297-1001-345

DMS-100 Family

Device Independent Recording Package

Administration Guide

BCS33 and up Standard 01.07 May 2000

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DMS-100 Family

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BCS33 Standard 01.01 first release of this document. It contains restructured information that was previously in *DMS-100 Family Device Independent Recording Package User Guide*, 297-1001-312. Information about the suite of documents and related material for the DIRP utility is found in the *Device Independent Recording Package (DIRP) Product Guide*, 297-1001-013.

Contents

Administration Guide

About this document

This document describes the device independent recording package (DIRP) utility and provides information required for its administration. The information in this document is intended for operating company personnel who are responsible for maintaining the DIRP utility.

When to use this document

Northern Telecom (NT) software releases are referred to as batch change supplements (BCS) and are identified by a number, for example, BCS29. This document is written for DMS-100 Family offices that have BCS33 and up.

More than one version of this document may exist. The version and issue are indicated throughout the document, for example, 01.01. The first two digits increase by one each time the document content is changed to support new BCS-related developments. For example, the first release of a document is 01.01, and the next release of the document in a subsequent BCS is 02.01. The second two digits increase by one each time a document is revised and rereleased for the same BCS.

To determine which version of this document applies to the BCS in your office, check the release information in *DMS-100 Family Guide to Northern Telecom Publications,* 297-1001-001.

How to identify the software in your office

The *Office Feature Record (D190)* lists your current BCS and the NT feature packages in it. You can view similar information on a MAP (maintenance and administration position) terminal by typing

```
>PATCHER;INFORM LIST;LEAVE
```

and pressing the ENTER key

How DIRP documentation is organized

This document is part of DIRP documentation that supports the Northern Telecom DIRP utility. DIRP documentation is a subset of the DMS-100 Family library.

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

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

References in this document

The following documents are referred to in this document:

- *Provisioning Guide*
- *Translations Guide*
- *Input/Output System Reference Manual*1, 297-1001-129
- *Remote Data Polling System Description*1, 297-1001-524
- *Operational Measurements Reference Manual*

What precautionary messages mean

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

Table 1

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

Examples of the precautionary messages follow.

DANGER

Risk of electrocution

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

WARNING

Damage of backplane connector pins

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

CAUTION

Loss of service

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

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 LINK
```

Variables

Variables are shown in lowercase letters:

```
>BSY LINK ps_link
```

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:

```
Any active calls may be lost
Please confirm ("YES" or "NO"):
```

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 LINK ps_link

and pressing the Enter key.

where

ps_link
is the number of the P-side link (0 through 19)

Example input:

>BSY LINK 7

Example of a MAP response:

```
Any active calls may be lost
Please confirm ("YES" or "NO"):
```

1 Understanding DIRP administration

Defining the DIRP utility

The device independent recording package (DIRP) is a utility that manages the reading and writing of data between various DMS subsystems and recording devices. The DIRP utility is a part of the *Common Basic* feature package (NTX001AA), which is the basic operating software for all DMS-100 Family switches.

Two other software feature packages provide the DIRP utility with added capabilities:

- automated billing
- recording to system load module (SLM) disk drives

NTX243AA, *Automatic Message Accounting Teleprocessing System (AMATPS)*, enables the DIRP utility to process billing data automatically in Bellcore billing format.

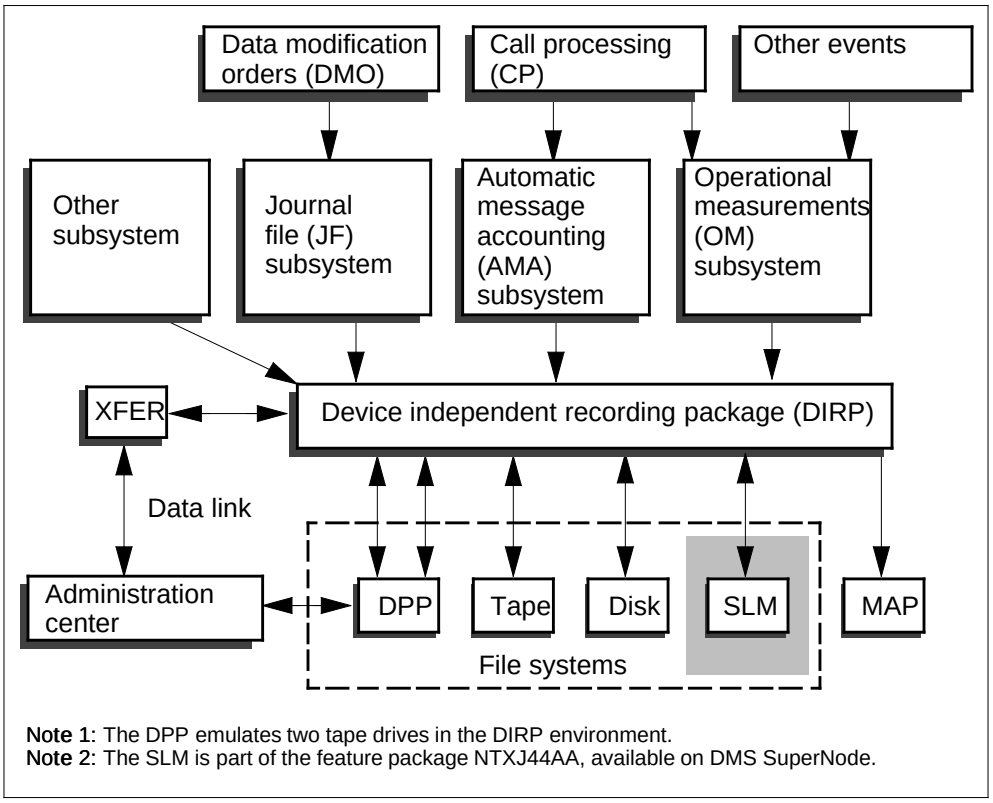
NTXJ44AA, *DIRP on SLM*, enables the DIRP utility to record to system load module (SLM) disk drives. This feature applies only to DMS SuperNode switches.

Figure , "The DIRP utility," on page 1-2 illustrates the interrelationships between DIRP utility, the contributing subsystems, the data storage devices, and the remote data polling system (XFER). Examples of contributing subsystems are Automatic Message Accounting (AMA), Journal File (JF), and Operating Measurements (OM). Refer to *Remote Data Polling System Description*, 297-1001-524 for more information about the remote data polling station.

This chapter focuses on defining the DIRP utility performance factors and indicators that the administrator can use to track the status of the various subsystems and to recognize the problems in the DIRP utility's performance for each subsystem. Refer to *Translations Guide* and *Provisioning Guide* for an overview and information on the DIRP suite of NTPs.

The following figure shows data, originating from the subsystems, being directed by the DIRP utility to an appropriate storage device, for example, magnetic tape or disk. By interacting with the remote data polling system and a data link, the DIRP utility makes data available to other locations. Although this figure shows only three subsystems, other subsystems are available.

The DIRP utility



Note 1: The DPP emulates two tape drives in the DIRP environment.
Note 2: The SLM is part of the feature package NTXJ44AA, available on DMS SuperNode.

Defining administration functions

The functions relating to the administration of the DIRP utility, as addressed in this document, are as follows:

- tasks that pertain to the surveillance of the DIRP utility's management of the recording facilities for data recording in the DMS-100 switch through the use of operational measurements
- tasks involving the daily collection of performance information, especially that identifying system faults. Information regarding faults is collated and delivered to the maintenance and engineering organizations.

DIRP performance factors

The DIRP utility performance factors are the individual components of overall performance and the effect that they may have on the DMS-100 Family switch. To monitor the performance of the utility's management of data systems, data

is gathered through performance indicators such as operational measurements and log reports related to the specific components and resources of the switch. The DIRP utility has four performance factors:

- DIRP availability, measured by overflow rates, indicates how often DIRP services are unavailable when a request to perform its function is received
- DIRP accessibility, measured by overflow rates, indicates how often the product cannot be accessed because DIRP software is not functioning correctly
- DIRP capacity, measured by usage, indicates whether the product is performing within its engineering capacity limits
- DIRP reliability, measured by operational measurements and log reports, indicates whether product error rates and out-of-service rates are within engineering limits

Performance indicators

The DIRP utility performance indicators are measurements or records of events that occur during a given period of time or in a time sequence. For the DIRP utility, performance indicators take the form of operational measurements (OM) and log reports.

Operational measurements

OM are data containing records of events occurring during a given time period. There are three basic types of measurements: peg counts, usage, and overflow. OM are used as service level indicators, as well as input for maintenance, hardware and software assignment, accounting, and provisioning decisions. For further information about OM, and complete descriptions of all OMs, refer to *Operational Measurements Reference Manual*.

Log reports

A log report is a message generated by the DIRP utility whenever a significant event has occurred with the utility's management of a subsystem or within the subsystem itself. Log reports include status and activity reports, as well as reports on hardware or software faults, test results, and other events or conditions that are likely to affect performance of the switch. A log report may be generated in response to a system or manual action. Complete descriptions of all log reports are contained in *Log Report Reference Manual*.

The DIRP logs are of the report type DIRP101, with reason codes added to distinguish the various examples of DIRP101 logs that can be produced.

DIRP system resources

Traffic-sensitive areas that may be affected by the DIRP utility are the occurrences of certain billable calls, record loss, number of calls that are recorded, and the number of free calls that are completed due to a shortage of recording facilities. Log reports and OM may indicate failures in DIRP

software or underlying hardware. Figur“DIRP utility resources performance factors” on page 1-5 and figure “DIRP utility fault locations” on page 1-7 illustrate the types of failure that can take place. The data collected from these performance indicators is used to verify the following traffic-sensitive areas.

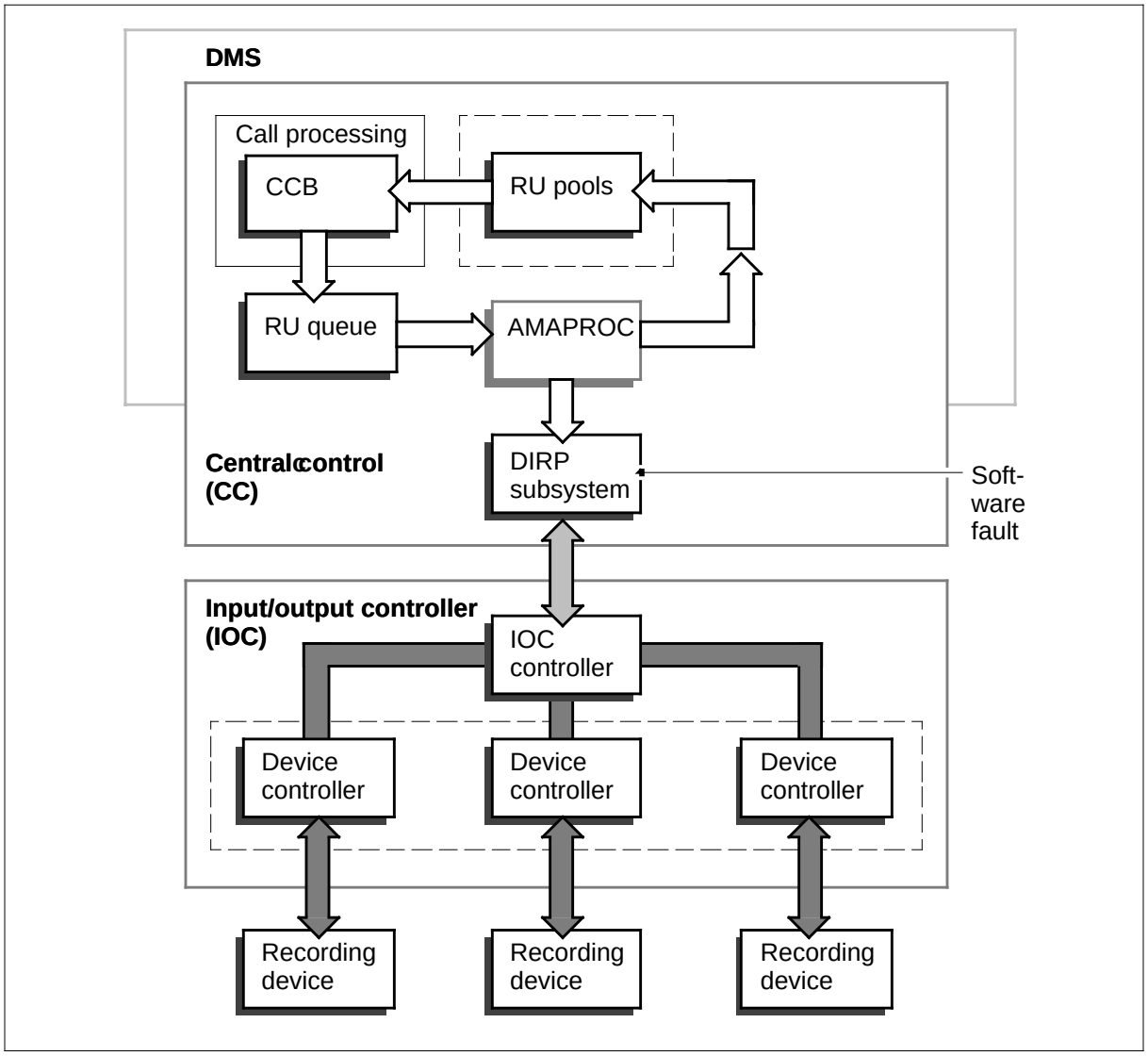
Call volumes and mix

The data recorded by the DIRP utility is the number and type of billing records from the automatic message accounting (AMA) and call detail recording (CDR) subsystems and sent to the downstream processor.

Emergency rotations

The data recorded by the DIRP utility is the number of emergency rotations that the DIRP utility performs to accommodate software problems.

DIRP utility resources performance factors



DIRP component failures and system faults

The failure of a subsystem or component can be caused by several problems. Figure , “DIRP utility fault locations,” on page 1-7 shows how system faults and hardware failures affect the DIRP utility's ability to coordinate the recording resources and requests for the storage and retrieval of information.

Recording device failure

The magnetic tape drive and disk drive unit are the currently supported hardware components that serve as recording devices on which the DIRP utility records data from contributing systems. These recording devices are provisioned during the engineering phase of a DMS office. Refer to *Provisioning Guide* for information on the hardware provisioning process.

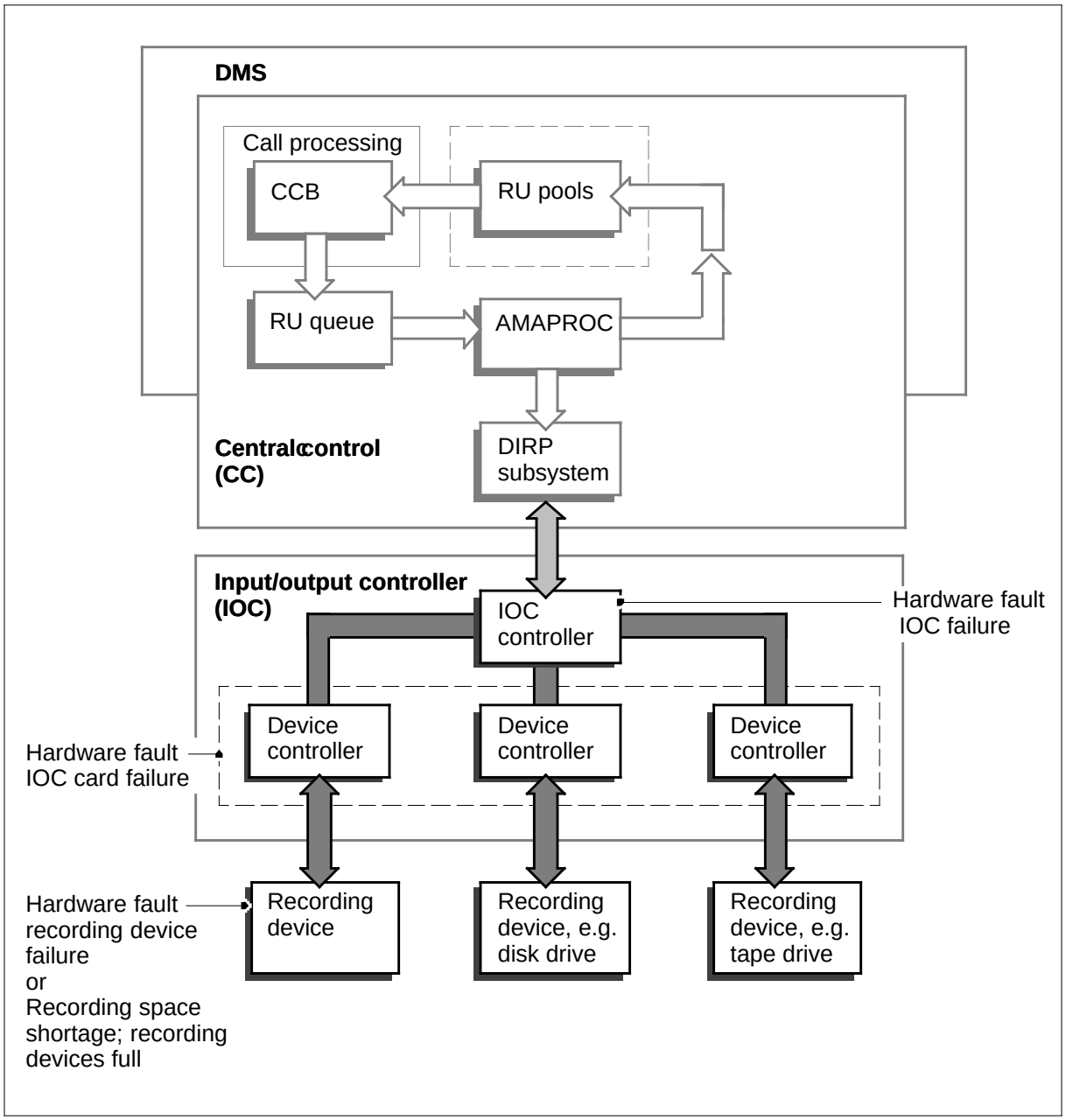
The DIRP utility can also record to the system load module (SLM) disk. SLM recording is available through feature package NTXJ44AA. Figure “DIRP utility fault locations” on page 1-7 does not show the SLM hardware.

Loss of call data occurs when there is no active tape unit or disk drive because no active drive was assigned before or after a data transfer. Disk problems are limited to the drive itself and its controller in the input/output controller (IOC).

Input/Output controller failure

Failure of the input/output controller causes all recording volumes on recording devices to be marked C-side busy. When the DIRP utility attempts to write to these volumes, a write failure occurs. In response to the failure, the DIRP utility performs an emergency rotation to take the volumes(s) out and mark the faulty volumes INERROR.

DIRP utility fault locations



2 Evaluating DIRP performance factors

Creating a performance monitoring plan

Planning and enabling switch-based measurement activities—including selecting log reports for output and defining the operational measurement (OM) parameters listed above—is usually the joint responsibility of operating company administration, and engineering and maintenance organizations.

The following procedure explains how to create and execute a plan to monitor the performance of the DIRP utility and the effect of the DIRP utility on the overall performance of the DMS-100 Family switch.

Creating a DIRP performance monitoring plan

1 Select the appropriate performance indicators.

Operational measurements and log reports are listed in tables associated with each of the performance factors that are described in later sections of this chapter.

2 Activate the performance indicators.

3 Activate the appropriate measurement options in the switch and collect the outputs. To define and activate specific log reports, refer to procedures in*DMS-100 Family Input/Output System Reference Manual*, 297-1001-129. To set up OM and route OM reports to output devices, refer to procedures in *Operational Measurements Reference Manual*, 297-1001-814. Required parameters for setting up OM are:

- class names and register assignments
- OM thresholds (provided the OM threshold feature package, NTX385, is included in the software load. To determine whether it is included, see "How to identify the software in your office" in "About this document" at the beginning of this manual.)
- data collection schedules
- reporting schedules
- output devices

4 Analyze the results.

In accordance with the reporting schedules set up in the previous step, review the output associated with the OM reported.

- Look for service indications, such as performance factors, that exceed the established engineering criteria for DIRP.
- Look for service conditions, such as log reports, that may indicate a maintenance or datafill problem.
- Look at OM readings that may indicate a need for more facilities.

Monitoring DIRP performance factors

DIRP performance factors are those individual components of overall product performance, such as the coordination of recording resources and information retrieval, that the administrator monitors to ensure full product availability, capacity, and reliability. The factor is measured by a performance indicator or indicators such as operational measurements (OM) and associated DIRP logs. For further information about logs refer to *Log Report Reference Manual*. The data collected is then evaluated and, if required, the necessary calculations are made to evaluate the factor performance. For further information about OM, and complete descriptions of all OM, refer to *Operational Measurements Reference Manual*.

Monitoring DIRP system faults

DIRP system faults are those subsystem faults or components whose failure affects the ability of the DIRP utility to coordinate the requests for the storage and retrieval of information with the recording resources. The system fault factors are measured by a performance indicator or indicators such as OM and associated DIRP logs. For further information about logs refer to *Log Report Reference Manual*. For further information about OM, and complete descriptions of all OM, refer to *Operational Measurements Reference Manual*.

DIRP performance factors
Record loss

Description

Normally, the value of register AMAENT provides an accurate representation of the automatic message accounting (AMA) data volume; however, if a DIRP utility fault causes some records to be lost, the value shown is not a true representation of the AMA data volume. The following table lists the performance indicators for evaluating AMA record loss.

Performance indicators for record loss

Operational measurements		
Group	**Register**	**Log reports**
AMA	AMAENT	AMAB100 AMA_CALL_DATA
		AMAB101 LAMA_CALL_DATA
		AMAB102 TOPS_F_ENTRY
		AMAB103 TOPS_EO_ENTRY
		AMAB104 TOPS_E1_ENTRY
		AMAB105 TOPS_E2_ENTRY
		AMAB106 TOPS_E4_ENTRY
		AMAB108 TOPS_F8_ENTRY
		AMAB109 TOPS_F8_ENTRY
		AMAB110 TOPS_E5_ENTRY
		AMAB111 TOPS_B6_B7_ENTRY
		AMAB116 AOS_CALL_DATA
		DIRP101 INFO_DIRP_FLOW_LOG
	AMAENT2	

How to evaluate factor performance

The AMAENT register provides a count of the initial records output to the DIRP utility for storage and eventual processing. An extension field, AMAENT2, is provided with register AMAENT to provide a true representation of the AMA data volume.

Record loss (end)

Calculations used to evaluate factor performance

Use the following formula to determine the true number of AMA records.

AMAENT 2 x 65,536 + AMAENT = True number of AMA records

Data evaluation factor procedure

On a periodic basis, compare the actual AMA data volume with the AMA data volume figure used in the original provisioning of the AMA system. If the value obtained from the OM is significantly greater than the provisioning data, re–evaluate the AMA system provisioning data in light of the new AMA data volume figure.

DIRP performance factors
Emergency rotation

Description

The DIRP utility automatically handles the normal recording of data output from the contributing subsystems. Sufficient recording space must be available for each subsystem for the DIRP utility to continue regular, orderly rotation of recording duty. When the DIRP utility cannot open a file on an active recording device or when it detects an error in writing data to an open file, it performs an emergency rotation to remove the faulty volume from the affected subsystem, and marks the faulty volume INERROR. The INERROR marking minimizes the loss of critical data, such as AMA data, by freezing the data on the faulty volume and preventing its use until the data is manually recovered by using the RSETVOL command. During an emergency rotation, DIRP recording is suspended while the active file is rotated out and a standby file is rotated in. The following table lists the performance indicators for evaluating emergency rotations.

Performance indicators for emergency rotation

Operational measurements		
Group	**Register**	**Log reports**
AMA	AMAEMTR	AMA117 AMA_OPTIONS DIRP 101 INFO_DIRP_FLOW_LOG

How to evaluate factor performance

Register AMAEMTR in OM group AMA is used to verify the provisioned volume size in the AMA subsystem. The register indicates the number of times a DIRP emergency rotation was performed. DIRP101 logs are used to evaluate the type and reasons for the rotation.

Calculations used to evaluate factor performance

None

Data evaluation factor procedure

Ideally, the AMAEMTR register should always be zero (0). DIRP utility faults may cause an emergency rotation, but consistent rotations are probably the result of volume overflow. A consistent non-zero value in this register indicates that the AMA data volume has exceeded the original expectations of the DIRP rotation schedule for the AMA subsystem. Report the out-of-compliance value to planning and engineering for re-evaluation of AMA resource provisioning

Emergency rotation (end)

and the DIRP utility rotation schedule. Assigning disk volumes is described in *Translations Guide* and *Provisioning Guide.*

DIRP

Note: If the space rotation feature is enabled (through datafill of SPACROTE = Y or MAXDFSIZ < 64 in table DIRPSSYS for a subsystem), running out of space often produces many space rotations, but no emergency rotations. The AMAEMTR register does not increase for the number of space rotations. Emergency rotations still occur in genuine emergencies.

DIRP Freecalls

Description

The operating company, through office parameters, can specify the route taken by AMA calls because no recording units or recording devices are available. There are two options existing: routing the AMA call free of charge or routing the AMA call to an operator system. The following table lists the performance indicators for evaluating AMA free calls.

Performance indicators for free calls

Operational measurements		
Group	**Register**	**Log reports**
AMA	AMAFREE	DIRP101 INFO_DIRP_FLOW_LOG

How to evaluate factor performance

Register AMAFREE in the OM group AMA provides the number of calls that were denied billing due to a shortage of recording units or DIRP recording facilities. DIRP101 logs are used to evaluate the type and the reasons for the shortage of recording facilities. If the DIRP utility is known to be fully operational, the AMAFREE register indicates the degree to which the recording unit pool is under-provisioned.

Calculations used to evaluate factor performance

None

Data evaluation factor procedure

After calculating the percentage of free calls during the study period, compare this percentage with the engineering service-level objective set for free-of-charge calls. Report any out-of-compliance value to planning and engineering for re-evaluation of AMA resource provisioning and the DIRP utility rotation schedule.

DIRP performance factors
Emergency rotation - CDR

Description

The call detail recording (CDR) system captures call details from call processing and maps this data to a file. These CDR records are then stored in a buffer. When the buffer is full, the DIRP utility automatically transfers the CDR records to tape or disk. Sufficient recording space must be available for the DIRP utility to continue regular, orderly rotation of recording duty. When the DIRP utility cannot open a file on an active recording device or when it detects an error in writing data to an open file, it performs an emergency rotation between CDR volumes. The following lists the performance indicators for a emergency rotation between recording devices.

Performance indicators for emergency rotation-CDR

Operational measurements		
Group	**Register**	**Log reports**
CDR	CDREMTR	DIRP101 INFO_DIRP_FLOW_LOG

How to evaluate factor performance

Register CDREMTR in OM group CDR and DIRP101 logs can be used to count the emergency rotations between the CDR recording volumes. The register indicates the number of times a DIRP utility emergency rotation was performed.

Calculations used to evaluate factor performance

None

Data evaluation factor procedure

Ideally, the CDREMTR register should always be zero (0). DIRP utility faults may cause an emergency rotation, but consistent rotations are probably the result of volume overflow. A consistent non-zero value in this register indicates that the DTR data volume has exceeded the original expectations of the rotation schedule. Emergency rotations could also be the result of the failure of an active tape or disk drive. Report the out-of-compliance value to planning and engineering for re-evaluation of AMA resource provisioning and the DIRP utility rotation schedule. Assigning disk volumes is described in *DIRP Planning and Engineering Guide*, 297-1001-175.

Note: If the space rotation feature is enabled (through datafill of SPACROTE = Y or MAXDFSIZ < 64 in table DIRPSSYS for a subsystem), running out of space often produces many space rotations, but no emergency

rotations. The CDREMTR register does not increase for the number of space rotations. Emergency rotations still occur in genuine emergencies.

DIRP performance factors
Entry count

Description

The call detail recording (CDR) system captures call details from call processing and maps this data to a file. These CDR records are then stored in the AMA buffer. When the buffer is full, the DIRP utility automatically transfers the CDR records to tape or disk. Sufficient recording space must be available in order for the DIRP utility to continue regular, orderly rotation of recording duty. When the DIRP utility cannot open a file on an active recording device or detects an error in writing data to an open file, it performs an emergency rotation between CDR devices. The following table lists the performance indicators for evaluating entry count.

Performance indicators for entry count

Operational measurements		
Group	**Register**	**Log reports**
CDR	CDRENT	DIRP 101 INFO_DIRP_FLOW_LOG
	CDRENT2	

How to evaluate factor performance

Register CDRENT in OM group CDR and DIRP101 logs can be used to monitor the number of entries on the active files and ensure that files are large enough to handle the number of calls. The amount of AMA storage capacity that is required in an office is determined through the analysis of the following factor:

- call record length in bytes (CRlength). Values can be 40 bytes for station message detail recording (SMDR), 65 bytes for equal access toll, and between 65 and 129 bytes for Bellcore AMA format (EBAF).

Calculations used to evaluate factor performance

Size of file (32 megabytes)

---------- = Maximum number of CDR entries on a tape

Number of bytes per file(129 bytes max

Entry count (end)

Data evaluation factor procedure

Periodically, monitor the number of CDR entries on the active tape and compare this value with the maximum number allowed per tape to reduce unnecessary rotations by the DIRP utility. Report any out-of-compliance value to planning and engineering for re-evaluation of AMA resource provisioning and the DIRP utility rotation schedule. Assigning disk volumes is described in *Translations Guide*, and *Provisioning Guide*.

DIRP system faults
Input/Output controller failure

Description

A DIRP utility emergency rotation may be caused by a fault in the input/output controller (IOC) or message switch. When an IOC goes system-busy, all recording volumes on recording devices that are hosted by the system-busy IOC are marked C-side busy (C status). For disk volumes, the physical disk file system closes all open files before going out of service. When the DIRP utility attempts to write to these files, a write failure occurs. In BCS33, the DIRP utility marks disk drive unit volumes that are out-of-service as RECOVERING. These volumes may be used again by the utility without manual intervention if the out-of-service condition clears on the disk drive unit. Some more serious device errors still lead to a marking of INERROR by the DIRP utility. Consult DIRP101 logs for an explanation of any disk drive unit failure. The following lists the performance indicators for evaluating IOC failure and its effect on DIRP utility performance.

Performance indicators for IOC failure

Operational measurements		
Group	**Register**	**Log reports**
AMA	AMAEMTR	AMA117 AMA-OPTIONS DIRP101 INFO_DIRP_FLOW_LOG

How to evaluate fault performance

Register AMAEMTR in OM group AMA indicates the number of times a DIRP emergency rotation was performed.

Calculations used to evaluate performance

None

Data evaluation fault procedure

Ideally, the AMAEMTR register should always be zero (0). An emergency rotation is caused either by the device out-of-service condition or, if the device has returned to service, by a no-open-files condition. The DIRP utility emergency rotation caused by the out-of-service condition is noted in the register.

Check the DIRP101 logs for the significance of the fault, and other events or conditions likely to affect the performance of the utility subsystem. Report the out-of-compliance value to planning and engineering for re-evaluation of

AMA resource provisioning and the DIRP rotation schedule. Assigning disk volumes is described in *Translations Guide* and *Provisioning Guide*.

DIRP system faults
Storage device

Description

Data storage devices include disk drive units (DDU) and magnetic tape drives (MTD). The following table lists the performance indicators for evaluating storage device failure and the effect on the DIRP utility.

Performance indicators for storage device

Operational measurements		
Group	**Register**	**Log reports**
AMA	AMAEMTR	AMA117 AMA_OPTIONS DIRP101 INFO_DIRP_FLOW_LOG

How to evaluate fault performance

The DIRP utility checks the reason for the write failure before taking action to determine whether the failure is caused by a device out-of-service condition. The utility then performs an emergency rotation to remove the faulty volume. Register AMAEMTR in OM group AMA is used to verify the provisioned volume size in the DIRP AMA subsystem. The register indicates the number of times a DIRP utility emergency rotation was performed.

Calculations used to evaluate performance

None

Data evaluation fault procedure

Ideally, the AMAEMTR register should always be zero (0). Evaluate the AMAEMTR register and the DIRP logs and determine which of the emergency rotations is caused by the recording device failure. Report the out-of-compliance value to maintenance for investigation and repair.

3 Using operational measurements to evaluate DIRP performance

Defining operational measurements

The performance of the DIRP utility can be recorded through the use of operational measurements (OM). The DMS-100 is provided with a number of measurements that, when used in conjunction with a mechanized data collection system, aid the DIRP utility administrator in tracking the performance either daily or on an accumulated basis. Refer to *Operational Measurements Reference Manual* for procedures to designate collection periods, establish thresholds, and associate the OM output with printing devices.

The following table provides a description, BCS history, associated registers, and validation information for the OM that are relevant to the DIRP utility.

Table 3-1 DIRP operational measurements (Sheet 1 of 2)

Group	Register	Information
AMA		**Description:** The automatic message accounting (AMA) group records the total number of initial AMA entries that are generated by call processing, the number of occurrences of emergency transfers between the AMA tape units, and the number of times that an AMA call is routed to traffic operator position system (TOPS). **BCS history:** This group was created in BCS20.
	AMAENT	**Description:** The AMAENT register records the total number of initial AMA record entries that have been output for downstream processing. One call generates one initial AMA record entry. TOPS calls involving a billing number charge adjustment may generate additional record entries. In DMS-250 applications, this register is increment when a call detail record (CDR) is made for AMA. **BCS history:** This register was created before BCS20. **Associated registers:** None **Register validation:** None
	AMAEMTR	**Description:** The AMAEMTR register records the number of occurrences of emergency transfers between AMA tape units. An emergency transfer occurs when there is no active tape unit or when an end-of-tape record cannot be written. No loss of call data is implied unless the *from* or *to*tape drive number indicated in the AMA117 log accompanying the transfer is ~Symbol {-1, signifying that no active drive was assigned before or after the transfer. In the latter case, the current software tape buffer, possibly containing call data, is overwritten.} **BCS history:** This register was created before BCS20. **Associated registers:** None **Register validation:** None

Table 3-1 DIRP operational measurements (Sheet 2 of 2)

Group	Register	Information
	AMAFREE	**Description:** The AMAFREE register counts the number of AMA calls that are routed free of charge. Included in this register are calls that are processed free of charge because no devices or recording units were assigned. **BCS history:** This register was created before BCS20. **Associated registers:** None **Register validation:** None
CDR		**Description:** The call detail recording (CDR) registers monitor the use of resources that are required for CDR operation in a DMS-300 office. **BCS history:** This group was created before BCS20.
	CDREMTR	**Description:** The CDREMTR register counts emergency transfers between CDR devices. **BCS history:** This register was created before BCS20. **Associated registers:** None **Register validation:** None
	CDRENT	**Description:** The CDRENT register counts entries on the active register tape. **BCS history:** This register was created before BCS20. **Associated registers:** None **Register validation:** None

4 DIRP tracking work sheets

Using the work sheets

The following describes suggested work sheets that may be used to track the performance of the DIRP utility. The work sheets are provided for keeping track of

- the number and causes of emergency rotations that were performed by the DIRP utility
- the number of automatic message accounting (AMA) records that were lost
- the number of calls that were denied billing because of a shortage of recording units or devices
- the number of call detail recording (CDR) entry counts and emergency transfers

Performance trends can be observed as data is accumulated.

Emergency rotations

The emergency rotations work sheet enables the administrator to record the type and number of error conditions that occurred and forced the DIRP utility to perform an emergency rotation. The administrator analyzes this data and reports any out-of-compliance value to the planning and engineering group for

re-evaluation of AMA resource provisioning and the DIRP utility rotation schedule.

Table 4-1

Study period _____		**Emergency Rotations**		
Write errors	**Volume overflow**	**Number of open files**	**Recording device out-of-service**	**I/O controller failureSubSubHead**
1	2	3	4	5
Prepared by Name _____ Date _____ Tel. No. _____				

AMA record loss

The AMA record loss work sheet enables the administrator to record the number of AMA record entries reported by the register AMAENT and to compare this figure to the actual number of AMA record entries. The administrator analyzes this data and reports any out-of-compliance value to the

planning and engineering group for re-evaluation of AMA resource provisioning.

Table 4-2

Study period _____		**AMA Record Loss**	
Record entries (AMAENT)	**Extension register (AMAENT2)**	**AMAENT2 x65,536**	**Column 1 + Column 3 is equal to actual data record**
1	2	3	4
Prepared by Name _____ Date _____ Tel. No. _____			

AMA free calls

The AMA free calls work sheet enables the administrator to record the number of calls that are routed free of charge. The administrator analyses this data, compares the figures to the free call-service-objective, and reports out-of-compliance values to the planning and engineering group for

re-evaluation of AMA resource provisioning, and to maintenance for evaluation of recording device and process downtime.

Table 4-3

Study period _____ **AMA free calls**			
Number of AMA calls	**Number of free calls (AMAFREE)**	**Percentage of free Calls (Column 2 / Column 1 x 100)**	**Free call service-level objective**
1	2	3	4
Prepared by Name _____ Date _____ Tel. No. _____			

CDR entry count and emergency rotations

The CDR work sheet enables the administrator to record the number of CDR entries on the active tape and the emergency rotations between recording devices. The administrator compares these with the maximum number of

entries on an active tape, and reports out-of-compliance values to the planning and engineering group for re-evaluation of AMA resource provisioning.

Table 4-4

Study period _____		**CDR entry count and emergency rotations**		
CDR entry count on active tape	**Number of emergency rotations**	**Maximum number of CDR entries on the active tape**	**Compare columns 1 and 3**	**Compare columns 2 and 3**
1	2	3	4	5
Prepared by Name _____ Date _____ Tel. No. _____				

List of terms

AMA

Automatic message accounting

Automatic message accounting (AMA)

An automatic recording system that documents all the necessary billing data of subscriber-dialed long distance calls.

Call detail recording (CDR)

A system that collects and records data on all calls that are processed by the DMS-300 gateway international switching system. CDR is later stored on a recording device and is used to compile studies on service (traffic and equipment), division of revenue, engineering, and fraud.

Call processing (CP)

The software system that handles the processes involved in setting up connections through the DMS-100 Family network between calling and called parties.

CC

Central control

CDR

Call detail recording

Central control (CC)

Comprises the data processing functions of the DMS-100 Family, with associated data store and program store.

CI

Command interpreter

Command interpreter (CI)

A support operating system component that functions as the main interface between machine and user. Its principal roles are

- to read lines entered by a terminal user
- to break each line into recognizable units
- to analyze the units
- to recognize command item-numbers on the input lines
- to invoke these commands.

CP

Call processing

Data stream interface (DSI)

Circuits or ports in the distributed processing peripheral through which the distributed processing peripheral (DPP) receives automatic message accounting data from the DMS-100.

DDU

Disk drive unit

Device independent recording package (DIRP)

Software that automatically directs data from the various administrative and maintenance facilities to the appropriate recording devices.

DIRP

Device independent recording package

Disk drive unit (DDU)

Consists of a disk drive and a power-converter card installed in an input/output equipment frame.

Distributed processing peripheral (DPP)

A peripheral module that accepts data from the DMS-100, formats the data if necessary, and stores it on a disk. Upon request, the DPP retrieves and sends data to the host office collector.

DPP

Distributed processing peripheral

DSI

Data stream interface

IBN

Integrated business network

Input/output controller (IOC)

An equipment shelf that provides an interface between up to 36 input/output devices and the central message controller. The IOC contains a peripheral processor that independently performs local tasks, thus relieving the load on the central processing unit.

Input/output device (IOD)

A hardware device that interprets input and formats output for human users or remote computers.

Integrated business network (IBN)

Now known as Meridian Digital Centrex. A special DMS business services package that uses the data-handling capabilities of a DMS-100 Family office to provide a centralized telephone exchange service. Many optional features are also available.

Interrecord gap (IRG)

The space between two consecutive blocks on a data medium. An area on a data medium to indicate the end of a block or physical record.

IOC

Input/output controller

IOD

Input/output device

IRG

Interrecord gap

JF

Journal file

Journal file (JF)

A facility that preserves, on a recording device, changes made to the data tables of the DMS-100 Family systems. The JF provides a means of restoring the tables should it be necessary to reload office software from a backup image.

Magnetic tape drive (MTD)

In DMS, a device used to record DMS-100 Family data. An MTD may be mounted on either a magnetic tape center frame or an input/output equipment frame.

Maintenance and administration position (MAP)

A group of components that provides a user interface between operating company personnel and the DMS-100 Family systems. A MAP consists of

a visual display unit and keyboard, a voice communications module, test facilities, and MAP furniture. MAP is a trademark of Northern Telecom.

Man-machine interface (MMI)

See user interface.

MAP

Maintenance and administration position

MMI

Man-machine interface. *See* user interface.

MTD

Magnetic tape drive

OM

Operational measurements

Operational measurements (OM)

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

Remote data polling system (XFER)

A system that permits an operating company to transfer information concerning the operation of a DMS-100 Family office to its data processing center.

SMDR

Station message detail recording

Station message detail recording (SMDR) system

In Meridian Digital Centrex, a system that provides recording facilities for the details of billable and nonbillable calls for each Meridian Digital Centrex customer group.

User interface

The series of commands and responses that are used by operating company personnel to communicate with the DMS-100 Family system machines. User interface is achieved through the MAP and other input/output devices. Used to be known as man-machine interface.

VDU

Visual display unit

Visual display unit (VDU)

An electronic output device that presents data to a terminal user in the form of a television picture. In DMS, the VDU is one of the components of the maintenance and administration position, and, along with a keyboard, provides the main user interface in the DMS-100 Family systems.

XFER

Remote data polling system

DMS-100 Family

Device Independent Recording Package

Administration Guide

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