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DMS-100 Family

Bellcore Format Automatic Message Accounting

Maintenance Guide

BCS33 and up Standard 01.01 October 1991

northern telecom

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Contents

About this document

This document provides the information necessary for operating company craftspersons to maintain the DMS automatic message accounting (AMA) subsystem. Provided in this chapter is general information on AMA subsystem maintenance practices, tools, and procedures. Any craftsperson with minimal craft experience can detect faults and diagnose problems using this document.

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 AMA documentation is organized

This document is part of AMA documentation that supports the NT line of AMA products. AMA 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 AMA products, you need documents from the following layers:

- DMS-100 Family basic documents in the 297-1001 layer
- AMA documents in the 297-1001 layer
- DMS-100 documents in the 297-1401 layer
- DMS-100 documents in the 297-2071 layer
- DMS-100 documents in the 297-2101 layer
- DMS-100 documents in the 297-2271 layer
- DMS-100 documents in the 297-2281 layer.

AMA documents and other documents that contain related information are listed in "Finding AMA information" in *Bellcore Format AMA Product Guide*, Product guide.

References in this document

The following documents are referred to in this document.

Number	Title
297-1001-001	*DMS-100 Family Guide to Northern Telecom Publications*
297-1001-012	*Bellcore Format Automatic Message Accounting Product Guide*
297-1001-110	*Maintenance and Administration Position (MAP)*
297-1001-138	*Distributed Processing Peripheral (DPP) Reference Manual*
297-1001-311	*Distributed Processing Peripheral (DPP) User Guide*
297-1001-312	*Device Independent Recording Package (DIRP) User Guide*
297-1001-340	*Automatic Message Accounting-Northern Telecom to Bellcore Format Conversion Guide*
297-1001-341	*Bellcore Format Automatic Message Accounting Administration Guide*
297-1001-451	*Common Customer Data Schema*
297-1001-500	*Index to Maintenance Procedure Documents*
297-1001-509	*Command Reference Manual*

Number	Title
297-1001-513	*Input/Output Devices (IODs) Man-Machine Interface Description*
297-1001-520	*Maintenance System Man-Machine Interface Description*
297-1001-529	*Distributed Processing Peripheral Maintenance Reference Manual*
297-1001-556	*Input/Output Devices Subsystem Maintenance Procedures*
297-1001-814	*Operational Measurements Reference Manual*

What precautionary messages mean

Caution messages in this document indicate potential risks, as shown below.

Message	Significance
CAUTION	Possibility of service interruption or degradation

An example of a caution message follows.

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

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 it is a command:

>BSY

Commands and fixed parameters

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

>BSY LINK

Variables

Variables are shown in lowercase letters:

>BSY LINK ps_link

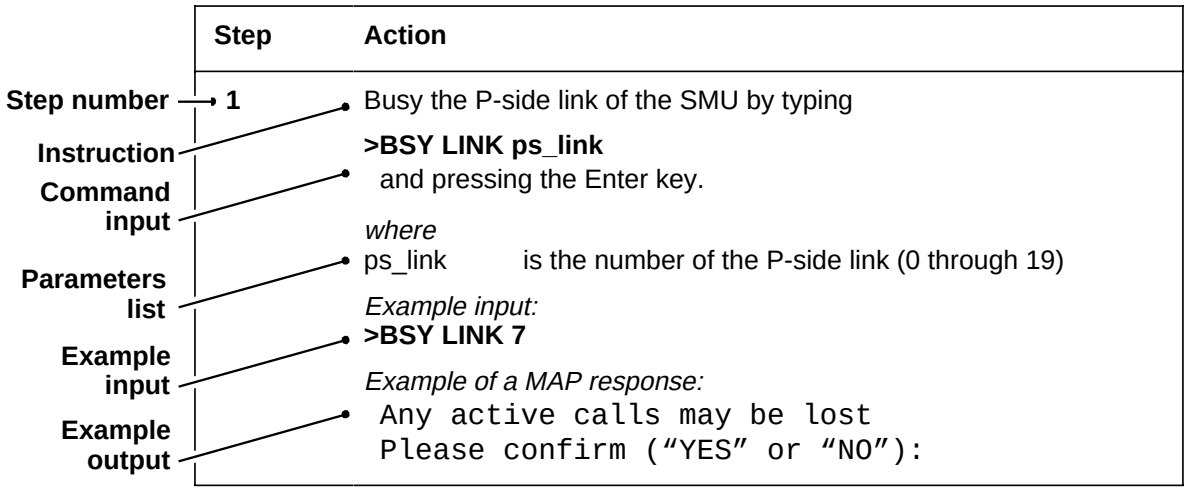
The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

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 example illustrates the command syntax used in this document.



Maintenance

Maintenance overview

General

This chapter provides the information necessary for operating company craftspersons to maintain the DMS automatic message accounting (AMA) subsystem. Provided in this chapter is general information on AMA subsystem maintenance practices, tools, and procedures.

Any craftsperson with minimal craft experience can detect faults and diagnose problems using this document. To detect faults and diagnose problems, the craftsperson need only be familiar with how to use the MAP. For information about how the DMS system is interfaced with the MAP, refer to the *Maintenance and Administration Position (MAP)*, 297-1001-110.

The instructions in this chapter will enable the craftsperson to isolate faults in the AMA subsystem by using the MAP to telescope in on any given fault. Telescoping is a branching scheme used to isolate faults in system components. This telescoping process is also used to change and/or update the system status.

The AMA subsystem is mainly software and requires minimal maintenance. Most of the maintenance associated with the AMA subsystem is actually maintenance of data recording and transferral systems. These systems include the device independent recording package (DIRP) and in many configurations either the AMA teleprocessing system (AMATPS) or the remote data polling system (XFER). Some basic maintenance procedures for these systems as they pertain to the AMA subsystem are contained in this chapter. Please refer to the following documents for more detailed information on these systems:

- *Distributed Processing Peripheral (DPP) Reference Manual*, 297-1001-138
- *Distributed Processing Peripheral (DPP) User Guide*, 297-1001-311
- *Distributed Processing Peripheral Maintenance Reference Manual*, 297-1001-529
- *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312

- *Remote Data Polling System Description and Man-Machine Interface*, 297-1001-524

Maintenance tools

Maintenance tools available to the operating company maintenance craftspersons for AMA include the DMS MAP, logs, and operational measurements (OMs).

DMS MAP

The DMS MAP is used to observe the status of and perform specific maintenance tasks on the hardware components of the AMA subsystem. These components include the AMA storage devices and the AMA transmitter (AMAT). Using the MAP, maintenance craftspersons can view the status of, busy, test, and return to service any AMA hardware component and can manage the AMA recording facilities as required.

Logs

For maintenance purposes, logs are a source of fault detection as well as useful for locating and clearing faults. The usefulness of these logs depends on their source and content.

Log reports provide a record of events taking place in a DMS switch. These events include:

- the occurrence of errors caused by changes in the status of software and hardware resulting from input of commands at a MAP
- changes resulting from system action

The following are log reports that are related to AMA failures:

- **AMA100** is logged for recording stream failures. The log is output whenever a process related to AMA changes status. The log indicates the status of acting billing functions and should never be suppressed or made unavailable.
- **AMA114** is logged when an incoming or outgoing emergency AMA transfer occurs. The log gives counts of the number of records that have been written into the AMA file just closed. The count stored is identical to that in the DIRP101 file rotation log.
- **DIRP101** is logged whenever the AMA process fails due to software bugs, when recording-unit extension blocks are not available, or when files are rotated.
- **EXT108** is logged as an AMAFAIL ON, indicating that the AMA subsystem is in trouble, or logged as AMAFAIL OFF, indicating that the AMA subsystem has been restored to normal.

How to set up and route log reports Three software tables affect the routing of log reports. These tables are as follows:

- **LOGCLASS** contains classes of log reports and associates the names of one or more log reports to each class.
- **LOGDEV** contains a list of the primary output devices to which log reports are to be sent, associates a class of log reports to each output device, and specifies a backup device to which log reports should be sent if the primary device fails.
- **TERMDEV** identifies output devices such as a printer, a disk drive unit (DDU), or a magnetic tape drive (MTD) to system software.

The table editor may be used to fill in or to modify information in these tables (assuming table screening permits it). Once routes are established by this method, a series of commands belonging to the LOGUTIL software can be used to reroute logs temporarily or to query routing in effect.

When a reload restart of the system occurs, either as a result of the RELOAD RESTART command or as a result of automatic action by the system, the temporary rerouting is removed and the routes revert to the default values contained in system data tables.

> ***Note:*** Associate the fifth class of reports with a printer to ensure that a hard copy of the reports will be available even if a fault should prevent accessing the files on the DDU or the MTD.

Operational measurements

Operational measurements record the number of times an event occurs or a resource is used. This information, which is used for traffic provisioning, service monitoring, accounting allocation, and market evaluation, is also a useful source for fault indication, identification, and location. The OMs currently produced by the AMA subsystem for Bellcore format are listed in the *Bellcore Format AMA Administration Guide*, 297-1001-341.

Scheduling and routing of OMs to output devices is performed by modifying the contents of certain system data tables by using the table editor or the command interpreter (CI) commands. For a description of the CI commands, system data tables, OM registers and their use in scheduling and routing OMs, see the *Operational Measurements Reference Manual*, 297-1001-814.

Operational measurements relevant to AMA maintenance are listed in Table 1-1.

Table 1-1xxx
AMA operational measurements relevant to AMA maintenance

OM group	Register	Description
AMA	AMAEMTR	This register records the number of occurrences of emergency transfer between AMA tape units. An emergency transfer occurs when there is no active tape unit or a proper 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 message accompanying the transfer is -1, signifying no active drive assigned before or after the transfer. In the latter case, the current software tape buffer, possibly containing call data, is overwritten. Associated logs: ▪ AMAB117 AMA_OPTIONS ▪ DIRP101 INFODIRP_FLOW_LOG Associated registers: None
AMA	AMAFREE	This 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 due to no devices or no recording units. Associated logs: DIRP INFO DIRP_FLOW_LOG Associated registers: None
AMA	AMAROUTE	This register is associated with TOPS offices and will increment each time there are no centralized AMA (CAMA) TOPS recording units available for storing the call details. When this happens, an EM3 treatment is applied to the AMA recording device. Associated logs: None Associated registers: None
ATTAMA	AMLTSTPD	This register counts the number of call records for answered station paid calls that are lost. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None

-continued-

Table 1-1xxx
AMA operational measurements relevant to AMA maintenance (continued)

OM group	Register	Description
ATTAMA	AMNASTPD	This register counts the number of answered station calls that have lost the answer message. Lost answer message calls are pegged when a disconnect message is received from an answered call but there is no record of receipt of an answer message. Under these conditions no AMA record is produced. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMLT411	This register counts the number of directory assistance (DA) 411 billable calls that are lost. The register scores when a record has been output to the DIRP buffer and a tape unit is not available or when a software recording unit is not available. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMNA411	This register counts the number of answered DA411 calls for which the answer message is lost. Lost answer message calls are pegged when a disconnect message is received from an answered call, but there is no record of receipt of an answer message. Under these conditions, no AMA record is produced. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMLT555	This register is pegged when a record has been output to the DIRP buffer and a tape unit is not available or when a software recording unit is not available. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None

-continued-

Table 1-1xxx
AMA operational measurements relevant to AMA maintenance (continued)

OM group	Register	Description
ATTAMA	AMNA555	This register counts the number of DA 555-1212 calls with a lost answer message. Lost answer message calls are pegged when a disconnect message is received from an answered call, but there is no record of receipt of an answer message. Under these conditions no AMA record is produced. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMLTTRCR	This register counts the number of tracer, transfer, and time change records that are lost. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMLTOTHR	This register is pegged when nonchargeable calls are recorded for study purposes and the study records are lost. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMNAOTHR	This register is pegged when a nonchargeable study call is recorded with a lost answer message. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMLTLONG	This register is pegged when *A* and *B* long duration records are lost. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None
ATTAMA	AMUNANS	This register is pegged when an unanswered AMTRMT call is disconnected and no answer message is received. This register is only pegged if UNANSTOLL option is on and UNASLOCAL option is on for those offices with feature package NTX159AA. Associated logs: AMAB117 AMA_OPTIONS Associated registers: None

-continued-

Table 1-1xxx
AMA operational measurements relevant to AMA maintenance (continued)

OM group	Register	Description
ATTLAMA	AMLTIWAT	This register is pegged when an INWATS call has been lost, either due to an attempt to record the call without an AMA tape, or due to failure to get a BC_LAMA_UNIT. Associated logs: None Associated registers: EXT -Index 28
ATTLAMA	AMLTOWAT	This register is pegged when an OUTWATS call has been lost, either due to an attempt to record the call without an AMA tape, or due to a failure to get a BC_LAMA_UNIT. This register will only peg if the OUTWATS option is on in Table AMAOPTS Associated logs: None Associated registers: EXT - Index 28

End

Man-machine interface

The following commands are directly related to the AMA subsystem and are described in the *Command Reference Manual*, 297-1001-509:

- CALLDUMP
- AMADUMP
- MAKEAMA
- BCCONV
- AMARESTART

For specific information on syntax and use of these utility commands, refer to *Command Reference Manual*, 297-1001-509. A brief functional description of these commands follows:

CALLDUMP utility

The CALLDUMP utility provided in feature packages NTX042, NTX044, and NTX102 allows the user to display fully formatted billing records at the user's terminal immediately after the records have been created by billable calls.

CALLDUMP outputs formatted billing records using the same display format as the AMADUMP command. The main difference between the two is that CALLDUMP formats its billing records directly out of the internal call record buffer, whereas AMADUMP requires the user to use DIRP to record call records in a file, and then format records from a DIRP file. The

user then must apply AMADUMP to that file. This sequence is inconvenient if the user wishes to see one or two records at a time while making calls. CALLDUMP gets around this problem by not using DIRP files. The user need not record in DIRP, nor is any other type of setup required. The user simply makes a call(s), goes on-hook, and enters CALLDUMP to see the resulting billing record(s). This process is repeated as many times as desired. The user specifies via a parameter what call stream the billing records are to be taken from. AMA is the default. If AMA is specified, the system will automatically choose the correct AMA format (BC or NT).

CALLDUMP is safe to use. It does not affect billing records in any way. It does not interrupt any DIRP recording in progress. CALLDUMP's only effect on DIRP is that it dumps the internal call record buffer to DIRP before the buffer is full. This is exactly the same effect as the AMADUMPB command. CALLDUMP's real time impact on call-processing is small. These characteristics make CALLDUMP safe to use in live offices.

CALLDUMP dumps the internal call record buffer to DIRP and clears the buffer. This allows the next invocation of CALLDUMP to display only records generated since the previous invocation of CALLDUMP. If the user wishes to redisplay the records shown by the last invocation of CALLDUMP, then CALLDUMP PREVIOUS must be entered. CALLDUMP PREVIOUS allows the user to redisplay the same set of records as many times as desired. There are ways other than CALLDUMP that can cause the internal call record buffer to be dumped to DIRP and cleared: 1) the buffer becomes full, 2) use of fields TIMERDMP and TIMERINT in Table CRSFMT, and 3) use of command AMADUMPB. If one of these events occurs while the user is making calls and using CALLDUMP, the user may get unexpected results (missing record(s)) if the buffer is cleared before the CALLDUMP command is invoked. The user should be aware of those situations.

The CALLDUMP command is described in detail in the *Command Reference Manual*, 297-1001-509.

Multiple users are not allowed to invoke CALLDUMP simultaneously. If this is attempted, an error message will be given. Multiple users may all use CALLDUMP, but they must take turns. Users should be aware of other users of CALLDUMP on the switch, otherwise they might easily end up capturing each other's billing records. When a user invokes CALLDUMP, the system checks to see if any other user has invoked the command within the previous five minutes. If so, then a message is given to the user warning of the situation.

AMADUMP utility

The AMADUMP utility provided in feature package NTX001AA provides for the display or hard copy printout (dump) of the contents of AMA files produced in a local AMA (LAMA) or CAMA office using the following output formats:

- a block-by-block hexadecimal dump of the contents of a file, with the range of blocks optionally specified by the user
- a record-by-record dump of AMA call-entries, data-entries, or header-entries within an AMA file, with screening that may be optionally specified by the user.

The AMADUMP command is described in detail in the *Command Reference Manual*, 297-1001-509.

MAKEAMA utility

The MAKEAMA utility is used to generate billing records for testing.

MAKEAMA	call code	quantity

generates Bellcore AMA billing records without making a phone call. These billing records are processed through AMAPROC with other AMA records but are distinguished from other records by having the test call flag in the study indicator set.

Parameters

call code one of the valid call codes that identifies a type of call in the DMS environment. Range: 1-999

quantity the number of AMA records to be generated. Range: 1-100.

```
THIS COMMAND WILL CAUSE 1 BILLING RECORD(S) WITH CALL
CODE 6 TO BE GENERATED.  DO YOU WISH TO PROCEED?
```

Explanation: The user entered the command string "MAKEAMA 6." The system is ready to execute the command and produce an AMA billing record identified by call code 6 but prompts the user first for validation.

Responses

```
COMMAND COMPLETED SUCCESSFULLY.
1 BILLING RECORD(S) GENERATED.
```

Explanation: The system executed a user MAKEAMA request successfully, producing one billing record.

```
COMMAND TERMINATED DUE TO REQUEST.
```

Explanation: The system terminated the MAKEAMA command after the user replied "no" to the system prompt about proceeding with execution of the command.

```
COMMAND ABORTED.  CALL CODE 555 CANNOT BE
GENERATED WITH THIS COMMAND.
```

Explanation: The user entered an invalid call code.

```
WRONG TYPE:  <CALL CODE> {1 TO 999}
ENTER:  <CALL CODE> {QUANTITY}
```

Explanation: The user entered a value out of range for one or both of the parameters, call code and quantity.

User action: Enter a valid call code and, if desired, a valid quantity.

```
EITHER INCORRECT OPTIONAL PARAMETER(S) OR TOO MANY
PARAMETERS.  COMMAND ABORTED.  OPTIONAL PARAMETER ERROR.
```

Explanation: The user either entered an incorrect value for a parameter or too many parameters.

BCCONV utility

This command converts the 7-digit representation of a trunk number to a group common language name and an external trunk name. This command also converts a group common language name, or a short common language name, and an external trunk name to a 7-digit trunk identification.

BCCONV	**AGENTID**	**agentid**			
	CLLI	**clli**	**trunk**		
	EXTLEN	**lm**	**tn**		
	LEN	**fn**	**bn**	**dn**	**cn**

converts the Bellcore trunk and line identifiers to their normal DMS forms and vice versa.

Parameters

AGENTID converts the 7-digit representation of an agent identification (AGENTID), which is a trunk or line identification, to:

- for trunks, the group CLLI and external trunk name
- for lines, the external LEN and simple LEN

agentid is the agent identification, a string of up to seven digits enclosed within quotes that identifies the agentid.

CLLI converts the group CLLI or short CLLI and external trunk name to the 7-digit representation of the agentid.

clli is the common language location identifier, a string that identifies the group CLLI or short CLLI name.

trunk is the external trunk name (values 0 to 9999).

EXTLEN converts the external line equipment number to the 7-digit representation of the agentid.

lm is the line module number (values 0 to 199).

tn is the terminal number (values 0 to 639).

LEN converts the frame number, bay number, drawer number, and circuit (line) number form of the line equipment number to the 7-digit representation of the agentid.

fn is the frame number (values 0 to 99).

bn is the bay number (values 0 to 1).

dn is the drawer number (values 0 to 19).

cn is the circuit number (values 0 to 31).

Responses

`AGENTID MUST BE 1 TO 7 DIGITS LONG`

Explanation: The string that identifies the agentid must be no more than seven digits long.

User action: Repeat the command using an agentid string from one to seven digits long.

`CAN'T IDENTIFY TRUNK FROM CP_ID`

Explanation: The system cannot identify the associated trunk.

User action: Verify that the input string was correct, and repeat the command.

`CAN'T FIND TRUNK NAME FROM CP_ID`

Explanation: The system cannot find the associated trunk name.

User action: Verify that the input string was correct, and repeat the command.

`CONVERSION FAILED`

Explanation: The attempted conversion failed.

User action: If desired, repeat the command.

`EXT LINE EQUIPMENT NUMBER`

Explanation: An external line equipment number is identified.

User action: None

`INVALID CLLI NAME`

Explanation: The CLLI name input with the command is not recognized by the system.

User action: Repeat the command using a valid CLLI name.

`INVALID EXTERNAL TRUNK NAME`

Explanation: The external trunk name input with this command is not recognized by the system.

User action: Repeat the command using a valid external trunk name.

`INVALID LINE ID`

Explanation: The line identification input with the command is invalid.

User action: Repeat the command using a valid line identification.

`INVALID SHORT CLLI NAME`

Explanation: The short CLLI name input with the command is not recognized by the system.

User action: Repeat the command using a valid short CLLI name.

`LINE EQUIPMENT NUMBER`

Explanation: A line equipment number is identified.

User action: None

`MUST BE A NUMBER WITHIN QUOTES`

Explanation: The agentid number string must be enclosed within quotes.

User action: Repeat the command enclosing the agentid string within quotes.

Examples Following are 4 examples for this command.

1 Convert the agentid ‘0001212’ to the normal DMS form:

```
>BCCONV agentid ‘0001212’
```

If it is a line, use the LEN that is returned to perform a QLEN command to obtain the directory number.

2 Convert the group CLLI BLKDN and external trunk 1 to the agentid 7-digit representation:

>BCCONV clli blkdn 1

3 Convert the external line equipment number 012 (LM number) 253 (terminal number) to the agentid 7-digit representation:

>BCCONV extlen 012 253

4 Convert the line equipment number 142 (frame number) 1 (bay number) 043 (drawer number) 23 (circuit number) to the agentid 7-digit representation:

>BCCONV len 142 1 043 23

AMARESTART utility

When an AMA software failure occurs, operating company personnel can use the AMARESTART command to recreate the AMA process.

AMARESTART	param

causes the recreation of the desired AMAPROC child process.

Note: The system will attempt to recreate automatically the AMA stream AMAPROC process once every 10 minutes.

Parameter

stream specifies the stream associated with the AMAPROC process. There is one AMAPROC process for each stream defined in Table CRSFMT (*Common Customer Data Schema*, 297-1001-451).

Responses

```
AMA DADDY PROCESS (AMAEI) DID NOT RESPOND FOR STREAM: XXX;
THIS IS A POTENTIAL EMERGENCY CONDITION.
ENTER <QUERY PROCESS AMAEI> AND INVESTIGATE.
```

Explanation: A severe software error has occurred.

User action: Contact the next level of maintenance immediately.

```
AMAPROC PROCESS COULD NOT BE RESTARTED FOR STREAM: XXX
```

Explanation: The AMAPROC process was dead, could not be restarted, and is still dead.

User action: Contact the next level of maintenance.

```
AMAPROC PROCESS HAS BEEN RESTARTED FOR STREAM: XXX
```

Explanation: The AMAPROC process was dead but now has been restarted.

```
AMAPROC PROCESS IS ALREADY RUNNING FOR STREAM: XXX
```

Explanation: Stream ‘xxx’ is healthy. No action is taken.

```
COMMAND IGNORED.  NO ACTIVE STREAMS EXIST.
```

Explanation: Table CRSFMT has no active streams defined.

```
COMMAND REJECTED.  SPECIFIED STREAM IS INVALID.
```

Explanation: The stream specified as the command parameter does not appear in Table CRSFMT.

```
COMMAND TERMINATED DUE TO REQUEST.
```

Explanation: The user has entered NO in response to a prompt as to whether to proceed.

```
THIS COMMAND WILL CAUSE A DEAD AMAPROC PROCESS FOR THE
SPECIFIED STREAM TO BE RESTARTED.
DO YOU WISH TO PROCEED?

Please confirm (“YES” or “NO”):
```

Explanation: This is in response to the user entering the AMARESTART <stream> command.

```
THIS COMMAND WILL CAUSE DEAD AMAPROC PROCESSES FOR ALL
STREAMS TO BE RESTARTED.
DO YOU WISH TO PROCEED?

Please confirm (“YES” or “NO”):
```

Explanation: This indicates that AMARESTART was entered without a specified stream.

```
UNEXPECTED RESPONSE FROM AMA DADDY (AMAEI) FOR STREAM: XXX;
THIS IS A POTENTIAL EMERGENCY CONDITION.
ENTER <QUERY PROCESS AMAEI> AND INVESTIGATE.
```

Explanation: A severe software error has occurred.

User action: Contact the next level of maintenance immediately.

```
UNKNOWN AMAPROC PROCESS STATE FOR STREAM: XXX;
ENTER <QUERY PROCESS AMAPROC> AND INVESTIGATE
```

Explanation: A severe software error has occurred.

User action: Contact the next level of maintenance immediately.

Example Restart the AMA subsystem as follows:

```
>CI
>AMARESTART ama
THIS COMMAND WILL CAUSE A DEAD AMAPROC PROCESS FOR THE
SPECIFIED STREAM TO BE RESTARTED.
DO YOU WISH TO PROCEED?
Please confirm ("YES" or "NO"):
>YES
AMAPROC PROCESS HAS BEEN RESTARTED FOR STREAM: XXX
>CI
```

Automatic versus manual maintenance

The DMS performs automatic maintenance on a periodic basis and in response to system failures. When a periodic check detects an error, or when a component in the DMS reports a fault, the DMS automatically tests the faulty device, and if no faults are found, attempts to return the device to service. If all attempts by the DMS fail to return the device to service, the DMS raises an alarm. The alarm indicates to the maintenance craftsperson that manual action is required.

Automatic maintenance in the AMA subsystem

Automatic maintenance in the AMA subsystem involves primarily the DIRP subsystem and the distributed processing peripheral (DPP) unit, if equipped. DIRP performs audits on itself and on its recording devices to ensure that sufficient recording space is available, that the available space is being used efficiently, and that the recording devices are operating properly. These audits can be classified as follows:

- FILESYS device audits
- DIRP device audits
- subsystem audits

A description of the AMA subsystem audit is provided in this section. Refer to *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312, for a complete description of all DIRP audits.

AMA subsystem audit The audits included in the AMA subsystem audit class provide the following:

- verify that all files needed by the AMA subsystem are open, and open or reopen files when necessary
- verify that volume and file assignments are consistent and are properly distributed

- invoke DIRP device audits on the ACTIVE, STANDBY, and PARALLEL volumes

This audit class includes the hourly subsystem audit and the unscheduled AMA subsystem audit.

The hourly subsystem audit runs every hour. The unscheduled AMA subsystem audit runs when:

- new volumes are allocated to the AMA subsystem's pool
- the AMA subsystem's volume is recovering after a system restart
- data in Tables DIRPPOOL, DIRPSSYS, and DIRPHOLD is changed
- the RSETVOL command is used to reset the AMA subsystem's INERROR disk volumes

The hourly and unscheduled AMA subsystem audits perform the same tasks, including:

- **open parallel files:** Open a parallel file on any parallel volume marked READY, that does not have an open parallel file. If a parallel file cannot be opened, mark the volume INERROR.
- **reopen files after restarts:** (This task is only done during warm/cold restarts.) Attempt to reopen the files that were open before the restart. If the files cannot be reopened, mark the file(s) INERROR. If the files can be reopened, prepare the files for recording.
- **fill in missing files:** If the number of files in the AMA subsystem does not satisfy the NUMFILES defined in Table DIRPSSYS, open new files on alternating input/output controllers (IOCs) until either NUMFILES is satisfied or no more room is left in the AMA subsystem recording pool.
- **close files on demounted volumes:** Close as many files as possible that are on TO_BE_DELETED volumes. Stop when all files are closed or MINFILES defined in Table DIRPSSYS is reached.
- **miscellaneous tasks:** Verify that the AMA subsystem has enough files and that the ACTIVE and STANDBY files are on different IOCs. Generate DIRP logs and alarms if enough files are not available or if any consecutive files in the ACTIVE/STANDBY lineup are on the same IOC. Invoke the DIRP device audits.

The DPP also performs periodic tests on its components and reports any faults found to the DMS alarm system through the EXT alarm subsystem. The DPP also provides additional information through the DMS log system using the DPP log reports.

Manual maintenance

Manual maintenance involves intervention when the DMS detects a fault that it cannot clear and other maintenance tasks that the DMS cannot perform. Manual maintenance is initiated by either an alarm or other trouble

indicator at the DMS MAP, or by a predetermined schedule of maintenance tasks.

Types of manual maintenance

There are two types of traditional manual maintenance: fault isolation and clearing, and routine maintenance. Fault isolation and clearing is performed in response to an alarm at the MAP and involves using the MAP to pinpoint the fault, and physical action in conjunction with the MAP to repair the faulty device.

Routine maintenance is performed according to a predetermined schedule and is preventative in nature. Typical routine tasks are cleaning and inspecting mechanical devices such as tape drives and fan filters, and mounting and demounting tapes. The intent of routine procedures is to prevent a system failure caused by mechanical problems or, in the case of tapes, by a lack of recording space.

General manual maintenance practices for the AMA subsystem

Good maintenance practices are essential to any system as critical as AMA to minimize the impact of a fault. Good general maintenance practices for AMA include:

1 monitoring DMS alarms continuously for fast responses to faults

2 making AMA-related logs and OMs easily accessible for quick analysis in case of a fault

3 keeping DMS and AMA maintenance documentation current and within easy reach for fast response to a fault

4 demounting full tapes and mounting replacements in a PROMPT manner to prevent recording space problems when magnetic tapes are used

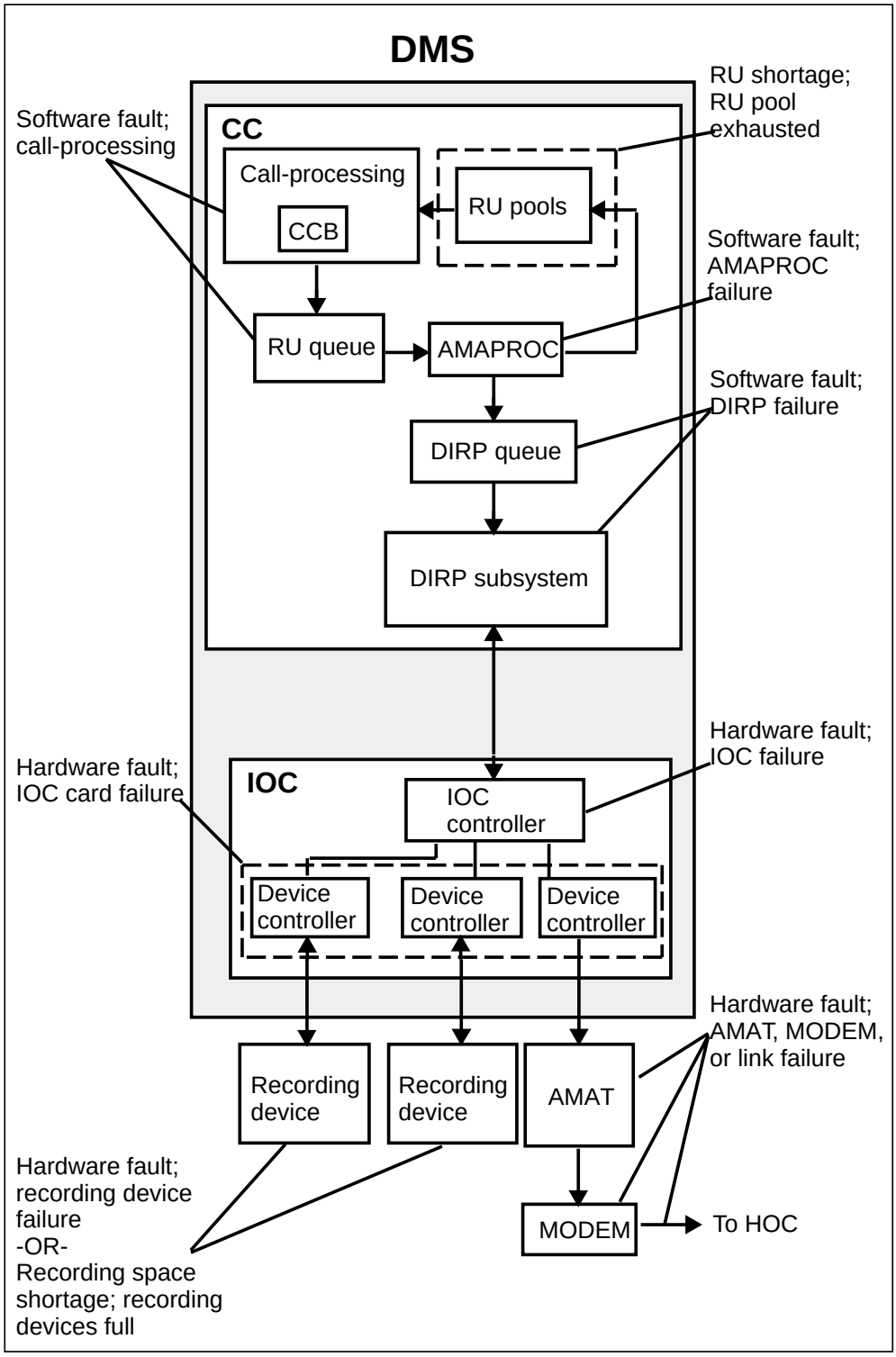
5 maintaining proper sparing levels for recording devices and other AMA-related hardware to expedite repairs

6 maintaining a current, easily accessible list of technical assistance personnel in case a fault cannot be cleared locally

Potential AMA subsystem failures

A failure of the AMA subsystem can be caused by several problems. Figure 1-1 shows the basic anatomy of the AMA subsystem and indicates key areas where failures can occur. Maintenance personnel responsible for AMA must familiarize themselves with the potential trouble spots in the AMA subsystem and their associated symptoms to locate and clear quickly any given fault in the AMA subsystem. See the list of terms at the end of this document for an explanation of the abbreviated terms.

Figure 1-1xxx
AMA subsystem - potential trouble spots



What happens when AMA fails

During the process of recording and storing billing information and prior to the actual writing of this information onto an AMA device, the following interruptions could occur, resulting in charge-free calls:

- no recording unit extension block available
- no AMA devices or files available
- the AMA process traps due to software bugs, necessitating a warm restart to recover the AMA system

In offices equipped with feature NTX030CC and related features, calls encountering such AMA failures can, at the discretion of the operating company, be routed as follows:

- f**ree-of-charge**: Office parameter AMA_FAILURE_FREE_CALL of Table OFCENG is set to Y (yes).
- **to TOPS/TSPS or to an announcement or tone**: Office parameter AMA_FAILURE_FREE_CALL of Table OFCENG is set to N (no), causing all toll calls to be routed according to office parameter AMA_FAILURE_ROUTE_POSITION of Table OFCVAR that specifies the position in Table POSITION to which the calls are to be routed.

  The default for AMA_FAILURE_ROUTE_POSITION is AMAFAIL. The operating company must datafill AMAFAIL in Table POSITION with an office route reference index that refers to a route list in Table OFRT. If this is not done, the routed calls will be taken down with CCB and CDB dumps.

AMA subsystem trouble indicators

Alarms

System alarm indicators

Audible and visual alarms posted by the system indicate that something requires corrective action. Alarm severity and corresponding urgency for corrective action are indicated by the level (none, minor, major, critical) of the alarm, as shown in Table 1-2.

Table 1-2xxx
MAP display alarm levels

Alarm	Displayed on MAP	Corresponding urgency
No alarm	(Blank)	Non-service affecting
Minor	(Blank)	Usually non-service affecting
Major	(M)	Usually indicates a service degrading or threatening condition
Critical	(*C*)	Usually indicates a service outage or potential service outage

All critical and major alarms are indicated by an audible alarm and the appearance of the alarm status indicator will be at the MAP. The alarm status indication will flash if the option is provided on the visual display unit (VDU). Audible alarms are reset by inputting the command SIL (silence) at the VDU keyboard. A blank space below a system fault indication indicates a minor alarm.

Proper performance of routine system maintenance and use of OMs and logs should minimize the occurrence of alarms.

DIRP alarms Alarm conditions applicable to the DIRP system appear under the IOD heading of the top level maintenance subsystem display at the MAP. The MAP is described in *Maintenance and Administration Position (MAP)*, 297-1001-110; the system status area is described in *Maintenance System Man-Machine Interface Description*, 297-1001-520. There are two broad categories of DIRP alarms: those indicating insufficient recording resources and those indicating an inconsistency in an audit. Table 1-3 describes the alarm indications specific to the AMA subsystem. The severity of the alarm condition is indicated by the entry on the next line of the MAP display directly under the alarm indication. The severity codes are listed in Table 1-2.

> ***Note:*** Both Minor and No Alarm are indicated by blanks on the MAP display. A blank refers to No Alarm if the line above it displays a dot.

Table 1-3 xxx
Alarm indications

Indication	Meaning
NO AMA	Currently, there are no files open for recording data output by the AMA subsystem.
nnAMA	DIRP is unable to open a sufficient number of files to match the level specified for the AMA subsystem, where 'nn' represents the number of files still required.
AMA P	The parallel, or backup, file requested for the AMA subsystem is not recording. It may be rewinding. This alarm should disappear in two or three minutes.
AMA D	There is no entry for the AMA subsystem in the DIRPSSYS control table. Recording cannot take place.
AMA B	Software for the AMA subsystem has failed to bind in (identify itself) to DIRP.
AMA I	Two or more files are configured for the AMA subsystem, and DIRP detects that the standby file is on the same IOC/system load module (SLM) disk as the active file.
AMA E	Although sufficient resources are available for recording, there may be files requiring special attention. The emergency indicator may be turned off by responding to the prompt given when executing the AUDIT command. Set any reload or emergency rotate.
DEVBnn	Software for a device driver has failed to bind in to DIRP. Therefore, manipulation of the recording device corresponding to this driver may be impaired. The driver is identified by the value nn, which is the reference number of the entry for this driver in an internal device driver table.
SSYS F DEVT F	The specified control table is full, and an attempt has been made to add another entry. The table is: DIRPSSYS (SSYS) or internal device table.
HOLDnn	Table DIRPHOLD is full or is nearly full. nn indicates the number of free slots left. When only 10 free slots are left, the HOLD10 alarm is raised. As the number of free slots approaches zero, the HOLD10 alarm becomes HOLD09, HOLD09 becomes HOLD08, and so on until nn is 00, which indicates that no more free slots are available in Table DIRPHOLD.

- continued -

Table 1-3 xxx
Alarm indications (continued)

Indication	Meaning
POOLnn	Resources in recording pool nn, in Table DIRPPOOL, are insufficient to satisfy all potential demand.
PnnVnn	The recording volume (identified by the value nn to the right of V) in the recording pool (identified by the value nn to the right of P) has less than 2 Mbytes of free space, or it has been marked IN ERROR. Use the QUERY command to find out the cause of the alarm.

End

Multiple alarm conditions associated with the IOD are "stacked" starting with the most severe. There is no precedence within DIRP pertaining to alarm conditions displayed when the severity codes are equal. The following example illustrates the alarm condition stacking precedences. The IOD has detected the following four alarm conditions with their associated alarm indicators and severity:

```
NO AMA      *C*       Critical
1OM         M         Major
JF E        blank     Minor
SMDR I      blank     Minor
```

The NO AMA alarm condition is displayed. When the NO AMA alarm condition is cleared, the 1OM alarm condition is displayed. Upon clearing the 1OM alarm condition, either the JF E or SMDR I alarm condition is displayed. Finally, when either the JF E or SMDR I alarm condition is cleared, the remaining alarm condition is displayed.

When working in the DIRP environment, all IOD and DIRP alarm conditions must be cleared and kept cleared before beginning. This precaution ensures that alarms affecting DIRP are not masked and unknown to the user. Non-DIRP IOD alarm conditions (such as tape, DDU, and IOC alarms) can indirectly affect DIRP operation and manipulation.

A suggested approach to alarm analysis is to use the QUERY <subsystem> and AUDIT <subsystem> commands to determine the status of contributing subsystem volumes and files and compare this information to the contributing subsystems data recording configuration displayed in Tables DIRPSSYS and DIRPPOOL.

Logs

The DMS log system can also indicate problems with the AMA subsystem. The logs specifically related to AMA subsystem problems are as follows:

- **AMA100** This log is output whenever a process related to AMA changes status due to a failure. This log indicates an AMA software-related problem and should ***never*** be suppressed. If this log appears, contact your maintenance support group immediately.
- **AMA114** This log indicates that an incoming or outgoing emergency AMA transfer has occurred. The log gives counts of the number of records that have been written into the AMA file just closed and is accompanied by the DIRP101 log. A DIRP emergency transfer, or rotate, is caused by either a recording device fault or a device full condition. The DIRP logs will provide more specific information.
- **DIRP101** This log indicates that an AMA process has failed due to a software bug, a shortage of recording unit extension blocks, or a DIRP file rotate. The AMA100, AMA114, EXT108, and the DIRP logs will provide more specific information on the exact cause.
- **EXT108** This log indicates an AMA failure. When logged as AMAFAIL ON, the AMA subsystem is in trouble. When logged as AMAFAIL OFF, the AMA subsystem is normal. AMAFAIL ON can be caused by a number of faults, such as an AMA software problem, a DIRP problem, or an AMA subsystem overload. The AMA100, AMA114, and DIRP logs will give more specific information on the cause.

OMs

The DMS OMs can indicate problems with the DMS AMA subsystem. Table 1-4 lists these OMs, the problem(s) they indicate, and the possible causes.

Table 1-4xxx
AMA operational measurements indicating AMA system problems

OM group	Register	Meaning and possible cause
AMA	AMAEMTR	This register records the number of occurrences of emergency transfer between AMA tape units. Ideally, this register should be zero. A consistent non-zero value in this register most likely indicates that the DIRP volumes for AMA are too small or the rotation schedule for the AMA subsystem is insufficient. Periodic non-zero values are indicative of possible recording unit faults or transiental peaks in AMA traffic. DIRP101 logs should have been generated and will provide more specific information.
AMA	AMAFREE	This register counts the number of AMA calls that are routed free of charge. Ideally, this register should be zero. A non-zero value indicates a shortage of RU caused by a DIRP problem, an AMA software problem, or an AMA subsystem overload. The AMA100, AMA114, DIRP101, and EXT108 logs should provide specific information on the exact cause.
AMA	AMAROUTE	This register is associated with TOPS offices and will increment each time there are no CAMA TOPS recording units available for storing the call details. Ideally, this register should be zero. A non-zero value in this register indicates a shortage of CAMA RU caused by a DIRP problem, an AMA software problem, or an AMA subsystem overload. The AMA100, AMA114, DIRP101, and EXT108 logs should provide specific information on the exact cause.
ATTAMA	AMLT555	This register is pegged when a record has been output to the DIRP buffer and a tape or software recording unit is not available. A non-zero value indicates either an RU shortage or a DIRP recording device problem. The DIRP101 and EXT108 logs will provide more specific information.
ATTLAMA	AMLTIWAT	This register is pegged when an INWATS call has been lost, either due to an attempt to record the call without an AMA tape, or due to failure to get a recording unit. A non-zero value indicates either an RU shortage or a DIRP recording device problem. The DIRP101 and EXT108 logs will provide more specific information.

Establishing AMA parallel recording

Parallel recording is an effective means of protection against the loss of AMA data should a serious fault occur in the DIRP AMA subsystem. If a fault prevented AMA data from being recorded on the primary (ACTIVE and STANDBYn volumes) for a period of time, if parallel recording was in effect during the fault, then AMA data that was not recorded on the primary volumes can be recovered from the parallel volume, thus preventing a loss of AMA data. Parallel recording is described in detail in *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312.

It is *highly* recommended that parallel recording be used at all times in the AMA subsystem. One or more volumes can be allocated for this purpose. Establishing parallel recording is shown in Procedure 1-1.

Procedure 1-1xxx
Establish parallel recording for the AMA subsystem

Step	Action and response
1	Check the DIRP datafill to determine if the AMA subsystem is datafilled for parallel recording. First, check Table DIRPPOOL for the AMA parallel recording pool. Input: **>TABLE DIRPPOOL** TABLE: DIRPPOOL **>LIST ALL** If AMA parallel recording is datafilled, the AMA parallel recording pool tuple should look as follows: <pool_no> <pool_name> PARALLEL <device_type> $ The pool_name should indicate the AMA subsystem. Verify this with your office records, if necessary.
2	Is an AMA parallel recording pool datafilled?

If	Then	Do
YES	Look for an available volume	Step 3
NO	Datafill a parallel recording pool for AMA	Step 11

- continued -

Procedure 1-1xxx
Establish parallel recording for the AMA subsystem (continued)

Step	Action and response
3	Note the device type (<device_type>) used for AMA parallel recording. If you plan to use multiple parallel volumes, determine the number of volumes you will need. Check your office records for an idle recording volume(s) (MTD or disk volume) of the same type as the AMA parallel recording pool device type (tape or disk) to satisfy your parallel recording requirements.
4	Is an idle volume(s) available?

If	Then	Do
YES	Mount a parallel volume(s)	Step 5
NO	Consider the alternate device type	Step 6

Step	Action and response
5	Exit Table DIRPPOOL. Input: **>QUIT** Proceed to Step 15.
6	Look for an available volume(s) of the alternate type (that is, if tape is specified, look for an available disk volume or vice versa).
7	Is a volume(s) of the alternate type available?

If	Then	Do
YES	Change the device type in Table DIRPPOOL	Step 8
NO	You have no means for parallel recording.	Contact next level of maintenance support to establish parallel recording.

- continued -

Procedure 1-1xxx
Establish parallel recording for the AMA subsystem (continued)

Step	Action and response
8	Change the recording device type of the AMA parallel recording pool to the alternate device type. Input: **>CHA DEVTYPE <device_type>** (where device_type is the alternate type) TUPLE TO BE CHANGED (the following tuple is an example) 5 AMAPARL PARALLEL TAPE $ ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT **>Y** TUPLE CHANGED
9	Exit Table DIRPPPOOL. Input: **>QUIT**
10	Mount the available volume(s) you found in Step 6. To do this, proceed to Step 15.
11	Add a tuple for AMA parallel recording to Table DIRPPOOL. Select a recording pool number, a pool name that reflects AMA parallel recording, and a device type of tape or disk (whichever you have available), then input: **>ADD <pool_no> <pool_name> PARALLEL <dev_type> $** TUPLE TO BE ADDED (the following tuple is an example) 5 AMAPARL PARALLEL TAPE $ ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT >Y TUPLE ADDED
12	Exit Table DIRPPOOL. Input: **>QUIT**

- continued -

Procedure 1-1xxx
Establish parallel recording for the AMA subsystem (continued)

Step	Action and response
13	Access Table DIRPSSYS and change the parallel recording pool name to the parallel pool name you used in Step 11. Input: **>TABLE DIRPSSYS** TABLE: DIRPSSYS **>POS AMA;CHA PARLPOOL <pool_name>** (where <pool_name> is the pool name you used in Step 11) TUPLE TO BE CHANGED (the tuple following is an example) AMA Y 2 1 AMADISK DMS100 CR MJ NA NA 30 30 AMAPARL N NA OPENED NNYNYYN 0 NOROTATE NONE NONE N 64 Y ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT **>Y** TUPLE CHANGED
14	Exit Table DIRPSSYS. Input: **>QUIT**
15	Mount the parallel volume. Input: **MNT AMA <vol_name> PARALEL** (where vol_name = volume name) Volume = 'vol_name' Parallel recording is not currently active for AMA. Recording may begin immediately on this parallel volume. Updating volume information for vol_name: Volume n in Parallel Pool n, pool_name ***Note***: The actual response you receive may differ somewhat.
16	If you need multiple parallel volumes, repeat Step 15 for the remaining volumes in the parallel pool. ***Note***: The command response will be different for the subsequent parallel volumes.
17	Query the AMA subsystem to verify that the parallel volumes mounted. Input: **>QUERY AMA ALL**

- continued -

Procedure 1-1xxx
Establish parallel recording for the AMA subsystem (continued)

Step	Action and response		
18	Are all of the parallel volumes mounted?		
	If	**Then**	**Do**
	YES	Update your office records	Step 19
	NO		Notify your maintenance support group for further investigation
19	Record in your office records the fact that parallel recording for AMA is in effect, the number of volumes used for parallel recording, and the volume names (if required). **STOP - PROCEDURE COMPLETED**		

End

AMA subsystem routine maintenance procedures

Monitoring data recording and rotation patterns

DIRP automatically handles the normal recording of data output from the AMA subsystem. Sufficient recording resources must be available for the AMA subsystem for DIRP to continue regular, orderly rotation of recording duty. Sufficient recording resources are also needed to maintain resources in reserve to correct unanticipated situations. If resources for recording data from the AMA subsystem become insufficient, DIRP raises alarm indicators.

The space rotate feature can also be used to manage DIRP files on disk. This feature is controlled by the SPACROTE and MAXDFSIZ fields in Table DIRPSSYS.

When SPACROTE is set to Y, a rotation will take place when DIRP senses that it is running low on disk free space. This disk management algorithm minimizes the number of emergency rotations. Also, setting the SPACROTE to Y will prevent unexpired processed files from being erased by DIRP before they have passed their retention period.

A rotation will also take place when the size of a disk volume reaches the MAXDFSIZ specified by the user. The MAXDFSIZ field defines the limit in megabytes (Mbyte) of the file size. MAXDFSIZ can be set between 5 and

64 (default) Mbyte. With this field, operating companies can set the maximum size of a disk file. Setting the MAXDFSIZ field to the tape length standardizes the size of disk file and also makes transfer of data from disk to tape more transparent and robust.

A space rotate will, under normal circumstances, write transfer records to the active file before closing it. DIRP reserves eight DIRP blocks for this purpose on the outgoing volume during a space rotate. The number of DIRP blocks that are reserved for storing transfer records is called the space rotate threshold.

After a space rotate, the former active file is closed regardless of the setting of ROTACLOS field in Table DIRPSSYS.

If SPACROTE is set to N (default) and the file is less than the MAXDFSIZ limit, space rotate will not take place and DIRP will handle space management as it previously did. If SPACROTE is set to Y, and a subsystem is recording to disk, unexpired processed files will not be erased and space rotate may take place.

Whenever SPACROTE is changed from N to Y, a warning message is shown on the screen indicating unexpired processed files are not erasable and space rotates may take place. Whenever SPACROTE is changed from Y to N, a warning message is shown on the screen indicating unexpired processed files are subject to be erased and space rotates are disabled.

DIRP101 logs with reason codes 12, 13, 14, and 15 are generated when a space rotate occurs.

If disk space is under-provisioned, space rotates may be fairly common. This could greatly increase the number of files on hand for craftspersons to handle. Operating companies may need to consider adding more disk space if they are to retain unexpired files without overly risking the loss of new data.

Allocating and deallocating recording volumes

Recording volumes can be either allocated to the AMA subsystem or deallocated from the AMA subsystem and from DIRP by the MNT and DMNT commands, respectively.

Allocating volumes

Allocation of volumes to DIRP is made either to initiate recording for the AMA subsystem that was not previously recording or to expand the amount of file space available to the AMA subsystem.

A typical sequence of events for allocating a volume to the AMA subsystem is the following. In this example, a tape volume is to be allocated to the

AMA subsystem. MTD 0 has been selected for AMA use. A tape, marked as being suitable for use in the AMA subsystem, is placed on MTD 0.

At the MAP console, use the following series of commands to allocate the tape volume.

```
>MNT AMA 0
 Volume = 'volume_name'
 Formatting tape as 'volume_name'.
 OK
 Updating volume information for
 T0: Volume nn in Regular Pool n, pool_name
 Please confirm ("YES" or "NO"):
>YES
 Regular volume T0 allocated.
```

When recording for the AMA subsystem is initiated, this process is repeated to allocate as many volumes as required for the AMA subsystem. The number of files required by the AMA subsystem is indicated by the parameter NUMFILES in the entry for the AMA subsystem in Table DIRPSSYS. Volumes of type DISK or TAPEX are allocated in similar fashion.

Deallocating volumes

Deallocation of a recording volume is made for the following reasons:

- to allow a tape to be sent to a data center for processing
- to remove a device on which excessive input/output errors have occurred
- to make the recording device available for maintenance or administrative purposes

When a volume is to be deallocated, the DMNT command from the DIRP level menu is used. For example, if the tape-type volume on MTD 3 is deallocated from the AMA subsystem, the command would be:

```
>DMNT AMA 3
 Updating volume information for
 T3: Volume nn in Regular Pool n, pool_name
 Please confirm ("YES" or "NO"):
>YES
 Regular Volume T3 will be taken out of DIRP as soon as
    possible.
```

An example will illustrate why this message is printed. Assume that AMA has only one file open, on T0, and the MINFILES field in the DIRPSSYS control table is set to 1, that is, it cannot be closed down to less than one file. An attempt to demount that volume will not be allowed. In this case the user should allocate T1. The system will close down T0 automatically, if the user had requested previously that T0 be deleted.

When attempting to delete a volume, wait for the log report that says the volume has been deleted or query the volume status, using the QUERY command.

Note that parallel volumes cannot be allocated or deallocated by the DIRP-level commands, but only by modification to the datafill of Table DIRPSSYS.

Daily replacement of AMA tapes

If operating company operating procedures specify that AMA tapes are to be replaced on a daily basis, follow Procedure 1-2.

Procedure 1-2xxx
Daily replacement of AMA tapes

Step	Action

1	If not already done, establish AMA recording: Access the DIRP MAP menu and display by inputting the following command:
	
	>MAPCI;MTC;IOD;DIRP
	
	Mount an active and standby volume by inputting the following commands (see note):
	
	Note: This procedure assumes blank tapes are used for AMA recording as opposed to expired tapes. When expired tapes are used, the command responses will be different. Refer to *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312 for information on DIRP commands and responses.
	
	>MNT AMA 0
	`Volume = 'volume_name'`
	`Formatting tape as 'volume_name'.`
	`OK`
	`Updating volume information for`
	`T0: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume T0 allocated.`
	
	>MNT AMA 2
	`Volume = 'volume_name'`
	`Formatting tape as 'volume_name'.`
	`OK`
	`Updating volume information for`
	`T2: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume T2 allocated.`
	
	thereby giving an active file on MTD 0 and a standby file on MTD 2.

- continued -

Procedure 1-2xxx
Daily replacement of AMA tapes (continued)

Step	Action
2	On the second day, when one of the tapes is to be changed, rotate the active file on MTD 0 to the standby position and close the file by inputting the following commands: **>MAPCI;MTC;IOD;DIRP** **>ROTATE AMA** SENDING REQUEST TO SUBSYSTEM Please confirm (“YES” or “NO”): **>YES** REQUEST SENT TO SUBSYSTEM. CHECK DIRP LOGS FOR DETAILS **>DMNT AMA 0** Updating volume information for T0: Volume nn in Regular Pool n, pool_name Please confirm (“YES” or “NO”): **>YES** Regular Volume T0 will be taken out of DIRP as soon as possible.
3	Confirm the volume deletion by finding the corresponding DIRP101, Reason 124 log report (following): DIRP101 FEB07 04:27:53 6700 INFO DIRP_FLOW_LOG REASON=124 SSYS#=0 SSNAME= AMA POOL#= n VOLUME#= nn SOS_FILE_ID= 0000 0000 0000 TEXT1= REGULAR TAPE DEMOUNTED ON DRIVE: PARM1= 0 TEXT2= D PARM2= FFFF Change the tape on MTD 0 and then allocate it to AMA by inputting the following command: **>MNT AMA 0** Volume = ‘volume_name’ Formatting tape as ‘volume_name’. OK Updating volume information for T0: Volume nn in Regular Pool n, pool_name Please confirm (“YES” or “NO”): **>YES** Regular volume T0 allocated. At this point, the active file is on MTD 2, and the standby file is on MTD 0.

- continued -

Procedure 1-2xxx
Daily replacement of AMA tapes (continued)

Step	Action
4	On the next day, rotate the active file on MTD 2 to the standby position and close the file by inputting the following commands: **>MAPCI;MTC;IOD;DIRP** **>ROTATE AMA** SENDING REQUEST TO SUBSYSTEM Please confirm (“YES” or “NO”): **>YES** REQUEST SENT TO SUBSYSTEM. CHECK DIRP LOGS FOR DETAILS **>DMNT AMA 2** Updating volume information for T2: Volume nn in Regular Pool n, pool_name Please confirm (“YES” or “NO”): **>YES** Regular Volume T2 will be taken out of DIRP as soon as possible.
5	When the deletion is verified (by DIRP101, Reason=124 log report), change the tape on MTD 2 and remount MTD 2 by inputting the following command: **>MNT AMA 2** Volume = ‘volume_name’ Formatting tape as ‘volume_name’. OK Updating volume information for T2: Volume nn in Regular Pool n, pool_name Please confirm (“YES” or “NO”): **>YES** Regular volume T2 allocated.
6	Repeat this procedure each day.
	End

Clock changes

If for any reason the real time clock is changed, any scheduled rotations and audits still occur, although the actual time of these events may be delayed or moved ahead.

For example, assume that the time is 11:59 P.M. and the clock must be moved back to 10:59 P.M. because of the change from daylight saving time to standard time. If a rotate is scheduled for twelve o’clock midnight, it still

occurs at that time, but according to the new clock setting. Thus, the first file has, for example, 25 hours of data, while the next file has 24 hours of data.

Note: Any scheduled audits will still occur at the proper times.

AMA subsystem trouble clearing tasks

How to respond to AMA alarms

The following guidelines should be followed when responding to alarms:

- If alarms are displayed for more than one maintenance subsystem on the MAP, clear the most severe alarm first.
- When more than one alarm of the same severity is displayed on screen of the MAP, clear alarms from the left of the screen to the right.
- If, while fixing an alarm, an alarm of greater severity occurs, respond to the new alarm. Do not continue attempts to clear the less severe alarm.

How to clear AMA alarms using this document

The remainder of this chapter includes procedures for clearing AMA alarms. A procedure or recommended course of action is provided for each AMA alarm. An index to the proper procedure based on a specific AMA alarm is provided in Table 1-5 along with a brief description of the meaning of each alarm. To clear an AMA alarm, find the alarm name in Table 1-5, refer to the procedure indicated, and follow the steps within the specified procedure.

The individual procedures are intended for both experienced and inexperienced maintenance personnel. Each procedure is summarized for the experienced craftsperson and detailed in a separate procedural table for the inexperienced craftsperson. Follow the procedure that is appropriate for your level of expertise.

Some AMA alarms are related to software problems, which cannot be cleared locally. For such alarms, you are instructed to contact your next level of maintenance. For this reason, make sure your list of technical contacts is current at all times.

Table 1-5xxx
AMA alarm-to-clearing procedure cross-reference

AMA alarm	Meaning	Procedure to follow
NO AMA	No open files are available for recording AMA data.	Refer to Procedure 1-3
AMA P	The parallel file assigned to the AMA subsystem is not recording.	Refer to Procedure 1-4
AMA I	The ACTIVE and STANDBY 1 volume in the AMA subsystem are on the same IOC.	Refer to Procedure 1-5
AMA E	One or more AMA files requires special attention.	Specific action is determined locally. Check your office records for the specific action required.
nnAMA	DIRP cannot open a sufficient number of recording files to meet the number of files specified in Table DIRPSSYS. nn is the number of additional files required.	Refer to Procedure 1-6
AMA D	There is no entry in Table DIRPSSYS for the AMA subsystem.	Refer to Procedure 1-7
PnnVnn	The recording volume identified by Vnn in the recording pool identified by Pnn has less than 2 Mbytes of free space, or has been marked INERROR by DIRP.	Refer to Procedure 1-8
DEVBnn	The software for device driver nn did not bind into DIRP; therefore, manipulation of the recording device corresponding to this device driver may be impaired. This is a software problem and cannot be cleared locally.	Contact the next level of maintenance support.
SSYS F	An attempt to add another tuple to Table DIRPSSYS was made, but Table DIRPSSYS is full. This cannot be cleared locally.	Contact the next level of maintenance support.
DEVT F	An attempt to add another tuple to Table DEVT was made, but Table DEVT is full. This cannot be cleared locally.	Contact the next level of maintenance support.

- continued -

Table 1-5xxx
AMA alarm-to-clearing procedure cross-reference (continued)

AMA alarm	Meaning	Procedure to follow
HOLDnn	Table DIRPHOLD is full or nearly full. nn indicates the number of free slots left. When nn is zero (0), Table DIRPHOLD is full.	Contact your HOC and request an immediate polling session to free some space in Table DIRPHOLD.
AMACRT	DPP critical alarm.	Refer to 297-1001-529
AMAMAJ	DPP Major alarm	Refer to 297-1001-529
AMAMIN	DPP Minor alarm	Refer to 297-1001-529
DPPaaa	DPP alarm	Refer to 297-1001-529
End		

NO AMA alarm clearing procedure

CAUTION
Technical assistance is required

Due to the nature of a NO AMA situation, you must contact your maintenance support group immediately upon receiving a NO AMA alarm. Your maintenance support group should provide assistance in isolating and clearing the alarm or should direct you to instructions for doing so.

The following procedure is recommended for clearing a NO AMA alarm; however, your operating company policy may require you to contact your maintenance support group for this alarm. *Always follow your local practices*. Use the following procedure *ONLY* if instructed to do so by your maintenance support group.

Procedure summary

1 Access the DIRP MAP menu and display and silence the audible alarm.

2 QUERY the AMA subsystem and note the current status of the AMA subsystem recording volumes.

3 If no recording volumes are mounted, mount additional volumes as needed.

4 If volumes are mounted but are marked INERROR, check the DIRP logs for the reason the volumes were marked INERROR:

   a. If the volumes are full:

      i) For tape volumes, replace the full tapes with blank or expired tapes, then remount the volumes.

      ii) For disk volumes, try to locate an alternate disk recording volume. If an alternate volume is not available, contact your maintenance support group for further instructions.

   b. If the volumes are faulty, attempt to locate and mount an alternate recording volume. Repair, then remount the INERROR volumes.

5 When the alarm is cleared, verify that sufficient recording volumes are mounted. Mount additional volumes as needed.

6 Follow your local practices to recover any lost AMA data from the parallel file (if parallel recording is used).

Step-by-step procedure

Procedure 1-3xxx
NO AMA alarm clearing procedure

Step	Action and response
1	If you have not already done so, access the DIRP MAP menu and display. Input: **>MAPCI;MTC;IOD;DIRP**
2	Silence the audible alarm if it is not already silent. Input: **>SIL**
3	Contact your maintenance support group immediately and notify them of the situation. If your maintenance support group instructs you to follow this procedure, continue to Step 4. Otherwise, follow the instructions of your maintenance support group.

4	Query the status of the AMA subsystem files. Input:
	
	>QUERY AMA FILES
	
	Example of command response:
	`SSNAME SSNO  SEQNO ROTATES POOLNO PARLPOOL EMERGENCY`
	`AMA       0      1       2      0        6 ***YES***`
	
	`REGULAR`
	`FILE(S)  STATE VOLUME RECCOUNT BLOCK  E  V  V_B  VLID FNUM FRN#`
	`ACTIVE   NONE`
	`STANDBY1 NONE`
	
	`PARALLEL          STATE    IOC CARD VOL FSEG ROOM VLID CURR`
	`B910212061307AMA  READY      0    0   0  N/A    1 2400 YES`
	
	Examine the status of the files in the AMA subsystem (shaded area of the example command response above). Determine the number of volumes required for AMA by counting the number of ACTIVE and STANDBYn files displayed. Two are shown in the example above. Note this number for later use. If a parallel volume is not mounted, the STATE will be NONE and the FILE/VOLUME field will be blank.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

5	Query the volumes currently mounted in the AMA subsystem. Input:
	
	>QUERY AMA VOLUMES
	
	Example of command response:
	`SSNAME SSNO SEQNO ROTATES POOLNO PARLPOOL EMERGENCY`
	`AMA 0 1 2 0 6 ***YES***`
	
	`REGULAR VOLUME(S)`
	`VOL# VOLNAME STATE IOC CARD VOL FSEG ROOM VLID FILES`
	`22 T0 INERROR 0 0 0 N/A 0 2400`
	`23 T1 INERROR 2 1 0 N/A 0 2400`
	
	`PARALLEL VOLUME(S)`
	`PARALLEL STATE IOC CARD VOL FSEG ROOM VLID CURR`
	`B910212061307AMA READY 0 0 0 N/A 1 2400 YES`
	
	Note the status of the regular volumes (shaded area of example above). The example above shows two REGULAR volumes mounted but marked INERROR.

6	Are any REGULAR volumes mounted?

If	Then	Do
YES	Determine the type of device being used for recording	Step 11
NO	Determine the type of device being used for recording	Step 7

7	Determine from your office records or from datafill the type of recording device you are using for AMA data. To determine the device type from datafill, query the AMA subsystem and note the REGULAR recording pool number. Input:
	
	>QUERY AMA FILES
	
	Partial example of command response:
	
	`SSNAME SSNO SEQNO ROTATES POOLNO PARLPOOL EMERGENCY`
	`AMA 0 1 2 0 6 ***YES***`
	
	Note the number under “POOLNO” (shaded area of above example). The example above shows the AMA REGULAR pool number as 0.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
8	Access Table DIRPPOOL, position on and list the tuple for the AMA REGULAR pool. Input: **>TABLE DIRPPOOL** TABLE: DIRPPOOL **>POS n;LIST** (where n = the pool number you found in Step 7) (an example tuple follows) POOLNO POOLNAME POOLTYPE DEVTYPE VOLUME0 VOLUME1 VOLUME2 VOLUME3 VOLUME4 VOLUME5 VOLUME6 VOLUME7 VOLUME8 VOLUME9 VOLUME10 VOLUME11 VOLUME12 VOLUME13 VOLUME14 VOLUME15 VOLUME16 VOLUME17 VOLUME18 VOLUME19 VOLUME20 VOLUME21 VOLUME22 VOLUME23 0 AMAPOOL REGULAR TAPE $ T1 T2 Look at the device type under “DEVTYPE” (encircled in the above example). The device type shown in the above example is TAPE. Note the device type for later use.
9	Exit Table DIRPPOOL. Input: **>QUIT**
10	Are you recording on tape or disk?

If	Then	Do
TAPE		Step 42
DISK		Step 50

11	Determine from the volume name the recording device type used for the volume(s) mounted: tape volumes are typically named “Tn” and disk volumes are typically named “Dnnnaaa.” Make a note of the device type for later use.
12	Note the status of the volumes mounted (repeat Step 5 if necessary).

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
13	Are any volumes in the INERROR state?

If	Then	Do
YES	Determine why the volume was marked INERROR	Step 14
NO	Try remounting volume(s)	Step 38

14 Check the DIRP logs to determine if the volumes were marked INERROR because of a volume full condition or a device error. Access LOGUTIL and open the DIRP logs. Input:

>LOGUTIL;OPEN DIRP
(the last [latest] DIRP log generated is displayed)

Use the BACK and FORWARD commands to browse through the DIRP logs. The following log sequence (shown from the latest log report to the earliest) indicates a volume being marked INERROR due to a volume full condition:

```
DIRP101 FEB22 04:48:02 nnnn INFO DIRP_FLOW_LOG REASON=21 SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=REGULAR FILE CLOSED, RECORDS:nnnn              PARM1=nnn
 TEXT2=VOL: vol_name, FILE: file_name, ROTATE         PARM2=nnnn

DIRP101 FEB22 04:48:02 nnnn INFO DIRP_FLOW_LOG REASON=56 SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=REGULAR VOLUME MARKED INERROR                  PARM1=-1
 TEXT2=VOL: MANUAL INTERVENTION REQUIRED TO RECOVER   PARM2=FFFF

DIRP101 FEB22 04:48:01 nnnn INFO DIRP_FLOW_LOG REASON=15 SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=EMERGENCY OG ROTATE COMPLETED, RECORDS:nnnn    PARM1=nnn
 TEXT2=VOL:VOL: vol_name, FILE: file_name, ROTATE     PARM2=nnnn

DIRP101 FEB22 04:48:01 nnnn INFO DIRP_FLOW_LOG REASON=14 SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=EMERGENCY OG ROTATE INITIATED, RECORDS:nnnn    PARM1=nnn
 TEXT2=VOL:VOL: vol_name, FILE: file_name, ROTATE     PARM2=nnnn

DIRP101 FEB22 04:48:01 nnnn INFO DIRP_FLOW_LOG REASON=14 SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=EMERGENCY OG ROTATE INITIATED, RECORDS:nnnn    PARM1=nnn
 TEXT2=VOL:VOL: vol_name, FILE: file_name, ROTATE     PARM2=nnnn
```

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

```
DIRP101 FEB22 04:48:01 nnnn INFO DIRP_FLOW_LOG REASON=6  SSYS#=0
 SSNAME=AMA POOL#=0 VOLUME#=23 SOS_FILE_ID=nnnn nnnn nnnn
 TEXT1=ACTIVE VOLUME FULL - COULDN'T EXTEND          PARM1=nnn
 TEXT2=***EMERGENCY***                               PARM2=nnnn
```

The log report shaded indicates the volume full condition. A device error is the second possibility. When you have determined the reason, exit LOGUTIL. Input:
>QUIT

15 Is the volume INERROR because of a volume full condition or a device error?

If	Then	Do
VOLUME FULL	Locate additional volumes	Step 16
DEVICE ERROR	The device may be faulty. Attempt to reset the volume	Step 19

16 Reset the INERROR volume. Input:

>RSETVOL vol_name (where vol_name = name of INERROR volume)

```
FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH
MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR
MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.
THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED
AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING
THIS VOLUME.

Please confirm ("YES" or "NO"):
>YES
Regular AMA volume will be marked as "READY"
vol_name: Volume nn in Regular Pool n, pool_name

DONE - Auditing affected volume/subsystem(s).
```

Repeat for each of the full volumes that were marked INERROR.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
17	Is the recording device(s) type TAPE or DISK?

If	Then	Do
TAPE	Unload full tape and replace with blank	Step 18
DISK	Try to locate another disk volume	Step 50

18 Demount the full tape volume. Input:

>DMNT AMA vol_name (where n = MTD number)

```
Updating volume information for
Tn: Volume nn in Regular Pool n, pool_name
Please confirm ("YES" or "NO"):
>YES
Regular Volume Tn will be taken out of DIRP as soon as
possible.
```

Unload the full tape from the drive, label, and store per your local procedures. Load a new tape suitable for AMA recording on the drive. Repeat for all full tape volumes.

Proceed to Step 45.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

19	Attempt to reset the INERROR volumes. Input:
	
	>RSETVOL vol_name (where vol_name = name of INERROR volume)
	
	`FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH`
	`MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR`
	`MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.`
	`THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED`
	`AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING`
	`THIS VOLUME.`
	
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular AMA volume will be marked as "READY"`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	
	If the volume reset is successful, the response continues as follows:
	
	`DONE - Auditing affected volume/subsystem(s).`
	
	If the volume reset fails, the response continues as follows:
	
	`ERROR: FILE SYSTEM AUDIT FAILED, VOLUME NOT RESET.`
	
	(possible further error messages)

20	Query the AMA subsystem again and verify the status of the volume(s) you just reset. Input: **>QUERY AMA VOLUMES**
21	Did any of the INERROR volumes reset successfully?

If	Then	Do
YES		Step 30
NO	Recording device may be faulty	Step 22

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

22	The recording device(s) may be faulty. You will have to repair the device later. Record the volume name, and the IOC and CARD hosting the suspected faulty device. You can get this information from the QUERY command response. Input:
	
	>QUERY AMA VOLUMES
	(example response follows)
	
	`SSNAME SSNO SEQNO ROTATES POOLNO PARLPOOL EMERGENCY`
	`AMA 0 1 2 0 6 ***YES***`
	
	`REGULAR VOLUME(S)`
	`VOL# VOLNAME STATE IOC CARD VOL FSEG ROOM VLID FILES`
	`22 T0 INERROR 0 0 0 N/A 0 2400`
	`23 T1 INERROR 2 1 0 N/A 0 2400`
	
	`PARALLEL VOLUME(S)`
	`PARALLEL STATE IOC CARD VOL FSEG ROOM VLID CURR`
	`B910212061307AMA READY 0 0 0 N/A 1 2400 YES`
	
	The area shaded in the above example shows the volume name, and the IOC and CARD hosting each.

23	Check your office records for another available recording volume.
24	Is another volume available?

If	Then	Do
YES		Step 25
NO		Step 26

25	Are you recording on tape or disk?

If	Then	Do
TAPE		Step 45
DISK		Step 53

26	You will have to repair the faulty recording device you found in Step 22. Refer to *Input/Output Devices Alarm Analysis and Card/Device Replacement,* 297-1001-556, to repair the faulty recording device. When the faulty device is repaired, proceed to Step 27.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

27	Reset the repaired volume(s). Input:
	
	>RSETVOL vol_name (where vol_name = name of INERROR volume)
	
	`FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH`
	`MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR`
	`MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.`
	`THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED`
	`AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING`
	`THIS VOLUME.`
	
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular AMA volume will be marked as "READY"`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	
	If the volume reset is successful, the response continues as follows:
	
	`DONE - Auditing affected volume/subsystem(s).`
	
	If the volume reset fails, the response continues as follows:
	
	`ERROR: FILE SYSTEM AUDIT FAILED, VOLUME NOT RESET.`
	
	(possible further error messages)

28	Query the AMA subsystem and verify the status of the repaired volume(s). Input: **>QUERY AMA VOLUMES**
29	Did any of the repaired volumes reset?

If	Then	Do
YES		Step 30
NO		Step 31

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response		
30	Did the NO AMA alarm clear?		
	If	**Then**	**Do**
	YES	Check resources	Step 58
	NO	Try remounting the volumes	Step 31
31	Are you using tape or disk?		
	If	**Then**	**Do**
	TAPE	Reload the tape volumes	Step 32
	DISK	Remount disk volumes	Step 38
32	Obtain enough blank or expired tapes for the number of tape volumes to be remounted. Make sure each tape has a write enable ring attached.		

33	Select a tape volume to demount and note the MTD number. Demount the volume you selected. Input:
	
	>DMNT AMA vol_name (where vol_name is the tape volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular Volume vol_name will be taken out of DIRP as soon as possible.`		

34	Unload the tape from the MTD you just demounted. This volume was marked INERROR and may contain data errors. Label and store this tape per your local practices.		
35	Load a blank or expired tape on the MTD you just unloaded.		

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

36	Mount the volume you just loaded. Input:
	
	>MNT AMA vol_name (where vol_name = the tape volume name)
	`Volume = 'volume_name'`
	`Formatting tape as 'volume_name'.`
	`OK`
	`Updating volume information for`
	`T0: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume T0 allocated`

37	Repeat Step 33 through Step 36 for any other tape volumes that need to be remounted (if any). When all tape volumes have been remounted, proceed to Step 39.

38	Try demounting, then remounting each disk volume.
	
	For each volume, input:
	
	>DMNT AMA vol_name (where vol_name is the disk volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular Volume vol_name will be taken out of DIRP as soon as possible.`
	
	>MNT AMA vol_name
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume vol_name allocated.`

39	Allow approximately one minute for DIRP to allocate the volumes. Note whether the NO AMA alarm is still posted after this period.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response		
40	Did the NO AMA alarm clear?		
	If	**Then**	**Do**
	YES	Check the recording resources	Step 58
	NO	There may be a fault in the DIRP subsystem	Step 41
41	The alarm should have cleared. There may be a fault in the DIRP subsystem. Contact your maintenance support group for further investigation. **STOP -CONSULT WITH YOUR MAINTENANCE SUPPORT GROUP FOR FURTHER INSTRUCTIONS**		
42	Check your office records to locate an available MTD for AMA recording. Note the MTD number.		
43	Do you have an available MTD?		
	If	**Then**	**Do**
	YES		Step 45
	NO		Step 44
44	You have no means of recording AMA data on tape. Do not proceed any further in this procedure. Instead, consult with your maintenance support group for further instructions. **STOP -CONSULT WITH YOUR MAINTENANCE SUPPORT GROUP FOR FURTHER INSTRUCTIONS**		
45	Load a tape on the MTD to be used.		

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response

46	Mount the MTD in DIRP. Input:
	
	>MNT AMA n (where n = the MTD number)
	`Volume = 'volume_name'`
	`Formatting tape as 'volume_name'.`
	`OK`
	`Updating volume information for`
	`Tn: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume Tn allocated.`
	
	Note: The responses shown are received when mounting a blank (unformatted) tape. If mounting an expired tape, the actual responses will be different.

47	Did the NO AMA alarm clear?

If	Then	Do
YES	Check recording resources	Step 58
NO	Try another tape volume	Step 48

Step	Action and response
48	Check your office records for another available tape volume that you have not yet tried.
49	Is another tape volume available?

If	Then	Do
YES		Step 45
NO		Step 57

Step	Action and response
50	Check your office records to locate an available disk recording volume for use with AMA. Note the volume name.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response		
51	Is a disk volume available?		
	If	**Then**	**Do**
	YES	Mount the disk volume(s) in DIRP	Step 53
	NO	You have no means for recording AMA data	Step 52
52	You do not have any disk space available for recording AMA data. Contact your maintenance support group for further assistance. *Do not proceed any further in this procedure.* Follow the instructions of your maintenance support group. **STOP -CONSULT WITH YOUR MAINTENANCE SUPPORT GROUP FOR FURTHER INSTRUCTIONS**		

53	Mount the disk volume in DIRP. Input:
	
	>MNT AMA vol_name (where vol_name = disk volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`		

54	Did the NO AMA alarm clear?		
	If	**Then**	**Do**
	YES	Check recording resources	Step 58
	NO	Try another disk volume	Step 55
55	Check your office records for another available disk volume that you have not yet tried.		
56	Is another disk volume available?		
	If	**Then**	**Do**
	YES		Step 53
	NO		Step 57

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
57	If disk volumes are being used, all of your available volumes may be full. Otherwise, there may be a fault in the DIRP subsystem. If you have not already done so, you ***must*** contact your maintenance support group. *Do not proceed any further in this procedure.* Follow the instructions of your maintenance support group. **STOP -CONSULT WITH YOUR MAINTENANCE SUPPORT GROUP FOR FURTHER INSTRUCTIONS**
58	Query the AMA subsystem again. Input: **>QUERY AMA ALL** (typical response is shown in Figure 1-2 on page 1-58) Look under the FILE(S), STATE, and VOLUME headers and note if any volumes are unassigned (if "NONE" is displayed under the VOLUME header, the volume is unassigned) and if any volumes are still marked INERROR.
59	Are any volumes still unassigned?

If	Then	Do
YES	Mount additional volumes	Step 60
NO		Step 71

60	In the response to the QUERY command, count the number of volumes marked as "NONE." Repeat Step 58 if necessary. You will need enough volumes to fill the "NONE" positions. Check your office records for any available recording volumes.
61	Are there enough volumes available to fill the "NONE" positions?

If	Then	Do
YES	Mount the additional volumes	Step 68
NO	Repair any INERROR volumes	Step 62

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
62	Are any any volumes still marked INERROR (repeat Step 58 if necessary)?

If	Then	Do
YES	Repair INERROR volume(s)	Step 63
NO	Your recording resources are insufficient	Step 70

63 On the MAP display, check the IOD alarm header for an IOC alarm. If an IOC alarm exists, refer to *Input/Output Devices Subsystem Maintenance Procedures*, 297-1001-556 to clear IOC alarm. If no alarm is present, contact the next level of maintenance to restore the INERROR volumes.

64 Once the INERROR volume(s) is repaired, reset the volume(s). Input the following command:

>RSETVOL vol_name

```
FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH
MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR
MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.
THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED
AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING
THIS VOLUME.

Please confirm ("YES" or "NO"):
>YES
Regular AMA volume will be marked as "READY"
vol_name: Volume nn in Regular Pool n, pool_name
```

If the volume reset is successful, the response continues as follows:

```
DONE - Auditing affected volume/subsystem(s).
```

If the volume reset fails, the response continues as follows:

```
ERROR: FILE SYSTEM AUDIT FAILED, VOLUME NOT RESET.
```
(possible further error messages)

Repeat for all of the repaired volumes.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response
65	When all INERROR volumes are reset, QUERY the AMA subsystem and verify that the volume status is READY. Input: **>QUERY AMA VOLUMES** Note the status of the volumes you reset in Step 64. Also note the number of volumes mounted. You may have an excess of volumes mounted at this point.
66	Are there any volumes that will not reset (return to READY state)?

If	Then	Do
YES		Step 67
NO		Step 68

67	Contact your maintenance support group to clear problem. When problem is cleared (volume returned to READY state), proceed to Step 68.

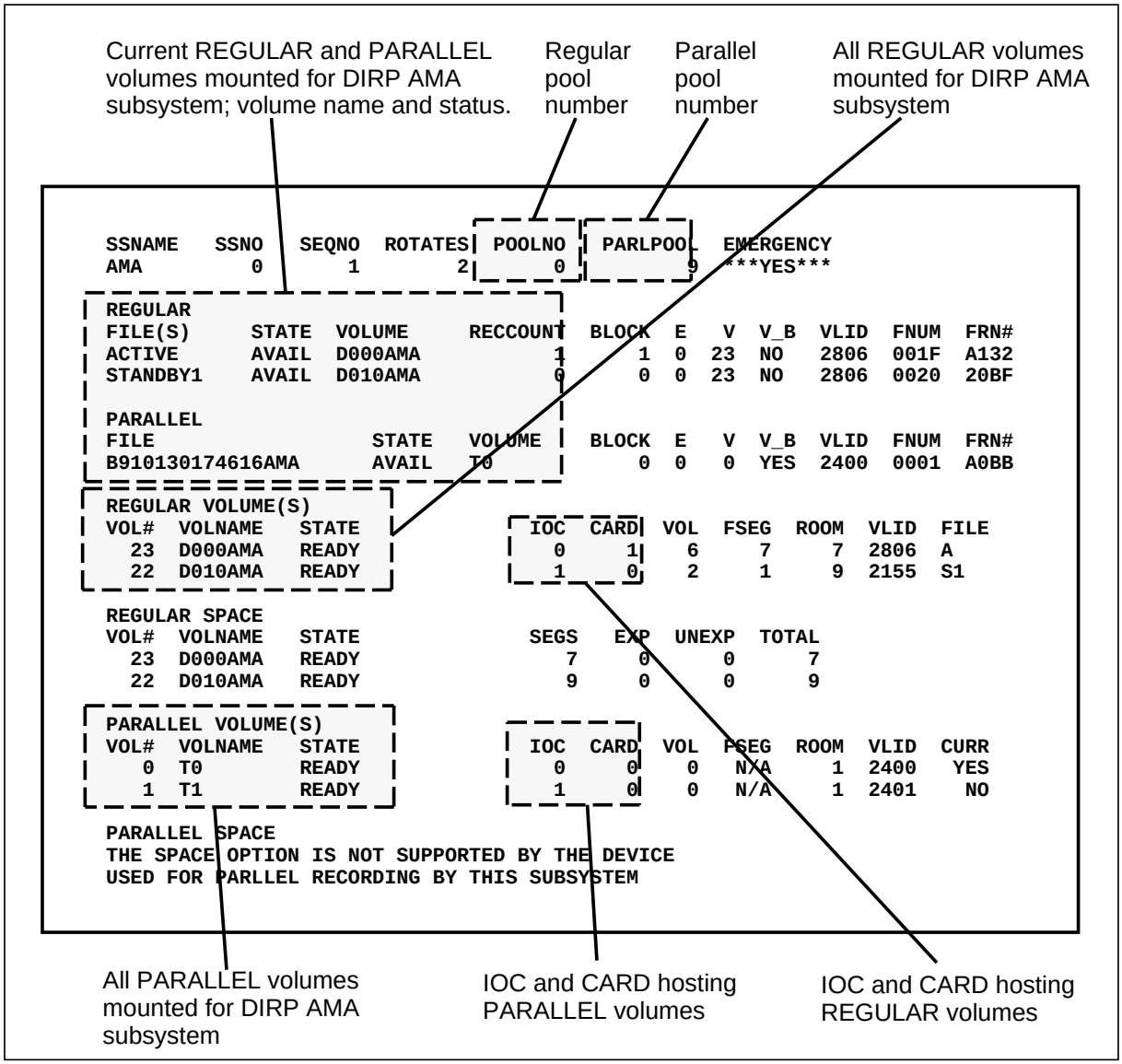
68	Mount the additional volumes in DIRP. For tape volumes, input the following commands:
	
	>MNT AMA n (where n = the MTD number)
	`Volume = 'volume_name'`
	`Formatting tape as 'volume_name'.`
	`OK`
	`Updating volume information for`
	`Tn: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume Tn allocated.`
	
	For disk volumes, input the following commands:
	
	>MNT AMA vol_name (where vol_name = disk volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm ("YES" or "NO"):`
	>YES
	`Regular volume vol_name allocated.`
	
	Repeat for all volumes required.

- continued -

Procedure 1-3xxx
NO AMA alarm clearing procedure (continued)

Step	Action and response		
69	Did you have enough volumes to fill all of the "NONE" positions?		
	If	**Then**	**Do**
	YES		Step 71
	NO		Step 70
70	Your recording resources are insufficient. Contact your maintenance support group to have additional recording resources allocated as soon as possible. For now, proceed to Step 71.		
71	Update your office records per your local practices to reflect the current AMA subsystem configuration.		
72	You will need to save the AMA data on the parallel volume (if parallel recording was used during this recovery process) for data recovery purposes. Follow your local practices regarding the recovery of AMA data from the parallel file. **STOP - PROCEDURE COMPLETED**		
	End		

Figure 1-2xxx
DIRP QUERY response



AMA P/AMA MP alarm clearing procedure

Procedure summary

1 Silence the audible alarm.

2 Access the DIRP MAP menu and query the AMA subsystem.

3 Examine the QUERY command response under header PARALLEL to determine the status of the parallel volume.

a. If parallel volume status is RWIND, the parallel file is in the process of rewinding. Wait three minutes for rewind to complete. If alarm does not clear, continue to Step 4.

b. If parallel volume status is something other than RWIND, continue to Step 4.

4 Proceed according to the parallel file device type as follows:

a. If tape is used for the parallel file:

i) Select an MTD to use for parallel recording.

ii) Load a tape suitable for AMA data on the selected MTD.

iii) Format the tape.

iv) Continue to step 5.

b. If disk is used for the parallel file:

i) Determine which disk volume should be assigned to record parallel data.

ii) Use the DIRP CLEANUP command to remove any expired files from the parallel volume.

iii) Reformat the parallel volume.

iv) Continue to step 5.

5 Add the name of the parallel recording volume to Table DIRPSSYS.

6 At the DIRP MAP menu, QUERY the AMA subsystem to verify that the parallel volume was mounted.

7 If multiple parallel volumes are being used, mount additional parallel volumes to satisfy your local requirements.

Step-by-step procedure

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure

Step	Action and response
1	Access the DIRP MAP menu and display. Input: **>MAPCI;MTC;IOD;DIRP**
2	If an audible alarm is sounding, silence it. Input: **>SIL**

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
3	Query the AMA subsystem. Input: **>QUERY AMA ALL** (typical response is shown in Figure 1-2 on page 1-58)
4	Examine the information under the PARALLEL header. This information is shown in Figure 1-2 on page 1-58 and is highlighted below. REGULAR FILE(S) STATE VOLUME ACTIVE AVAIL D000AMA STANDBY1 AVAIL D010AMA PARALLEL FILE **STATE** **B910130174616AMA AVAIL** The information displayed here shows a parallel volume mounted. If a parallel volume is not mounted, the STATE will be NONE and the FILE/VOLUME field will be blank.
5	Is an active parallel volume mounted?

If	Then	Do
YES		Step 6
NO		Step 9

6 Is the status of the active parallel volume RWIND (RWIND appears in the STATE field; see Step 4)?

If	Then	Do
YES	Parallel volume is rewinding	Step 7
NO	Alarm should not occur	Contact next level of maintenance

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
7	Wait approximately 3 minutes for the rewind to complete. Continue QUERYing the AMA subsystem periodically to monitor the parallel volume status.
8	Did the AMA P alarm clear?

If	Then	Do
YES	Alarm is cleared	Stop. Procedure is completed.
NO		Contact the next level of maintenance

Step	Action and response
9	Query the AMA subsystem again and examine the information on the parallel volume(s) currently mounted in DIRP (see note). ***Note:*** If the parallel volume(s) is closed due to manual or automatic action, the volume will not appear as the active parallel volume(s) in the QUERY response but will appear as a mounted parallel volume in the AMA subsystem. See Figure 1-2 on page 1-58. Note whether a parallel volume(s) is mounted and if so, the parallel volume(s) status. This information is highlighted in the following:
10	Is a parallel volume(s) mounted in the DIRP AMA subsystem?

If	Then	Do
YES		Step 11
NO	Mount a parallel volume(s)	Step 16

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
11	Is the status of the parallel volume(s) INERROR?

If	Then	Do
YES	Reset INERROR volume(s)	Step 12
NO	Remount parallel volumes	Step 15

12 Reset the INERROR volume(s). Input the following command:

>RSETVOL vol_name (where vol_name = name of INERROR volume)

```
FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH
MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR
MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.
THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED
AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING
THIS VOLUME.

Please confirm ("YES" or "NO"):
>YES
Regular AMA volume will be marked as "READY"
vol_name: Volume nn in Regular Pool n, pool_name
```

If the volume reset is successful, the response continues as follows:

```
DONE - Auditing affected volume/subsystem(s).
```

If the volume reset fails, the response continues as follows:

```
ERROR: FILE SYSTEM AUDIT FAILED, VOLUME NOT RESET.
```
(possible further error messages)

Repeat for all INERROR volumes

13 Query the AMA subsystem again and verify that the INERROR parallel volume(s) reset (state changed from INERROR to AVAIL).

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
14	Did the INERROR volume(s) reset?

If	Then	Do
YES		Step 15
NO	Possible device/IOC fault	Step 26

Step	Action and response
15	Did AMA P alarm clear?

If	Then	Do
YES		Stop. Procedure is completed.
NO		Contact the next level of maintenance

16 Determine the recording device type used for AMA parallel recording. You can determine this either from your office records or from datafill. To use datafill, first determine the pool number for AMA parallel recording from the QUERY command response. Query the AMA subsystem and note the value under the POOLNO field. To query the AMA subsystem input:

>QUERY AMA ALL

Next, determine the recording device type used for the AMA parallel pool from Table DIRPPOOL. Input the following commands:

>TABLE DIRPPOOL
TABLE: DIRPPOOL
>POS n;LIST (where n is the pool number)
(tuple for pool n is displayed)

Look under the DEVTYPE header for the recording device type.

Exit Table DIRPPOOL. Input:

>QUIT

Proceed to Step 17.

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
17	Is the parallel device type TAPE or DISK?

If	Then	Do
TAPE		Step 18
DISK		Step 20

18	Select an MTD to be used for parallel data and note the MTD number.
19	Mount a tape suitable for recording parallel AMA data onto the selected MTD. Proceed to Step 22.
20	Select a disk volume for parallel AMA recording. Check your office records for the volume name (volname).
21	List the files on the selected disk volume. Input: **>DSKUT** **>LIST vol_name ALL** (where vol_name = the disk volume name.) (all volumes on volume vol_name are listed) **>QUIT**

22	Mount the parallel volume(s). Input the following commands:
	
	>MNT AMA vol_name PARALLEL (where vol_name = volume name)
	`Volume = 'vol_name'`
	
	`Parallel recording is not currently active for AMA. Recording may begin immediately on this parallel volume.`
	
	`Updating volume information for vol_name: Volume n in Parallel Pool n, pool_name`
	
	Note: The actual response you receive may differ somewhat.

23	Wait for the system to allocate the new parallel volume.

- continued -

Procedure 1-4xxx
AMA P/AMA MP alarm clearing procedure (continued)

Step	Action and response
24	Query the AMA subsystem. Input: **>QUERY AMA ALL** Note the status of the parallel volumes (see Figure 1-2 on page 1-58).
25	Verify that the parallel volume was mounted and that the AMA P alarm cleared. If alarm persists, contact the next level of maintenance. Otherwise, **STOP - PROCEDURE IS COMPLETED**
26	On the MAP display, check the IOD alarm header for an IOC alarm. If an IOC alarm exists, refer to *Input/Output Devices Alarm Analysis and Card/Device Replacement*, 297-1001-556 to clear IOC alarm. If no alarm is present or if the INERROR volume(s) will not reset, contact the next level of maintenance to restore the INERROR volume(s). When the INERROR volume(s) is restored, return to Step 12.
27	If you are using multiple parallel volumes, as a final check, make sure that enough recording volumes are allocated to the parallel recording pool. Check your office records to determine the desired number of volumes. Query the AMA subsystem to determine the number of parallel volumes that are currently mounted. Input:: **>QUERY AMA ALL** Mount any additional volumes needed. Input:: **>MNT AMA vol_name PARALLEL** Repeat for each additional volume needed.
	End

AMA I alarm clearing procedure

Procedure summary

1 Silence the audible alarm, if any.

2 Access the DIRP MAP menu, QUERY the AMA subsystem, and determine if a volume is mounted that is on a different IOC than the ACTIVE volume.

   a. If there is another volume mounted that is on a different IOC than the ACTIVE volume, proceed to Step 3.

   b. If there is no volume mounted that is on a different IOC, continue to Step 4.

3 Note the status of the volume on the alternate IOC.

   a. If the status is INERROR, try to RSETVOL the INERROR volume. If the volume is made READY, ROTATE the AMA subsystem until the AMA I alarm clears.

   b. If the INERROR volume is not made READY, a fault exists in the IOC or recording device. Isolate and repair the fault, RESETVOL the INERROR volume, then ROTATE the AMA subsystem until the AMA I alarm clears.

4 Mount a recording volume on an alternate IOC, then ROTATE the AMA subsystem until the AMA I alarm clears.

5 QUERY the AMA subsystem again and note the IOC hosting each device. If necessary, reconfigure the devices to ensure equal distribution over all available IOCs.

Step-by-step procedure

Procedure 1-5xxx
AMA I alarm clearing procedure

Step	Action and response
1	Access the DIRP MAP menu and display. Input: **>MAPCI;MTC;IOD;DIRP**
2	If an audible alarm is sounding, silence it. Input: **>SIL**
3	Query the AMA subsystem. Input: **>QUERY AMA ALL** **(**typical response is shown in Figure 1-2 on page 1-58)

- continued -

Procedure 1-5xxx
AMA I alarm clearing procedure (continued)

Step	Action and response
4	From the QUERY command response, note the name of the ACTIVE and STANDBY1 volumes and the IOC hosting each. This information is shown in Figure 1-2 on page 1-58.
5	From the QUERY command response, note the other volumes that are mounted in the AMA subsystem and their status. See Figure 1-2 on page 1-58.
6	Are any volumes INERROR?

If	Then	Do
YES	Reset INERROR volume(s)	Step 7
NO	See if any available volumes are on another IOC	Step 15

7 Reset the INERROR volume(s). Input::

>RSETVOL vol_name (where vol_name = the volume name.)

```
FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH
MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR
MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.
THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED
AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING
THIS VOLUME.

Please confirm ("YES" or "NO"):
```

>YES

```
Regular AMA volume will be marked as "READY"
vol_name: Volume nn in Regular Pool n, pool_name
```

If the volume reset is successful, the response continues as follows:

```
DONE - Auditing affected volume/subsystem(s).
```

If the volume reset fails, the response continues as follows:

```
ERROR: FILE SYSTEM AUDIT FAILED, VOLUME NOT RESET.
```
(possible further error messages)

Repeat for all INERROR volumes.

- continued -

Procedure 1-5xxx
AMA I alarm clearing procedure (continued)

Step	Action and response		
8	Did INERROR volumes return to READY status?		
	If	**Then**	**Do**
	YES	See if any are on another IOC	Step 16
	NO	Recording device or host IOC is faulty	Step 9
9	In the DIRP MAP display, look at the IOC status display. Note the status of the IOC hosting the INERROR recording device.		
10	Is IOC hosting the INERROR recording device in-service (a dot displayed in the status field)?		
	If	**Then**	**Do**
	NO	Repair IOC	Refer to 297-1001-556
	YES	Check card status	Step 11
11	Access the IOC menu. Input: **>IOC n** **(**where n = the IOC number) Note the card status.		
12	Is the CARD hosting the INERROR recording device in-service (dot displayed in status field)?		
	If	**Then**	**Do**
	YES	Check device	Step 13
	NO	Repair faulty card	Refer to 297-1001-556
13	Access the CARD menu. Input: **>CARD n** **(**where n = the card number) Note the status of the recording device.		

- continued -

Procedure 1-5xxx
AMA I alarm clearing procedure (continued)

Step	Action and response
14	Is the recording device in-service (dot displayed in status field)?

If	Then	Do
YES		Contact the next level of maintenance
NO	Repair faulty recording device	Refer to 297-1001-556

15	Return to the DIRP MAP menu. Input: **>DIRP**
16	Query the AMA subsystem again, if necessary, and note if any volumes are mounted on an alternate IOC. Input: **>QUERY AMA ALL** **(** typical response is shown in Figure 1-2 on page 1-58)
17	Are there any volumes in the AMA subsystem hosted by an alternate IOC?

If	Then	Do
YES	Rotate the AMA subsystem	Step 21
NO	Mount a volume on an alternate IOC	Step 18

18	Check your office records to find an available recording volume on an alternate IOC. Note the volume name.

19	Mount the volume in the AMA subsystem. Input:
	
	>MNT AMA vol_name (where vol_name = the volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

- continued -

Procedure 1-5xxx
AMA I alarm clearing procedure (continued)

Step	Action and response
20	Confirm the system requests as needed.
21	Determine the recording device type used for AMA by examining the volume names. If volume names are Tn, tape is used. If volume names are Dnnnaaa, disk is used.
22	Is the recording device TAPE or DISK?

If	Then	Do
TAPE	Rotate AMA	Step 25
DISK	Close the STANDBY 1 volume	Step 23

23 Close the STANDBY 1 volume. Input:

```
>CLOSE AMA STDBY 1

SENDING REQUEST TO SUBSYSTEM
Please confirm ("YES" or "NO"):
>YES
REQUEST SENT TO SUBSYSTEM. CHECK DIRP LOG FOR DETAILS
```

24 Proceed to Step 26

25 Rotate the AMA subsystem until the AMA I alarm clears. Input:

```
>ROTATE AMA
SENDING REQUEST TO SUBSYSTEM
Please confirm ("YES" or "NO"):
>YES
REQUEST SENT TO SUBSYSTEM, CHECK DIRP LOG FOR DETAILS
```

Repeat until the ACTIVE and STANDBY1 volumes are on different IOCs.

- continued -

Procedure 1-5xxx
AMA I alarm clearing procedure

Step	Action and response
26	Query the AMA subsystem again. Input: **>QUERY AMA ALL** **(**typical response is shown in Figure 1-2 on page 1-58)
27	Note the volumes mounted and the IOCs hosting each. The recording devices for AMA should be evenly distributed over the available IOCs. If an imbalance exists, mount additional volumes hosted by other IOCs. Demount the excess volumes as needed. Once a balance is achieved, **STOP - PROCEDURE IS COMPLETED.**
	End

nnAMA alarm clearing procedure

Procedure summary

1 Record the number of files required. This number is indicated by “nn” in the nnAMA alarm indicator.

2 Locate additional recording volumes suitable for AMA.

3 Access the DIRP MAP menu and mount the additional volumes required to satisfy nn.

Step-by-step procedure

Procedure 1-6xxx
nnAMA alarm clearing procedure

Step	Action and response
1	Note and record the value of “nn” in the nnAMA alarm indicator. This value represents the number of files that are required to satisfy the minimum number of files specified in Table DIRPSSYS for the AMA subsystem.
2	Check your office records for available recording volumes suitable for AMA recording. Note the volume name(s).
3	Access the DIRP MAP menu. Input: **>MAPCI;MTC;IOD;DIRP**

Procedure 1-6xxx
nnAMA alarm clearing procedure

Step	Action and response

4	Mount the additional recording volumes. Input:
	
	>MNT AMA vol_name
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

5	Verify that the nnAMA alarm cleared. If alarm clears, stop - procedure is completed. If alarm persists, contact the next level of maintenance.

AMA D alarm clearing procedure

Procedure summary

1 Determine from your office records the Table DIRPSSYS field values required to define the AMA subsystem.

2 Access Table DIRPSSYS and add the tuple defining the AMA subsystem.

3 Exit Table DIRPSSYS.

4 Check Table DIRPPOOL to verify that recording volumes are mounted. Mount volumes as needed.

5 Verify that the AMA alarm cleared.

Step-by-step procedure

Procedure 1-7xxx
AMA D alarm clearing procedure

Step	Action and response
1	Determine from your office records the value for each field in Table DIRPSSYS. Refer to *Common Customer Data Schema*, 297-1001-451 for detailed information on the fields in Table DIRPSSYS.
2	Access Table DIRPSSYS. Input: **>TABLE DIRPSSYS** `TABLE: DIRPSSYS`

- continued -

Procedure 1-7xxx
AMA D alarm clearing procedure (continued)

Step	Action and response
3	Add the AMA subsystem tuple. Although the specific values depend on operating company requirements, the following example shows how the tuple is added. In this example, multiple parallel volumes are used (equipped with feature package NTXP14) and mandatory parallel recording is specified. **>ADD AMA Y 2 1 AMADISK DMS100 CR MJ NA NA 30 30 AMAPARL N NA OPENED NNNNNNN 0 NOROTATE NONE NONE N 64 Y** TUPLE TO BE ADDED AMA Y 2 1 AMADISK DMS100 CR MJ NA NA 30 30 AMAPARL N NA OPENED NNNNNNN 0 NOROTATE NONE NONE N 64 Y ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT **>Y** TUPLE ADDED
4	Exit Table DIRPSSYS. Input: **>QUIT** CI:
5	Access Table DIRPPOOL. Input: **>TABLE DIRPPOOL** TABLE: DIRPPOOL
6	Position on the AMA recording pool tuple. Input: **>POS ama_pool_number** (where = the pool number for AMA) (ama_pool_name tuple is displayed)
7	Does the AMA pool exist?

If	Then	Do
YES	Verify that sufficient volumes are mounted	Step 11
NO	Add the AMA pool	Step 8

8	Determine from your office records the recording volumes to be used for AMA. Remember that the number of volumes should be equal to NUMFILES in Table DIRPSSYS, but never less than MINFILES. Note the volume names.

- continued -

Procedure 1-7xxx
AMA D alarm clearing procedure (continued)

Step	Action and response
9	If tape is used, mount a tape suitable for AMA recording on each drive to be used.
10	Add the AMA recording pool tuple. Although the actual datafill will vary according to operating company requirements, the following example shows how to add a tuple to Table DIRPPOOL. In this example, multiple parallel volumes are used (office is equipped with feature package NTXP14). **>ADD 0 AMAPOOL REGULAR TAPE $** TUPLE TO BE ADDED 0 AMAPOOL REGULAR TAPE $ ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT **>Y** TUPLE ADDED Proceed to Step 17
11	List the tuple headers. Input: **>LIST** (tuple with headers is displayed)
12	Note if any volumes are mounted. If a volume is mounted, the volume name should appear under a VOLUMEnn header.
13	Are any volumes mounted?

If	Then	Do
YES	Exit Table DIRPPOOL	Step 17
NO	Mount some volumes	Step 14

Step	Action and response
14	Check your office records to locate recording volumes to be used for AMA. Remember that the number of volumes should be equal to NUMFILES in Table DIRPSSYS, but never less than MINFILES. Note the volume names.
15	If tape is used, load a tape on each MTD.

- continued -

Procedure 1-7xxx
AMA D alarm clearing procedure (continued)

Step	Action and response

16	Mount the volumes in Table DIRPPOOL by changing the VOLUME names to the volumes to be mounted. To change a volume name, input:
	
	>CHA VOLUMExx vol_name
	where xx = the volume number in Table DIRPPOOL
	volname = the AMA recording volume name
	
	`TUPLE TO BE CHANGED`
	
	(tuple with changed field is displayed; in this case, VOLUMExx)
	
	`ENTER Y TO CONFIRM, N to REJECT OR E TO EDIT`
	>Y
	`TUPLE CHANGED`
	
	Repeat for each volume to be added.

17	Exit Table DIRPPOOL. Input: **>QUIT**
18	Verify that the AMA alarm has cleared.

If	Then	Do
Alarm cleared		Stop - procedure is completed
Alarm persists		Contact the next level of maintenance
A different AMA alarm appears	Clear new AMA alarm	Refer to Table 1-5

End

Pnn1Vnn2 alarm clearing procedure

Procedure summary

1 Silence the audible alarm.

2 Access Table DIRPPOOL and identify the affected volume. The volume number in Table DIRPPOOL is given in the Pnn1Vnn2 alarm as "nn2." The volume under the VOLUMEnn header in Table DIRPPOOL is the affected recording volume.

3 Check Table DIRPSSYS to determine the DIRP subsystem associated with the affected volume. If the volume is associated with the AMA subsystem, continue to Step 4. If the volume is with another DIRP subsystem, refer to *Input/Output Devices Subsystem Maintenance Procedures*, 297-1001-556 to clear this alarm. This document covers AMA alarms only.

4 If this is the second time in a five-minute interval that this alarm has occurred for this volume, do the following:

   a. Access the DIRP MAP menu.

   b. Demount, then mount the affected volume.

   c. If alarm persists, demount the affected volume again and use the DIRP CLEANUP command to remove any unnecessary files from the volume.

5 If this is the first time this alarm has occurred, do the following:

   a. Reset the affected volume.

   b. If the alarm does not clear, use Table DIRPPOOL to identify the volume name. The volume number in Table DIRPPOOL is indicated in the Pnn1Vnn2 alarm as "nn2." The affected volume name is under the VOLUMEnn2 header in Table DIRPPOOL.

   c. Use the DIRP CLEANUP command to remove any unnecessary files from the volume, then reset the affected volume.

   d. If the volume will not reset, mount a new volume to replace this one.

   e. If the alarm persists, contact the next level of maintenance.

Step-by-step procedure

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure

Step	Action and response
1	If an audible alarm is sounding, access the MAPCI maintenance level and silence the audible alarm. At the DMS MAP, input: **>MAPC;MTC;SIL**
2	Note and record the pool and volume numbers indicated in the Pnn1Vnn2 alarm. nn1 indicates the pool number and nn2 indicates the volume number in Table DIRPPOOL.
3	Access Table DIRPPOOL. Input: **>TABLE DIRPPOOL** `TABLE: DIRPPOOL`
4	List the DIRP pool name associated with this alarm. Input: **>POS poolnum;LIST** (where poolnum = the pool number (nn1)) (tuple for poolnum is displayed with field headers)
5	Note the pool name under POOLNAME and the name of the affected volume under VOLUMEnn2, where nn2 is the Table DIRPPOOL volume number indicated in the alarm. Exit Table DIRPPOOL. Input: **>QUIT** `CI:`
6	Access Table DIRPSSYS. Input: **>TABLE DIRPSSYS** `TABLE: DIRPSSYS`
7	List the DIRP subsystem associated with this alarm. Input: **>POS POOLNAME EQ pool_name;LIST** (where poolname = the pool name found in Step 5) (tuple with POOLNAME=pool_name is displayed with field headers)
8	Note the subsystem name under the header SSYSNAME. Exit Table DIRPSSYS. Input: **>QUIT** `CI:`

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response		
9	Is the affected subsystem AMA?		
	If	**Then**	**Do**
	YES		Step 10
	NO	You are in the wrong maintenance book. This book covers AMA only.	Refer to 297-1001-312 or 297-1001-556
10	Is this the second time in a five-minute interval that this alarm has occurred for this volume?		
	If	**Then**	**Do**
	YES	A special procedure is required	Step 23
	NO		Step 11
11	Record the time of the alarm, pool number, and volume number of the affected volume for future reference. The pool number is indicated by nn1 and the volume number by nn2.		
12	Access the DIRP MAP menu. Input: **>MAPCI;MTC;IOD;DIRP**		

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response

13 Reset the affected volume. Input:

>RSETVOL poolnum volnum
(where poolnum = the pool number (nn1)
volnum = the volume number (nn2))

```
FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH
MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR
MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME.
THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED
AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING
THIS VOLUME.

Please confirm (“YES” or “NO”):
>YES
Regular AMA volume will be marked as “READY”
vol_name: Volume nn in Regular Pool n, pool_name

DONE - Auditing affected volume/subsystem(s).
```

14 Did the alarm clear?

If	Then	Do
YES	Volume was removed from use due to a transiental error	Stop - procedure is completed.
NO	Volume is probably nearly full	Step 15

15 List the files on the affected volume. Input:

>DSKUT;LISTVOL volname ALL;QUIT
(where volname = the volume name found in Step 5)

16 Remove any unnecessary files from the affected volume. Input:
>CLEANUP VOLUME vol_name
(where vol_name = the name of the affected volume)
(Response depends on several conditions. See *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312 for information on responses to this command)

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response
17	Reset the affected volume. Input: **>RSETVOL pool_num vol_num** (where pool_num = pool number (nn1) vol_num = volume number (nn2)) FILE SYSTEM ERRORS HAVE OCCURRED ON THIS VOLUME WHICH MAY AFFECT ITS ABILITY TO RECORD DATA RELIABLY OR MAY HAVE CORRUPTED EXISTING DATA ON THE VOLUME. THE CAUSE OF THESE ERRORS SHOULD BE INVESTIGATED AND ALL PROBLEMS SHOULD BE RESOLVED BEFORE RESETTING THIS VOLUME. Please confirm (“YES” or “NO”): **>YES** Regular AMA volume will be marked as “READY” vol_name: Volume nn in Regular Pool n, pool_name DONE - Auditing affected volume/subsystem(s).
18	Did the alarm clear?

If	Then	Do
YES	Alarm is cleared	Stop - procedure is complete.
NO		Contact the next level of maintenance

19	Check your office records for an available recording volume to use for AMA. Note the volume name.
20	Demount the full volume. Input: **>DMNT ssysname vol_name** (where ssysname = the subsystem name found in Step 5 vol_name = the volume name found in Step 5) Updating volume information for vol_name: Volume nn in Regular Pool n, pool_name Please confirm (“YES” or “NO”): **>YES** Regular Volume vol_name will be taken out of DIRP as soon as possible.

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response

21	Mount the new volume. Input:
	
	>MNT ssysname vol_name
	(where ssysname = the subsystem name found in Step 5
	vol_name = the volume name found in Step 5)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

22	Did the alarm clear?

If	Then	Do
YES	Alarm is cleared	Stop - procedure is complete.
NO		Contact the next level of maintenance

23	Demount the affected volume. Input:
	
	>DMNT AMA vol_name (where vol_name = volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular Volume vol_name will be taken out of DIRP as soon as possible.`

24	Attempt to remount the affected volume. Input:
	
	>MNT AMA vol_name (where vol_name = volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response
25	Did the volume remount?

If	Then	Do
YES	Alarm should clear	Step 26
NO	Volume may be full	Step 27

Step	Action and response
26	Did the alarm clear?

If	Then	Do
YES	Alarm is cleared	Stop - procedure is complete.
NO	Volume may be nearly full	Step 27

Step	Action and response

27	Demount the affected volume. Input:
	
	>DMNT AMA vol_name
	(where vol_name = the name of the affected volume)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular Volume vol_name will be taken out of DIRP as soon as possible.`

28	List the files on the affected volume. Input: **>DSKUT;LISTVOL vol_name ALL;QUIT** (where vol_name = volume name) (all files in volume vol_name are listed)
29	Remove any unnecessary files from the affected volume. Input: **>CLEANUP VOLUME vol_name** (where vol_name = volume name) (Response depends on several conditions. See *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312 for information on responses to this command)

- continued -

Procedure 1-8xxx
Pnn1Vnn2 alarm clearing procedure (continued)

Step	Action and response

30	Mount the volume again. Input:
	
	>MNT AMA vol_name (where vol_name = volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

31	Proceed to Step 34.
32	Check your office records to locate an available disk volume for recording AMA data. Note the volume name.

33	Mount the new volume. Input:
	
	>MNT AMA new_vol_name (where new_vol_name = new volume name)
	`Updating volume information for`
	`vol_name: Volume nn in Regular Pool n, pool_name`
	`Please confirm (“YES” or “NO”):`
	>YES
	`Regular volume vol_name allocated.`

34	Did the alarm clear?

If	Then	Do
YES	Alarm is cleared	Stop - procedure is complete.
NO		Contact the next level of maintenance.

End

AMA test calls

Software package NTX159AA provides the ability to designate an originating or terminating line (integrated business network (IBN), plain ordinary telephone service (POTS), residential enhanced service (RES), business set, data unit, and trunk groups) as a test call line or trunk. Any calls originating or terminating from a line with AMATEST will have all subsequent billing records treated as AMATEST records. This includes billing records generated on the virtual facility group (VFG) leg of a call

originated from an AMATEST IBN line as well as records generated as a result of terminating billing. The terminating agent does not have to have AMATEST on it for the terminating record to be considered a test record. The originating line with AMATEST will take care of this scenario. It is, however, still valid to place AMATEST on the terminating line.

If a line with the AMATEST option enabled produces a billing record, the fourth position of the study indicator field will contain a 1. An AMAB200 log will also be produced if the LOGTEST option in Table AMAOPTS is set to ON.

For trunk groups, AMATEST is created as a trunk option in Table AMATKOPT. A member selector allows all or only particular trunk group members to have the AMATEST option applied. For RES lines, the AMATEST option can be applied using SERVORD. For business sets and data units, the AMATEST option can be applied using SERVORD or by datafilling Table KSETLINE.

A line with AMATEST enabled will not produce a high-runner structure code.

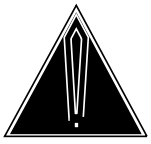
AMA emergency procedures

Reload recovery

It is possible for DIRP with disk to recover AMA subsystem data that records through DIRP, immediately after reload restart without manual intervention. Recovery is accomplished with the image taken containing DIRP disk information.

Should an image be taken and found to contain current disk volumes, if that image should ever be rebooted, the system will automatically recover whatever was on those disks volumes. A disk audit cleans up any files that were open prior to the reload.

CAUTION



After a restart reload or an activity switch of the DMS-100 CC when the CCs are out of sync, the AMA subsystem may not be mounted. Immediately after a reload restart, check the AMA subsystem (ACTIVE, STANDBY, and PARALLEL) to see if AMA is mounted. All restarts, except a warm restart, will demount a magnetic tape drive.

When a reload occurs, the ACTIVE file is marked INERROR. The system may or may not mark the ACTIVE file as an unprocessed file. If the system does mark the ACTIVE file as an unprocessed file, it will place a “U” in front of the file name. If the system does not mark the file as an

unprocessed file, the file will be lost. Because there is a risk of losing the ACTIVE file during a reload, take an image after performing any DIRP file manipulations.

Planned restart

The loss of critical data can be minimized over a warm, cold, or reload restart by making certain preparations prior to the restart.

When the CC synchronization is dropped in the DMS, the inactive CC initiates a cold restart. Being in the inactive NOSYNC state, the inactive CC is isolated from the DMS system. The actions occurring in the inactive CC, at this point, have no effect on the DMS system. Conversely, the actions occurring in the active CC have no effect on the inactive CC.

While in the NOSYNC state, any changes made to DIRP in the active CC are not propagated to DIRP in the inactive CC, resulting in a mismatch. Should a CC SWACT occur during this condition, when the inactive CC is made active, the actual DIRP configuration may not match the datafilled configuration and a DIRP emergency could result.

To avoid a possible DIRP emergency in this situation, operating companies can access Table DIRPSSYS in the inactive CC prior to the activity switch to verify that the proper volumes are mounted or to change the volume datafill to reflect volume changes made in the active side. By changing the datafill in the inactive side to match the datafill in the active side, when the inactive CC is made active, DIRP in the now active side can mount its datafilled volumes automatically, thus averting a DIRP emergency and eliminating the need for manual action.

When the DMS CCs have been out of sync for over five minutes and an activity switch is to be performed, to avoid a DIRP emergency following the activity switch, perform the following steps:

1 Access Table DIRPPOOL from the MAP and record the volume names for the critical AMA subsystems in the active CC.

2 Use the MATEIO command to access Table DIRPSSYS in the inactive CC. Verify that the volumes are the same as those for the active CC. Change the datafill as required.

If a reload is planned, the risk of losing data in the the ACTIVE file can be substantially reduced if the ACTIVE file is manually rotated and closed prior to the reload. This can be accomplished as follows:

1 Enter the DIRP MAP level.

2 Input:

>ROTATE <subsystem>

3 If ROTACLOS in Table DIRPSSYS is set to NONE, input:

>CLOSE

If ROTACLOS in Table DIRPSSYS is set to MROTATE or BOTH, the ACTIVE file will be closed automatically upon rotation.

Failure to follow this procedure may result in the improper closure of the ACTIVE file and a possible loss of AMA and other subsystem data. This only applies to reload restarts.

Perform the activity switch and monitor the DIRP system closely after the switch activity completes. If DIRP fails to mount its volumes, take immediate action to restore DIRP operation.

Power removal

Refer to the following when removing power.

CAUTION

Extreme caution should be used in removing power from the core modules as interruptions of AMA billing data could result. If the IOC needs to be powered down, the AMA billing device (tape, disk, DPP) will have to be configured onto the IOCs that will remain in-service. AMA data currently on disk should be processed prior to removing the IOC from service if time permits. Once the IOC is removed from service and powered down, the central message controller (CMC) should be removed from service and then the central processing unit (CPU) can be removed from service. Should any system initializations occur, some previously manually busied equipment may be put back into service. Such equipment should be made manual busy again as system diagnostics will be invoked and will use system real time unnecessarily. Refer to *Index to Maintenance Procedure Documents*, 297-1001-500 for more switch maintenance information.

Manual emergency recovery procedures

DIRP fault recovery procedure Faults in the DIRP subsystem are reported to the user through the following methods:

- MAP DIRP level display
- output messages (logs)
- audible indicators

Most faults reported through DIRP are due to error conditions existing in other parts of the system. Even though the faulty AMA subsystem may not report the fault condition, DIRP is not always at fault.

Some DIRP logs report a change in status condition, whereas others indicate an alarm condition. For those that indicate alarms, perform the following steps:

1 Examine all the associated logs. A given alarm may cause several logs to be output. Look at all the logs that relate to the fault, in the following precedence:

   a. DIRP
   b. SWERR
   c. TRAP
   d. IOD
   e. DDU
   f. AUD
   g. other logs

2 Query the various affected subsystems indicated on the logs. The order in which the subsystems are queried depends on the seriousness of the problem.

   - QUERY (DIRP)
   - DSKUT
   - IOD MAINT
   - other query commands

   Note: For more information on the DIRP QUERY command, refer to *Device Independent Recording Package (DIRP) User Guide*, 297-1001-312; *Command Reference Manual*, 297-1001-509; *Input/Output Devices (IOD) Man-Machine Interface Description*, 297-1001-513; and *Maintenance System Man-Machine Interface Description*, 297-1001-520.

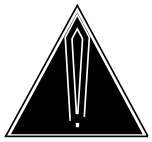
3 The response from the QUERY command contains information useful in locating the cause of the alarm (for example, tape fault, IOC busy, disk trap). Based on the information obtained from the logs and from the queries, determine if possible the source of the fault condition.

4 It may be necessary to contact the technical support group for aid in locating and correcting the problem. Another source of information for correcting fault conditions is *Index to Maintenance Procedure Documents*, 297-1001-500.

5 Specific recovery information is explained in the individual log descriptions. If it is necessary to perform a warm restart, contact the technical support group. Occasionally, a condition exists where normal procedures will not clear a PnnVnn DIRP alarm. The normal procedure is to use the RSETVOL command to reset the INERROR volume. If this fails to clear the alarm, or if the alarm reappears within five minutes, demount, then remount the affected volume. If the affected volume does not remount, or if the alarm persists, contact your maintenance support group.

6 If you suspect that AMA data on a disk volume has been lost or corrupted as the result of a fault, it is imperative that you remove the affected volume(s) from the DIRP system immediately to prevent the possibility of existing AMA data being overwritten. You can demount the suspected volume(s) using the DMNT command or by deleting the volumes from Table DIRPPOOL.

After you demount the volume(s), contact your maintenance support group for assistance in recovering the AMA data from the affected volume(s).



CAUTION

DO NOT REMOUNT THE VOLUMES UNTIL INSTRUCTED TO DO SO BY YOUR MAINTENANCE SUPPORT GROUP .

Restarting AMA

When an AMA software failure occurs, operating company personnel can use the AMARESTART command to recreate the AMA process. Refer to the AMARESTART utility in the Man-machine interface section of this chapter, page 1-13, for the usage of this command.

List of terms

AMA

Automatic Message Accounting

AMAT

Automatic Message Accounting Teleprocessor

AMATPS

Automatic Message Accounting Teleprocessing System

Automatic message accounting (AMA)

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

Automatic message accounting transmitter (AMAT)

A subsystem of the automatic message accounting teleprocessing system that, on request, transmits automatic message accounting data to the collector in the central office.

Automatic message accounting transmitter (AMAT)

A subsystem of the automatic message accounting teleprocessing system that, on request, transmits automatic message accounting data to the collector in the central office.

Call condense block (CCB)

A data block associated with a call from initiation through completion. The CCB contains enough information to describe a basic call, and can be extended for calls which require more data.

CAMA

Centralized AMA

CC

Central control

CCB

Call condense block

Central control (CC)

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

Central processing unit (CPU)

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

Centralized automatic message accounting (CAMA)

A system that produces itemized billing details for subscriber-dialed long distance calls. Details are recorded at a central facility serving a number of exchanges. In exchanges not equipped for Automatic Number Identification, calls are routed to a CAMA operator who obtains the calling number and keys it into the computer for billing. *See* local automatic message accounting.

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

DA

Directory Assistance

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.

Digital multiplex system (DMS)

A central office switching system in which all external signals are converted to digital data and stored in assigned time slots. Switching is performed by reassigning the original time slots.

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.

DMS

Digital Multiplex System

DPP

Distributed processing peripheral

HOC

Host office collector

Host office collector (HOC)

A data center that collects automatic message accounting data from central offices within a given region. The HOC collects the data onto tapes and passes the information to the revenue accounting office for the production of subscriber bills.

IBN

Integrated business network

Input/output controller (IOC)

An equipment shelf that provides an interface between up to thirty-six 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 utilizes the data-handling capabilities of a DMS-100 Family office to provide a centralized telephone exchange service. Many optional features are also available.

Inward wide area telephone service (INWATS)

A telephony service that allows a subscriber to receive telephone calls originated within specified service areas without a charge to the originating

party. *See* also outward wide area telephone service; wide area telephone service; Basic 800 Service.

INWATS

Inward wide area telephone service

LAMA

Local AMA

LEN

Line equipment number

Line equipment number (LEN)

A seven-digit function-reference used to identify line circuits.

Local automatic message accounting (LAMA)

A system similar to automatic message accounting, but providing local collection and recording of billing information. LAMA consists of a combination of AMA equipment and automatic number identification equipment in the same office. Such a system can automatically process a subscriber-dialed toll call without operator assistance. Contrast with central automatic message accounting (CAMA).

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 provide a man-machine 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)

The series of commands and responses that are used by operating company personnel to communicate with the DMS-100 Family system machines. MMI is achieved through the maintenance and administration position and other input/output devices.

MAP

Maintenance and Administration Position

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 manages its transfer to displays and records on which maintenance, traffic, accounting, and provisioning decisions are based.

Outward wide area telephone service (OUTWATS)

A telephony service, provided over one or more dedicated access lines to the serving central office, that permits subscribers to make calls to specified service areas on a direct dialing basis for a flat monthly charge or for a charge based on accumulated usage. Outward WATS lines have special directory numbers. *See* also inward wide area telephone service; wide area telephone service.

OUTWATS

Outward wide area telephone service

Plain ordinary telephone system (POTS)

POTS is an acronym used in the telephone industry to denote basic, conventional telephone services.

POTS

Plain ordinary telephone service

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.

RES

Residential enhanced services

Residential enhanced services (RES)

Software which provides a platform for the implementation of sophisticated phone services to residential subscribers and small businesses previously serviced on a POTS (1FR or 1MR) line.

RU

Recording unit

SLM

System load module

System load module

A mass storage system in DMS-Supernode that is used to store office images. From the SLM, new loads or stored images can be booted into the computing module.

TOPS

Traffic Operator Position System

Traffic operator position system (TOPS)

A call processing system made up of a number of operator positions. Each operator position consists of a visual display unit (VDU), a controller, a keyboard, and a headset. TOPS is a trademark of Northern Telecom Ltd.

VDU

Visual display unit

VFG

Virtual Facility Group

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 man-machine interface in the DMS-100 Family systems.

XFER

Remote data polling system

DMS-100 Family

Bellcore Format Automatic Message Accounting

Maintenance Guide

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