"COMM-STOR*" II COMMUNICATIONS STORAGE UNIT

STATION MESSAGE DETAIL RECORDING (SMDR) FEATURE

DESCRIPTION AND OPERATION

1. GENERAL

1.01 This section covers the COMM-STOR II Communications Storage Unit manufactured by Sykes Datatronics, Incorporated, as described in their section SYKS 578-400-102.

1.02 Whenever this section is reissued, the reason(s) for reissue will be listed in this paragraph.

1.03 Information covering the description and operation of the COMM-STOR II Communications Storage Unit, Model 8220AS for Station Message Detail Recording (SMDR) applications, is contained in the attached reprint of the practice prepared by Sykes Datatronics, Incorporated.

1.04 The COMM-STOR II/SMDR unit can interface with the direct output version of the SMDR option offered with the DIMENSION† PBX system. The unit records call information and generates report summaries by date and time of call, duration, dialed number, calling station, account code, department, dial-access code, and cost. These reports may be printed on a hard-copy terminal.

1.05 The operator communicates with the COMM-STOR II/SMDR unit via a terminal by responding to questions or making selections from a menu of activities.

1.06 The COMM-STOR II/SMDR unit consists of a microprocessor-based controller, a firmware-based operating system, random access memory (RAM), and two flexible diskette drives. Standard density recording is implemented on soft-sectored diskettes.

* Registered trademark of Sykes Datatronics, Incorporated
† Registered trademark of AT&T.

Comm-Stor II
COMMUNICATIONS STORAGE UNIT
DESCRIPTION AND OPERATION OF THE STATION MESSAGE DETAIL RECORDING (SMDR) FEATURE

CONTENTS PAGE

1. GENERAL 1
2. DESCRIPTION 2
   FRONT PANEL INDICATORS 2
   EXTERNAL DEVICE CONNECTIONS . . . 2
   INTERNAL HARDWARE 2
3. OPERATIONAL FEATURES 6
   NORMAL OPERATIONS 6
   A. Recording Call Records 6
   B. Report Generation 6
   C. Updating System Tables and Configuration 6
   VARIABLE BIT RATE SETTINGS 6
   RACK MOUNT CABINET 6
   SMDR DISKETTES 6
   A. System Diskette 6
   B. Site Diskette 7
   C. Site Generation Diskette 7
   D. Data Diskette 7
   E. Refresh Diskette 7
   CONTROL CODES 7
4. DESCRIPTION OF CALL RECORD REPORTS . 7
   DETAIL REPORT 7
   EXCEPTION REPORT 8
   SUMMARY REPORT 8
   SELECTIVE RETRIEVAL REPORT 9
   THE AUTOMATIC REPORT CONTROL FILE . 9
5. DETERMINATION OF CALL COSTS 9
   DIRECT DISTANCE DIALED CALLS 9

CONTENTS PAGE

   FLAT RATE CALLS 10
6. TECHNICAL DATA 10
   POWER REQUIREMENTS 10
   ENVIRONMENTAL REQUIREMENTS . . . 10
   WEIGHT AND DIMENSIONS 10
7. ERROR MESSAGES 10
8. CONFIGURATION PARAMETERS 13
9. SAMPLE REPORTS 13

Figures

1. Typical Station Configuration 2
2. Front View of the Comm-Stor II/SMDR Unit 3
3. Rear View of the Comm-Stor II/SMDR Unit 3
4. Comm-Stor II/SMDR System Block Diagram 5

Tables

A. EIA RS-232C Connections 4
B. Available Bit Rates 6
C. Special Characters and Control Codes . . 7
D. Power Requirements 10
E. Weights and Dimensions 10
F. Warnings and Error Messages 11

1. GENERAL

1.01 This section covers the description and operation of the Comm-Stor® II unit model 8220AS for Station Message Detail Recording (SMDR) applications, hereafter referred to as the Comm-Stor II/SMDR unit.

1.02 Whenever this section is reissued, the reason(s) for the reissue will be listed in this paragraph.

1.03 The Comm-Stor II/SMDR unit can interface with the direct output version of the SMDR option offered with a DIMENSION® PBX system. The Comm-Stor II/SMDR unit records call information from the SMDR unit. An operator may generate reports that summarize the call information by date and time of call, duration, dialed number, calling station, account code, department, dial access code, and cost. Reports may be printed on a hardcopy terminal.

1.04 The operator communicates with the Comm-Stor II/SMDR unit from a terminal. The system displays a message on the terminal to which the operator responds. The operator may be instructed to perform a particular action or type information in response to a question. Frequently, a MENU of activities appears from which the operator selects ***one*** to perform.

1.05 The Comm-Stor II/SMDR unit consists of a microprocessor-based controller, a firmware-based operating system, RAM, and two flexible diskette drives. Standard density recording is implemented on soft-sectored diskettes.

2. DESCRIPTION

2.01 The Comm-Stor II/SMDR unit equipped for SMDR application is a model 8220AS dual drive unit. The rack mount cabinet is available as an option.

FRONT PANEL INDICATORS

2.02 The front panel of the Comm-Stor II/SMDR unit (Figure 2) has several indicators to assist the user. Two of these, READY and BUSY, are duplicated to provide information about each drive. The function of each indicator is as follows:

RESTART: A switch/indicator to show when the unit is turned on.

READY: An indicator which signifies that a diskette has been properly inserted in the drive.

BUSY: An indicator which signifies that data is being transferred to or from the diskette. A diskette should not be removed when the BUSY indicator is illuminated. Wait until the BUSY indicator is off before removing the diskette.

CARRIER: Provides an indication of the presence of a Carrier Detect Signal from the modem.

STATUS: This indicator has a dual purpose: first it indicates that data is being transferred to or from any of the ports. Second, it indicates the presence of a parity error. The lamp will flicker when data is being transferred to or from any port. If a parity error occurs and data is not being transferred through any of the ports, it will illuminate at full brilliance. When a parity error occurs and data is being transferred through a port, the lamp will illuminate at half brilliance, but will return to full brilliance after completion of the data transfer.

> ***Note:*** The Comm-Stor II/SMDR unit has a self-checking feature to make sure that the parameters stored in the configuration memory are meaningful. If for any reason (such as storing the unit for longer than one year in a power-down condition) the contents of the configuration memory are altered or destroyed, the STATUS indicator on the front panel will illuminate when the unit is initially turned on.

2.03 To refresh the configuration memory, place either the System Management diskette or a Refresh diskette in the top drive and depress the RESTART button.

EXTERNAL DEVICE CONNECTIONS

2.04 A terminal is connected to the Comm-Stor II/SMDR unit through the industry standard port on the rear of the unit (Figure 3). No special wiring of the pins is necessary. Figure 1 shows a typical station configuration.

2.05 The cable (male connectors) from the SX03 connector of the Dimension SMDR Direct Output interface is connected to the PRINTER port of the Comm-Stor II/SMDR unit. The cable (male connector) from the terminal is connected to the port labeled TERM on the Comm-Stor II/SMDR unit. All cables should be in compliance with EIA RS-232C standards.

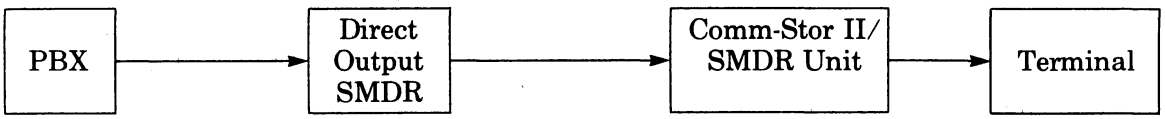

Fig. 1—Typical Station Configuration

Fig. 2—Front View of the Comm-Stor II/SMDR Unit

Fig. 3—Rear View of the Comm-Stor II/SMDR Unit

INTERNAL HARDWARE

The Comm-Stor Controller

2.06 The Comm-Stor II/SMDR unit (Figure 4) is designed around a microprocessor with all operating software contained in ROM (Read Only Memory). All operational features are available when the unit is turned on. In addition to the ROM, four other subsystems are directly accessed by the microprocessor during normal operation: RAM, CMOS-RAM memory, diskettes, and the communications interfaces.

RAM (Random Access Memory)—RAM provides temporary storage of data received through the ports, and storage for internal information required by the microprocessor. The Comm-Stor II/SMDR unit for SMDR applications contains 28K bytes of RAM, none of which is accessible to the user. Buffering at each port is automatically allocated as follows:

Terminal port—1 sector

Printer port—6 sectors

CMOS-RAM—This memory, which is also designated as configuration memory, is a non-volatile type of RAM memory which stores user defined equipment configuration parameters. When the Comm-Stor II/SMDR unit is turned off, the contents of CMOS-RAM memory are maintained by a 4.5 volt battery. The current requirement of this memory is so low that battery life is approximately equal to normal shelf life (one year). All operating parameters are stored in CMOS-RAM memory. The parameters remain in memory as long as the battery is not removed when the unit is turned off. The information stored in CMOS-RAM memory may be altered by the operator using the terminal keyboard with a System Management diskette in the drive.

Diskette Drive(s)—The microprocessor has direct control of the diskette drives. Data is read from or written to the diskettes as required.

Communications Interface—All data transfers through the data communications interfaces occur through the microprocessor. The microprocessor has the ability to control the outgoing EIA leads and senses the incoming activity and control line transitions at the three ports. (Refer to Table A.)

TABLE A

EIA RS-232C CONNECTIONS

PIN	DESCRIPTION	TERMINAL PORT		MODEM PORT		PRINTER PORT	
		USED	DIRECTION	USED	DIRECTION	USED	DIRECTION
1	Chassis Ground (FG)	X	—	X	—	X	—
2	Transmitted Data (SD)	X	in	X	out	X	in
3	Received Data (RD)	X	out	X	in		
4	Request to Send (RS)	X	in	X	out		
5	Clear to Send (CS)	X	out	X	in	X	out
6	Data Set Ready (DR)	X	out	X	in	X	out
7	Circuit Ground (SG)	X	—	X	—	X	—
8	Carrier Detect (CD)	X	out	X	in	X	out
11, 19	Secondary Request to Send (SRS)	X	in			X	in
12	Secondary Carrier Detect (SCD)	X	out			X	out
15	Modem Transmit Clock			X	in		
17	Modem Receive Clock			X	in		
20	Data Terminal Ready (DTR)	X	in	X	out	X	in
22	Ring Indicator (RI)	X	out	X	in	X	out

Note: Direction refers to signal direction with respect to the Comm-Stor II/SMDR unit at each port, e.g., transmitted data is out of the unit on Pin 2 at the modem port.

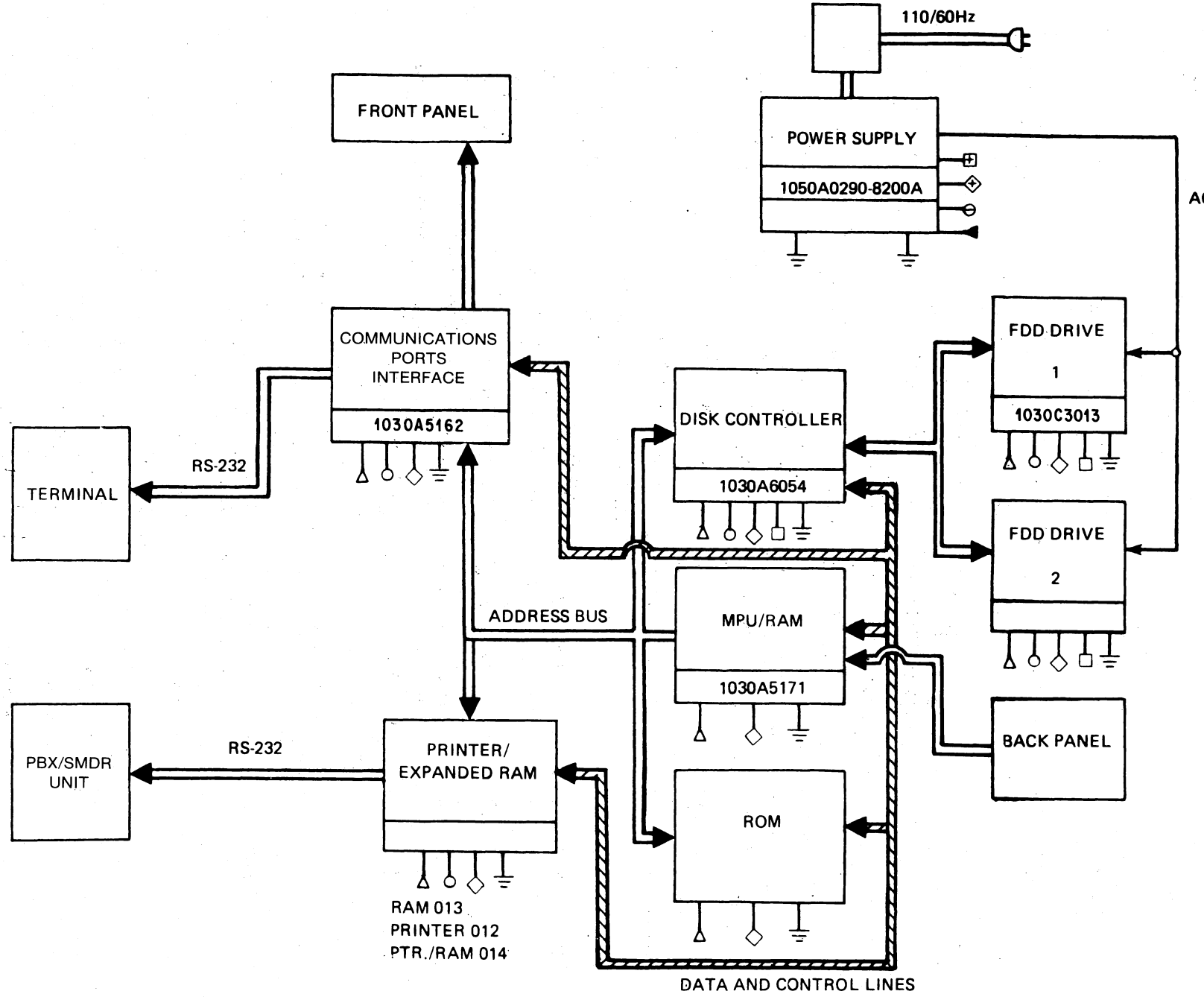

Fig. 4—Comm-Stor II/SMDR System Block Diagram

2.07 The Comm-Stor II/SMDR unit controller comprises six printed circuit (PC) cards. These are inserted into a base card assembly and held in place by a wire-form card retainer. The PC cards are: the microprocessor card, the communication ports interface card, the ROM memory card, the diskette interface card, RAM memory card, and printer port card.

3. OPERATIONAL FEATURES

NORMAL OPERATIONS

3.01 Normal operations of the Comm-Stor II/SMDR unit equipped for SMDR applications may involve ***recording call records, report generation, updating system tables, configuration,*** or any combination of these activities. Each activity is briefly described below.

A. Recording Call Records

3.02 Call records may be stored on one or more Data diskettes. When a diskette becomes full, the new unit notifies the operator that a new diskette must be inserted. Each diskette in the reporting period is assigned a number which represents the order in which the Data diskettes were filled.

B. Report Generation

3.03 The Comm-Stor II/SMDR unit determines and reports costs for several call types including long distance, and special circuits such as WATS, and Foreign Exchange networks. Four types of reports can be generated: Detail, Exception, Summary, and Selective Retrieval. The information reported differs in each and will be explained in subsequent chapters.

C. Updating System Tables and Configuration

3.04 The user will need to update the system tables when telephone company rates change, exchanges are added or deleted, or stations or departments change. Hardware operating parameters may also change. These operations are not usually performed on a day to day basis but are part of normal operations of the system.

3.05 During normal operations, the Site diskette remains in the top drive; the Data diskette is placed in the bottom drive. As call records are received by the Comm-Stor II/SMDR unit, they are recorded on the Data diskette. Later when the operator generates reports, the unit refers to the information on the Site diskette and determines call costs accordingly.

3.06 Call records can still be recorded while reports are being generated or while the system is being updated. Finally, the operator need only interface with the system to change the Data diskette or generate reports.

VARIABLE BIT RATE SETTINGS

3.07 Users may change the bit rate settings at different ports by using the thumbwheel switches on the rear of the unit. Any one of the 9 bit rate settings in Table B may be selected.

Comm-Stor II/SMDR units equipped for SMDR applications can record data at speeds up to 4800 BPs from the Direct Output SMDR unit.

TABLE B

AVAILABLE BIT RATES

110	300	4800
134	1200	7200
150	2400	9600

RACK MOUNT CABINET

3.08 This option provides standard 19″ rack mount with the BINARY switch relocated to the front panel.

SMDR DISKETTES

3.09 The Comm-Stor II/SMDR unit equipped for SMDR applications stores call record information on a magnetic medium called a diskette. The following six types of diskettes are used:

A. System Diskettes

System Management Diskette

3.10 This diskette is used to (1) change the operating parameters of the unit, (2) build the Site diskette, and (3) copy Data and Site diskettes.

Rate Center Diskette

3.11 This diskette contains a table of telephone company central switching offices in the United States, Puerto Rico, the Virgin Islands, Canada, and Mexico. Each office is defined by the area code and exchange. It is used to build the Site File and Area Code/Exchange Table on the Site diskette. The Comm-Stor II/SMDR unit will indicate which drive to put the Rate Center diskette into.

B. Site Diskette

3.12 This diskette contains information about the telephone system that the Comm-Stor II/SMDR interfaces with. The Site diskette is placed in the top drive of the unit.

C. Site Generation Diskette

3.13 This diskette is used exclusively to build the Site diskette.

D. Data Diskette

3.14 The Data diskette stores call information; it can store 16,000 call records. The Data diskette is placed in the bottom drive of the unit.

E. Refresh Diskette

3.15 Once the Comm-Stor II/SMDR unit has been configured with the System Management diskette, it is possible to store this configuration on a blank diskette. After a Refresh diskette has been created, the Comm-Stor II/SMDR unit can be identically configured at another time.

The Spool Area

3.16 There is a special area on the Site diskette called the "spool area" that is used to ***temporarily*** store incoming call records. Call records are stored in the spool area when:

(1) the Data diskette is full,

(2) the end of the reporting period has been reached,

(3) the user changes the system's configuration or performs other system management operations,

(4) the operator generates reports.

3.17 This spool area can store call records for approximately two days, depending on telephone usage. These call records will be automatically transferred to the correct Data diskette when it is inserted. If the spool area is allowed to fill completely, an error is reported and any additional incoming records are lost.

CONTROL CODES

3.18 Table C provides a list of the most commonly used special characters and control codes that may be entered from the operator's terminal.

TABLE C

SPECIAL CHARACTERS AND CONTROL CODES

CONTROL CODE/ CHARACTER	DESCRIPTION
[CR]	End of line character, or while updating system configuration, keep the existing entry
[RUB]	Character delete
[CTRL/C]	Terminate the present operation (e.g., report generation, building Report Control File)
[CTRL/S]	Temporarily interrupt the report display
[CTRL/Q]	Resume the report display

4. DESCRIPTION OF CALL RECORD REPORTS

4.01 The Comm-Stor II/SMDR unit produces four categories of reports that provide concise call cost information in specified categories. These reports summarize call records from either the current or a previous reporting period. Refer to part 9 for sample reports.

DETAIL REPORT

4.02 The Detail report provides ***all*** completed call record information for a reporting period. This information includes: date of call, time of call, duration, condition code, dial access code, called number, calling station, account code, and cost.

4.03 The "time of call" represents when the call ***ended.*** This entry consists of four digits; the first and second digits represent the hour, and the third and fourth represent the minute (e.g., 15:56).

4.04 The "duration" entry consists of three digits, representing hours (0-9) and minutes (0-59) (e.g., 0:03 represents a three minute call). The duration is rounded up to the next whole minute to match telephone company billing techniques.

4.05 The "condition code" is a character that categorizes the call record information.

4.06 Four types of Detail reports may be produced:

(1) ***Chronological:*** all call records are listed in the order in which the calls were recorded.

(2) ***By Dial Access Code:*** all call records are listed numerically, sorted by dial access code, (trunk).

(3) ***By Calling Station:*** all call records are listed numerically, sorted by calling station.

(4) ***By Account Code:*** all call records are listed numerically, sorted by account code.

At the end of the Detail report, the total number of good calls, total duration, and total cost are given. For example:

TOTALS

GOOD CALL RECORDS	9 CALLS
TOTAL DURATION	0:16
TOTAL COST	$23.50

EXCEPTION REPORT

4.07 The Exception report lists the following types of calls:

(1) the record is syntactically incorrect:

(a) a required field is missing,

(b) the record is too short or too long,

(c) there are non-numeric characters in a numeric field.

(2) the call was misdialed (e.g., an illegal area code),

(3) the call duration was less than the configured minimum of a completed call (and the unit was configured to record such calls).

4.08 The Exception report contains the same types of information as the Detail report except for call costs and date. Also, the duration entry includes tenths of a minute.

SUMMARY REPORT

4.09 The Summary report gives the total number of calls and total cost for up to eight categories of call record information. The system manager specifies categories by selecting summary sub reports. If none are specified, all eight categories are listed. These categories are as follows:

(1) ***Time of Call:*** Call records are grouped according to the half-hour of the day in which they occurred, regardless of the date. For example, one group contains those calls made between 11:00 A.M. and 11:30 A.M. for all days of the reporting period.

(2) ***Date of Call:*** Call records are grouped by date.

(3) ***Call Duration:*** Call records are grouped by call duration in the following categories:

1 MINUTE
2- 3 MINUTES
4- 5 MINUTES
6-10 MINUTES
11-30 MINUTES
31-60 MINUTES
MORE THAN 60 MINUTES
MORE THAN 30 MINUTES
MORE THAN 10 MINUTES

The call duration is rounded up to the next whole minute to allow for accurate cost assignment.

(4) ***Cost of Call:*** Call records are grouped by cost in the following categories:

LESS THAN $1.00
$1.00- $3.00
$3.00- $5.00
$5.00- $7.50
$7.50- $10.00
$10.00- $15.00
$15.00- $25.00
$25.00- $50.00
$50.00-$100.00
$100.00 OR HIGHER

(5) ***Dial Access Code***

(6) ***Account Code***

(7) ***Department***

(8) ***Calling Station***

At the end of the Summary report, the total number of good calls and the total cost are given. For example:

TOTALS

GOOD CALL RECORDS	717
COST	$13,303.50

SELECTIVE RETRIEVAL REPORT

4.10 The Selective Retrieval report lists call records selected by one or two categories of call information. It contains the same types of information for each category as the Detail report. This report permits the system manager to analyze particular categories of call record information.

4.11 Any one or two of the following nine categories may be specified:

Time of Day (Range)
Date of Call (Range)
Call Duration (Range)
Cost of Call (Range)
Dial Access Code
Account Code
Department
Calling Station
Dialed Number

At the end of the report, the total number of completed calls, total duration, and the total cost are given. For example:

TOTAL SELECTED RECORDS	65
TOTAL DURATION	4:35
TOTAL COST	$320.00

THE AUTOMATIC REPORT CONTROL FILE

4.12 Automatic report control relieves the operator from having to specify report requirements whenever reports are generated. This ensures that the required reports will always be generated with correct information. The automatic report control file contains a predefined list of the required reports and the types of information to be provided in each. This file is stored on the Site diskette and referred to by the Comm-Stor II/SMDR unit when reports are generated. The entire file must be re-entered to change the automatic report control file.

4.13 The system manager has two options regarding automatic reports:

(1) By configuring Parameter #26 Y (yes), the manager can ensure that the automatic report control file ***will not*** control report generation. Report requirements must be entered by the operator.

(2) By configuring parameter #26 N (no), report generation will be under control of the automatic report control file if one has been built. However, the system manager can allow the operator to override the automatic report control file. Report requirements can then be entered from the terminal when reports are generated.

5. DETERMINATION OF CALL COSTS

5.01 The Comm-Stor II unit can assign costs to the following types of calls:

INWATS
OUTWATS
TIE LINE
FOREIGN EXCHANGE (FX)
DIRECT DISTANCE DIALED (DDD)

DIRECT DISTANCE DIALED CALLS

5.02 To assign costs to DDD calls, the unit utilizes the following items of information:

(1) ***area code/exchange combination:*** Calling locations are identified by an area code and exchange combination. This combination associates the location with a particular central switching office.

All central switching offices are assigned a unique set of vertical (V) and horizontal (H) coordinates. These coordinates are contained on the Rate Center diskette and are used to determine the air mileage between locations. During site generation the air mileage for all area code/exchange combinations is written to the Site diskette. During cost assignment, each area code/exchange combination is used to determine the mileage step and the state.

(2) ***the time the call was initiated,***

(3) ***the date of the call is used*** to determine if weekday, Saturday, Sunday, or holiday rates apply.

5.03 With this information supplied, the Comm-Stor II/SMDR unit refers to the appropriate Rate table, Calendar table, and Discount table; locates the applicable rates; and assigns the cost to the call.

FLAT RATE CALLS

5.04 The Comm-Stor II/SMDR unit assigns costs to WATS, TIE line, or Foreign Exchange calls by using either the ***Actual Cost*** method or the ***Precalculated*** method. The system manager specifies the method by configuring Parameter #25. The Comm-Stor II/SMDR unit assigns costs as follows:

(1) The unit determines the total number of minutes used by the trunk group for the billing period.

(2) The unit assigns the total cost to the trunk group by either of the following costing methods:

(a) Actual Cost Method—The total cost is equal to the flat rate charge for the basic reporting period (BASE DOLLARS specified in the Trunk table).

(b) Precalculated Method—The total cost is a variable, dependent on a percentage of the BASE MINUTES (specified in the Trunk table) actually used by the trunk group.

For ***both*** methods, if the total usage is greater than the BASE MINUTES assigned in the Trunk table, any overtime costs are added to the total BASE DOLLARS to establish the total cost.

(3) The unit determines the cost per minute from the total cost and the total usage.

(4) The unit assigns a cost per call.

5.05 For example, assume that the monthly charge for a WATS line is $600 for 600 minutes of usage. Also, assume that only ***three*** calls were placed during the billing period. These calls lasted 5 minutes, 30 minutes, and 50 minutes. The cost for each call is shown according to the method of cost determination:

Actual Cost Method

The 5-minute call cost = $35.29
The 30-minute call cost = $211.76
The 50-minute call cost = $352.95

Precalculated Method

The 5 minute call cost = $5.00
The 30-minute call cost = $30.00
The 50-minute call cost = $50.00

6. TECHNICAL DATA

POWER REQUIREMENTS

6.01 Power requrirements of the Comm-Stor II/SMDR unit are shown in Table D. The standard unit requires 60 ± 1 Hz power.

ENVIRONMENTAL REQUIREMENTS

6.02 The diskette media require an allowable ambient temperature of 40.25°F-95.25°F or 4.25°C-35.25°C.

6.03 The allowable ambient humidity is 20%-80% relative humidity.

TABLE D

POWER REQUIREMENTS

MODEL	VOLTAGE	CURRENT
8220AS	115 VAC	2.5 amp
	230 VAC	1.8 amp

WEIGHT AND DIMENSIONS

6.04 Weight and dimensions of the Comm-Stor II/SMDR unit are shown in Table E.

7. ERROR MESSAGES

7.01 Table F lists the most common Comm-Stor II/SMDR warnings and error messages.

TABLE E

WEIGHT AND DIMENSIONS

MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
8220AS	9.6 in. 24.38 cm.	13.75 in. 34.93 cm.	20 in. 50.80 cm.	55 lbs. 25 kg.

TABLE F

WARNINGS AND ERROR MESSAGES

WARNING/ERROR MESSAGE	DESCRIPTION
SYSTEM	The system has detected an equipment problem. Contact maintenance personnel.
WARNING—ROOM FOR APPROXIMATELY 2000 CALLS REMAINING.	Change the Data diskette before it becomes full.
WARNING—ROOM FOR APPROXIMATELY 1000 CALLS REMAINING.	Change the Data diskette before it becomes full.
ATTENTION—DATA DISKETTE IS FULL THE 'CHANGE DATA DISKETTE' FUNCTION IS AUTOMATICALLY INITIATED	The Comm-Stor II/SMDR unit begins recording call records on the Site diskette in the drive. The DATA DISKETTE MUST BE CHANGED.
WARNING: SPOOL AREA OVER 50% FULL PLEASE STAND BY	Wait until the BUSY lights stop blinking. Then continue to perform normal Comm-Stor II/SMDR operations. This message also is displayed if the Data diskette is full and needs to be changed. Change the Data diskette.
WARNING SPOOL AREA FULL INCOMING RECORDS ARE NOT BEING RECORDED	Call records are lost.
WARNING: DATA DISKETTE IS INSERTED IN BOTTOM DRIVE SHOULD THIS DISKETTE BE USED AS THE NEW DATA DISKETTE (Y/N)?	The Data diskette contains call record information. Type: Y: The data is written over. N: Insert another diskette.
WARNING: DATA DISKETTE IS INSERTED IN BOTTOM DRIVE SHOULD THIS BE USED AS THE COPY DISKETTE (Y/N)?	The Data diskette to receive the copy contains data. Y: The diskette is written over; the data will be lost. N: Insert another diskette.
WARNING: ROOM FOR n CALLS BEFORE LOSING CALL RECORDS	Diskettes should be copied when telephone usage is reduced, or call records may be lost.
WARNING—INCORRECT CALENDAR INSTALLED, PLEASE REBUILD BEFORE REPORTING	The year specified in the Calendar table does not match the year specified for the reporting period. Modify the Calendar table.

TABLE F (Cont)

WARNING/ERROR MESSAGE	DESCRIPTION
INPUT ERROR	The information was not entered properly. Re-enter the information correctly.
ATTENTION—SYSTEM HAS HAD A POWER LOSS, DATA RECOVERY PROCEDURES STARTED	The RESTART button was depressed, or the system had a power loss.
READ ERROR or DISKETTE ERROR	During diskette verification or report generation, the diskette could not be read without errors. The probable cause is a bad diskette, or the drive door has been opened.
NOT READY	A diskette is either not inserted or improperly inserted in one of the drives. Insert the diskette properly.
DATA DISKETTE NUMBER n OF REPORTING PERIOD MM/DD/YY IN BOTTOM DRIVE IS NOT LAST IN SEQUENCE. PLEASE REMOVE DISKETTE FROM BOTTOM DRIVE	Insert the Data diskette that is the last of the present sequence.
DATA DISKETTE n OF THE REPORTING PERIOD STARTING AT MM/DD/YY IS IN BOTTOM DRIVE IS THIS CORRECT (Y/N)?	This question appears during report generation if there is more than one Data diskette for the reporting period. Type: Y: The report is printed. N: Remove the present Data diskette. Insert the proper Data diskette into the bottom drive and depress the space bar. The report is printed.
INVALID REPORTING PERIOD—PERIOD BEGINS ON MM/DD/YY	The date specified as the last day of the reporting period causes the reporting period to exceed 31 days. Type the correct date.
?	During system configuration, an improper command or value was entered. Re-enter the proper command or value.
ERROR—SITE DISKETTE COMPLETE	This error message appears during report generation if a partial Site diskette has been inserted. Modify the Site diskette.

8. CONFIGURATION PARAMETERS

8.01 The following parameters are configurable in the Comm-Stor II/SMDR unit. Configuration is done using the System Management diskette. The default values are given in parentheses.

1: END OF LINE CHARACTER ([CR])
2: SYSTEM TO ADD LINE FEED AFTER CARRIAGE RETURN
- TERMINAL PORT? (YES)
- MODEM PORT? (NO)
3: LINE FEED CHARACTER ([LF])
4: TRANSMIT "END OF TRANSMISSION" CHARACTER? (NO)
5: "END OF TRANSMISSION" CHARACTER ([^D])
6: "PAUSE" CHARACTER (FROM MODEM/TERMINAL) ([^S])
7: "RESUME" CHARACTER (FROM MODEM/TERMINAL) ([^Q])
8: ENABLE LINE-BY-LINE PROMPTING? (NO)
9: "ACKNOWLEDGEMENT" CHARACTER ([^Q])
10: "NEGATIVE ACKNOWLEDGEMENT" CHARACTER ([^U])
11: IGNORE "NULL" CHARACTER FROM MODEM? (YES)
12: MODEM "NULL" CHARACTER ([NULL])
13: MODEM PARITY
EVEN/ODD/NONE (EVEN)
NUMBER OF DATA BITS EXCLUDING PARITY AND INCLUDING FIXED BITS (IF ANY) (7)
14: ANSWERBACK MESSAGE (**NONE**)
15: CHARACTER TO INITIATE ANSWERBACK MESSAGE ([^E])
16: SPECIAL OUTPUT CHARACTER #1 ([CR])
PORTS (NONE)
DELAY FACTOR/SUBSTITUTION (1)
17: SPECIAL OUTPUT CHARACTER #2 ([CR])
PORTS (NONE)
DELAY FACTOR/SUBSTITUTION (1)
18: "DELETE" CHARACTER ENTERED ([RUB])
19: "DELETE" CHARACTER ECHOED (\)
20: NUMBER OF LINES ON PAGE (51)
21: TERMINAL PARITY
EVEN/ODD/NONE (NONE)
NUMBER OF DATA BITS
INCLUDING FIXED BITS (IF ANY) (8)
EIGHTH DATA BIT (0)
22: MINIMUM DURATION FOR GOOD CALLS (2)
23: RECORD "INCOMPLETE" CALLS? (NO)
24: RECORD "INVALID" CALL RECORDS? (NO)
25: METHOD FOR COSTING FLAT RATE CALLS
1. ACTUAL COST METHOD
2. PRECALCULATED METHOD (1)
26: DISABLE AUTOMATIC REPORT CONTROL FILE? (NO)

9. SAMPLE REPORTS

9.01 This section provides examples of call record reports that may be generated by the Comm-Stor II/SMDR unit.

XYZ CO.

REPORTING:
1979 SEP 15

TODAY'S DATE OCT 10

SUMMARY REPORT

TIME OF CALL

14:30-15:00	171 CALLS	$104.83
15:00-15:30	276 CALLS	$148.35
15:30-16:00	270 CALLS	$115.76

DATE OF CALL

09/20	37 CALLS	$18.05
09/21	39 CALLS	$21.88
09/22	38 CALLS	$19.30
09/23	39 CALLS	$18.43
09/24	34 CALLS	$25.45
09/25	33 CALLS	$17.75
09/26	33 CALLS	$17.93
09/27	38 CALLS	$23.12
09/28	37 CALLS	$14.52
09/29	37 CALLS	$18.06
09/30	30 CALLS	$15.85
10/01	36 CALLS	$17.57
10/02	33 CALLS	$14.90
10/03	36 CALLS	$17.61
10/04	37 CALLS	$22.93
10/05	33 CALLS	$12.71
10/06	35 CALLS	$17.26
10/07	32 CALLS	$20.39
10/08	37 CALLS	$20.07
10/09	36 CALLS	$15.52
10/10	7 CALLS	$3.64

CALL DURATION

1 MINUTE	336 CALLS	$88.39
2-3 MINUTES	229 CALLS	$105.11
4-5 MINUTES	65 CALLS	$51.99
6-10 MINUTES	64 CALLS	$62.47
11-30 MINUTES	23 CALLS	$60.98
MORE THAN 10 MINUTES	23 CALLS	$60.98

XYZ CO.

REPORTING:
1979 SEP 15

COST OF CALL

LESS THAN $1.00	642 CALLS	$212.30
$1.00-$3.00	65 CALLS	$102.82
$3.00-$5.00	7 CALLS	$28.12
$5.00-$7.50	1 CALL	$6.30
$7.50-$10.00	1 CALL	$8.80
$10.00-$15.00	1 CALL	$10.60

DIAL ACCESS CODE

80	82 CALLS	$52.86
81	4 CALLS	$7.70
84	17 CALLS	$17.94
85	10 CALLS	$23.53
86	192 CALLS	$124.00
88	62 CALLS	$14.72
82	5 CALLS	$10.85
83	9 CALLS	$6.24
87	21 CALLS	$25.19
71	145 CALLS	$43.76
72	12 CALLS	$6.16
74	26 CALLS	$6.96
76	6 CALLS	$3.44
9	126 CALLS	$25.59

ACCOUNT CODE

NONE	717 CALLS	$368.94

XYZ CO.

REPORTING:
1979 SEP 15

TODAY'S DATE OCT 10

DEPARTMENT

PAYROLL	9 CALLS	$0.56
ORDER ENTRY	36 CALLS	$15.90
MARKETING	29 CALLS	$10.73
ACCOUNTING	46 CALLS	$27.15
EXECUTIVE	20 CALLS	$3.98
FIELD SALES	94 CALLS	$69.92
PURCHASING	44 CALLS	$23.19
CUST. SVCE.	81 CALLS	$42.83

CALLING STATION

6102	1 CALL	$0.56
6107	2 CALLS	$0.56
6117	1 CALL	$0.08
6138	1 CALL	$0.00
6153	2 CALLS	$0.45
6154	1 CALL	$0.21
6161	1 CALL	$0.08
6200	1 CALL	$0.64
6204	1 CALL	$0.16
6206	1 CALL	$0.24
6209	1 CALL	$0.38
6213	1 CALL	$0.16
6227	9 CALLS	$14.46
6230	2 CALLS	$0.46
6232	1 CALL	$0.08
6233	4 CALLS	$0.48
6234	3 CALLS	$0.72
6235	4 CALLS	$0.40
6236	3 CALLS	$0.50
6240	2 CALLS	$1.20
6245	4 CALLS	$0.69

END OF REPORT

REPORTING:
1979 SEP 15

XYZ CO.

TODAY'S DATE OCT 10

DETAIL REPORT: CHRONOLOGICAL

KEY

$>>>.>> COST TOO LARGE
$###.## COST INDETERMINABLE

DATE	TIME	DUR	CODE	ACCESS CODE	CALLED NUMBER	STATION	ACC'T	COST
09/20	14:41	0:02	I	71		6561		$ .16
09/20	14:41	0:01		80	1-317-468-1234	6364		$ .39
09/20	14:42	0:02		80	1-304-525-5678	6705		$ .78
09/20	14:42	0:01	80	86	1-312-555-1212	6650		$ .00
09/20	14:42	0:01		9	629-1234	6327		$ .18
09/20	14:43	0:01	I	71		6869		$ .08
09/20	14:43	0:03	84	83	1-605-343-5678	6807		$ 1.17
09/20	14:43	0:01	I	71		6235		$ .08
09/20	14:43	0:02	I	71		6451		$ .16

TOTALS

GOOD CALL RECORDS	9
TOTAL DURATION	0:14
TOTAL COST	$3.00

REPORTING: XYZ CO.
1979 SEP 15 TODAY'S DATE OCT 10

DETAIL REPORT: BY DIAL ACCESS CODE

KEY

$>>>>>> COST TOO LARGE
$###.## COST INDETERMINABLE

DATE	TIME	DUR	CODE	ACCESS CODE	CALLED NUMBER	STATION	ACC'T	COST
ACCESS CODE: 9								
09/20	14:45	0:12		9	334-5678	6138		$ .00
09/20	14:47	0:10		9	334-1234	6296		$ .00
09/20	14:42	0:01		9	629-5678	6327		$ .18
09/20	14:46	0:02		9	675-1234	6870		$ .28
09/20	14:47	0:03		9	334-5678	6234		$ .00
09/21	14:50	0:03		9	644-1234	6247		$ .38
09/21	14:49	0:01		9	338-5678	6269		$ .21
09/21	14:49	0:03		9	338-1234	6460		$ .21
09/21	14:50	0:01		9	338-5678	6460		$ .21
09/21	14:48	0:15		9	334-1234	6508		$ .00
09/21	14:50	0:02		9	626-5678	6568		$ .28
09/21	14:48	0:01		9	334-1234	6596		$ .00
09/21	14:48	0:02		9	1411	6596		$ .00
				.				
				.				
				.				
10/09	15:54	0:03		9	338-5678	6369		$ .21
10/09	15:54	0:03		9	334-1234	6430		$ .00
10/09	15:56	0:02		9	338-5678	6430		$ .21
10/09	15:56	0:01		9	334-1234	6461		$ .00
10/09	15:55	0:03		9	338-5678	6520		$ .21
10/09	15:55	0:01		9	338-1234	6538		$ .21
10/09	15:54	0:03		9	1-800-624-5678	6870		$ .00
10/09	15:56	0:01		9	1-705-728-1234	6873		$ .84
10/10	15:57	0:03		9	629-5678	6533		$ .38

TOTALS

GOOD CALL RECORDS	127 CALLS
TOTAL DURATION	6:03
TOTAL COST	$25.59

REPORTING: XYZ CO.
1979 SEP 15 TODAY'S DATE OCT 10

DETAIL REPORT: BY CALLING STATION

KEY

$>>>.>> COST TOO LARGE
$###.## COST INDETERMINABLE

DATE	TIME	DUR	CODE	ACCESS CODE	CALLED NUMBER	STATION	ACC'T	COST
	STATION: 6102							
09/26	15:10	0:07	I	71		6102		$ .56
	GOOD CALL RECORDS			1 CALL				
	TOTAL DURATION			0:07				
	TOTAL COST			$0.56				
	STATION: 6107							
09/20	14:43	0:02	I	71		6107		$ .16
09/25	15:08	0:05	I	88		6107		$ .40
	GOOD CALL RECORDS			2 CALLS				
	TOTAL DURATION			0:07				
	TOTAL COST			$0.56				
	STATION: 6117							
10/03	15:37	0:01	I	71		6117		$ .08
	GOOD CALL RECORDS			1 CALL				
	TOTAL DURATION			0:01				
	TOTAL COST			$0.08				
	STATION: 6138							
09/20	14:45	0:12		9	334-5678	6138		$ .00
	GOOD CALL RECORDS			1 CALL				
	TOTAL DURATION			0:12				
	TOTAL COST			$0.00				

REPORTING: XYZ CO.
1979 SEP 15 TODAY'S DATE OCT 10

DETAIL REPORT: BY ACCOUNT CODE

KEY

$>>>.>> COST TOO LARGE
$###.## COST INDETERMINABLE

DATE	TIME	DUR	CODE	ACCESS CODE	CALLED NUMBER	STATION	ACC'T	COST
ACCOUNT: 3124								
09/20	14:43	0:02	I	71		6107	3124	$ .16
09/20	14:45	0:12		9	334-5678	6138	3124	$ .00
09/20	14:43	0:01	I	71		6235	3124	$ .08
09/20	14:44	0:01	I	71		6235	3124	$ .08
09/20	14:47	0:10		9	334-1234	6296	3124	$ .00
09/20	14:46	0:01	I	88		6317	3124	$ .08
09/20	14:44	0:01	I	71		6325	3124	$ .08

TOTALS

GOOD CALL RECORDS	7
TOTAL DURATION	0:28
TOTAL COST	$.48

REPORTING: XYZ CO. PAGE 1
1979 SEP 15 TODAY'S DATE OCT 10

EXCEPTION REPORT

TIME	DUR	CODE	ACCESS CODE		CALLED NUMBER	STATION	ACC'T
14:43	0:00.1		9		629-1234	6625	
14:44	0:00.1		9		626-5678	6625	
14:44	0:00.1		9		629-1234	6625	
14:46	: .	I			6268	71	
14:47	0:00.1		9		334-5678	6274	
14:47	0:00.6		80		180-135-1234	6650	
14:48	0:00.1		9		1411	6596	
14:49	0:00.1		9		338-5678	6852	
14:50	0:00.1		80	86	1-404-1234	6364	
14:53	0:00.1		9		6281	6873	
14:53	0:00.1		80	86	1-301-296-5678	6227	
14:53	0:00.1		9		628-1234	6873	
14:54	0:00.1		80		1-301-296-5678	6227	
14:59	: .		80		1-404-335-1234	6259	
15:01	: .		80			6648	
15:01	0:00.1		80	86	1-301-433-5678	6266	
15:02	0:00.1		81		1-312-298-1234	6850	
15:02	0:00.1	H	84	83		6850	
15:04	0:00.1		9		31-2555	6871	
15:04		I			6102	71	
15:04	0:01.4		88		37-7540	6870	
15:06	0:00.1		80	86	1-214-689-1234	6649	
15:06	0:00.1		80	86	1-615-761-5678	6540	
15:06	: .		80	86	1-617-477-1234	6650	
15:08	: .		81	82	1968	6314	
15:08	0:00.1		80	86	131-387-5678	6364	
15:08	: .		81	82	1	6314	
15:08	: .		80	86	1-313-876-1234	6364	
15:09	: .		81	82	1	6314	
			.				
			.				
			.				
15:09	0:00.1		80	86	1-301-396-1234	6266	
15:09	0:00.1		80		1-502-879-5678	6705	
15:10	: .		80	86	14-1435	6477	
15:10	: .		81		166	6850	

TOTAL ERROR RECORDS 132

END OF REPORT

REPORTING: XYZ CO. PAGE 1
1979 SEP 15 TODAY'S DATE OCT 10

SELECTIVE RETRIEVAL REPORT

COST OF CALL	$ 1.00-$ 3.00
DIAL ACCESS CODE	9

KEY

$>>>.>> COST TOO LARGE
$###.## COST INDETERMINABLE

DATE	TIME	DUR	CODE	ACCESS CODE	CALLED NUMBER	STATION	ACC'T	COST
09/22	14:53	0:04		9	1-634-1234	6836		$ 1.01
09/22	14:53	0:05		9	1-565-5678	6813		$ 1.13
09/25	15:07	0:13		9	1-628-1234	6873		$ 1.65
09/25	15:17	0:04		9	1-634-1234	6836		$ 1.01
10/06	15:44	0:09		9	1-312-687-5678	6818		$ 1.20

TOTAL SELECTED RECORDS	5 CALLS
TOTAL DURATION	0:35
TOTAL COST	$6.00

END OF REPORT