP) command

Toll Network Protection (TNP) can be activated or deactivated as follows:

- with a CI (nonmenu) command
- at the MAPCI MAP level (unlisted command)
- at the MTC MAP level (unlisted command)
- at any NWM MAP level (unlisted command)

Syntax

TNP [ON / OFF]

where

ON
denies access to the toll network for all lines that are not designated as TES and ELN in field OPTLIST of table LENLINES and posts a critical EXT alarm.

OFF
restores access for all lines previously denied access by the TNP ON command, returns the alarm to a no-alarm state, and generates a log. The TNP ON command limits outgoing toll calls such that only TES (Toll essential Service) lines are allowed access to the network. All TES lines must be designated as ELN. The TNP command provides the DMS-100 with the DMS-200 capability.

Responses

The following table provides explanations for responses and system actions for the TNP command.

Table 14-1

Response	Explanation
`Toll Network Protection is ON.or Toll Network Protection is OFF.`	These responses are generated when the TNP command is entered without a parameter.
`OK`	The TNP ON or TNP OFF command was successful.
System action: When you use the ON parameter, the system generates an EXT108 log and posts a critical EXT alarm. The text of the EXT108 log report includes "TNP ALRM ON". When you use the OFF parameter, the system generates an EXT108 log. The text of the EXT108 log report includes the text "TNP ALRM OFF".	

15 Essential Service Protection (ESP) command

Essential Service Protection (ESP) can be activated or deactivated as follows:

- with a CI (nonmenu) command
- at the MAPCI MAP level (unlisted command)
- at the MTC MAP level (unlisted command)
- at any NWM MAP level (unlisted command)

Syntax

ESP [ON / OFF]

where

ON
delays access of nonessential lines to the CCB origination queue. essential lines that are datafilled in field OPTLIST of tables LENLINES and IBNLINES are given precedence for origination.

OFF
restores access of all lines to the CCB origination queue.

The ESP ON command delays the origination of nonessential lines in the CCB origination queue to give priority to essential line (ELN) service. Refer to Chapter 4 for a description of the ESP feature.

Responses

The following table provides explanations for responses and system actions for the ESP command.

Table 15-1

Response	Explanation
`ESP ON` or `ESP OFF`	ESP is activated or deactivated. These responses are generated when the ESP command is entered without a parameter.
`Essential lines will be given priority service. Other lines may receive slower service. (Y/N?`	The prompt requests confirmation of the ESP ON command. Y (yes) confirms the command. N (no) cancels the command.
`Essential lines will not be given priority service. All lines will receive equal service. (Y/N?`	The prompt requests confirmation of the ESP OFF command. Y (yes) confirms the command. N (no) cancels the command.
`ESP started by <user> from <terminal>`	The response confirms activation of ESP, where <user> is the user identification and <terminal> is the location at which the ESP command was entered.
`ESP stopped by <user> from <terminal>.`	The response confirms activation of ESP, where <user> is the user identification and <terminal> is the location at which the ESP command was entered.
System action: When you use the ON or OFF parameter, the sytem generates one of the following logs: EXT105, EXT106, EXT107, or EXT108.	

Example

The following is the simplest form of user/terminal response to the ESP command for checking the ESP status.

```
ESP STARTED BY OPERATOR FROM MAP
```

or

```
ESP STOPPED BY OPERATOR FROM MAP
```

Appendix A Network management commands

The following table lists network management menu commands.

Table A-1 Network management menu commands (Sheet 1 of 4)

Command	MAP level (menu)	Parameter
APPLY	AutoCtrl	ctrl index
		ALL
	CodeCtrl	CBK blocktype PCT type code level
		GAP type code gap
		ann
		snpa/sts
		ALL
		PRP type code snpa/sts
		ALL
		HTRF type code snpa/sts
		ALL
	GrpCtrl	DRE level
		PRE level
		CANT dr_pct ar_pct ann
		CANF dr_pct ar_pct ann
		SKIP dr_pct ar_pct
		ITB Level
		STR levl [lev2] [LEVEL]

Table A-1 Network management menu commands (Sheet 2 of 4)

Command	MAP level (menu)	Parameter
		FRR dr_pct ar_pct ctrlopt htropt eaopt cicropt viaopt
		ITO
		BRC pct_inc pct_og num_pr
	IntCCtrl	ctrl blocktype type direction olo userclass country_code national_code level gap_level ann
	RteCtrl	RRTE rrtno rrtsub level
DCRMOCH	all	BOTH ON
		TANDEM OFF
		NONTANDEM
DCRSEL	all	netname
DISABLE	AutoCtrl	ctrl index [fclli]
		ALL
DISPLAY	all	FINALS
		GROUPS fclli1 ... fclli9
ENABLE	AutoCtrl	ctrl index [fclli]
		ALL
LIST	AutoCtrl	ctrl index [fsclli]
		ALL
	CodeCtrl	CBK blocktype PCT
		GAP
		PRP type code snpa/sts
		ALL ALL
		HTRF type code snpa/sts
		ALL ALL
	GrpCtrl	ctrl fsclli 1...fsclli 9
		ALL

Table A-1 Network management menu commands (Sheet 3 of 4)

Command	MAP level (menu)	Parameter
	IntCCtrl	ctrl blocktype type direction olo country_code
		userclass national_code
		ALL
	RteCtrl	RRTE rrtno
		ALL
PAGE	AutoCtrl	
	CodeCtrl	
	GrpCtrl	
	IntCCtrl	
	RteCtrl	
REMOVE	AutoCtrl	ctrl index [fsclli]
		all
	CodeCtrl	CBK blocktype PCT type code level
		GAP type code gap
		ann
		snpa/sts
		ALL
		PRP type code snpa/sts
		ALL
		HTRF type code snpa/sts
		ALL
	GrpCtrl	ctrl
		ALL
	IntCCtrl	ctrl blocktype type direction olo country_code
		userclass national_code
		ALL

Table A-1 Network management menu commands (Sheet 4 of 4)

Command	MAP level (menu)	Parameter
	RteCtrl	RRTE rrtno
		ALL
SELECT	GrpCtrl	fclli

The following table lists network management nonmenu (CI) commands.

Table A-2 Network management nonmenu (CI) commands (Sheet 1 of 2)

Nonmnu (CI) command	NWM command	Control	Parameter
MASSCALL	APPLY	CBK	type code level annsnpa/sts
			ALL
		HTRF	type codesnpa/sts
			ALL ALL
		STR	fsclli
			ALL
		CGAP	type code gap ann snpa/sts
			ALL
	LIST	CBK	type code snpa/sts
			ALL ALL
		HTRF	type code snpa/sts
			ALL ALL
		STR	fsclli lev1 [lev2] [LEVEL]
		CGAP	type code gap ann snpa/sts
			ALL
	REMOVE	CBK	type code snpa/sts
			ALL ALL
		HTRF	type code snpa/sts
			ALL ALL

Table A-2 Network management nonmenu (CI) commands (Sheet 2 of 2)

Nonmnu (CI) command	NWM command	Control	Parameter
		STR	fsclli
			ALL
		CGAP	type code snpa/sts
			ALL ALL
PREPEG	APPLY		type code snpa/sts
			ALL ALL
	LIST		type code snpa/sts
			ALL
	REMOVE		type code snpa/sts
			ALL ALL
REROUT	APPLY		rrtno rrtsub [level]
	LIST		rrtno
			ALL
	REMOVE		rrtno
			ALL
ESP			**ON**
			OFF
LLC			ON
			OFF
TNP			ON
			OFF
CPSTAT			
CPSTATUS			

Appendix B Network management data schema

The following table identifies data schema tables associated with network management.

Table B-1 Data schema tables related to network management (Sheet 1 of 3)

Table	Subtable	Field or parameter
ALMSC		
ALMSD		
ALMSDGRP		
CCNAMES		
CCSDOC		
CCTR		
CCTRNSL		
CLLIMTCE		
DCROPT	DESTKEY	
	DESTNODE	
	TKTONODE	
DN		
FNPACONT	RTEREF	
HNPACONT	RTEREF	
	HNPACODE	CODETYPE
IBNLINES		OPTLIST

Table B-1 Data schema tables related to network management (Sheet 2 of 3)

Table	Subtable	Field or parameter
INWSNPA		
LENLINES		OPTLIST
NWMAOCR		
NWMCLLI		
NWMIDOC		IDOCLEV, MFONTHLD, MFOFTHLD, MFONFILT, MFOFFILT, CPONTHLD, CPOFTHLD, CPONFILT, CPOFFILT, SDGROUP, SDPT
NWMPPLN		PPLN
NWMSC		SCDATA
NWMSCPT		
NWMSD		
NWMSDPT		
OFCENG	E355	CC_ENGLEVEL_WARNING_THRESHOLD
	E356	CPSTATUS_SWITCHABLE
	E250	DTSR_AUTO_DEACTIVATION_ENABLE
	E273	ENHANCED_DEAD_SYSTEM_ALARM
	E306	GUARANTEED_CPU_TERMINAL_SHARE
	E063	INWATS_CCSI_OSO_ENABLE
	E080	NCCBS
	E268	NUM_DCR_EXT_BLKS
	E101	NWMTGBLU
OFCOPT	O029	NWMSTRCNTL
	O037	SDOC3_ENABLE
OFCVAR	V015	CAMA_SUSP_CALLS_ALLOWED
	V230	CPSTATUS_ON
	V060	TASINTVL

Table B-1 Data schema tables related to network management (Sheet 3 of 3)

Table	Subtable	Field or parameter
OFRT		
OMPRT		
OMREPORT		
OMTAPE		
OVRO-9		
PREPLANS		PPLN
RADR		RADKEY
		RADCALLR
		RADLTLYT
		RADUDLYT
RECEIVER		
REROUTE	NWNRROUT	RRTSUB, NEWROUTE, TBLUM, RTEREF
SILCNWM		CLLI, SCTRL, LEVEL1, LEVEL2
TASIB		
TRKGRP		
TRKSGRP		REMBSY
VIRTGRPS		
WRDN		

List of terms

ACC

Automatic Congestion Control

ACODE

area code

AOCR

Automatic Out-of-Chain Reroute (an automatic control)

AR

alternate route, alternate-routed

automatic controls

A class of network management controls that detects internal traffic overload conditions, alerts connected switches regarding the congestion, and responds to overload signals from other switches. Automatic controls activate trunk group controls when predefined thresholds are reached.

CANF

Cancel To (a group control)

CANT

Cancel From (a group control)

CBK

Code Blocking (a code control, an international code control)

CC

central control

CCB

call condense block

CCODE

country code

CCIS
Common Channel Interoffice Signaling

CCIS6
Common Channel Interoffice Signaling Number 6

CCS7
Common Channel Signaling Number 7

CI
command interface

CLLI
Common Language Location Identifier

code controls
A class of network management controls that limits the number of calls made to a particular destination code.

CPU
central processing unit

DCR
Dynamically Controlled Routing

DLC
Dynamic Load Control

DMS
Digital Multiplex System

DN
directory number

DOC
Dynamic Overload Control

DR
direct route, direct-routed

DRE
Directional Reservation Equipment (a group control)

DSA
dead system alarm

DTSR
Dial Tone Speed Recording

EA1
Emergency Announcement 1

EA2
Emergency Announcement 2

EA
Equal Access

EADAS
Engineering and Data Acquisition System

ELN
essential line

ESP
Essential Service Protection

expansive controls
A category of network management controls that reroutes traffic to less loaded offices. Expansive controls change the availability of routes a call can take, to increase the probability that the call reaches its destination.

FCLLI
Full Common Language Location Identifier

FHR
Fixed Hierarchical Routing

FRR
Flexible Reroute (a group control)

FSCLLI
Full or Short Common Language Location Identifier

HPC
high probability of completion

HTRF
Hard-to-Reach Flag (a code control)

HTRP
Hard-to-Reach Peg Count (an international code control)

IDOC

Internal Dynamic Overload Controls (an automatic control)

IOD

input/output device

ISDN

integrated services digital network

ISUP

ISDN user part

ITB

Incoming Trunk Busy (a group control)

ITO

International Trunk Override (a group control)

line load controls

A class of network management controls that limits the amount of traffic by allowing only designated lines (essential lines) to originate calls.

LLC

Line Load Control

MAP

Maintenance and Administration Position

MAP display

The information and responses displayed at a MAP terminal. Each MAP level has a dedicated MAP display.

MAP level

A layer in the MAP display hierarchy with a list of commands (menu commands) and in some cases, unlisted commands. MAP levels are accessed from the CI level through a telescoping hierarchy, starting at the MAPCI level.

MC

machine congestion

menu

A numbered list of commands located on the left side of the MAP display at each MAP level.

menu command

A command (listed or unlisted) available at a particular MAP level.

MF

multifrequency

NAC

non-area code

NCA

No Circuit Announcement

nonmenu command

A command accessed at the CI level of the MAP(also referred to as a "CI command

NOP

network operations protocol

NP

network protocol

NTP

Northern Telecom Publication

NWM

network management

OLO

other licensed operator

OM

operational measurement

OM group

A set of registers that stores related OM data.

PRE

Protection Reservation Equipment (a group control)

protective controls

A category of network management controls that blocks or cancels traffic attempting to enter the network or switch, or prevents traffic from being routed on specified trunk groups.

PRP

Preroute Peg Count (a code control)

PPLN

Preplanned Control (an automatic control)

RADR

Receiver Attachment Delay Recorder (a code control)

route controls

A class of network management controls that modifies internal route lists in a switch.

RRTE

Reroute Control

SC

scan control

SDOC

Selective Dynamic Overload Control (an automatic control)

SILC

Selective Incoming Load Control (an automatic control)

SKIP

Skip Control (a group control)

SNPA

serving numbering plan area

STR

Selective Trunk Reservation (a group control)

STS

serving translation scheme

TASI

Time Assignment Speech Interpolation (a group control)

TNP

Toll Network Protection

trunk group controls

A class of network management controls which limits the amount of traffic to and from specified trunk groups, and increases the number of routes available to a call

XPM

extended peripheral module

unlisted menu command

A command available at the CI level of the MAP or in one of the directories available at the CI level, for example, SOC (software optionality control).

Index

A

ACC 3-6
ACODE controls
  operation 9-2
AOCR 3-2, 3-6
APPLY command 7-2, 8-2, 9-3, 10-2, 11-2, A-1
AutoCtrl
  access to MAP level 7-1
  APPLY command 7-2
  commands 7-2
  DISABLE command 7-3
  ENABLE command 7-5
  LIST command 7-6
  PAGE command 7-10
  REMOVE command 7-10
AUTOCTRL command 6-10
Automatic Congestion Control 3-6
Automatic Control 3-2
automatic controls 1-2
Automatic Out-of-Chain Reroute 3-6

C

call attempts per hour 5-5
call processing occupancy 5-5
Cancel From 3-8
Cancel In-Chain Return control 8-4
Cancel To 3-8
CANF 3-8
CANT 3-8
CBK 3-14
CCIS6
  DOC 4-8
  IDOC 4-8
  RDOC 4-8
CICR 8-4
Code Blocking 3-14
code controls 1-2
CodeCtrl
  access to MAP level 9-1
  APPLY command 9-3
  commands 9-2
  LIST command 9-9
  PAGE command 9-12
  REMOVE command 9-12
CODECTRL command 6-10
command
  APPLY 7-2, 8-2, 9-3, 10-2, 11-2, A-1
  AUTOCTRL 6-10
  CPSTAT 5-1, 5-6, A-5
  CPSTATUS 5-1, 5-8, A-5
  DCRMOCH 4-19, 6-5, 6-10, A-2
  DCRSEL 6-12, A-2
  DISABLE 7-3, A-2
  DISPLAY 6-12, A-2
  ENABLE 7-5, A-2
  ESP 15-1, A-5
  GRPCTRL 6-13
  INTCCTRL 6-14
  LIST 7-6, 8-8, 9-9, 10-3, 11-4, A-2
  LLC A-5
  MASSCALL 12-1, A-4
  PAGE 6-14, 7-10, 8-12, 9-12, 10-6, 11-6, A-3
  PREPEG 12-5, A-5
  QUIT 6-14
  REMOVE 7-10, 8-12, 9-12, 10-6, 11-6, A-3
  REROUT 12-7, A-5
  RTECTRL 6-14
  SELECT 8-13, A-4
  TNP 14-1, A-5
  TRAVER 4-20
commands
  menu

Network Management 6-9
nonmenu
Network Management 12-1
CPSTAT command 5-6, A-5
CPStatus 5-1, 6-4
activation 5-1
datafill 5-2
MAP display 5-6
measurement display 5-6
operation 5-3
operational measurements 5-1
reporting measurements 5-1
setting up 5-1
types of measurements 5-4
CPSTATUS command 5-8, A-5
CPU
occupancy by non-call processing functions 5-5
realtime 5-4
remaining realtime 5-5
usage 5-3

D

data schema table
ALMSD 3-5
ALMSDGRP 3-5
CCSDOC 4-9
CCTR 3-15
CCTRNSL 3-15
CLLIMTCE 3-13, 8-4, 8-9
DCROPT 4-11, 4-14
DESTKEY 4-14
DESTNODE 4-14, 4-15, 4-19
HNPACODE 4-10
IBNLINES 4-3
INWSNPA 4-10
LENLINES 4-2, 4-3, 13-1, 14-1
NWMAOCR 3-6
NWMCLLI 2-4
NWMIDOC 3-4, 3-5, 4-8
NWMPPLN 3-6, 4-8
NWMRROUT 12-7
NWMSC 4-6
NWMSCPT 4-6, 4-8
NWMSD 2-4, 3-4
NWMSDPT 2-4, 3-4, 6-6
OCCINFO 9-5
OFRT 10-1
OMPRT 2-2
OMTAPE 2-2
OVNTRNSL 11-2
POECNM 8-3, 11-2
PREPLANS 3-6, 4-8, 7-2
RADR 3-18
RECEIVER 3-19
REROUTE 3-18, 10-1
RTEREF 10-1
TASIB 3-13
TKTONODE 4-14
TRKSGRP 3-9
DCR 4-10, 6-5
data schema tables 4-13, 4-14
extension blocks 4-15
DCR network
adding offices 4-19
DCR routes 4-11
DCRMOCH command 4-11, 4-13, 4-14, 6-10, A-2
DCRSEL command 6-12, A-2
Directional Reservation Equipment 3-7
DISABLE command 7-3, A-2
DISPLAY command 6-12, A-2
DLC 3-12
DOC 3-3
Level 1 3-4
Level 2 3-4
Level 3 3-5
levels 3-3
DRE 3-7
Dynamic Load Control 3-12
Dynamic Overload Control 3-3
CCIS6 4-8
level 1 3-4
Level 2 3-4
Level 3 3-5
levels 3-3
Dynamically Controlled Routing 4-10

E

EADAS 3-15, 3-16, 4-1
ENABLE command 7-5, A-2
engineering threshold 5-6
Equal Access 4-20

ESP command 4-3, 15-1, A-5
ESP in XPMs 4-3
essential lines 4-2, 4-3, 4-4
Essential Service Protection 15-1
expansive control 2-1
expansive controls 1-2

F

FHR routes 4-11
Fixed Hierarchical Routing 4-11
Flexible Reroute 3-11
FRR 3-11

G

Group Control 3-7
GrpCtrl
  access to MAP level 8-1
  APPLY command 8-2
  commands 8-2
  LIST command 8-8
  PAGE command 8-12
  REMOVE command 8-12
  SELECT command 8-13
GRPCTRL command 6-13
Guaranteed Dial Tone 4-3

H

Hard-to-Reach Flag 3-17
Hard-to-Reach Peg 3-18
HTRF 3-17
HTRP 3-18

I

IDOC 3-2, 3-3, 6-4
Incoming Trunk Busy 3-9
IntCCtrl
  access to MAP level 11-1
  APPLY command 11-2
  commands 11-1
  LIST command 11-4
  PAGE command 11-6
  REMOVE command 11-6
INTCCTRL command 6-14
Internal Dynamic Overload Control 3-3
International Code Controls 3-18
International Trunk Override 3-9
INWATS OSO 4-10
ITB 3-9
ITO 3-9

L

Line Load Control 13-1
line load controls 1-2
LIST command 7-6, 8-8, 9-9, 10-3, 11-4, A-2
LLC command 4-2, A-5
log
  DCR100 4-16
  DCR101 4-16
  DTSR100 3-20
  DTSR101 3-20
  EXT105 15-2
  EXT106 15-2
  EXT107 15-2
  EXT108 14-2, 15-2
  LLC100 13-2
  LLC101 13-2
  NWM107 8-6
  NWM110 9-11
  NWM111 9-11
  NWM112 9-11
  NWM130 7-2
  NWM601 3-17
  NWM602 3-17
  NWM603 3-15

M

Maintenance and Administration Position 2-2
MAP 2-2
MASSCALL command 4-1, 12-1, A-4

N

Network Management
  access to NWM MAP level 6-9
  applicability 1-1
  CI commands 12-1
  controls 3-1
    ACC 3-6
    automatic 1-2
    Automatic Congestion Control 3-6
    Automatic Out-of-Chain Reroute 3-6
    Cancel From 3-8

Cancel In-Chain Return 8-4
Cancel To 3-8
CANF 3-8
CANT 3-8
categories 1-2
CBK 3-14
CICR 8-4
classes 1-2
code 1-2
Code Blocking 3-14
description 2-1
Directional Reservation Equipment 3-7
DOC 3-3
DRE 3-7
Dynamic Overload Control 3-3
Dynamically Controlled Routing 4-10
ESP 15-1
Essential Service Protection 4-3
expansive 1-2
Flexible Reroute 3-11
FRR 3-11
Hard-to-Reach Flag 3-17
Hard-to-Reach Peg 3-18
HTRF 3-17
HTRP 3-18
IDOC 3-3
Incoming Trunk Busy 3-9
Internal Dynamic Overload Control 3-3
International Trunk Override 3-9
ITB 3-9
ITO 3-9
line load 1-2
Line Load Control 4-2
LLC 13-1
Mass Calling 4-1
PPLN 3-6
PRE 3-7
Preplanned Control 3-6
Preplanned Pegging 4-2
Preroute Peg 3-16
priority 3-20
protective 1-2
Protective Reservation Equipment 3-7
PRP 3-16
Reroute 3-18
Rerouting 4-2
route 1-2
SDOC 3-6, 4-9
Selective Dynamic Overload Control 3-6, 4-9
Selective Incoming Load Control 3-7
Selective Trunk Reservation 3-10
SILC 3-7
SKIP 3-8
STR 3-10
TASI 3-12
Time Assignment Speech Interpolation 3-12
TNC 14-1
Toll Network Protection 4-2
trunk group 1-2
description 1-1
feature
CCISTNWM 4-7
feature packages 2-1
features 3-1
interfacing facilities 2-2
MAP displays 6-1
MAP level status displays 6-7
MAP levels 6-1
menu commands 6-9, A-1
menus 6-6
Network Management command
ESP 4-3
LLC 4-2
MASSCALL 4-1
PREPEG 4-2
REROUT 4-2
TNP 4-2
Network Operations Protocol 4-12
NWM MAP level 6-9

O

office parameter
AUXCP_CPU_SHARE 5-8
CAMA_SUSP_CALLS_ALLOWED 6-5
CC_ENGLEVEL_WARNING_THRESHOLD 5-2, 5-6
CPSTATUS_ON 5-2, 5-3
CPSTATUS_SWITCHABLE 5-2, 5-3
DTSR_AUTO_ACTIVATION_ENABLE 3-19
ENHANCED_DEAD_SYSTEM_ALARM 3-5
GUARANTEED_TERMINAL_CPU_SHARE 5-2
NCCBS 4-4
NUM_DCR_EXT_BLKS 4-12, 4-16

NUM_OF_CCIS_INWATS_BLOCKS 4-10
NWMTGBLU 2-5
SDOC3_ENABLE 3-5
TASINTVL 3-13, 8-5
OM group
AVOFZ 5-1
BRSTAT 5-1
CPUSTAT 5-1
DCRDEST 4-16
DCRICTRK 4-16
DCRLINK 4-16
DCRMISC 4-16
EXT 4-16
IHTRP 3-18
OFZ 5-1
OTS 5-1
RADR 3-19
operational measurements 2-2
overload thresholds 5-6

P

PAGE command 6-14, 7-10, 8-12, 9-12, 10-6, 11-6, A-3
PPLN 3-2, 3-3, 3-6
PRE 3-7
PREPEG command 12-5, A-5
Preplanned Control 3-6
Preplanned Pegging 4-2
Preroute Peg 3-16
priority
automatic controls 3-20
code controls 3-21
group controls 3-20
Network Management controls 3-20
route controls 3-21
protective control 2-1
protective controls 1-2
Protective Reservation Equipment 3-7
PRP 3-16

Q

QUIT command 6-14

R

RADR 3-17
Receiver Attachment Delay Recorder 3-17
Remote Make Busy by Scan Point Control 4-5
Remote Operations 4-12
REMOVE command 7-10, 8-12, 9-12, 10-6, 11-6, A-3
REROUT command 4-2, 12-7, A-5
Reroute 3-18
route controls 1-2
route lists 4-15
RRTE 3-18
RteCtrl
access to MAP level 10-1
APPLY command 10-2
commands 10-1
LIST command 10-3
MAP display 10-1
PAGE command 10-6
REMOVE command 10-6
RTECTRL command 6-14

S

SDOC 3-2, 3-6, 4-9, 7-1
SELECT command 8-13, A-4
Selective Dynamic Overload Control 3-6, 4-9
Selective Incoming Load Control 3-7
Selective Trunk Reservation 3-10
SILC 3-7
SKIP 3-8
status board lamp display 2-4, 3-4
STR 3-10

T

TASI 3-12
thresholds
DOC 3-3
STR 3-10, 3-11
Time Assignment Speech Interpolation 3-12
TNP command 4-2, 14-1, A-5
Toll Network Protection 14-1
toll-essential service 4-2
TRAVER 4-20
trunk group controls 1-2

DMS-100 Family

North American DMS-100

Netwrok Management System Reference Manual

electronic mail: cits@nortelnetworks.com

Copyright © 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1993, 1999, 2000 Nortel Networks,
All Rights Reserved

NORTEL NETWORKS CONFIDENTIAL: The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

Information is subject to change without notice. Northern Telecom reserves the right to make changes in design and components as progress in engineering and manufacturing may warrant.

DMS, MAP, NORTEL, NORTEL NETWORKS, NORTHERN TELECOM, NT, and SUPERNODE are trademarks of Northern Telecom.

Publication number: 297-1001-453
Product release: TL13
Document release: Standard 11.03
Date: September 2000
Printed in the United States of America

NORTEL NETWORKS™

How the world shares ideas.