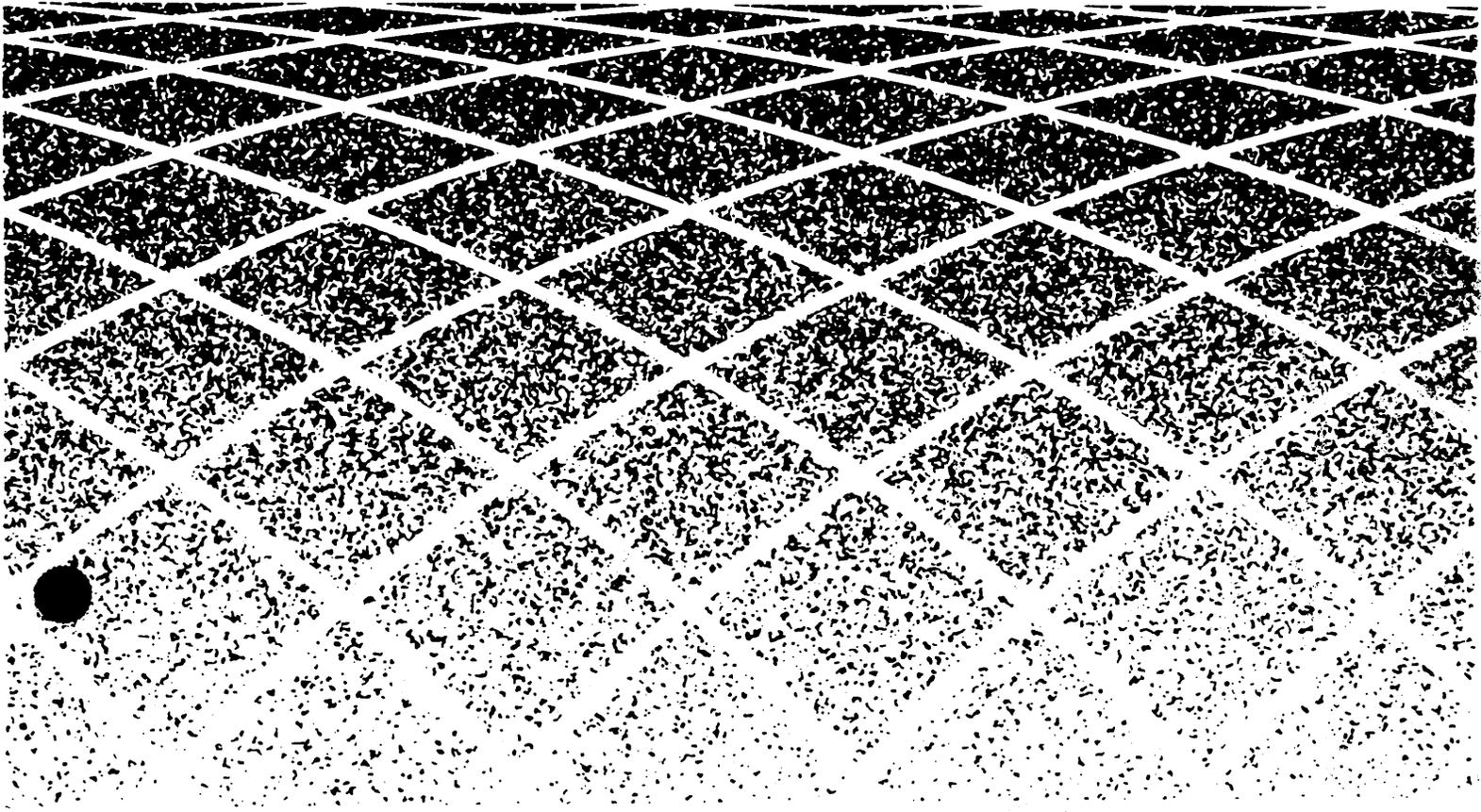




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Issue 1
October 1989

Call Detail Recording Unit/Small User Guide



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Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Remote Access Feature: Security Considerations

AT&T has designed the remote access feature incorporated in this product that, when properly administered by the customer, will enable the customer to minimize the ability of unauthorized persons to gain access to the network. It is the customer's responsibility to take the appropriate steps to properly implement the features, evaluate and administer the various restriction levels, protect access codes, and distribute them only to individuals who have been advised of the sensitive nature of the access information. Each authorized user should be instructed concerning the proper use and handling of access codes.

In rare instances, unauthorized individuals make connections to the telecommunications network through use of remote access features. In such event, applicable tariffs require that the customer pay all network charges for traffic. AT&T cannot be responsible for such charges, and will not make any allowance or give any credit for charges that result from unauthorized access.

FCC Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

Ordering Information

The ordering number for this document is 555-006-212. To order this document, call the AT&T Customer Information Center at 1-800-432-4600 (in Canada, 1-800-255-1242). For more information about AT&T documents, refer to the *Business Communications Systems Publications Catalog* (555-000-010).

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ABOUT THIS DOCUMENT

PURPOSE

This document is intended for customers and AT&T personnel who want a comprehensive description of the AT&T Call Detail Recording Unit/Small (CDRU/S) and who need to know how to install and administer the CDRU/S system.

The CDRU/S is part of the AT&T call detail acquisition and processing (CDAP) product line, which also includes such systems as the Call Detail Record Poller (CDRP), the 93B Call Message Detail Recorder (CMDR), and the following CDRU systems with larger storage capacities:

- 3B2 CDRU system — operating under UNIX® in an AT&T 3B2 computer
- 6386 CDRU system — operating under UNIX® in an AT&T 6386 WGS computer

INTENDED AUDIENCES

This document was written for the following audiences:

- AT&T customers such as telecommunications managers
- AT&T technical marketing consultants
- AT&T account teams
- AT&T support specialists — switch and other CDR system installers and administrators

PREREQUISITE SKILLS AND KNOWLEDGE

To use this document you should be familiar with:

- Data Communication devices such as modems and RS232C interfaces
- Computer terminals such as the AT&T 513, 615, 4410, and 4425
- Basic telephone switch operation and administration

HOW THIS DOCUMENT IS ORGANIZED

This document consists of the following chapters:

Chapter 1, *CDRU/S Overview*, explains what the CDRU/S system is and its role in a call detail acquisition and processing network. It also describes the CDRU/S components and features.

Chapter 2, *Installation*, provides step-by-step instructions to install, configure, and test a CDRU/S system. It includes a flowchart showing the “critical path” of tasks — from preparation, pre-installation, installation, to system integration — that must be completed before a telecommunications network can process calls from a newly installed CDRU/S.

Chapter 3, *Administration*, describes how to access and then configure the CDRU/S to receive, process, store, and transmit CDR records.

Chapter 4, *Getting Assistance for Problems*, describes some basic troubleshooting procedures to identify and correct problems that arise in the operation of the CDRU/S, and how to obtain assistance for those problems that cannot be corrected.

Appendix A, *Site Preparation Specifications*, lists the environmental, electrical, and telephone line requirements for installing the CDRU/S.

Appendix B, *Cable Requirements*, describes the CDRU/S port pin assignments and the cable and adapter requirements for various switch and terminal interfaces.

Appendix C, *Switch Administration*, describes the administration required by the AT&T Systems 25, 75, 75XE, 85, and the DEFINITY™ Generic 1 and 2 switches to interface with the CDRU/S.

Appendix D, *Polled Output Format*, provides a conversion chart and diagrams of every type of record produced by the CDRU/S.

A list of abbreviations, a glossary, and an index appear at the end of this book.

CONVENTIONS USED IN THIS DOCUMENT

The following typographic conventions are used throughout this document:

- Information appearing on a terminal display is shown in constant-width type. For example...

```
login:
```

- Information entered by the user on a terminal keyboard appears in constant-width bold or reverse video type. For example...

(a) In an instruction: The system displays the date entered. Type **y** to continue.

(b) In a terminal display: Setting date to 9/28/88.
 Confirm (y/n). **y**

- Variables for which the system or user substitutes specific values appear in italic type; if the set of values is a short list, the list appears enclosed in brackets (“{ }”). For example...

```
CDRU/S> status
Time: hh:mm:ss
Date: mm/dd/yy
CDR collection: {enabled, disabled}
Active poller: {NONE, CMDR, CDRP}
...
```

- Terminal keys appear in boxes with rounded corners; if more than one key must be pressed simultaneously, they appear together in a box. For example:

Press **RETURN**.

To abort an operation, press **CTRL-c**.

TRADEMARKS AND SERVICE MARKS USED IN THIS DOCUMENT

The following trademarks and service marks are used in this document:

- DEFINITY™ 75/85 Communications System, trademark of AT&T
- DEFINITY Manager™ II, trademark of AT&T
- Digital Data Communications Message Protocol® (DDCMP), registered trademark of Digital Equipment Corporation
- Silent Knight®, registered trademark of Silent Knight Security Systems, Inc.
- UNIX®, registered trademark of AT&T

RELATED RESOURCES

The following documents are related to the CDRU/S system.

General

- *AT&T Call Detail Recording Reference Manual (555-006-202)* — overview of the AT&T CDR acquisition and processing systems

Call Detail Recording Systems

- *AT&T Call Detail Recording Utility (555-006-211)* — installation and administration manual for the 6386 and 3B2 CDRU systems
- *AT&T Call Detail Record Poller (555-006-213)* — installation and administration manual for the CDRP system

Switches

- *System 25 Administration Manual for R2 (555-530-500)* — user manual for the System 25 software
- *System 25 Installation and Maintenance Manual (555-530-103)* — maintenance and service manual for the System 25
- *System 75 and System 75XE Maintenance (555-200-105)* — maintenance and service manual for Systems 75 and 75XE
- *AT&T DEFINITY 75/85 Communications System Generic 1 and System 75 and System 75XE Administration and Measurement Reports (555-200-500)* — user manual for System 75 and 75XE
- *AT&T DEFINITY 75/85 Communications System Generic 1 and System 75 and System 75XE Feature Descriptions (555-200-201)* — description of the SMDR feature for the DEFINITY Generic 1
- *System 85 Feature Translations (R2V4) (555-103-107)* — installation and administration manual for System 85 R2V4 software
- *System 85 Advanced Networking Switch (R2V4) Maintenance (555-103-108)* — maintenance and service manual for the System 85 R2V4
- *DEFINITY Communications System Generic 2 and System 85 Feature Descriptions (555-104-301)* — description of the SMDR feature for the DEFINITY Generic 2 and System 85
- *DEFINITY Communications System Generic 2 Administration Procedures (555-104-506)* — administration manual for the DEFINITY Generic 2 software
- *DEFINITY Communications System Generic 2 Administration of Features and Hardware (555-104-507)* — administration manual for the DEFINITY Generic 2 using the DEFINITY Manager™ II

Other Hardware

- *Model 1450 5-channel Digital Dialer (Silent Knight Security Systems number 150106)* — installation manual for the Silent Knight Transmitter.

TO ORDER COPIES OF THESE DOCUMENTS

Contact: AT&T Customer Information Center
2855 North Franklin Road
P.O. Box 19901
Indianapolis, Indiana 46219
1-800-432-6600
In Canada: 1-800-255-1242

For more information about AT&T documents, see *Business Communications Systems Publications Catalog* (555-000-010).

HOW TO MAKE COMMENTS ABOUT THIS DOCUMENT

Reader comment cards are included at the back of this book. While we have tried to make this document fit your needs, we are interested in your suggestions for improving it and urge you to fill a card out.

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Room 31C56
11900 North Pecos Street
Denver, Colorado 80234

1. CDRU/S OVERVIEW

This chapter tells you what the CDRU/S is, how it works, and what its features and capabilities are. It also describes how the CDRU/S connects to other systems involved in the acquisition and processing of call records produced by business communications switching systems.

CALL RECORD ACQUISITION AND PROCESSING SYSTEMS

Telecommunications management essentially follows one of two approaches — a local or central system — for acquiring and processing call record data. Local operations involve special-purpose computer systems processing data directly from the switch on premises. Operations involving multiple locations typically benefit from control of network-wide call record data and so choose central processing. This approach requires a local call record collector and storage system, a central poller system to retrieve data from remote sites, and a processor system for such telecommunication management functions as cost allocation and network optimization.

A diagram of a centralized call record acquisition and processing system is shown below.

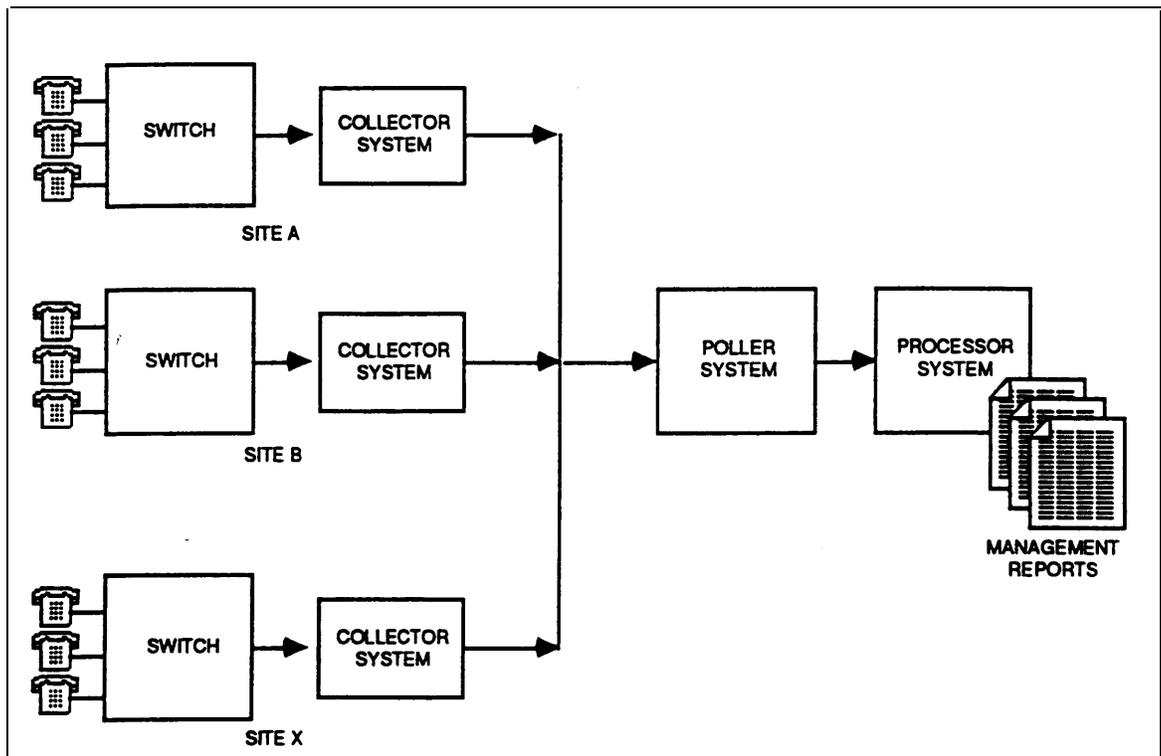


Figure 1. Call Record Acquisition and Processing Network

WHAT IS THE CDRU/S?

The CDRU/S is a “collector system” component of a call detail acquisition and processing network. It consists of a specialized microcomputer designed to collect, optionally filter, and store call records from a switch. Upon request from a poller system, it then transmits all records received since the last poll. A simple set of commands entered from an administration terminal selects the format of the call detail recording (CDR) record input and polled record output, as well as other system characteristics.

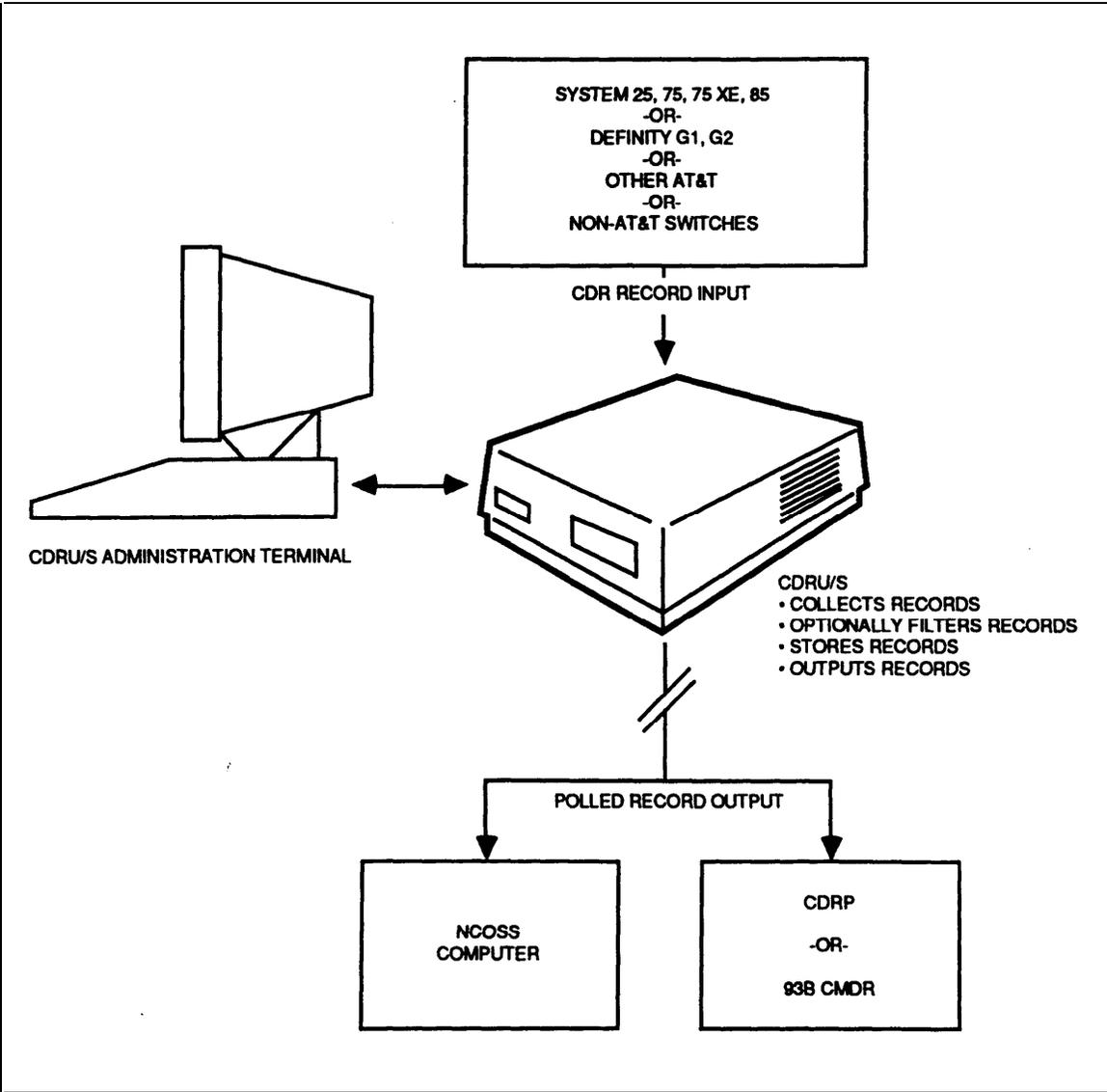


Figure 2. CDRU/S Configuration

HOW DOES THE CDRU/S WORK?

The CDR process in the switch collects information about selected voice and data calls controlled by the switch. The collected information, which concerns the path of incoming and outgoing calls from origination to termination, is put in the form of call records generated in the switch. A call record includes such information as time and date of call, duration, number called, line, group, or service used, account code, etc. — which you can use for call cost analysis and allocation, troubleshooting, abuse detection, and network optimization.

The CDRU/S, connected directly to the switch CDR output port, receives the record. Upon arrival, records are assembled word by word according to a preselected format (see *Switch Connection*, below). Then they are time-stamped and converted to the format expected by the poller system. A record screening or filtering test set up by the system administrator removes unwanted records or sets a sampling rate for traffic analysis. Finally, the records are stored, awaiting a poll from one of the poller systems listed under *Poller Connection*, on the next page.

Administration Terminal Connection

The CDRU/S can be administered locally via a terminal directly connected to the CDRU/S or remotely via a dial-up link. Compatible terminals include:

- AT&T terminals: 615, 4410, 4425, and 513 BCT
- Other terminals: DEC VT100, ADM3A, and HP 2126

Switch Connection

The CDRU/S accepts the 15-, 18-, and 24-word ASCII standard and Integrated Services Digital Network (ISDN) records from the following AT&T switches:

- System 75 R1V1, R1V2, and 75XE
- DEFINITY Generic 1
- System 85 R2V4
- DEFINITY Generic 2

The system can also accept records from other AT&T and non-AT&T switches that output up to 132 ASCII character records to an asynchronous serial port. Based on the input format, the CDRU/S converts, then stores the records in the appropriate binary coded decimal (BCD) polled output format. Records from a System 25 and other AT&T and non-AT&T switches are stored in ASCII format for transfer to compatible poller and processing systems (see table 1, *CDR Record and Poller Compatibility*).

Poller Connection

The CDRU/S can be polled from two sources without affecting or duplicating either's records from a previous poll. The sources are:

- AT&T Call Detail Record Poller (CDRP) or 93B Centralized Message Detail Recorder (CMDR)
- AT&T Network Control Operations Support System (NCOSS) computer

Pollers are identified as "primary" and "secondary" to assign read/write privileges. The primary poller may set the time, date, call filters, and enable or disable CDR record collection. Either poller can perform changes affecting its own data.

The system uses a variation of Digital Equipment Corporation's Digital Data Communications Message Protocol (DDCMP) for all data transmissions. An internal modem transmitting at 1200 baud provides a dial-up link between the CDRU/S and the pollers.

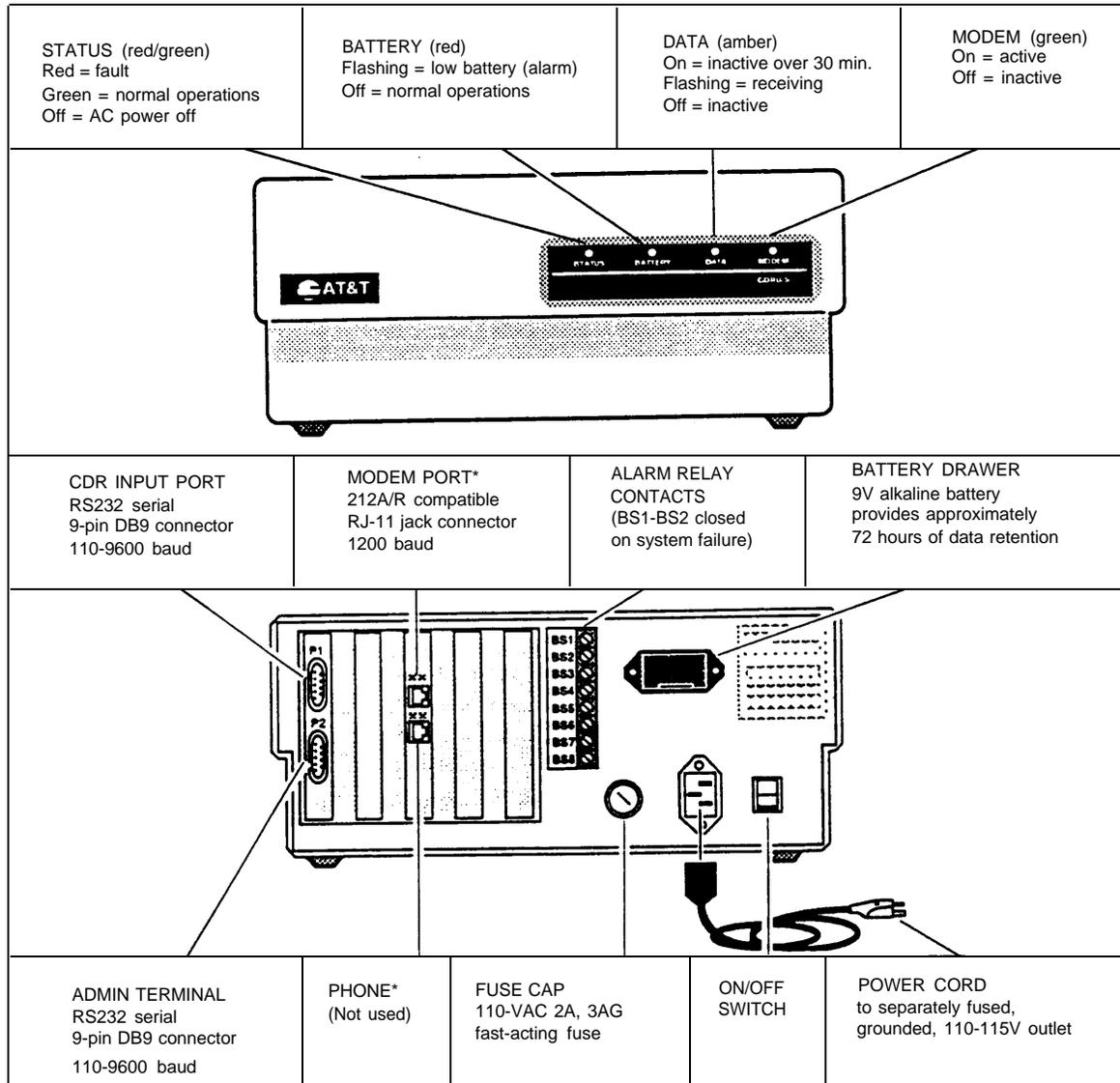
The table below lists the CDR formats supported by the CDRU/S. The polled output record format column shows the corresponding record conversion (see appendix D for diagrams of polled output records). A check mark (✓) indicates compatibility with the polled output.

CDR Output ASCII Format	Polled Output Record Format	Poller Systems		
		CMDR	CDRP	NCOSS
15-word std (System 85)	Type D2 (BCD)	✓	✓	
18-word std 5-digit account code (System 75, 75XE, DEFINITY G1, System 85)	Type D3 (BCD)	✓	✓	✓
18-word 15-digit account code (system 75, 75XE, DEFINITY G1, System 85)	Type D6 (BCD)	✓	✓	✓
18-word, ISDN (DEFINITY G1, System 85)	Type D5 (BCD)	✓	✓	✓
24-word std (DEFINITY G1, G2, System 85)	Type D4 (BCD)		✓	✓
Variable, up to 24-word (DEFINITY G2, System 85)	Type D7 (BCD)		✓	✓
Variable up to 132 characters (System 25, other AT&T, non-AT&T switches)	Type D8 (ASCII)		✓	✓

Table 1. CDR Record and Poller Compatibility

HARDWARE USED BY THE CDRU/S

The CDRU/S hardware consists of a special-purpose microcomputer housing a CPU, modem, and mother boards, power supply, and battery backup. This hardware provides storage for programs and call records, an internal clock, as well as the various connections for all front and back panel components (see figure 3).



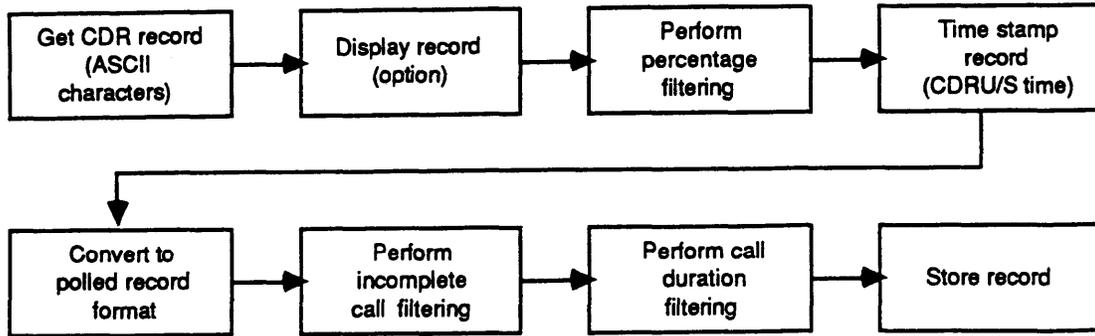
* These connectors may be reversed. The modem port is labelled "WALL" or "LINE."

Figure 3. CDRU/S Front and Back Panels

SOFTWARE USED BY THE CDRU/S

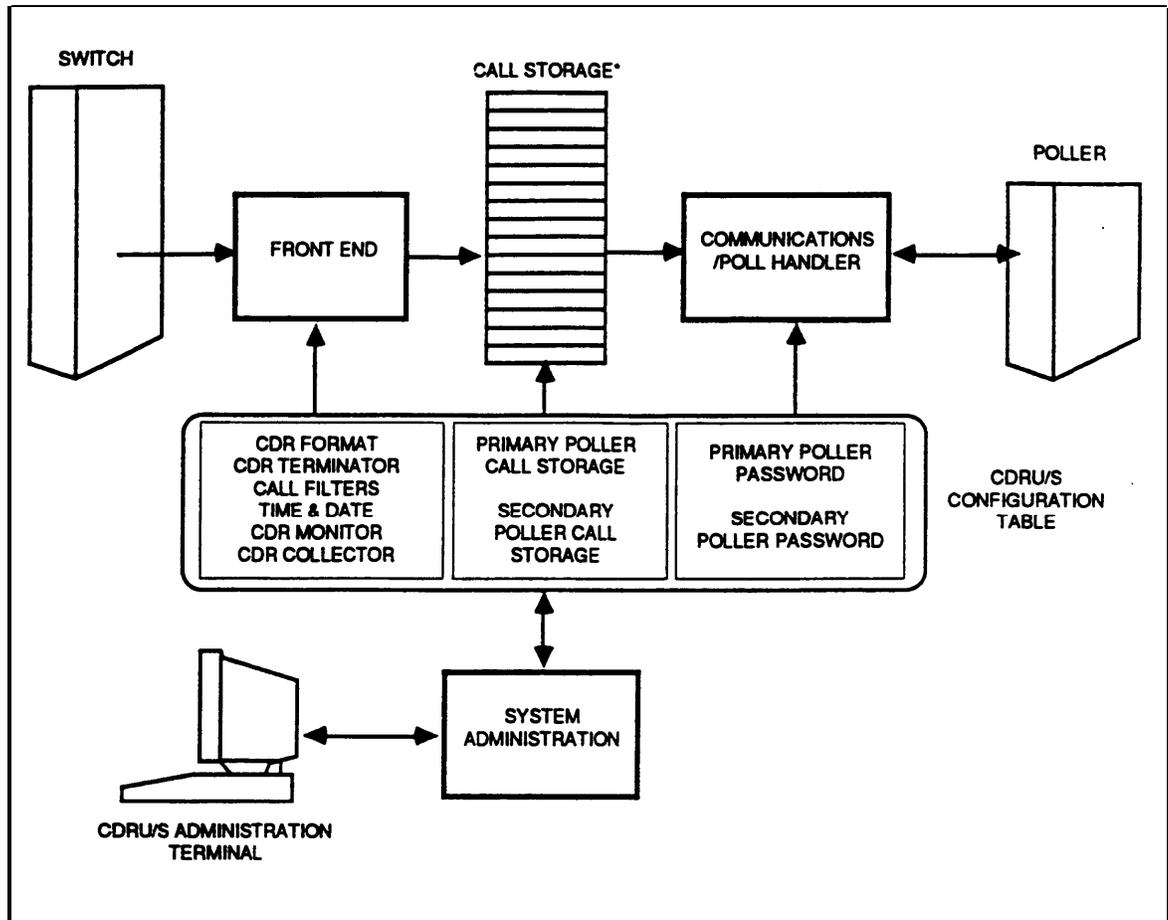
The CDRU/S software provides the following major functions:

- The *Front End* function receives, processes, and stores the CDR records received from the switch as in the flow chart below.



- The *System Integrity* performs system start-up and control functions. It also handles major errors and restarts.
- The *Communications/Poll/Handler* function controls data transfers between the CDRU/S and the pollers — including the commands to change the CDRU/S configuration — providing the interface for an AT&T CDRP, 93B CMDR, or NCOSS polling systems.
- The *System Administration* function provides the user interface via a terminal attached to port P2 or dialed in through the internal modem. The interface uses a simple command-response-confirmation scheme to configure the CDRU/S and effect the following actions:
 - Select the output record format expected from the switch
 - Set the CDR record delimiter
 - Set the CDR and CDRU/S administration terminal (CAT) port characteristics
 - Set filtering parameters (sampling rate, duration, and ineffective call attempts)
 - Set the primary and secondary poller ID and password
 - Change the time and date
 - Monitor CDR records as received from the switch
 - Enable/disable call collection
 - Display the CDRU/S status
 - Execute an on-line diagnostic test
 - Reset call storage

The diagram below displays the flow of information in a working system.



* Call storage is allocated in blocks of 8K (8192) bytes. The CDRU/S uses a table of pointers, called "block indexes," to identify and control access from call storage to each poller.

Figure 4. CDRU/S Data Flow Diagram

CAPABILITIES OF THE CDRU/S

This section discusses call record capacity, security, alarms, and other CDRU/S capabilities related to data retention.

Call Record Capacity

The following table shows CDRU/S total call record capacity for different record sizes. The daily call volume estimates assume that the unit is polled when 67% full. Shaded areas represent the daily volumes under the recommended schedule of two polls per day.

CDR Record Size	CDRU/S Maximum Record Capacity*	Daily Call Volume (Records)				
		1 Poll	2 Polls	3 Polls	4 Polls	5 Polls
15-word	7008 records	4695	9390	14,085	18,780	23,475
18-word	6120 records	4100	8200	12,300	16,400	20,500
24-word	3720 records	2490	4980	7470	9960	12,450

* More than one poll is required to collect the CDRU/S maximum record capacity.

Table 2. CDRU/S Call Record Capacity and Daily Volume

Security

Access to the CDRU/S is secured by a system of login IDs and associated passwords. Each poller, as well as the CDRU/S administration terminal, has its own login ID and password.

Passwords may be changed after installation from the following defaults:

- Administration terminal (login ID: `sysadm`) password = `tomxyz`
- NCOSS Poller (login ID: `NCOSS`) password = `NCOSS`
- CDRP or 93B CMDR (login ID: `CMDR`) password = `CMDR`

Alarms

The CDRU/S has a built-in “watchdog” timer that monitors the system status continually. Upon a hardware error or a severe software error, a set of alarm contacts will close (see the Alarm Relay Contact strip on the rear panel of the CDRU/S in figure 3). If the error is recoverable, contact opens after one second and the unit is again operational. Otherwise, the contacts remain closed until the unit is repaired and restarted. This alarm contact will also close in the event of a power failure.

Wiring an alarm reporting device — such as an AT&T Remote Alarm Unit or a Silent Knight® Transmitter — to the CDRU/S alarm contact provides a reliable system of alerts in case of unit or power failure.

- The Remote Alarm Unit (see figure below) provides an audible alert for on-site administration and maintenance of the CDRU/S.
- The Silent Knight Transmitter provides a dial-up link to a remote CDRU/S support center equipped with alarm sensing utilities, whenever on-site administration and maintenance is not available.

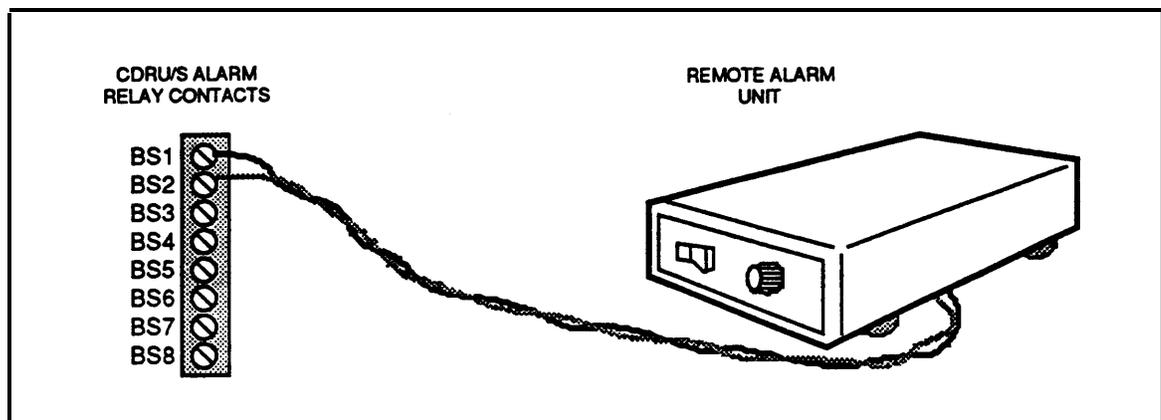


Figure 5. Remote Alarm Unit

Data Retention

The CDRU/S has the capability to maintain its memory contents if external AC power is lost. Should this occur, all system operations cease. However, call records successfully processed will be saved for a period of 72 hours (assuming a “fresh” battery at the start). Approximately 36 hours into a power failure, the BATTERY indicator will flash in sync with an audible alert.

Power-Fail Recovery

When power is restored, a power-up diagnostic routine checks the memory, modem, ports, and real-time clock. (On-line diagnostics, available as part of the system administration, consist of a memory and real-time clock test.) If the memory is not corrupt, all stored data — including call records — is recovered and processing resumes. Otherwise, the software performs a system initialization.

Initialization

A system initialization occurs when either (1) the CDRU/S power switch is turned on, after being off for more than one minute, or (2) when power is restored, having been off longer than the battery could maintain it. A system initialization resets all pointers, clears the memory, and sets the CDRU/S configuration to the built-in values listed in table 3.

Parameter	Default Value
system administration password	tomxyz
pollers primary/secondary status and passwords	cmdr poller = primary, password = CMDR ncoss poller = secondary, password = NCOSS
CDR record format	DEFINITY Generic 1, 24-word standard
CDR record termination string	carriage return, line feed, null, null, null
CDR and CAT port configuration	1200 baud, no parity, 8 data bits, 1 stop bit
call filters	storing 100% of calls storing ineffective call attempts storing calls longer than 0 hours, 0.0 minutes
CDR record collection	enabled
time and date	time and date of firmware release

Table 3. CDRU/S Initial Configuration

2. INSTALLATION

Installing the CDRU/S itself is a simple task, requiring only a slot-head screwdriver. Starting call collection services on a site, however, requires the careful coordination of the following phases:

- *Preparation* — in which AT&T support specialists survey the site and advise users on the environmental, electrical, and telephone line requirements. The proper material is ordered. Appendix A covers these requirements.
- *Pre-installation* — in which AT&T support specialists equip the switch at the site with CDR capability. Appendixes B and C cover cabling and switch configuration.
- *Installation* — in which the CDRU/S is installed and tested. This chapter is devoted to the CDRU/S installation phase, assuming all prior phases have been successfully completed.
- *System Integration* — in which the new site is added to the call record acquisition and processing network. This is the responsibility of AT&T support specialists working with network users and administrators.

Figure 6 shows the “critical path” of tasks that must be completed before the system can process calls from a newly installed CDRU/S.

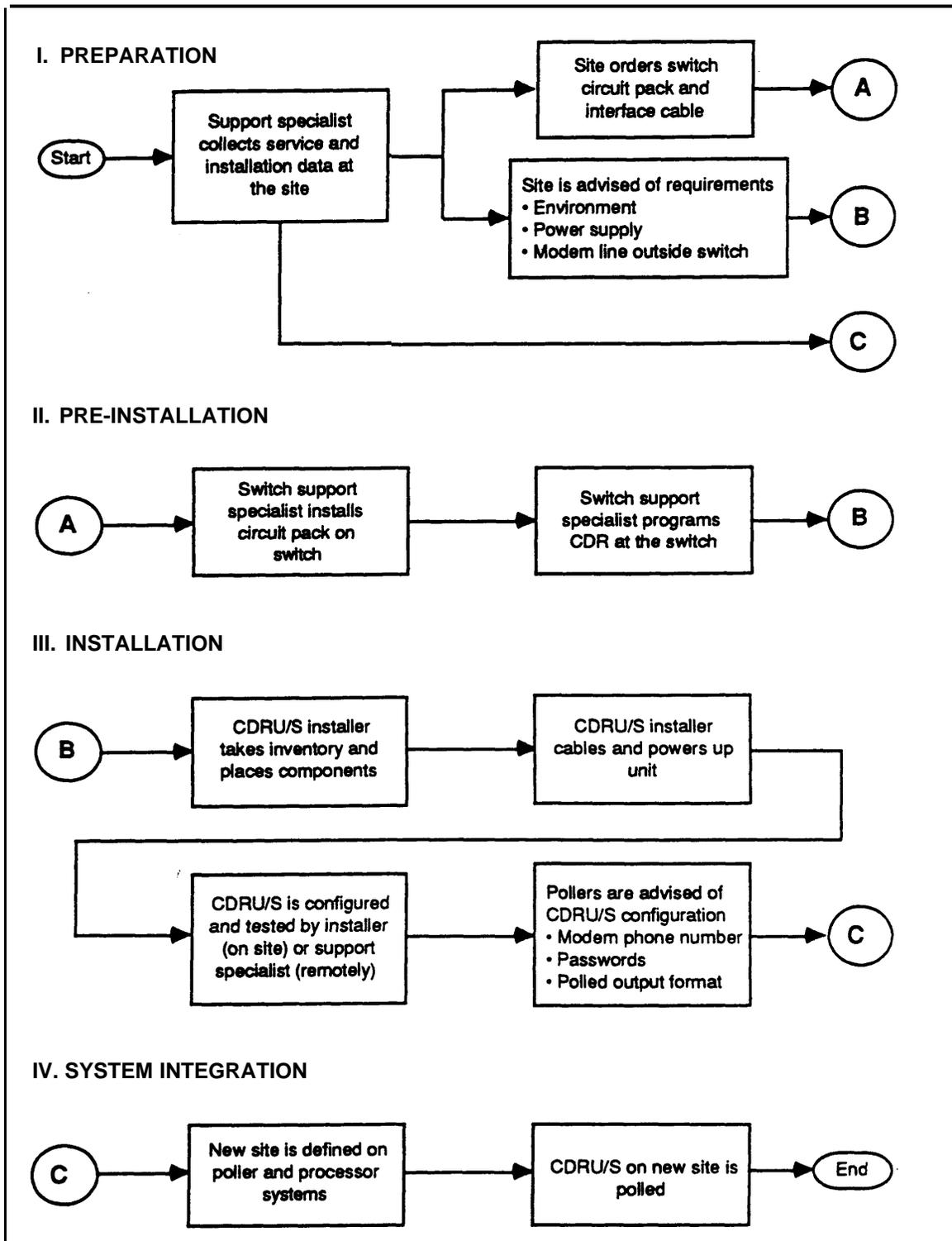


Figure 6. System Installation Flowchart

TAKING INVENTORY

In the CDRU/S package you should find:

- CDRU/S, power cord, and 9-volt alkaline battery
- Two modular-to-9 pin port adapters
- Telephone cord for the modem, terminated in RJ-11 jacks
- This document

The following materials — complying with appendix B specifications — are required:

- Switch interface kit (already installed)
- Direct central office (CO) telephone line (already installed)
- 3B2 modular cable and modular-to-25 pin adapter for a modem

To configure the CDRU/S on site, the following materials are required:

- Administration terminal*
- 3B2 modular cable and modular-to-25 pin adapter for a terminal or printer

To install an alarm reporting device option, the following materials are required:

- AT&T Remote Alarm Unit or Silent Knight transmitter kit
- Analog touch-tone line (already installed for a Silent Knight transmitter)
- Twisted pair wire, with loop resistance less than 200 ohms

* The CDRU/S administration interface assumes the use of most standard terminals, including the AT&T 615, 4410, 4425, and 513 BCT. Other compatible terminals include the DEC VT100, ADM3A, and HP 2126.

PLACING THE COMPONENTS

NOTE: This installation assumes that the site complies with the environmental, electrical, and telephone line requirements listed in appendix A.

Position all components at their final locations according to the following considerations (see figure 7):

- *Environmental* — make certain that the area is well ventilated, within a 40°F to 100°F temperature range, free from dust and static interference.
- *Clearance* — place the CDRU/S on a smooth, flat surface (do not place anything on top of it). The unit must have 4 inches of clearance from its sides and top, and 6 inches of clearance from the back.
- *Distance to Switch* — make certain this distance does not exceed the length of the cable at hand. (Maximum cable length is 50 feet. For greater distances, modems must be used.)
- *Distance to Power Outlet and Wall Telephone Jack* — make certain this distance does not exceed the length of the materials at hand. The power cord is 6 ft, 7 in long; the telephone cord is 4 ft, 9 in long. Extensions may be used as required.

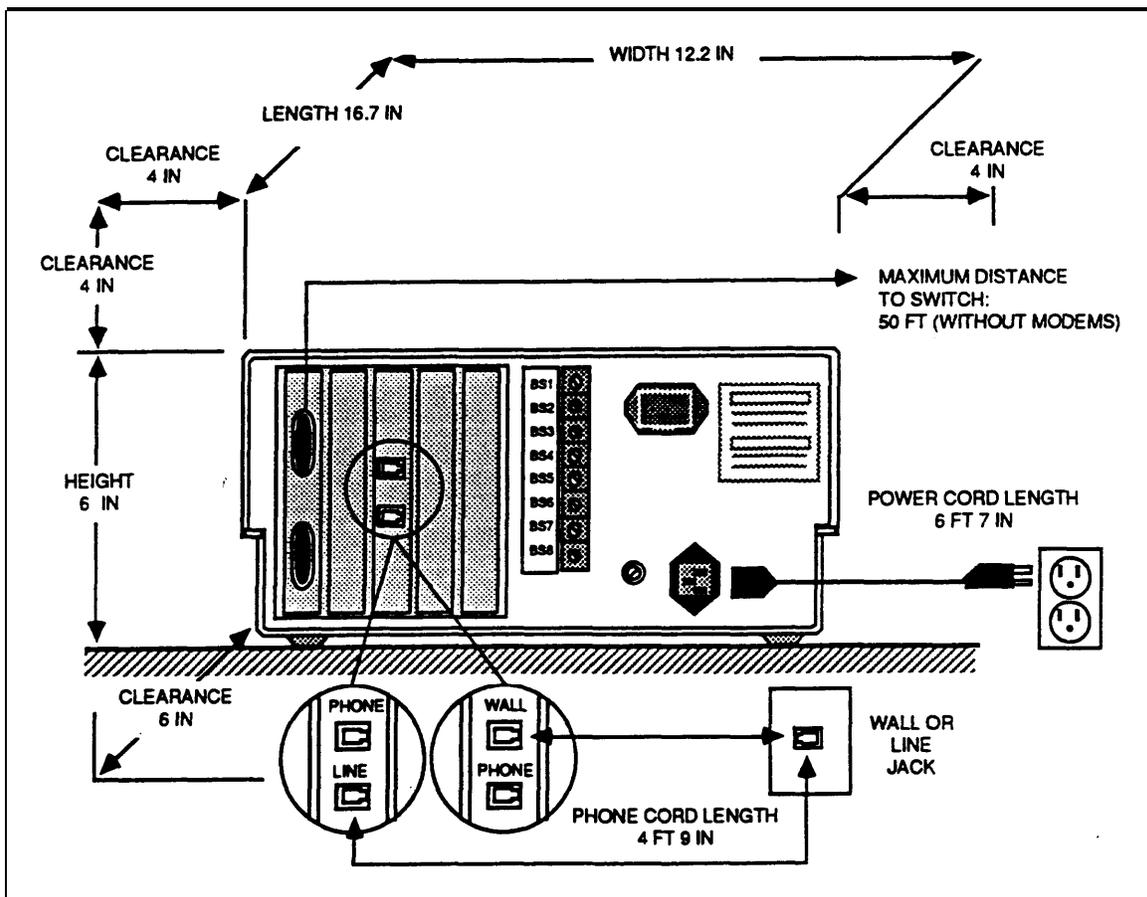


Figure 7. CDRU/S Component Placement

CONNECTING THE COMPONENTS

NOTE: This installation assumes that the switch interface kit described in appendix B is already in place.

1. Attach one of the CDRU/S port adapters (item 1 in figure 8) to port P1.
2. Attach the ACU modem connector (item 2 in figure 8) to the appropriate interface port.
3. Connect the modular cable (item 3 in figure 8) to both switch and CDRU/S ports.
4. Connect the telephone cord (item 4 in figure 8) from the CDRU/S jack labelled WALL or LINE to the wall outlet of a direct CO line — that is, a line not routed through the switch.

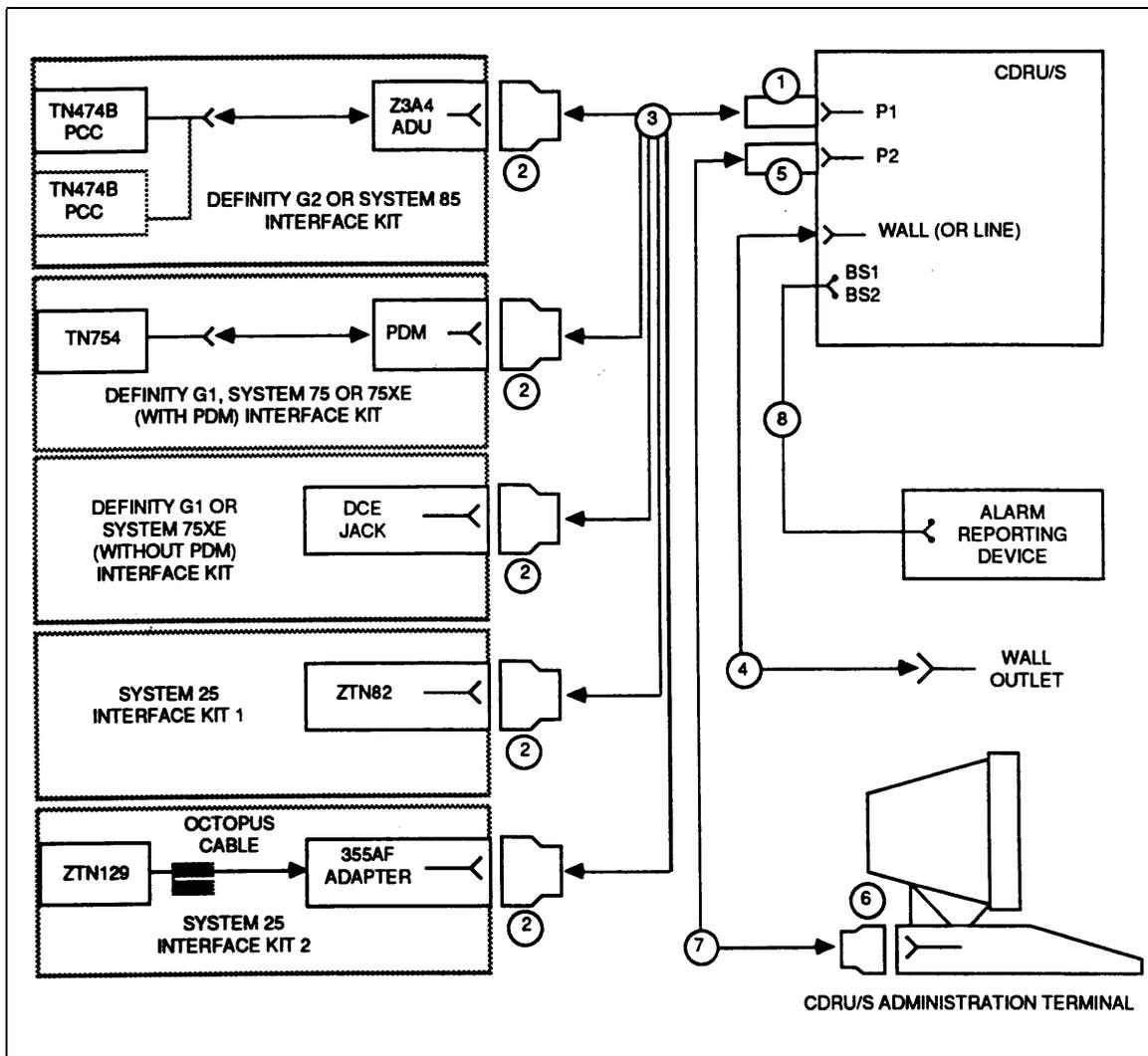


Figure 8. CDRU/S Cabling Configuration

5. To install a local CDRU/S administration terminal, proceed as follows:
 - a. Attach the other CDRU/S port adapter (item 5 in figure 8) to port P2.
 - b. Attach the terminal connector (item 6 in figure 8) to the main serial port on the back of the terminal.
 - c. Connect the modular cable (item 7 in figure 8) to both terminal and CDRU/S ports.
 - d. Set up the terminal according to its installation manual. Transmission parameters must be set at 1200 baud, 8 data bits, no parity, 1 stop bit. ("Space" parity may be used if the terminal does not support "no" parity.)
6. To install a Remote Alarm Unit, proceed as follows:
 - a. Hook one end of the alarm wire (item 8 in figure 8) to the CDRU/S contacts labelled BS1 and BS2.
 - b. Hook the other end of the wire to the screw terminals under the Remote Alarm Unit.
 - c. Open the remote alarm battery compartment under the unit and attach a fresh 9-volt alkaline battery.
 - d. Press the TEST/RESET switch (see figure 9) to the TEST position. (When the alarm sounds, adjust the volume to the desired level.)
7. To install a Silent Knight Transmitter (model 1450 5-channel digital dialer), proceed as follows:
 - a. Hook one end of the alarm wire (item 8 in figure 8) to the CDRU/S contacts labelled BS1 and BS2.
 - b. Hook the other end of the wire to channel 1, 2, 3, or 4 on model 1450.
 - c. Refer to the model 1450 installation manual to configure the channel for momentary activation on a normally open contact (no other options are required).
 - d. Complete the installation as instructed in the model 1450 manual.

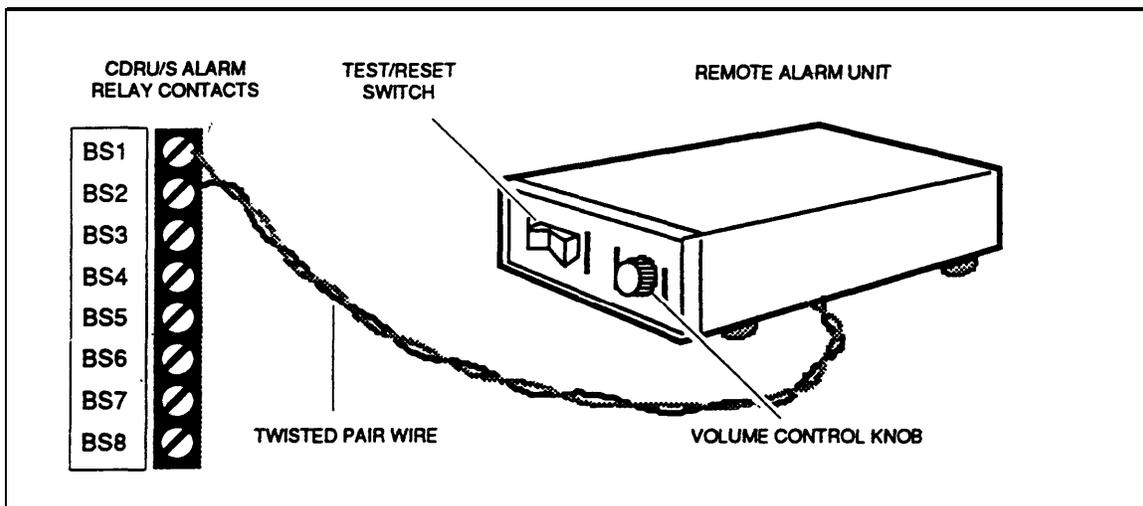


Figure 9. Remote Alarm Unit Installation

POWERING UP THE CDRU/S

To power up the CDRU/S, proceed as follows:

1. Insert a screwdriver in the notch of the CDRU/S battery drawer and pry it open.
2. Remove the drawer and insert a fresh 9-volt alkaline battery with the terminals in the proper position (see figure 10).
3. Replace the drawer. Make certain it is closed tightly.
4. Plug the CDRU/S power cord to a separately fused, grounded 110- to 115-volt wall outlet.
5. Turn the CDRU/S power switch ON.

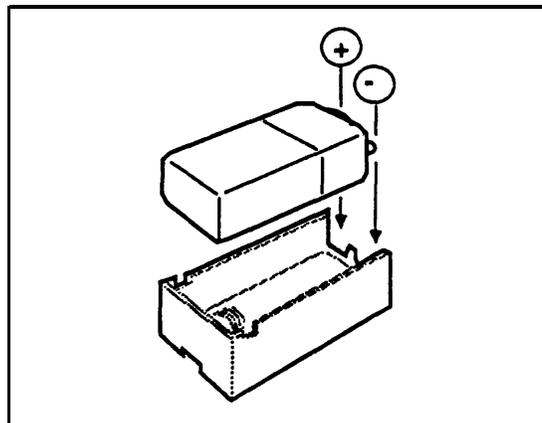


Figure 10. CDRU/S Battery Installation

The system now performs internal diagnostics and an initialization of its configuration parameters. During a successful power-up, the indicator lights on the CDRU/S front panel should progress through the sequence shown in table 4:

STATUS	DATA	MODEM	Start-Up State
RED	OFF	OFF	First powered on
RED	OFF	ON	Memory diagnostics complete
RED	ON	OFF	Operating system started
RED	ON	ON	System initialization task started
GREEN	OFF	OFF	CDRU/S is up and running

Table 4. Front Panel Indicators Power-Up Sequence

If an error is encountered the STATUS light will flash from green to red. A severe hardware or software error results in either (1) all lights are turned OFF or (2) the lights remain in a start-up state (before the unit is up and running) for more than five minutes.

Report any problems as indicated in chapter 4, *Getting Assistance for Problems*.

The CDRU/S is installed. See *Configuration and Testing the CDRU/S*, next, for further instructions.

CONFIGURING AND TESTING THE CDRU/S

The CDRU/S powers up with a default configuration (see table 3) that requires some customization before the unit can be polled. Copy the blank worksheet on the next page and complete all items. Then proceed to the referenced sections in chapter 3 to complete the CDRU/S configuration and testing.

1. Enter your worksheet values, if they are different from the default values:
 - Switch output and CDR record termination string (see *Selecting the CDR Record Format*)
 - CDR port configuration (see *Setting Up the Ports*)
 - Pollers (see *Selecting the Primary/Secondary Poller and Password*)
 - Call filters (see *Setting Filtering Criteria*)

2. Enter values for the following parameters:
 - Time (see *Setting the Time and Date*)
 - Date (see *Setting the Time and Date*)
 - sysadm password (see *Changing sysadm Password*)

3. Perform the following tasks in preparation for the CDRU/S first poll:
 - Verify that the system is collecting call records (see *Monitoring CDR Record Input*)
 - Clear all calls received while the system was partially configured (see *Clearing Call Storage*)

CONFIGURATION WORKSHEET

SWITCH OUTPUT (Circle correct item number. Default: shaded item)

- 1 System 75 or 75 XE — 18-word standard format, 5-digit account code
- 2 System 75 or 75 XE — 18-word standard format, 6 to 15-digit account code
- 3 DEFINITY Generic 1 — 18-word ISDN format
- 4 **DEFINITY Generic 1 — 24-word standard format**
- 5 DEFINITY Generic 1 — non-standard format
- 6 System 85 — 15-word standard format
- 7 System 85 — 18-word standard format, 5-digit account code.
- 8 System 85 — 18-word standard format, 6 to 15-digit account code
- 9 System 85 — 18-word ISDN format
- 10 System 85 — 24-word standard format
- 11 DEFINITY Generic 2 — 24-word standard format
- 12 DEFINITY Generic 2 or System 85 — up to 24-word variable format
- 13 Not used
- 14 System 25, other AT&T, or any non-AT&T switch with record size ≤ 132 characters

CDR RECORD TERMINATION STRING (Check one. Default: shaded item)

- DEFINITY G1, G2, Systems 75 and 85: carriage return, line feed, null, null, null
- System 25: carriage return, line feed
- Other (please specify):

CDR PORT (Circle proper values. Default: shaded items)

Baud Rate: 110 300 600 **1200** 2400 4800 9600

Parity/Data Bits: even/7 odd/7 **none/8**

Stop Bits: **1** 2

POLLERS (Circle proper values. Default: shaded items)

CDRP or 93B CMDR (poller ID: cmdr) **primary** secondary

NCOSS (poller ID: ncss) secondary primary

CALL FILTERS (Enter proper values)

Store _____ % of calls. (Default: 100%)

Store calls over _____ (hours): _____ (min.). _____ (tenths of a min). (Default: 0:0.0)

Store ineffective call attempts: yes no (Default: yes)

3. ADMINISTRATION

This chapter tells you how to administer the CDRU/S using the following procedures:

- Beginning and ending an administration session
- Setting the time and date
- Setting up the ports
- Selecting the CDR record format
- Selecting the primary/secondary poller and password
- Changing the sysadm password
- Setting filtering criteria
- Enabling and disabling CDR record collection
- Monitoring CDR record input
- Resetting the CDRU/S
- Performing on-line diagnostics
- Displaying the CDRU/S status
- Displaying a summary of CDRU/S commands

BEGINNING AND ENDING AN ADMINISTRATION SESSION

You can begin a CDRU/S administration session any time when no other session is in progress.

Logging In

1. Press any key from a locally connected terminal or press **BREAK** from a remote terminal* (once the connection has been made via the modem).
2. At the Login: prompt, type **sysadm** and press **RETURN**.
3. At the Password: prompt, type the current password (the default is tomxyz) , followed by **RETURN**.

If correct, the system displays the prompt CDRU/S>

If incorrect, the system displays Login incorrect.
Login:

After six unsuccessful attempts to log in, the terminal will be disconnected.

Command Processing

Once the CDRU/S prompt appears, you can enter commands in upper or lower case, or a combination thereof. Editing keys include:

Backspace	Erases the last character typed	CTRL-u	Erases an entire line
CTRL-a	Redisplays the previous line	CTRL-c	Cancels the operation

When you press **RETURN**, the system verifies the command string and responds with a prompt for confirmation. Syntax errors result in one of the following messages:

- Unknown command — Keyboard entry is not a command
- Bad parameter count — Number of parameters in the command is incorrect
- Illegal parameter -> *value* — Incorrect value for parameter

Logging Off

To end an administration session, type **exit** and press **RETURN**. For example:

```
CDRU/S> exit  
Confirm (y/n).
```

Type **y** to confirm your choice.

NOTE: An administration session automatically ends if no keyboard entry occurs for one half hour. This prevents an unattended terminal from blocking access to the system and possibly preventing a poll.

* A remote terminal must be configured to transmit at 1200 baud, no parity, 8 data, and 1 stop bits. "Space" parity may be used if "no" parity is not supported by the terminal.

SETTING THE TIME AND DATE

1. To set the time of the CDRU/S internal clock, type **time hh:mm:ss** and press **RETURN** (where *hh*=hours, *mm*=minutes, and *ss*=seconds in a 24-hour clock notation). For example:

```
CDRU/S> time 17:03:00
Setting time to 17:03:00.
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

2. To set the date of the CDRU/S internal clock, type **date mm/dd/yy** and press **RETURN** (where *mm*=month, *dd*=day, and *yy*=year). For example:

```
CDRU/S> date 9/28/88
Setting date to 9/28/88.
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

CAUTION: The CDRU/S does not validate a February 29 date on non-leap years.

SETTING UP THE PORTS

You can set the transmission characteristics for the CDRU/S ports P1 and P2 to match (respectively) the switch CDR port and the CDRU/S administration terminal.

NOTE: To avoid transmission errors, it is recommended to stop CDR collection before changing the CDR port (see *Enabling and Disabling CDR Record Collection*).

1. To configure the CDR port (P1), type **cdrinp baud/parity/data/stop** and press **RETURN**. Where

```
baud = 110, 300, 600, 1200, 2400, 4800, or 9600
parity/data = e/7, o/7, or n/8 (e=even, o=odd, and n=no parity check)
stop = 1 or 2 (stop=2 if baud=110)
```

For example:

```
CDRU/S> cdrinp 2400/n/8/1
Setting CDR port to 2400 baud, no parity, 8 data, 1 stop.
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

2. To configure the CDRU/S administration terminal port (P2), type **catport baud/parity/data/stop** and press **RETURN**. Where the *baud*, *parity*, *data*, and *stop* can be set as above. For example:

```
CDRU/S> catport 9600/n/8/1
Setting CAT port to 9600 baud, no parity, 8 data, 1 stop.
Confirm (y/n).
```

Type **y** to make the change* or **n** to cancel it.

* The next time you access the CDRU/S, your terminal must match any port P2 changes. "Space" parity may be used to match "no" parity.

SELECTING THE CDR RECORD FORMAT

The system “recognizes” a CDR record using the current settings for (1) the switch output and (2) the string of characters delimiting a CDR record. The CDR input format also determines the polled output conversion generated by the CDRU/S (see appendix D).

1. To select the switch output, type **selpbx nn** and press **RETURN**. Where
 - nn* = 1 (System 75 or 75XE — 18-word standard format, 5-digit account code)
 - 2 (System 75 or 75XE — 18-word standard format, 6 to 15-digit account code)
 - 3 (DEFINITY Generic 1 — 18-word ISDN format)
 - 4 (DEFINITY Generic 1 — 24-word standard format)
 - 5 (DEFINITY Generic 1 — non-standard format)
 - 6 (System 85 — 15-word standard format)
 - 7 (System 85 — 18-word standard format, 5-digit account code)
 - 8 (System 85 — 18-word standard format, 6 to 15-digit account code)
 - 9 (System 85 — 18-word ISDN format)
 - 10 (System 85 — 24-word standard format)
 - 11 (DEFINITY Generic 2 — 24-word standard format)
 - 12 ((DEFINITY Generic 2 or System 85 — up to 24 words variable format)
 - 13 (Not used)
 - 14 (System 25 and other switches with record size \leq 132 characters)

For example:

```
CDRU/S> selpbx 2
Selecting PBX source 2.
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

2. To set the CDR record termination string, type **term char[char...]** and press **RETURN** (where you can set up to 10 *chars* — *char* is any character representing itself or a value from the list below).

<code>\n</code> = newline (line feed)	<code>\f</code> = form feed	<code>\ddd</code> = the ASCII character represented by (octal) <i>ddd</i>
<code>\t</code> = tab	<code>\\</code> = backslash	
<code>\b</code> = backspace	<code>\'</code> = single quote	
<code>\r</code> = carriage return	<code>\0</code> = null	

For example:

```
CDRU/S> term \r\n
Setting terminator to <CR><LF>
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

NOTE: Most AT&T switches do not require changing the default configuration of `\r\n\0\0\0` as a termination string.

SELECTING THE PRIMARY/SECONDARY POLLER AND PASSWORD

CDRU/S poller IDs must be set up at installation if they are different from the default configuration of the CMDR (representing the CDRP or 93B CMDR) as primary and the NCOSS computer as secondary poller.

In some networks, the primary poller is responsible for setting the CDRU/S time, date, call filters, and call collection status (enabled/disabled). Upon a poll, if any of these parameters differ from those in the poller internal table, the poller downloads its values to the CDRU/S. On command, either poller may change its own CDRU/S login password, clear its own call storage, and retrieve the CDRU/S status.

1. To change the poller primary/secondary ID and password, type **logid {CMDR,NCOSS} {p,s}** and press **RETURN** (where *p* = primary and *s* = secondary poller). For example:

```
CDRU/S> logid NCOSS p
Enter password:
```

2. Type in a new password for that poller (one to ten characters) and press **RETURN**. The system does not display the entry.
3. At the **Reenter:** prompt, type the password again.

If you make a mistake, the system displays **Sorry, try again.**

Otherwise, the system displays **Selecting NCOSS as primary poller.**
Confirm (y/n).

4. Type **y** to make the change or **n** to cancel it.

CHANGING THE SYSADM PASSWORD

1. To change the CDRU/S system administration password, type **passwd** and press **RETURN**. For example:

```
CDRU/S> passwd
Enter password:
```

2. Type in a new password (one to ten characters) and press **RETURN**. The system will not display the entry.
3. At the **Reenter:** prompt, type the password again.

If you make a mistake, the system displays **Sorry, try again.**

Otherwise, the system displays **Password accepted.**

SETTING FILTERING CRITERIA

You can enter filtering criteria — minimum duration, ineffective attempts, and a percentage of records received by the CDRU/S — for any records with a fixed format sent from an AT&T System 75 or 85.

- The *minimum duration* filter is used to discard short length calls. For example, a setting of 30 seconds should filter out most calls of little significance.
 - The *ineffective attempts* filter is used to discard incomplete calls (marked by the switch with an “E” or “F” condition code).
 - The *percentage* filter is used to set a sampling rate, a feature typically used for traffic analysis. For example, a setting of 75% makes the CDRU/S store the first three out of every four records received.
1. To discard calls of less than some minimum duration, type **filtdur h:mm.t** and press **RETURN** (where *h*=hours, *mm*=minutes, and *t*=tenths of a minute. Do not enter a value greater than 9:59.9). or example:

```
CDRU/S> filtdur 0:00.5  
Discarding calls less than 0:00.5.  
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

2. To enable or disable the ineffective call attempt filter, type **filtatt {y,n}**, and press **RETURN** (where *y*=yes/enabled, *n*=no/disable). For example:

```
CDRU/S> filtatt y  
Discarding ineffective attempts.  
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

3. To set a call sampling rate, type **filtdcr n** and press **RETURN** (where *n* = 1 to 100). For example:

```
CDRU/S> filtdcr 10  
Storing 10% of calls.  
Confirm (y/n).
```

Type **y** to make the change or **n** to cancel it.

ENABLING AND DISABLING CDR RECORD COLLECTION

You can stop and start CDR record collection at the CDRU/S using these commands. To avoid transmission error messages, it is recommended to stop CDR record collection before changing any configuration parameters that affect transmissions from the switch.

1. To disable CDR record collection, type **disable** and press **RETURN**. For example:

```
CDRU/S> disable
Disabling call collection.
Confirm (y/n).
```

Type **y** to effect the change or **n** to cancel it.

2. To enable CDR record collection, type **enable** and press **RETURN**. For example:

```
CDRU/S> enable
Enabling call collection.
Confirm (y/n).
```

Type **y** to effect the change or **n** to cancel it.

MONITORING CDR RECORD INPUT

You can monitor CDR record input to verify that the CDRU/S is receiving calls. Monitored calls are displayed as received from the switch, before any record conversion.*

NOTE: This command is meant as a diagnostic tool and should not be used routinely. The processing overhead required to monitor CDR input may result in the loss of new CDR data coming from the switch.

1. To display call records as they are received from the switch, type **disprec** and press **RETURN**.

```
CDRU/S> disprec
Monitoring may slow system response.
Confirm (y/n).
```

2. Type **y** to continue or **n** to cancel. For example:

```
y
Entering display record mode. Press DELETE to exit.
0830 1590 23 23 17163856440 98 12345
0831 0020 23 23 5551212 9 12
```

NOTE: Shown above are sample records. Should your terminal fail to display any records, proceed as instructed in table 5, *Troubleshooting Chart*, in chapter 4.

3. To stop monitoring CDR records, press **DELETE** (or **RUBOUT**, in some terminals.)

* If the monitored records contain "op-codes," these will be substituted by spaces.

RESETTING THE CDRU/S

You can reset the CDRU/S to erase all stored CDR records, clear the error log, and set to zero all pointers pertaining to the status of each poller (see *Displaying the CDRU/S Status*). Use this command before the first poll, after a system initialization.

1. To reset the system, type **reset** and press **RETURN**.

```
CDRU/S> reset
Reset will cause the loss of all CDR data.
Confirm (y/n).
```

2. Type **y** to continue or **n** to cancel.

PERFORMING ON-LINE DIAGNOSTICS

The CDRU/S provides a manual test to check the erasable programmable read-only-memory (EPROM) and random access memory (RAM), as well as the internal clock.

NOTE: Perform this test only if the health of the unit is suspect. The processing overhead required to test the unit may result in the loss of new CDR data coming from the switch.

1. To run a diagnostic test, type **test** and press **RETURN**. For example:

```
CDRU/S> test
Executing selftest. Poller {inactive, active}.
Confirm (y/n).
```

2. Type **y** to continue or **n** to cancel. For example:

```
y
EPROM Test {OK, fault}.
RAM Test {OK, fault}.
Clock Test {OK, fault}.
CDRU/S>
```

NOTE: Should a test fail and the fault is not recoverable, contact the Customer Service Support Organization (CSSO) as instructed in chapter 4, *Getting Assistance for Problems*.

DISPLAYING THE CDRU/S STATUS

The CDRU/S status display is a “snapshot” of the system at the time you execute this command. It shows the CDRU/S current configuration, poller activity (if any), all call storage pointers, and the error logs of switch transmissions since each poller’s last poll.

NOTE: To use as a diagnostic tool, execute `status` several times in succession and look for increases in the error counts (see note 4, below).

To display the system status, type `status` and press **RETURN**. Figure 11 shows a sample status display.

```

CDRU/S> status
CDRU/S version 1.0      Time 15:46:08   Date 10/29/88
POLLER: Primary:CMDR   Active:NONE
CDR collection: enabled
Switch Type: System 75 Record Format: d3 (hex) Record Length: 18 words
Termination String: <CR><LF><NUL><NUL><NUL>
Total number of blocks: 24 Write Block: Index: 11 Rec Cnt: 50
CMDR STATUS: 5 % full Poll Block Index:10 Terminal Block Index:10
ERRORS: Parity: 0 Overrun: 0 Frame: 0 Format: 0
NCOSS STATUS:100 % full Poll Block Index:12 Terminal Block Index:12
ERRORS: Parity: 0 Overrun: 0 Frame: 0 Format: 0
PORT CONFIGURATIONS: CDR:9600/n/8/1 CAT:9600/n/8/1
FILTERING: Duration: 0:0.0 Percentage: 100% Inef. attempts: disabled
  
```

Figure 11. CDRU/S Status Display

NOTES:

- (1) The names of the primary poller and of the active poller, if any.
- (2) The switch output selected. The record format is the polled output format (see appendix D).
- (3) The call storage pointers:
 - The Write Block Index (WBI) points to the block currently storing CDR records from the switch. The Rec Cnt (record count) indicates how many records — including such non-call records as clock change, date stamp, power restore, etc. — are stored in the Write Block.
 - The Terminal Block Index (TBI) serves as “boundary” for the next poll. (When a poller initiates a poll, its TBI is set to equal the WBI.)
 - The Poll Block Index (PBI) points to the next block to be polled. (When a poller is active, its PBI advances after each block is transmitted. The poll ends when the PBI equals the TBI.)
- (4) The log of switch transmission errors since the last poll. Since each poller clears its error log after a poll, these numbers may differ for each poller.
 - Parity errors are caused by a mismatch of parity and/or data bits settings between the CDRU/S and the switch CDR ports.
 - Overruns are caused by too high a baud rate and/or lack of flow control on the switch CDR port.
 - Frame errors are caused by a baud rate mismatch between the CDRU/S and the switch CDR ports.
 - Format errors are caused by the wrong switch output or CDR termination string selection.

DISPLAYING A SUMMARY OF CDRU/S COMMANDS

To display a summary of commands, type ? and press **RETURN**. For example:

```
CDRU/S> ?
?
CDRINP <baud/parity/data/stop>
CATPORT <baud/parity/data/stop>
DATE <mm/dd/yy>
DISABLE
DISPREC
ENABLE
EXIT
FILTDUR <h:mm.t>
FILTAT [y, n]
FILTCDR [1-100]
LOGID [CMDR, NCOSS] [p,s]
PASSWD
RESET
SELPBX <PBX selection number>
STATUS
TERM <termination string>
TEST
TIME <hh:mm:ss>

- Print Command Summary
- Set CDR Input Port Configuration
- Set CAT Port Configuration
- Set CDRU/S Date
- Disable CDR Collection
- Display CDR Data Records
- Enable CDR Collection
- Exit CAT Session
- Set Duration Filtering Value
- Enable/Disable Condition Code Filtering
- Set Percentage Filtering Value
- Configure Poller
- Change Password
- Clear Call Storage
- Select PBX Output
- Display CDRU/S Status
- Set Termination String
- Perform Runtime Diagnostics
- Set CDRU/S Clock (24 hour)

CDRU/S>
```

4. GETTING ASSISTANCE FOR PROBLEMS

This chapter is addressed to the CDRU/S user. It describes basic troubleshooting procedures to identify and correct problems and how to get assistance for problems that cannot be corrected.

HOW TO REPORT A PROBLEM

If a problem arises when you are using the CDRU/S, first attempt to solve it using the troubleshooting chart in the following pages.

If the problem does not respond to these troubleshooting procedures, call the National Customer Support Center (NCSC) at 1-800-242-2121. The NCSC will assist you by performing remote diagnostics.

If it is necessary to replace a defective unit, the NCSC will dispatch a technician or they will arrange for a mail-in return.

NOTE: There is a service charge for NCSC involvement and dispatched maintenance if the CDRU/S is out of warranty, not leased, or not covered by a maintenance contract.

REPLACING THE CDRU/S

Under certain circumstances, your unit may need replacement. If so, and you wish to arrange for a mail-in return, follow these instructions:

1. Contact the NCSC to arrange for a replacement unit to be shipped from the National Parts Sales Center (NPSC).
2. When the replacement unit arrives, turn the disabled unit off (if you had not done so before), remove all cables, and re-attach them to the new unit.
3. Configure the new unit using the values on the configuration worksheet prepared for the old unit.
4. When the new unit is operational, use its shipping materials to pack the disabled unit. Complete the NPSC problem reporting form and ship it with the returned unit to the address furnished by the NPSC.

BASIC TROUBLESHOOTING

The CDRU/S front panel lights and the remote alarm — if a Remote Alarm Unit is connected — indicate most error conditions. Problems related to external devices — such as terminal malfunction or poller transmission problems — manifest themselves when the device is in use.

INDICATOR/PROBLEM	RECOMMENDED ACTION
STATUS red light is on for more than five minutes.	Severe error — contact the CSSO.
DATA light is on (steadily). No CDR records for more than 30 minutes.	<p>During high telephone traffic, this indicates switch problems. Check that:</p> <ul style="list-style-type: none"> • The switch-CDRU/S cable is securely attached • The switch and P1 port specifications match • The CDR output of the switch is enabled <p>If the problem remains, call the switch support specialist.</p>
All lights are off. Remote alarm sounds, if connected. No AC Power.	<p>If connected, press the TEST/RESET switch on the remote alarm unit to RESET.</p> <p>During a power outage, no other action is necessary if AC power is restored before the backup battery is drained. If AC power is restored long after the backup battery is drained, the software performs a system initialization. Refer to <i>Powering Up the CDRU/S</i> in chapter 2 to replace the battery (with a standard 9V alkaline battery) and to reconfigure and test the CDRU/S.</p> <p>If there is no power outage, check that:</p> <ul style="list-style-type: none"> • The CDRU/S is ON and connected to a live wall outlet • The CDRU/S fuse is not burned (see below)
BATTERY light is flashing.	<p>Battery charge is low. In a power outage, wait until AC power is restored to change the battery (otherwise, the software performs a system initialization). Refer to <i>Powering Up the CDRU/S</i> in chapter 2 to change the battery. Replace with a standard 9V alkaline battery.</p>
Burned CDRU/S fuse.	<p>Replace the fuse (refer to figure 12):</p> <ol style="list-style-type: none"> 1. Disconnect any alarm device from the back of the unit. 2. Disconnect the CDRU/S power cord from the wall outlet. 3. Locate the fuse cap on the back of the CDRU/S. 4. Insert a screwdriver into its slot, press in, and turn counter-clockwise. Remove the fuse and cap. 5. Replace with a 110-VAC-2A, 3AG, fast-acting type fuse. 6. Reversed all steps to return to normal system operations.

Table 5. Troubleshooting Chart (Continued)

INDICATOR/PROBLEM	RECOMMENDED ACTION
Poller cannot access the CDRU/S.	<p>Check that:</p> <ul style="list-style-type: none"> • The CDRU/S internal modem is operational (MODEM light turns on when dialed up by a modem) • The remote modem is operational and communicating at 1200 baud • The poller is using the current password <p>If the problem is the CDRU/S internal modem, contact the CSSO. Otherwise, consult the proper documentation for the host computer or modem.</p>
CDRU/S administration terminal does not respond.	<p>Check that:</p> <ul style="list-style-type: none"> • The terminal is powered and on-line • The interface cable is securely attached at both ends • The terminal baud rate matches port P2 specifications <p>If the problem persists, consult the terminal reference manual.</p>

Table 5. Troubleshooting Chart

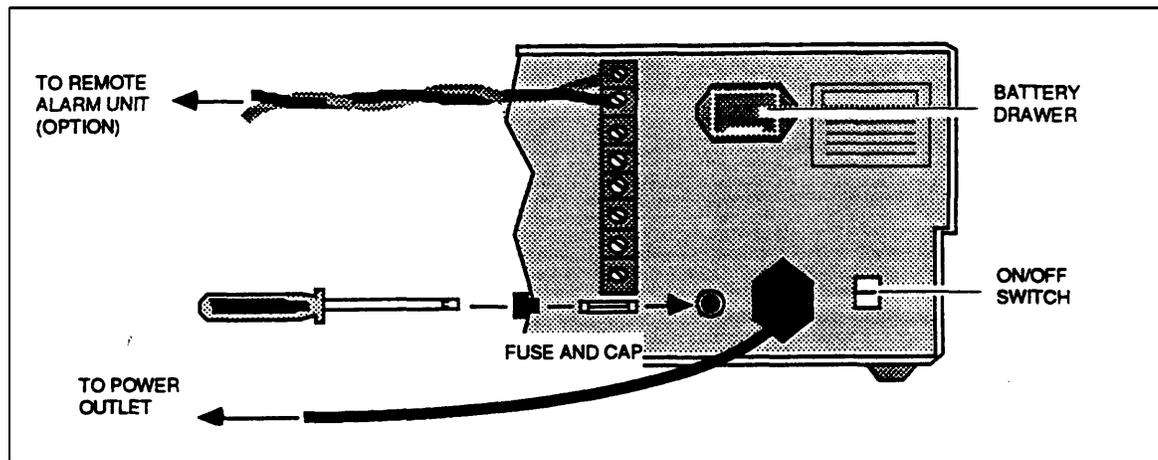


Figure 12. CDRU/S Back Panel (Power Components Section)

A. SITE PREPARATION SPECIFICATIONS

This appendix describes the environmental, electrical, and telephone line requirements for a CDRU/S. The specifications for the CDRU/S alarm relay contact feature are also included, to help install an alarm sensing device, if so desired.

ENVIRONMENTAL REQUIREMENTS

<i>Temperature</i>	Operating temperature range 40° to 100°F less 2°F for each 1000 feet above sea level, with a maximum change of 18°F per hour; storage temperature range: 14° to 120°F
<i>Relative Humidity</i>	20 to 80%, with a maximum change of 10% per hour (operating); 10 to 95% non-condensing, with a maximum change of 10% per hour (in storage)
<i>Altitude</i>	250 feet below to 10,000 feet above sea level

POWER REQUIREMENTS

<i>Power Consumption</i>	40 W
<i>Input Voltage</i>	115 VAC
<i>Frequency</i>	50/60 Hz

TELEPHONE LINE REQUIREMENTS

Direct CO line — that is, a line not routed through the switch — terminated in an RJ11 jack.

ALARM RELAY CONTACTS

<i>Contact Closure</i>	On system or external power failure, the alarm relay contacts will close for 1.6 seconds.
<i>Contact Rating</i>	No more than 0.25 ADC and 28 VDC
<i>Power Dissipation</i>	No more than 3W maximum
<i>Contact Resistance</i>	No more than 200 milliohms maximum
<i>Wiring to Alarm Reporting Device</i>	Twisted pair, with loop resistance of no more than 200 ohms

B. CABLE REQUIREMENTS

This appendix describes the pin assignments for the CDR input port (P1), the CDRU/S administration terminal port (P2), and the modular-to-9-pin adapters for these ports (shown in table 6). Also described are the interface kits, cables, and adapters (table 7) that comprise the CDRU/S cabling configuration (figure 13).

CDRU/S Ports P1 and P2			Modular Adapter
Pin	RS232C Signal	Source	Pin
1	Chassis Ground	—	1
2	Transmit Data	CDRU/S	5
3	Receive Data	Switch/Terminal	3
4	Request to Send	CDRU/S	6
5	Clear to Send	Switch/Terminal	4
6	Data Set Ready	Switch/Terminal	—
7	Signal Ground	—	7
8	Not used (always active)	CDRU/S	—
9	Data Terminal Ready	CDRU/S	—

NOTE: The connector required to make the modular port adapter is RJ-45 jack.

Table 6. Wiring for CDRU/S Ports P1 and P2

The diagram below shows the CDRU/S cabling configuration. Item numbers refer to table 7, *Interface Kits, Cables, and Adapters*.

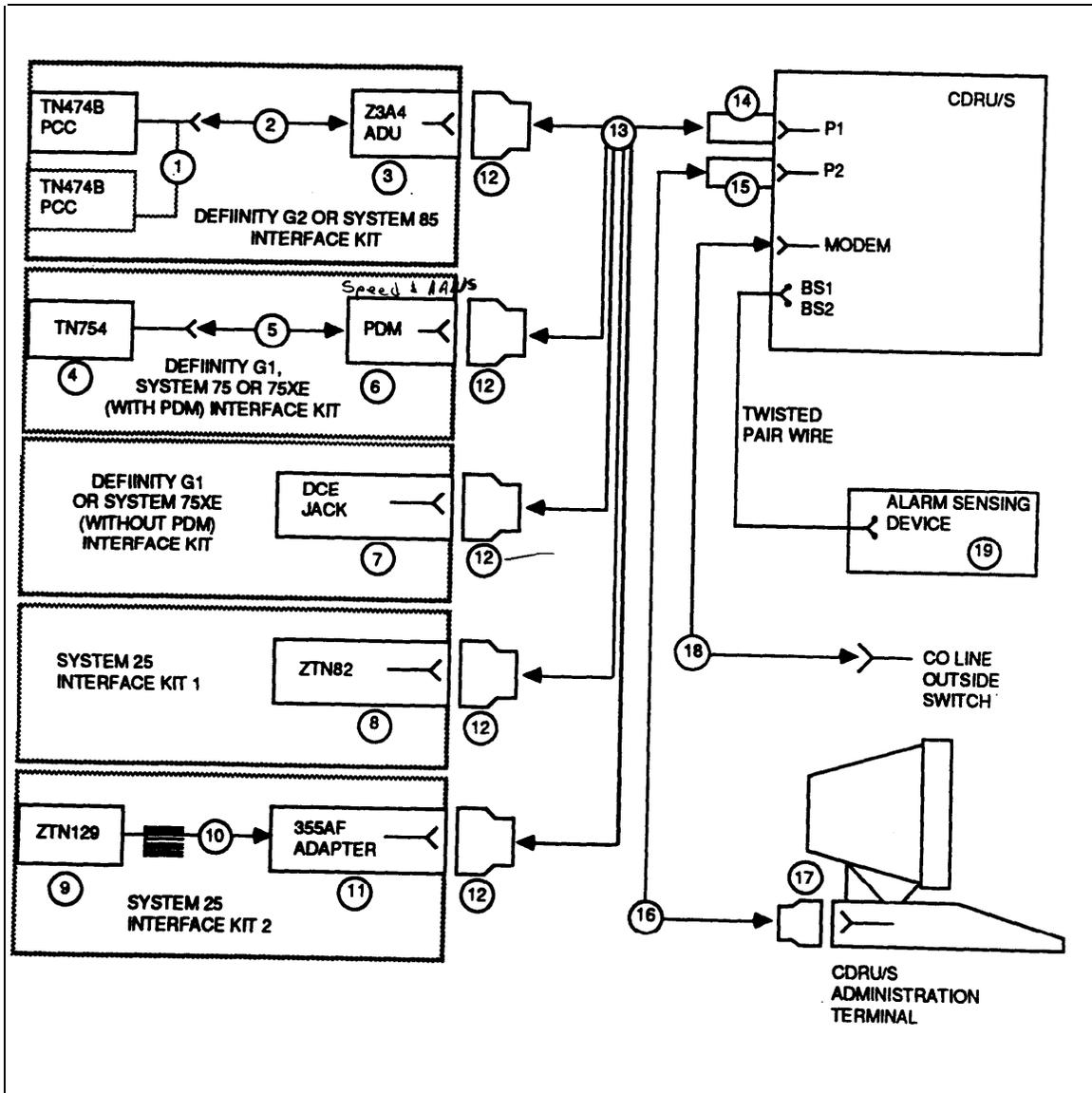


Figure 13. CDRU/S Cabling Configuration

Item	DESCRIPTION	PEC
DEFINITY G2 or System 85 Interface Kit		
1	TN474B processor communications circuit (PCC) pack	65401*
2	8-wire modular cable	2725-07G (7 ft), N (14 ft), S (25 ft)
3	Z3A4 asynchronous data unit	2169-004
DEFINITY G1, System 75 or System 75XE (with PDM) Interface Kit		
4	TN754 digital line circuit pack	63114 or 63114A*
5	8-wire modular cable	2725-07G (7 ft), N (14 ft), S (25 ft)
6	Processor data module (PDM)	2161-PDM
DEFINITY G1 or System 75XE (without PDM) Interface Kit		
7	Data communications equipment (DCE) jack	Included with the switch
System 25 Interface Kit 1		
8	ZTN82 processor circuit pack	Included with the switch
System 25 Interface Kit 2		
9	ZTN129 processor circuit pack	Included with the switch
10	Octopus cable	2720-05P (15 ft)
11	355AF adapter (modular-to-25 pin)	2750-A25
CDRU/S-to-Switch		
12	ACU modem connector (modular-to-25 pin)	2750-C10
13	3B2 8-wire modular cable	2725-16G (7 ft), N (14 ft), S (25 ft), V (50 ft)
14	PHV0029 kit (modular-to-9 pin adapter)	7095-100 (Included with the CDRU/S)
CDRU/S-to-Terminal		
15	PHV0029 kit (modular-to-9 pin adapter)	7095-100 (Included with the CDRU/S)
16	3B2 8-wire modular cable	2725-16G (7 ft), N (14 ft), S (25 ft), V (50 ft)
17	Terminal/printer connector (modular-to-25 pin)	2750-C09
CDRU/S-to-Telephone Line		
18	Telephone cord terminated in RJ11 jacks	Included with the CDRU/S
Alarm Reporting Option		
19	Silent Knight Transmitter or Remote Alarm Unit	94273 36103

* Cabling from the switch to the wall field is included with the switch. A System 85 with duplicate cabinets requires a PCC pack in each cabinet.

Table 7. Interface Kits, Cables, and Adapters

C. SWITCH ADMINISTRATION FOR THE CDRU/S

This appendix describes how to administer the following families of switches to work with the CDRU/S:

- DEFINITY Generic 1, System 75, and System 75 XE
- DEFINITY Generic 2 and System 85
- System 25

Because the administration of switches varies, an exact administrative procedure covering all other switches is not possible. Instead, you must administer the following characteristics in the switch for it to send records across a data link to the CDRU/S:

- Baud rate of the data link 110, 300, 1200, 4800, or 9600.
- Number of stop bits at the end of each transmitted character: one or two
- Parity bit sent with each character: odd, even, or none
- Variable record format, where call details can be any length and arranged in any order in a record.
- Record length: up to 132 characters.
- Type of characters composing the record: 5-bit ASCII, 6-bit ASCII, 7-bit ASCII, or 8-bit ASCII
- Flow control between the switch and the CDRU/S: either XON/XOFF or no XON/XOFF
- Record separators: characters that separate each record

DEFINITY GENERIC 1, SYSTEM 75, AND SYSTEM 75 XE

These switches are administered via a terminal that displays the screens used for translation data input. Consult the *AT&T DEFINITY 75/85 Communications Generic 1 and System 75 and System 75XE Administration* (555-200-500) for more comprehensive treatment of these administration procedures.

NOTE: These switches can also be administered via a remote Centralized System Management (CSM) terminal connected to the switch by a dial-up link. Once the link is established, follow the procedures below.

1. Determine to which switch port the CDRU/S will be connected. If the TN754 port is used, continue with step 2; if the RS232 DCE port is used, proceed directly to step 5.
2. Check the dial plan for the range of available extensions.
 - a. Enter **display dial plan** to display the `DIAL PLAN RECORD` screen.
 - b. Determine the range of unused extension numbers that you can assign to the PDM and each data or netcon channel.
3. Assign a data or netcon channel to the switch.
 - a. Enter **list data-module** to display the `DATA MODULE` screen.
 - b. Check under `Type` to see if a `data-channel` entry (for R1V1) or `netcon` entry (for R1V2, XE, and DEFINITY Generic 1), has been assigned to the switch. If so, proceed to step 4. Otherwise, continue with 3c.
 - c. Enter **add data-module ext** (where *ext* is an available extension from 2b) to display the `DATA MODULE` screen.
 - d. On page 1 of the screen, enter the following:
 - `Type`: **data-channel** (for R1V1) or **netcon** (for R1V2, XE, and DEFINITY Generic 1)
 - `Physical Channel`: **1, 2, 3, or 4**
 - `Maintenance Extension`: *any available extension*
4. Administer the switch for the PDM.
 - a. Enter **add data-module ext** (Where *ext* is an available extension from 2b) to display the `DATA MODULE` screen.
 - b. On page 1 of the screen, enter the following:
 - `Type`: **pdm**
 - `Port`: *port network number* (for DEFINITY G1), *carrier, slot, and port number for the TN754*
 - `Connected to`: **dte**

-
-
5. Administer the switch parameters to match the requirements of the CDRU/S.
 - a. Enter **change system-parameters features** to display the FEATURE-RELATED SYSTEM PARAMETERS screen.
 - b. For a System 75 R1V1, R1V2, and XE, enter on page 2 of the screen:
 - Output Device: **lsu**
 - Output Ext: the extension that you entered for the PDM in 4a (if using a TN754 port) or **eia** (if using the RS232C DCE port of a System 75XE)
 - (If you entered eia) EIA Device Bit Rate: **300, 1200, 2400, 4800, or 9600**
 - Record Outgoing Calls Only? **y** or **n**
 - SMDR Account Code Length: **5** (for System 75 R1V1) or **5** through **15** (for all other releases)
 - Forced Entry of Account Codes for 0/1 Toll Calls? **y** or **n**
 - Suppress SMDR for Ineffective Call Attempts? **y** or **n**
 - c. For a DEFINITY Generic 1, enter on page 2 of the screen:
 - Primary Output Layout: **lsu** (for 18-word standard records or 18-word standard ISDN records) or **unformatted** (for 24-word standard ISDN records)
 - Primary Output Ext: the extension that you entered for the PDM in 4a (if using a TN754 port) or **eia** (if using the RS232C DCE port)
 - (If you entered eia) EIA Device Bit Rate: **300, 1200, 2400, 4800, or 9600**
 - ISDN for 18-word or 24-word standard ISDN records: **y** or **n**
 - Record Outgoing Calls Only? **y** or **n**
 - SMDR Account Code Length: **5** through **15** (for 18-word records without ISDN or 24-word records) or **5** through **12** (for 18-word records with ISDN)
 - Disconnect Information in Place of FRL? **y** or **n**
 - Forced Entry of Account Codes for 0/1 Toll Calls? **y** or **n**
 - Suppress SMDR for Ineffective Call Attempts? **y** or **n**
 - Calls to Hunt Group Record: **group-ext** or **member-ext**
 - Answer Supervision Only? **y** or **n**
 6. Administer the switch for the trunk groups from which records are collected.
 - a. Enter **list trunk-group** to display the TRUNK GROUPS screen, which lists all the trunk groups.
 - b. Check if **y** is displayed under SMDR? for each trunk group that you want to produce records. If the appropriate trunk groups are listed as producing records, proceed to 7. Otherwise, continue with 6c.
 - c. For each *trunk group number* that you want to produce records, enter **change trunk-group trunk group number**, and answer **y** to SMDR Reports?

7. Backup translation information onto tape in case the switch translation memory loses the information.
 - a. Insert a blank cassette tape in the high capacity minirecorder or the removable mass storage system.
 - b. Enter **save translation** to copy translation information in memory to the tape.
 - c. When the screen displays command `successfully completed`, remove the backup tape and store it in a secure place.

DEFINITY GENERIC 2 AND SYSTEM 85

These switches are administered via a Maintenance and Administration Panel (MAAP) — a portable device located with the switch and directly connected to it. The DEFINITY Generic 2 may be administered using screens from the DEFINITY Manager™ II software in a PC connected to the switch.

The MAAP comes with a flip chart of procedures (PROCs) that guide you in using the MAAP keyboard to enter the translation information. Associated with each PROC are one or more words containing fields. A field corresponds to a particular translation item on the MAAP display. You enter numbers in the required fields to specify the translation items.

For information on how to use the MAAP and the PROCs, consult the *System 85 Feature Translations (R2V4)* (555-103-107). For using Manager II, consult the *DEFINITY Communications System Generic 2 Administration Procedures* (555-104-506) and the *DEFINITY Communications System Generic 2 Administration of Features and Hardware* (555-104-507).

NOTE: These switches can be administered via Centralized System Management (CSM) screens on a remote terminal connected by a dial-up link. Consult the *Centralized System Management Facilities Management User's Guide* (585-220-702) to use the Facilities Management (FM) procedures in the order listed below.

1. Use the *System Class of Service* procedure to disable the PCC and SMDR output ports.
2. Use the *Call Detail Record (CDR) Format* procedure to define the CDR record format.
3. Use the *Processor Communications Circuit* procedure to administer PCC link features.
4. Use the *Trunk and Trunk Group Administration Use* procedure to set up CDR feature on trunk groups.
5. Use the *System Class of Service* procedure to enable the PCC and SMDR output ports.
6. Backup the translation information onto tape.

The outline below is used to administer a DEFINITY Generic 2 or System 85 with a MAAP or a DEFINITY Generic 2 with Manager II. Detailed instructions appear in the following pages.

- Disable the PCC CDR feature
- Specify the record format — the length (a standard default 15- or 18-word record, or a variable 15- to 24-word record) and whether there are opcodes in the records. Use the optional variable format method to design and construct this record
- Specify the PCC data link attributes by assigning baud rate, parity check and other parameters to the PCC output port
- Enable the CDR feature — specify the account code length and the trunk groups used to send records to the CDRU/S, and activate the CDR port
- Backup the translation information onto tape

Disabling the PCC CDR Feature

1. Turn the flip chart to *PROC 275, Word 1, System COS — AIOD and Features*.
2. Press **PROC NO.** type **275** and press **ENTER** to call up PROC 275.
3. Press **DISPLAY** **EXECUTE** to display the information stored in the fields.
4. Enter **0** in field 12 to deactivate the CDR feature.
5. Press **CHANGE** **EXECUTE** to execute the entry in PROC 275, Word 1.

Specifying the CDR Record Format

Administering the record format may require two parts. In part one, you specify the record length, opcode indicator, and a standard or variable format. If you use the variable format capability to construct a record, use part two to administer it.

Part One — Specifying Record Length, Format, and Opcode Indicator

1. Turn the flip chart to *PROC 288, Word 1, Call Detail Recording — Variable Format Record*.
2. Press **PROC NO.** type **288** and press **ENTER** to call up PROC 288.
3. Enter **15**, **18**, or **24** in field 1 to specify the record length (15-, 18-, or 24-word) of the records sent from the PCC output port. For a standard default format, enter **15** or **18** in this step (field 1).
4. Enter **0** (for no opcodes) or **1** (for opcodes) in field 2 to specify whether the record has opcodes in the leftmost four bits of each word in a record. For a standard default format, enter **1** in this step. A **0** entry is valid only if you enter **1** (for a variable format) in step 5 (field 3).
5. Enter **0** (for a 15- or 18-word standard default format) or **1** for a variable (15- to 24-word) format in field 3. A **0** entry is valid only if you entered **15** or **18** in step 3 (field 1).
6. Enter **15** (for 15 words) or **18** (for 18 words) to specify the SMDR record length in field 4. This entry is independent of that in step 4 (field 1).
7. Press **ADD EXECUTE** to execute the entries in PROC 288, Word 1.
8. If you entered 0 (for standard default format) in step 5, go to the *Specifying the PCC Link Attributes* procedure. If you entered 1 (for variable format) in step 5, go to *Part Two — Designing and Constructing a Variable Format CDR Record* to administer the variable format.

Part Two — Designing and Constructing a Variable Format CDR Record

Table 8 lists the numbers (data item encodes) that you can enter for the call details in a variable format record. Use this table to construct the record in the procedure described below. Before doing so, however, you must know the actual record's composition and each call detail's cell length and should prepare a worksheet.

1. Turn the flip chart to *PROC 288, Word 2, Call Detail Recording — Variable Format Record*.
2. Press **PROC NO.** type **288** and press **ENTER** to call up PROC 288.
3. Press **WORD NO.** and enter **2** to go to Word 2.
4. Enter a data item encode number from table 8 to specify a call detail in field 1. You need not enter the numbers in sequence.
5. Enter the starting cell number (from 1 through 96) for the call detail in field 2.

You can enter the starting cell number of a call detail anywhere in the record with one exception: if opcodes are present, you cannot start a call detail in an opcode cell. Opcodes always reside in the following cell numbers: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89 and 93. Any cells not containing call details default to blanks.

Data Item Encode	Length	Data Item Encode	Length
0 not used	0	31 for ISDN bearer capability class	1
1 for call duration — hours	1	32 for QDN or VDN	1
2 for call duration — minutes	2	33 for agent login ID	1
3 for 10ths of a minute call duration	1	34 through 49 not used	0
4 for condition code	1	50 for control code 1	1
5 for trunk access code dialed	4	51 for time of day pattern set	1
6 for trunk access code used	4	52 for first DAC	1
7 for dialed number	15	53 for second DAC	1
8 for calling number	4 to 10	54 for third DAC	1
9 for account code	5 to 15	55 for fourth DAC	1
10 for authorization code	7	56 for fifth DAC	1
11 for time in queue	2	57 for sixth DAC	1
12 for facility restriction level (FRL)	1	58 for seventh DAC	1
13 for ten-thousandths digit	1	59 for eighth DAC	1
14 for incoming circuit ID	2 or 3	60 for ninth DAC	1
15 for feature flags	1	61 for tenth DAC	1
16 for outgoing circuit ID	2	62 for eleventh DAC	1
17 for outgoing circuit ID hundreds digit	1	63 for twelfth DAC	1
18 for incoming circuit ID hundreds digit	1 to 3	64 for thirteenth DAC	1
19 for interexchange carrier code (IXC)	1	65 for fourteenth DAC	1
20 for time of day — hours	1	66 for fifteenth DAC	1
21 for time of day — minutes	2	67 for sixteenth DAC	1
22 for date — month	1	68 for seventeenth DAC	1
23 for date — day	1	69 for eighteenth DAC	1
24 for date — year	1	70 for nineteenth DAC	1
25 for incoming trunk dial access code (DAC)	4	71 for twentieth DAC	1
26 for precedence level digit	1	72 for 21st DAC	1
27 for attendant console number	2	73 for 22nd DAC	1
28 for ISDN service value	3	74 for 23rd DAC	1
29 for extension partition number	1	75 for 24th DAC	1
30 for node number	2	76 through 127 not used	0

TABLE 8. Administering Word 2 of PROC 288

6. Enter the item length (in number of BCD cells up to 31) of the call detail in field 3.

If you don't enter enough cells for an item, its details will be truncated. If you enter two items that overlap, the second call detail remains intact, and the first is truncated where the second call detail begins.

7. Press **ADD EXECUTE** to execute the entries in steps 4 through 6.
8. Repeat steps 4 through 7 for each call detail until you have finished constructing the record.

If you finished constructing a new variable format record, go to the next procedure, *Specifying the PCC Link Attributes*. If you only changed call details in an existing variable format record and all other switch translations have been completed, call up PROC 275 to activate the CDR feature.

Specifying the PCC Link Attributes

Administering the PCC attributes is done in two parts. In part one, you administer the PCC CDR feature, including the baud rate, parity check, and other parameters of the records transmitted from the switch to the CDRU/S. In part two, you assign the CDR feature, one-way communication, type of message format, message length, protocol, and failure threshold to the PCC.

Part One — Administering the CDR Feature

1. Turn the flip chart to *PROC 255, Word 1, Processor Communications Circuit (PCC) Link Attributes*.
2. Press **PROC NO.** type **255** and press **ENTER** to call up PROC 255.
3. Enter **1** (the only valid entry) in field 1 of Word 1 to assign the CDR feature.
4. Enter **24** **25** or **26** in field 2 to specify that a PCC pack was inserted in slot number 24, 25, or 26 in the common control carrier sections.
5. Enter **0** or **1** in field 3 to specify that circuit number 0 (which corresponds to PCC port 0) or circuit number 1 (which corresponds to PCC port 1) on the PCC is used to transmit records.
6. Enter **4** (for 1200), **5** (for 2400), **6** (for 4800), or **7** (for 9600) in field 4 to specify the baud rate of records transmitted from the switch to the CDRU/S.
7. Enter **0** (for no check), **1** (for odd) or **2** (for even) in field 5 to specify the parity check.
8. Enter **1** (for one stop bit) or **3** (for 2 stop bits) in field 6 to specify the stop bit.
9. Enter **4** in field 7 to specify a character length of 8 bits for hexadecimal data.
10. Enter **1** (the only valid entry) in field 8 to specify that the data type between the common control carrier and the PCC is 4 hexadecimal nibbles.
11. Enter **2** in field 9 to specify that the data type between the PCC and the CDRU/S is two ASCII characters for ASCII output without BTC protocol.
12. Enter **1** in field 10 to specify a low threshold of 1000 to 1999 for the outgoing buffer.
13. Enter **7** in field 11 to specify a high threshold of 7000 to 7999 for the outgoing buffer.
14. Enter **1** in field 12 to specify a low threshold of 1000 to 1999 for the incoming buffer.
15. Enter **7** in field 13 to specify a high threshold of 7000 to 7999 for the incoming buffer.
16. Press **ADD EXECUTE** to execute the entries in PROC 255, Word 1.

17. Press **DISPLAY** **EXECUTE** to display field 14 for any data entry mismatches.

A dash indicates no mismatches. If the data you entered in the PCC and the data you entered in the switch memory do not match in fields 4 through 13, field 14 displays the number of that field. If more than one mismatch has occurred, field 14 displays the successive field numbers. Before continuing, go back through the procedure and enter the correct numbers in the mismatched fields.

NOTE: Make note of the specified PCC port (step 5) for connection to the CDRU/S, and that the baud rate (step 6), parity check (step 7), and stop bits (step 8) match the CDRU/S setup.

Part Two — Assigning the CDR Feature to the PCC

1. Turn the flip chart to *PROC 255, Word 2, Processor Communications Circuit (PCC) Link Attributes*.
2. If you administered PROC 255, Word 1, and PROC 255 is still active in the MAAP, proceed to step 3. Otherwise, press **PROC NO.** type **255** and press **ENTER** to call up PROC 255.
3. Press **WORD NO.** and enter **2** to go to Word 2.
4. Enter **1** (the only value available) in field 1 to assign the CDR feature.
5. Enter **1** in field 2 to send records in one direction from the PCC to the CDRU/S.
6. Enter **2** in the field 3 to specify the STX (start of text) and ETX (end of text) control characters that delimit the character groups in records sent to the CDRU/S.
7. Enter a dash (-) in field 4 to specify a variable transmitted message length.
8. Enter the protocol in field 5: **2** (for 18-word formatted ASCII record direct output without BTC protocol, matching the CDRU/S `selpbx 7`) or **3** (for 15-, 18-, or 24- word unformatted ASCII record direct output without BTC protocol, matching the CDRU/S `selpbx 6, or 8 to 12`).
9. Enter a number between **1** and **15** in field 6 to set the number of record transmission failures that the system tolerates before an error message results.
10. Press **ADD** **EXECUTE** to execute the entries in PROC 255, Word 2.
11. Press **DISPLAY** **EXECUTE** to display field 7 for any data entry mismatches.

A dash indicates no mismatches. If the data you entered in the PCC and the data you entered in the switch memory do not match in fields 3 through 6, field 7 displays the number of that field. If more than one mismatch has occurred, field 7 displays the successive field numbers. Before continuing, go back through the procedure and enter the correct numbers in the mismatched fields.

Activating the CDR Feature

Activating the CDR feature is done in two parts. In part one, you activate the CDR feature and specify the account code length and whether the switch-transmitted call records include only outgoing or both incoming and outgoing calls. In part two, you specify the CDR feature on one or more trunk groups.

Part One — Activating CDR and Specifying the Account Code Length and Call Direction Routing

1. Turn the flip chart to *PROC 275, Word 1, System COS — AIOD and Features*.
2. Press **PROC NO.** type **275** and press **ENTER** to call up PROC 275.
3. Press **DISPLAY EXECUTE** to display the information stored in the fields.
4. Enter **1** in field 12 to activate the CDR feature.
5. Enter a number between 1 and 15 in field 13 to specify the customer-required account code length of 1 through 15 digits.
6. Enter **0** or **1** in field 14 to specify that records are generated for outgoing calls only (0) or incoming and outgoing calls (1).
7. Press **CHANGE EXECUTE** to execute the entries in PROC 275, Word 1.

Part Two — Specifying the CDR Feature on One or More Trunk Groups

1. Turn the flip chart to *PROC 101, Word 1, Trunk Group Translation*.
2. Press **PROC NO.** type **101** and press **ENTER** to call up PROC 101.
3. Enter a number between 018 and 999 in field 1 to select a trunk group on which the CDR feature is activated.
4. Press **DISPLAY EXECUTE** to display the information stored in the fields.
5. Enter **1** in field 8 to specify that the CDR feature is active on the trunk selected in the previous step.
6. Press **CHANGE EXECUTE** to execute the entries in PROC 101.
7. Repeat this procedure for all trunk groups for which records will be generated.

Backing Up the Translation Information onto Tape

To establish a tape backup in case the switch translation memory loses the information, press **EXECUTE** to copy the translation information from memory to tape. **RUN TAPE**

SYSTEM 25

The System 25 is administered via a terminal attached to the call processor circuit pack (port 1, if using the ZTN82 circuit pack, or leg 1 of the octopus cable, if using the ZTN129 circuit pack).

Once a System 25 is installed, however, no further action is necessary to enable the standard SMDR interface on the call processor circuit pack transmitting at 1200 baud (port 2, if using the ZTN82 circuit pack, or leg 2 of the octopus cable, if using the ZTN129 circuit pack).

Consult the *System 25 Administration Manual for R2* (555-530-500) and *System 25 Installation and Maintenance Manual* (555-530-103) for details in setting up an SMDR interface in any of the optional TN726 data line ports.

D. POLLED OUTPUT FORMAT

This appendix contains the diagrams of every type of record produced by the CDRU/S (figures 14 - 20). The chart below shows the conversion from a switch output format into a polled output format. The D-type format names are derived from the contents of the first two hexadecimal nibbles of the converted record.

CDRU/S CONVERSION CHART							
SWITCH OUTPUT FORMAT	POLLED OUTPUT FORMAT						
	15-word BCD	18-word BCD 5-digit AC	18-word BCD 15-digit AC	18-word ISDN BCD	24-word BCD	Variable BCD	Variable ASCII
15-word default System 85	TYPE D2						
18-word default 5-digit AC System 75 R1V1, V2, XE, DEFINITY G1, System 85		TYPE D3					
18-word 15-digit AC System 75 R1V2, XE, DEFINITY G1 System 85 R2V4			TYPE D6				
18-word std ISDN DEFINITY G1 System 85 R2V4				TYPE D5			
24-word std DEFINITY G1, G2 System 85 R2V4					TYPE D4		
Non-standard System 75 Variables record System 85						TYPE D7	
ASCII record System 25, other AT&T and Non-AT&T switches							TYPE D8

Table 9. CDRU/S Conversion Chart

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
X(D)				X(2)				X(B)				X(B)			
Hour				Time Stamp				Minute							
Hours				Call Duration Min. (Xx)				Min. (xX)				10th Min.			
Condition Code				Access Code											
1				1				1				1			
1				Access Code				1				Dialed Number			
				Dialed Number											
				Dialed Number											
				Dialed Number											
Dialed Number								Calling Number							
Calling Number								Account Code							
				Account Code								Authorization Code			
				Authorization Code											
Authorization Code								Time in Queue							
FRL				X(B)				X(B)				X(B)			

Figure 14. Type D2 Record Format

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
X(D)				X(6)				X(B)				X(B)			
Hour				Time Stamp				Minute							
Hours				Min. (Xx)				Min. (xX)				10th Min.			
Condition Code				Access Code				Access Code				Access Code			
1				1				1				1			
1				Access Code				1				Dialed Number			
				Dialed Number											
				Dialed Number											
				Dialed Number											
Dialed Number				Dialed Number				Calling Number				Calling Number			
Calling Number				Calling Number				Account Code				Account Code			
				Account Code											
				Account Code											
				Account Code											
Account Code				5th Digit Calling No.				Incoming Circuit ID				Incoming Circuit ID			
Feat Flags I C Q D				Outgoing Circuit Id				Outgoing Circuit Id				Out Ckt ID Hund.			
In Ckt ID Hund.				IXC				X(B)				X(B)			

Figure 16. Type D6 Record Format

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
X(D)				X(5)				X(B)				X(B)			
Hour				Time Stamp				Minute							
Hours				Call Duration Min. (Xx)				Min. (xX)				10th Min.			
Condition Code				Access Code											
1				1				1				1			
Access Code				Dialed Number											
1				1				1				Dialed Number			
				Dialed Number											
				Dialed Number											
				Dialed Number											
Dialed Number				Calling Number											
Calling Number				Account Code											
Account Code				Authorization Code											
Authorization Code				ISDN Network Specific Facility											
Authorization Code				Incoming Circuit ID											
FRL				5th Digit Calling No.											
Feat Flags I C Q D				Outgoing Circuit Id								Out Ckt ID Hund.			
In Ckt ID Hund.				IXC				X(B)				X(B)			

Figure 17. Type D5 Record Format

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
X(D)				X(4)				X(B)				X(B)			
Hour				Time Stamp				Minute							
Hours				Call Duration Min. (Xx)				Min. (xX)				10th Min.			
Condition Code				Digit 1				Access Code Dialed Digit 2				Digit 3			
A/C Dialed Digit 4				Digit 1				Access Code Used Digit 2				Digit 3			
A/C Used Digit 4				Digit 1				Dialed Number Digit 2				Digit 3			
Digit 4				Dialed Number Digits 5				Digit 6				Digit 7			
Digit 8				Dialed Number Digit 9				Digit 10				Digit 11			
Digit 12				Dialed Number Digit 13				Digit 14				Digit 15			
Digit 1				Calling Number Digit 2				Digit 3				Digit 4			
Digit 5				Calling Number Digit 6				Digit 7				Digit 8			
Digit 9				Calling Number Digit 10				Account Code Digit 1				Digit 2			
Digit 3				Account Code Digit 4				Digit 5				Digit 6			
Digit 7				Account Code Digit 8				Digit 9				Digit 10			
Digit 11				Account Code Digit 12				Digit 13				Digit 14			
Acct. Code Digit 15				Digit 1				Authorization Code Digit 2				Digit 3			
Digit 4				Authorization Code Digit 5				Digit 6				Digit 7			

Figure 18. Type D4 Record Format (continued)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00				
Time in queue								FRL				Inc Ckt ID Digit 1							
Incoming Circuit ID Digit 2								Digit 3				Outgoing Circuit ID Digit 1				Digit 2			
Out Ckt ID Digit 3								Ftr Flags* I A Q D				IXC				Attendant Console			
Digit 1								Incoming Trunk Group Dial Access Code Digit 2				Digit 3				Digit 4			
Node Number Digit 1								Digit 2				ISDN Network Digit 1				Specific Facility Digit 2			
BCC																			
(Reserved for future use)																			
X(B)								X(B)											

Figure 18. Type D4 Record Format

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
01	X(D)				X(7)				X(B)				X(B)			
02	LENGTH				LENGTH				LENGTH				LENGTH			
03	Hours				Hours				Min. (Xx)				Min. (xX)			
04 - 27 max	VARIABLE BCD DATA															

Figure 19. Type D7 Record Format

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
01	X(D)				X(8)				X(B)				X(B)			
02	LENGTH				LENGTH				LENGTH				LENGTH			
03	Hours				Hours				Min. (Xx)				Min. (xX)			
04	CHAR 1								CHAR 2							
05 - 70 max	VARIABLE ASCII DATA															

Figure 20. Type D8 Record Format

ABBREVIATIONS

A	ampere
AC	alternating current
ACU	asynchronous communications unit
ADC	amperes direct current
ADU	asynchronous data unit
ASCII	American Standards Committee for Information Interchange
BCD	binary coded decimal
bit	binary digit
BTC	block transmission checking
CA	call accounting
CAT	CDRU/S administration terminal
CDAP	call detail acquisition and processing
CDR	call detail recording
CDRP	Call Detail Record Poller
CDRU	Call Detail Recording Utility
CDRU/S	Call Detail Recording Unit/Small
cm	centimeters
CMDR	Centralized Message Detail Recording
CPU	central processing unit
CR	carriage return
CSM	Centralized System Management
CSSO	Customer Service Support Organization
CTRL	control
DCE	data communications equipment
DCP	Digital Communications Protocol
DDCMP	Digital Data Communications Message Protocol

DTR	data terminal ready
EIA	Electronic Industries Association
EPROM	erasable programmable read-only memory
ETX	end of text
°F	degrees Fahrenheit
ft	foot
hex	hexadecimal
Hz	hertz
ID	identifier
in	inches
ISDN	Integrated Services Digital Network
K	kilo
kg	kilograms
KVA	kilo-volt-amperes
LF	line feed
LSU	local storage unit
m	meter
MAAP	maintenance and administration panel
max.	maximum
min.	minumum
modem	modulator-demodulator
NCOSS	Network Control Operations Support System
NCSC	National Customer Support Center
NPSC	National Parts Sales Center
opcode	operation code
PBX	private branch exchange
PC	personal computer
PCC	processor communications circuit
PDM	processor data module

PEC	price element code
PROC	procedure
RAM	random access memory
RFI	radio frequency interference
ROM	read-only memory
RS232C	recommended standard number 232, revision C
RxVx	release x, version x
SG	signal ground
SKT	Silent Knight transmitter
SMDR	station message detail recording
std	standard
STX	start of text
tty	terminal type
UUCP	UNIX -to- UNIX communications protocol
V	volts
VAC	volts alternating current
VDC	volts direct current
W	watts
WGS	work group station
XON	transmit on
XOFF	transmit off

GLOSSARY

93B Centralized Message Detail Recorder (CMDR)	A poller system in the AT&T call detail record (CDR) acquisition and processing (CDAP) family of products.
access code	A field in a call detail record that contains the numbers dialed to get an outside line to a telephone facility such as a central office (CO).
account code	A field in a call detail record that contains a user-defined identifier. Account codes are typically dialed when placing or receiving a call to identify the call subject matter, client account, and so on.
administration terminal	A terminal (also called a <i>console</i> or <i>monitor</i>), with a cathode ray tube (CRT) screen and keyboard connected to a computer, used to enter information for administering the computer.
alarm	Notification of a condition requiring immediate attention.
American Standards Committee for Information Interchange (ASCII)	The organization that established a standard digital code for alphanumeric characters sent between computers.
asynchronous data unit (ADU)	A device that translates incoming signals to outgoing RS232C signals levels at a 25-pin RS232C output connector, and extends the cabling distance beyond the maximum 50-ft limit between two systems.
asynchronous transmission	Transmission in which the start of each character or block of characters is arbitrary.
baud	A measurement of digital transmission speed representing the number of signal events per second. If the signal event represents the presence or absence of one bit, then the baud is identical to bits per second.
binary coded decimal (BCD)	The coding of decimal digits in which each digit is equivalent to four binary digits.
Block Transmission Checking (BTC) Protocol	A protocol that checks for errors in the data sent from a processor communications circuit (PCC) in an AT&T System 85 to a call detail recording system. BTC protocol provides a means for acknowledging and retransmitting call detail records sent from the PCC.
call accounting (CA) system	A system that processes call records and produces reports of their call details for billing purposes. The AT&T Centralized System Management (CSM) and AT&T Call Accounting System (CAS) systems are CA systems.

call detail acquisition and processing (CDAP) product line	<p>A group of interrelated AT&T products that collect, store, filter, output, poll, and process call records generated in a switch. These products are:</p> <ul style="list-style-type: none">• Call Detail Recording Utility (CDRU) and Local Storage Unit (LSU), which collect, optionally filter, store, and output records sent from a switch.• Call Detail Record Poller (CDRP) and 93B Centralized Message Detail Recorder (CMDR), which poll records from a CDRU system or an LSU, optionally filter them, and then output them to processing systems.• Centralized System Management (CSM), Call Accounting System (CAS), and Network Control Operations Support System (NCOSS), which process records sent from a poller, CDRU system, and LSU.• Call Detail Recording Unit/Small (CDRU/S), an AT&T collector system residing in a small special-purpose computer.
Call Detail Record Poller (CDRP)	<p>A poller system in the AT&T CDR acquisition and processing (CDAP) family of products that acquires, organizes, stores and transmits call records.</p>
call detail recording (CDR)	<p>An AT&T switch capability with which the details concerning the path of a call from origination to termination with an AT&T System 85, AT&T DEFINITY Generic 1, or AT&T DEFINITY Generic 2 switch are recorded as a call detail record.</p>
Call Detail Recording Utility (CDRU)	<p>An AT&T collector system in the AT&T CDR acquisition and processing family of products, that collects, stores, optionally filters, and outputs call records generated in a switch.</p>
Call Detail Recording Unit/Small (CDRU/S)	<p>An AT&T collector system residing in a small special-purpose computer.</p>
carrier	<p>1. A company that provides telephone services, such as AT&T Communications, MCI, and US SPRINT. 2. A field in a CDR record that contains a code for the carrier used by a call.</p>
CDRU/S administration terminal (CAT)	<p>A device with input capability that allows users to communicate with the CDRU/S to configure and operate that system.</p>
CDRU/S administration terminal (CAT)	<p>A device with input capability that allows users to communicate with the CDRU/S to configure and operate that system.</p>
central office	<p>The telephone company facility that routes and connects calls from local telephones.</p>
Centralized System Management (CSM)	<p>An AT&T product designed to administer a large telecommunications network.</p>

character	A letter, number, or symbol.
collector system	A device or utility that gathers and stores call detail records from a switch, to transmit them later to a poller system.
colocate	To place systems, devices, and/or units in the same vicinity.
command	An instruction that tells the computer to perform a function.
condition code	A field in a call detail record that contains information on the successful completion of a call. Condition codes for ineffective call attempts may be used by the CDRU/S as filtering criteria.
configuration	A particular software and/or hardware arrangement.
cursor	A movable pointer that designates where your input is entered on the screen or where you select an item from a displayed menu. The cursor occupies one character position.
custom format	See <i>variable format</i> .
data bits	The actual length (number of bits) of a single character transmitted by a device.
default	The value, option, or feature automatically supplied by the system, unless the user specifies otherwise.
dial-up link	A communication path between two or more systems that is established by a modem on one end of a link dialing a modem on the other end of the link.
direct output port	A CDRU output port that sends records continuously, without protocol, to a computer, printer, tape drive, or local call accounting (CA) system.
diskette	A thin, flexible platter (also called a floppy disk) coated with magnetic material and used as a storage medium.
diskette drive	A device that reads and writes information on a diskette.
Electronic Industries Association (EIA)	An organization that designs engineering standards.
extended binary-coded decimal interchange code (EBCDIC)	A code that uses eight binary positions to represent a single character.
extension	A field in a call detail record that contains the number of a voice terminal, indicating the origin of an outgoing call or the destination of an incoming call.

fixed format	A call detail record format in which a record's length and internal structure are not alterable. All AT&T call detail acquisition and processing (CDAP) products can process fixed-format records.
format	The arrangement or layout of data.
formatted ASCII	A type of ASCII-coded CDR record that has spaces between the data fields.
frontend task	A CDRU/S software module dedicated to the collection and processing of CDR records from the switch.
hexadecimal digit	Numbers in base 16.
Integrated Services Digital Network (ISDN)	A network that provides end-to-end digital communications to support a wide range of services, including voice and data, to which users have access by a set of standard, multipurpose user network interfaces.
interface	A device or system forming a common boundary at which independent devices or systems interact.
link	A transmitter-receiver channel that connects two systems.
log in	The process of gaining access to a computer system.
maintenance and administration panel (MAAP)	A portable device used to administer an AT&T System 85 switch.
menu	A list of selectable items on a screen.
modem	A device that converts digital data signals to analog signals for transmission over voice-terminal circuits. The analog signals are converted back to original digital data signals by another modem at the other end of the circuit. Also called a <i>data set</i> .
network	1. In the context of voice and/or data communications, a complex consisting of two or more interconnected switching systems. 2. In the context of computer operation, a system consisting of one or more computers and the connected terminals and related devices such as modems and input/output (I/O) channels.
Network Control Operations Support System (NCOSS)	An AT&T service, used for system network sanity checking, that requires the use of buffered Call Detail Recording (CDR) data collection with a local storage (LSU), such as the 94A LSU or 3B2 Call Detail Recording Utility (CDRU).
opcodes	Codes in a call detail record that check on-line errors in the record sent from an AT&T System 85 to a call detail recording system.

operating system	The software that controls and allocates a computer's resources, such as memory, disk storage, and the screen display.
parity	A method used by some devices to check that data was transmitted correctly. Parity can be "odd," "even," or not used at all.
password	A unique string of characters that a user enters to access a system, program, or feature.
peripheral system	A device external to the primary system.
polled output port	A CDRU system output port that sends records periodically to a poller.
poller system	A system that acquires, organizes, and stems call detail records collected from a collector system — such as the CDRU/S — and then transmits the records to a host processor or tape storage device.
polling	The process of periodically accessing a record storage system, such as the CDRU/S, to collect call detail records.
port	The data transmission "outlet" on a device used for communicating with other devices.
port adapter	A device that allows the coupling of different connectors—such as a 9-pin RS232C connector to an 8-pin modular jack. Adapters are used at both ends of an 8-wire modular cable connecting either a switch or an administration terminal to the CDRU/S.
price element code (PEC)	A special identifier given to each orderable item of AT&T equipment.
private branch exchange (PBX)	See <i>switch</i> .
processor	A central processing (CPU) that receives data, manipulates it and supplies results. The 6386 and 3B2 processors store the UNIX operating system and CDRU software.
processor data module (PDM)	A digital modem that connects the switch to data terminal equipment, (DTE) such as terminals and printers.
protocol	A set of conventions or rules that describe how data is organized, transmitted and received.
read/write privileges	Permission granted each user to copy (read) and/or change (write) data shared by other users in a system.
record filter	An administered CDRU software capability that prevents the CDRU system from sending some records based on characteristics such as minimum call duration, call type, and sampling rate.

remote access	The capability of accessing the CDRU/S from an administration terminal at a remote location.
remote alarm	A device that provides an audible alert if the CDRU/S malfunctions or if it loses external power.
RS232C interface	An Electronic Industries Association (EIA) standard 25-pin interface between data terminal equipment (DTE) and data communication equipment (DCE) using serial binary interchange signals.
serial data	Data transmitted or processed sequentially one bit after another.
special-purpose computer	A computer that solves a specific class of problems. The AT&T CDRU/S uses a special-purpose computer.
standard format	See <i>fixed format</i> .
Standard Message Detail Recording (SMDR)	An AT&T switch capability with which the details concerning the path of a call from origination to termination within an AT&T System 75 or AT&T Dimension® PBX are recorded in the form of an SMDR record.
straight-through cable	A cable with wires connected between identical pins on each end
switch	The software-controlled communications processor complex that interprets dialing pulses, tones, and/or keyboard characters, and makes the proper interconnections both within the system and external to the system. The switch itself consists of a digital computer, software, storage device (memory), and carriers with special hardware to perform the actual connections. A switch provides voice and/or data communications services (including access to public and private networks) for voice and data terminals on a customer's premises.
switch administration	To establish or change the characteristics of a switch.
termination string	The (printable) representation of the ASCII characters that end a call record transmission from a switch. A common termination string is "/b/n/0/0/0" (representing a carriage return, line feed, null, null, null).
trunk	1. A dedicated communication channel between two switches. 2. A field in a call detail record that contains the identifier for the specific trunk (or group of trunks) used by the call.
UNIX operating system	The program that manages the resources of the 3B2 and 6386 computers, including input and output procedures, process scheduling, and file systems.
unformatted ASCII	An ASCII-coded call record without spaces between the data fields.
utilities	A group of programs that provide a specific application within a computer.

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