"COMM-STOR*" II COMMUNICATIONS STORAGE UNIT
STATION MESSAGE DETAIL RECORDING (SMDR) FEATURE
INSTALLATION PROCEDURES

1. GENERAL

1.01 This section covers the COMM-STOR II Communications Storage Unit, Model 8220AS with Station Message Detail Recording (SMDR) feature, manufactured by Sykes Datatronics, Incorporated, as described in their section SYKS 578-400-202.

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

1.03 Installation information covering the COMM-STOR II Model 8220AS unit for SMDR applications is contained in the attached reprint of the practice prepared by Sykes Datatronics, Incorporated.

1.04 This unit is available only as a dual drive model. One or more sets of diskettes (Part 6) and manuals are also provided.

1.05 Any form of the word ***display*** as used throughout this section refers to data output through the terminal port of the COMM-STOR II/SMDR unit (ie, sending data to the terminal).

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Comm-Stor II
COMMUNICATIONS STORAGE UNIT
INSTALLATION PROCEDURES
FOR THE
STATION MESSAGE DETAIL RECORDING
(SMDR) FEATURE

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1. INTRODUCTION

GENERAL

1.01 This section provides installation information for the Comm-Stor II® model 8220AS unit for Station Message Detail Recording (SMDR) applications, hereafter referred to as the Comm-Stor II/SMDR unit. This unit is only available as a dual drive model. One or more sets of diskettes (part 6) and manuals are also provided.

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

1.03 Any form of the word ***display*** as used throughout this section refers to data output through the Comm-Stor II/SMDR unit's terminal port (i.e., sending data to the terminal).

DANGER AND WARNINGS

1.04

Danger: Turn off all the power and signal sources before removing or replacing any module or component.

Warning 1: To avoid possible internal damage to circuitry, wear a static discharge strap connected to ground to allow static discharge before handling circuit boards or components for removal or replacement. Avoid touching circuit lands or components as much as possible.

Warning 2: Put the replaced board in a static bag immediately after removal from unit. Never handle the board outside the bag without being properly grounded.

Warning 3: Handle all diskettes with care.

(Refer to paragraph 6.13.)

2. INSTALLATION OUTLINE

☐ (1) Review service order.

☐ (2) Unpack and inspect equipment (Part 3).

☐ (3) Check environmental and placement requirements (Part 4).

☐ (4) Power on (Part 5).

(a) Front panel indicators

(b) Turning the Comm-Stor II/SMDR unit ON.

☐ (5) Select the diskette (Part 6).

(a) System Management

(b) Rate Center

(c) Site Generation

(d) Site

(e) Data

(f) Refresh

(g) Diagnostic

☐ (6) Perform diagnostic check (Stand Alone Tests) (Part 7).

☐ (7) Install EIA cables (Part 8).

☐ (8) Set transmission rates (Part 9).

☐ (9) Configure the system (Part 10).

(a) Terminal

(b) Dimension PBX

(c) Comm-Stor II/SMDR unit

(d) Data set (for remote installation)

☐ (10) Local terminal tests (Part 11).

☐ (11) Perform operational checkout (SMDR tests) (Part 12).

☐ (12) Instruct customer on diskette care (Part 6).

☐ (13) Have customer try out the Comm-Stor II/SMDR unit.

☐ (14) Complete the installation.

(a) Give documentation to customer

(b) Clean up

(c) Complete

3. UNPACKING AND INSPECTING THE EQUIPMENT

3.01 To avoid equipment damage, unpack the equipment as close as possible to the installation site.

UNPACKING INSTRUCTIONS (Figure 1)

3.02 To unpack the Comm-Stor II/SMDR unit and accessories, proceed as follows:

(1) With box in upright position, open top flaps and fold outward.

(2) Turn box bottom side up, keeping top flaps folded outward.

(3) Lift box off unit and place aside.

(4) Remove inner packing material from around the Comm-Stor II/SMDR unit.

(5) Remove plastic bag and all foreign material from the Comm-Stor II/SMDR unit.

(6) Look for any accessories that would be packed separately (see Part 1).

(7) Compare accessories and options (on rear plate of unit) with the packing slip to assure completeness of the order.

(8) Retain the shipping container for repacking if service is needed on the unit.

VISUAL INSPECTION

3.03 After removing the Comm-Stor II/SMDR unit from its shipping container, visually inspect the unit for any shipping damage.

Warning: It is not necessary to remove the cover to perform any of the installation operations. Removing the cover and improperly handling the integrated circuits or other components may cause failures in these parts.

4. ENVIRONMENTAL AND PLACEMENT REQUIREMENTS

ENVIRONMENTAL

4.01 The Comm-Stor II/SMDR unit will function satisfactorily under temperature and humidity conditions suitable for operation of other equipment in an office or laboratory environment: relative humidity ranging from 20° to 90° (non-condensing) and temperature ranging from 45° to 95°F (7° to 35°C).

PLACEMENT

4.02 The Comm-Stor II/SMDR unit can be positioned at almost any angle and still function satisfactorily. However, the ideal position is right side up on a table or desk top, or any other hard, flat surface. The rack mounted Comm-Stor II/SMDR unit may be mounted in a 19-inch enclosure rack.

4.03 The Comm-Stor II/SMDR unit must be situated such that it has at least 4 inches clearance at the rear to allow intake of air by the

cooling fan and must be free of any magnetic fields.

4.04 The Comm-Stor II/SMDR unit may be connected directly to the Dimension SX03 port via an EIA cable. Or, it can be located at a remote site and connected to the Dimension via a data set.

ELECTRICAL POWER REQUIREMENTS

4.05 Voltage and frequency requirements are listed on the configuration plate attached to the rear of the unit. The standard operating requirements are 110v, 60Hz at 2.5 amps. Before connecting the Comm-Stor II/SMDR unit to a power source, check to be certain that both voltage and frequency agree with local usage, and that the Comm-Stor II/SMDR unit is properly grounded.

4.06 The units are shipped with a three-prong power plug commonly used in the U.S.A. and Canada which meets safety requirements. Do not attempt to defeat the purpose of this plug.

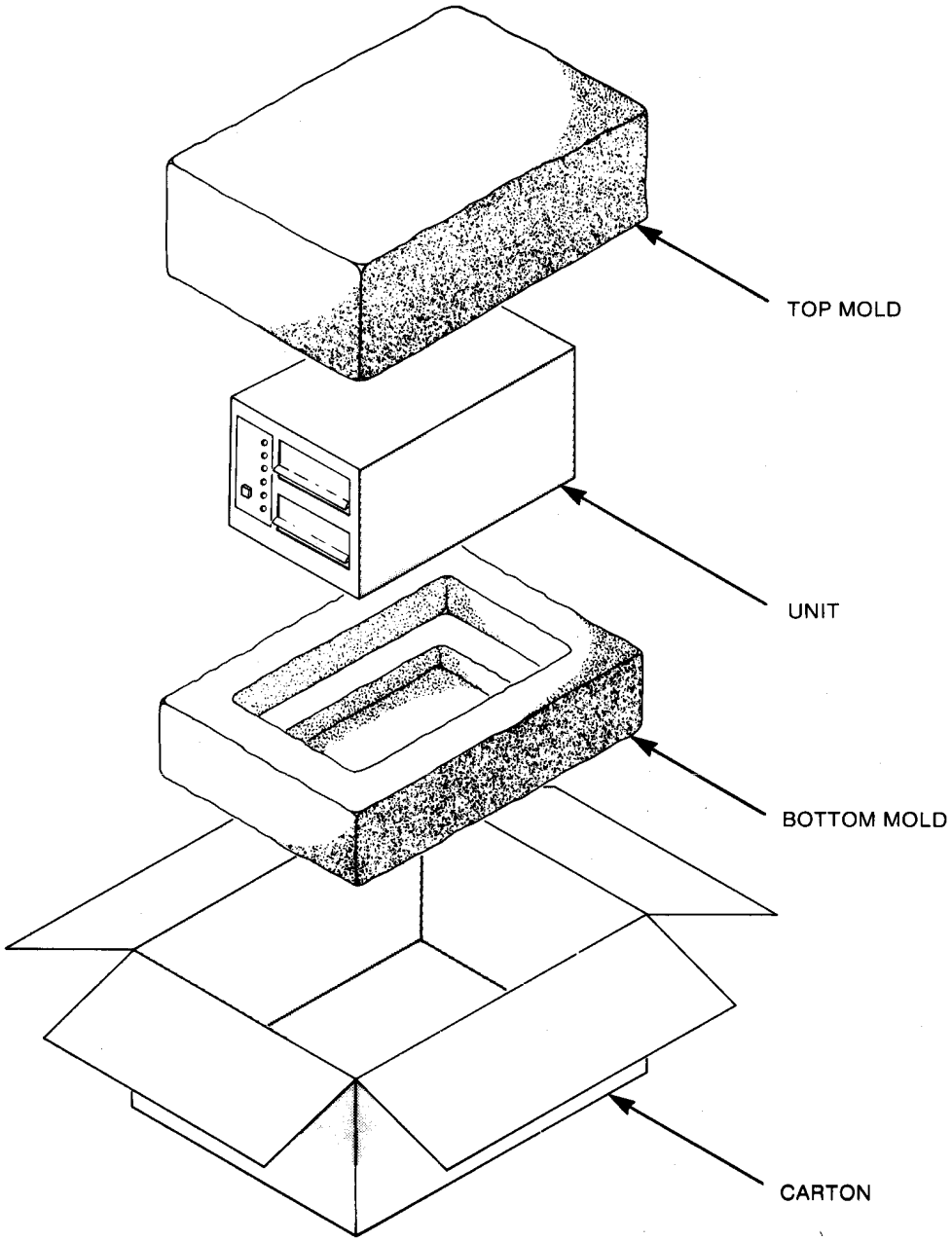


Fig. 1—Packaging Components

5. POWER ON

FRONT PANEL INDICATORS

5.01 The front panel of the Comm-Stor II/SMDR unit has several indicators to assist the operator. Two of the indicators, READY and BUSY, are duplicated in a dual drive unit to provide information about each drive. When the unit is turned on, all lamps are illuminated for a short time to allow the operator to perform a visual lamp test. The function of each indicator is described below (Figure 2).

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.

Status: This indicator has a dual purpose: first, it indicates that data is being transferred to or from any of the ports, and second, it indicates the presence of a parity error. The lamp will normally 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 stay on. No correction procedures are required.

TURNING THE Comm-Stor II/SMDR UNIT ON

5.02 The Comm-Stor II/SMDR unit is to be connected to a power source as described in paragraph 4.05.

5.03 The power switch, located on the rear of the unit, turns the unit on and off and acts as a circuit breaker.

5.04 To turn on the unit, depress the power switch; the RESTART button on the ***front panel*** should illuminate. If it does not light, press the power switch again. It should be noted that there is also a RESTART button on the rear panel of the unit. Both buttons function identically; however, the one on the rear panel is non-illuminating.

5.05 When provided, the terminal must also be turned on. The order in which power is applied will not affect the performance of the Comm-Stor II/SMDR unit.

6. SELECTING THE DISKETTE

Comm-Stor DISKETTES

6.01 This section contains important reference materials but no procedures necessary for installing the system.

6.02 Each diskette is composed of 77 tracks, and each track contains 26 sectors.

A. Data Diskette

6.03 This diskette stores call information; it can store approximately 16,000 call records on a single-sided diskette and 32,000 call records on a double-sided diskette. The Data diskette is placed in the bottom drive of the unit.

B. SMDR Site Diskette

6.04 This diskette contains information about the telephone system that the Comm-Stor II/SMDR unit interfaces with. A double-sided Site diskette should be used in Comm-Stor II/SMDR units that have double-sided drives. The Site diskette is placed in the top drive of the unit.

C. SMDR Site Generation Diskette

6.05 This diskette is used exclusively to build the Site diskette. The Site Generation diskette is placed in the top drive.

D. SMDR System Management Diskette

6.06 This diskette is used to change the operating parameters of the unit, create Refresh diskettes, modify the Site diskette, and copy Data and Site diskettes. The System Management diskette may be placed in either drive.

E. SMDR Rate Center Diskette

6.07 This diskette contains a table of telephone company central switching offices in the United States, Canada, Mexico, Puerto Rico, and the Virgin Islands. Each office is defined by the area code and exchange. It is used to build the Area Code/Exchange Table on the Site diskette.

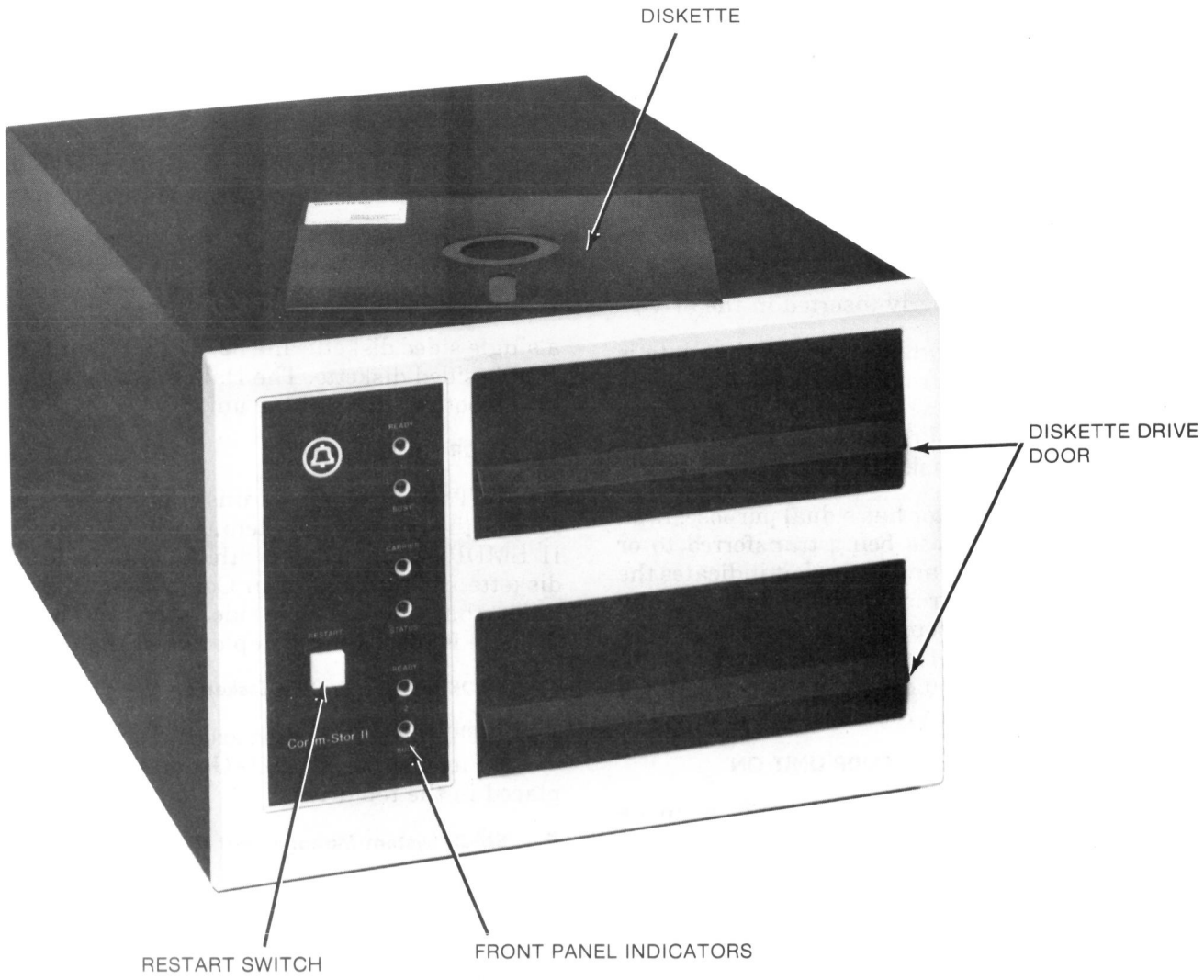


Fig. 2—Front View of the Comm-Stor II/SMDR Unit

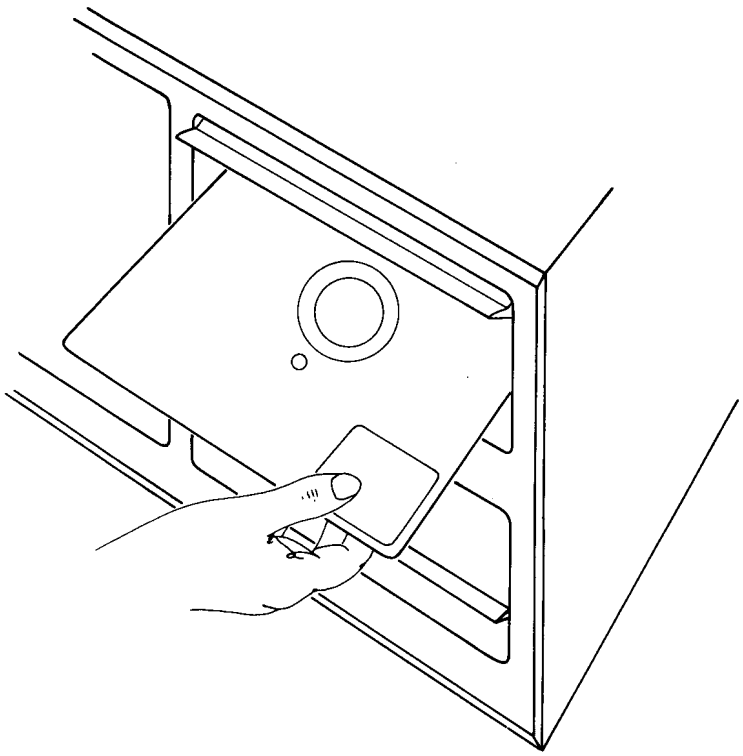


Fig. 3—Inserting the Diskette

F. Refresh Diskette

6.08 Once the unit has been configured with the System Management diskette, it is possible to store this configuration on a blank diskette. This diskette is called a Refresh diskette. It is used to refresh the system if the contents of configuration memory are altered. It is usually placed in the top drive.

G. Diagnostic Diskette

6.09 The Diagnostic diskette (part number 1030A5260) contains prerecorded information for running the Comm-Stor II/SMDR User Diagnostic tests described in Part 7.

> ***Warning: Be sure the Diagnostic diskette is specified for use on Comm-Stor II/SMDR units, as different units require different diskettes.***

INSERTING AND REMOVING THE DISKETTE

6.10 The drive doors (Figure 2) of all Comm-Stor II/SMDR units are equipped with an interlock which prevents them from closing unless a diskette is fully inserted.

6.11 To insert a diskette:

(a) Turn on the Comm-Stor II/SMDR unit.

(b) Grasp the diskette between the thumb and index finger. The label should be face up and toward the operator (Figure 3).

(c) Slide the diskette into the drive.

(d) Exert a slight inward pressure with the index finger and ***gently*** pull the drive door down with the thumb. ***Do not force the door closed!*** A gentle horizontal pressure on the diskette is sufficient to release the interlock. When the door closes, the READY light on the front panel will illuminate, indicating that the respective drive is ready for use.

> ***Warning: It is important that diskettes be inserted only with power on as spindle rotation aligns the diskette. A diskette need not be reinserted if the unit is turned off and on again, provided the door of the drive has not been disturbed.***
>
> ***If the Comm-Stor II/SMDR unit is turned off while a diskette is in the***

drive, opening and reclosing the door may cause mechanical deterioration of the diskette.

6.12 To remove the diskette:

(a) Gently lift the drive door until it is fully open.

(b) Slide the diskette out of the drive.

DISKETTE CARE

6.13 A diskette must be handled with care. Improper treatment or carelessness may result in loss of data, and possibly, many hours of work. Observe the following warnings:

Warning 1: Never touch the exposed diskette surface. Handle the diskette only near the label.

Warning 2: Do not write on the diskette cover; write only on the label using a felt-tip pen. If possible, write on a label before placing it on the diskette.

Warning 3: Do not attempt to clean a dirty or dusty diskette; such a diskette should be discarded.

Warning 4: Keep the diskette away from metals or other potentially magnetic materials or magnetic sources (unshielded power supplies, CRT monitors).

Warning 5: Do not bend the diskette.

Warning 6: Do not expose the diskette to extremes of heat or cold.

Warning 7: Keep the diskette in its protective cover when not in use. Dust and liquid can damage the exposed diskette surface.

Warning 8: Store diskettes vertically in boxes when not in use.

7. DIAGNOSTIC TESTS

7.01 This part describes the procedure for running each of the Comm-Stor II/SMDR User Diagnostic tests and provides a general explanation of the results of those tests. ***If an error occurs at any time during the tests, the unit should be replaced.***

7.02 A technical interpretation of the test results is found in section 578-400-502 ***Test and Troubleshooting.*** This information is required by communications technicians in order to pinpoint the fault and repair the Comm-Stor II/SMDR unit. This section should be consulted any time a diagnostic or system fault occurs.

7.03 Seven tests are provided to test the Comm-Stor II/SMDR unit. Individual tests are selected by setting the modem bit rate switch on the back of the unit (Table A).

TABLE A

MODEM SWITCH SETTINGS

SWITCH SETTING	TEST
1	LED/Switch Test
2	Internal Tests
3	Terminal and Modem Port Tests
5	Printer Port Test
7	Hardware Features Check
8	Configuration Memory Test
9	Diskette Test

7.04 Before inserting the Diagnostic diskette, check the diskette label to verify that it is the correct Diagnostic diskette. Insert the diskette and depress the RESTART button. The LED/Switch test will begin immediately. If the test does not begin, either the wrong diskette has been inserted or the system has a major failure.

7.05 The user may perform any diagnostic test after inserting the diagnostic diskette. ***However, the LED/Switch test and the Hardware Option Check must be performed before any other diagnostic test.*** Further, diagnostics should be performed in the order they are presented in this manual.

7.06 Test information and errors are reported on the front panel light emitting diodes (LEDs). The user should locate the LED ON/OFF arrangement in the Diagnostic Fault Tables provided for each test to determine the faulty component. Because the user diagnostic diskette controls the front panel LEDs, they do not represent their normal system functions.

Note: When running the diagnostic tests sequentially, it is not necessary to turn off or refresh the Comm-Stor II/SMDR unit between tests.

7.07 In addition to the diagnostic fault tables accompanying each test, two system faults may occur. Each is recognized by the blinking of a front panel light. The READY light will blink if a malfunction prevents the Comm-Stor II/SMDR unit from reading the User Diagnostic diskette. The STATUS light will blink if the binary switch is set to EXIT and the modem switch is set to 0.

DEFINITION OF TERMS

7.08

Diagnostic Test Plug—the diagnostic test plug (Figure 4) is a three part EIA connector which has two switches, numbered "1" and "2", for simulating the peripheral cabling. When mounted on the Comm-Stor II/SMDR unit, it covers all three ports. The plug (revision B or higher) is part of the User Diagnostic Kit Option (Sykes part number 1030A5298).

Drive 1—refers to the upper drive of an 8220AS system.

Drive 2—refers to the lower drive of an 8220AS system.

TEST PROCEDURES

7.09

Diagnostic Start-Up Procedure

(a) Turn the Comm-Stor II/SMDR unit on.

(b) Remove any diskettes from the drives. Insert the System Management diskette into drive 1. The System Management menu is displayed. Type 10 followed by a Carriage Return to refresh the system. The Refresh procedure ensures that the Comm-Stor II/SMDR unit is set to the standard factory configuration.

(c) Type 0[CR]. Remove the System Management diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

Note: Do not remove the Diagnostic diskette until instructed.

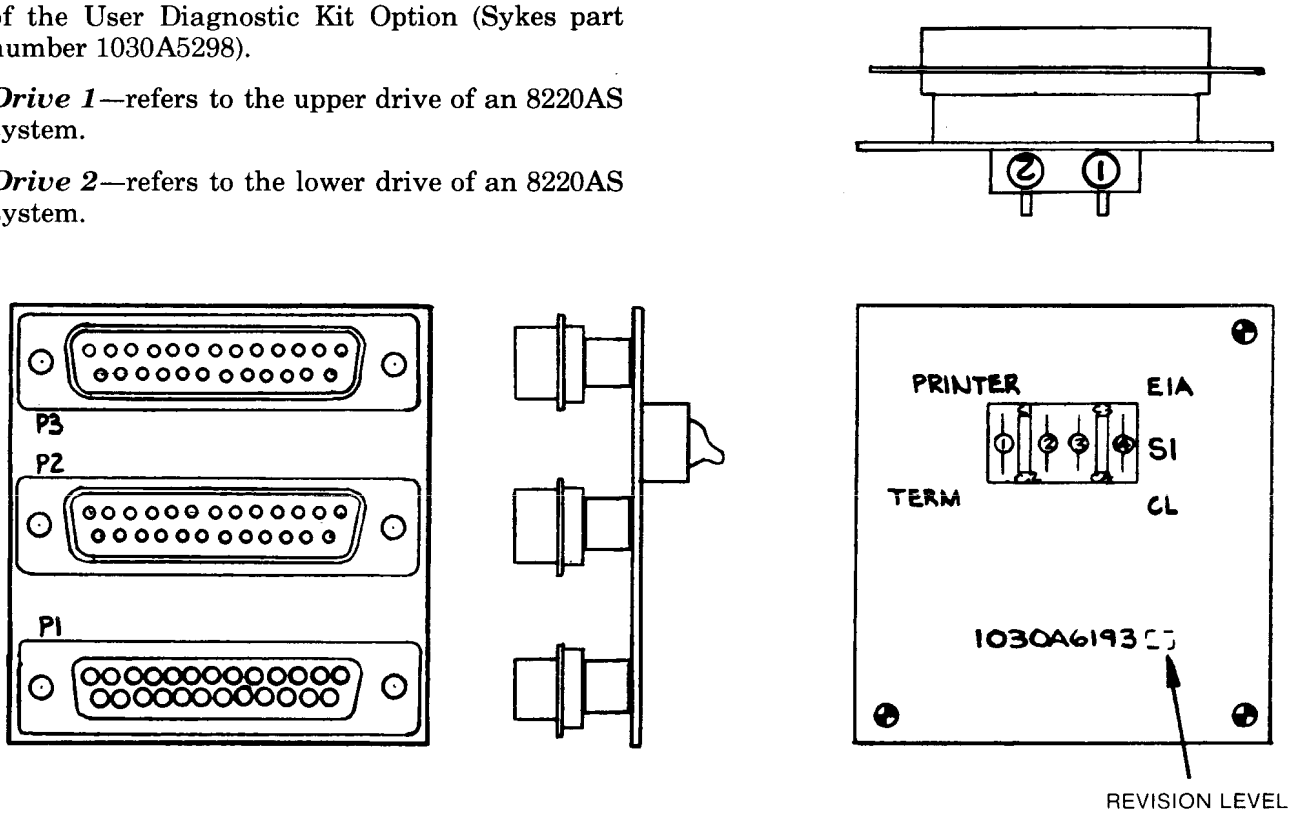


Fig. 4—Diagnostic Test Plug

LED/Switch Test

7.10

(a) Set the modem switch to 1.

(b) Set the binary switch to EXIT. Set the terminal switch to 0. Set the printer switch to 0.

(c) Depress the RESTART button.

(d) LED Test: The front panel LEDs will react immediately as follows:

Requirement 1: All the LEDs are lit (1 second).

Requirement 2: The READY 1 and BUSY 1 LEDs are lit (1/2 second). The READY 1 and BUSY 1 LEDs will illuminate randomly.

Requirement 3: After both the READY 1 and BUSY 1 LEDs go OFF, the visual LED test will be performed. Each LED is lit independently and sequentially (1 second each) in a "walking" pattern. If a LED does not respond, it is defective.

Requirement 4: The READY 1 LED will come on again. In subsequent tests, other LEDs will be lit, representing the modem switch setting.

(e) Bit Rate and Binary Mode Switch Tests:

The switch values are in a logically ORed state, and the test results are represented by the arrangement of the LED display.

Requirement 1: Set the bit rate switches to 0. At this time, the LEDs should be off (not lit).

Requirement 2: Move the binary mode switch to ENTER; the STATUS light should be lit. Move the switch to EXIT; it should be off (not lit).

Requirement 3: Move the printer bit rate switch through its settings of 0-9 (the other bit rate switches should be set to 0). Examine the LEDs at each setting and compare the values displayed with those in Table B. (Each bit rate switch value should generate a corresponding LED display.) If a LED display is incorrect, the switch is defective. Return the printer switch to 0 and follow the same procedure for the terminal and modem bit rate switches.

TABLE B

LED DISPLAY

BIT RATE SWITCH SETTING	LED DISPLAY			
	STATUS	CARRIER	BUSY(1)	READY(1)
BINARY VALUE	8	4	2	1
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON

Note: The LED display is a binary representation of the bit rate switch setting.

Hardware Features Check

7.11

(a) Set the modem switch to 7.

(b) Depress the RESTART button.

(c) The Diagnostic will immediately perform the visual LED test. The user may also perform the Switch test or proceed to step d.

(d) Open and close the drive 1 door.

Requirement: All LEDs will blink in unison.

(e) The installed hardware features will be indicated by a series of LED on/off patterns. To obtain the first pattern, open and close the drive 1 door. Locate the LED on/off pattern on the Comm-Stor II/SMDR unit in the "LED Pattern" column of Table C to determine the hardware feature; record the feature.

(f) Open and close the drive 1 door again to obtain the second LED pattern and locate the associated option in the second column. Follow this procedure until all five patterns have been obtained. Open and close the drive 1 door a final time. The LEDs will blink in unison.

TABLE C

HARDWARE FEATURES

LED PATTERN				PATTERN SEQUENCE				
				1st	2nd	3rd	4th	5th
STS	CAR	BSY (1)	RDY (1)	EXPANDED RAM MEMORY SIZE		NUMBER OF DRIVES/ STANDBY MODE	EDITOR/FORMS OPTIONS	PRINTER PORT/USER COMMAND TABLE OPTIONS
○	○	○	○	—	—	—	—	—
○	○	○	●	NA	OK	1 DRIVE NO STAND-BY	NA	NO PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	○	NA	4K	2 DRIVES NO STAND-BY	NA	PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	●	NA	8K	1 DRIVE STAND-BY	NA	NO PRINTER PORT EXTENDED USER COMMAND TABLE
○	●	○	○	NA	12K	2 DRIVES STAND-BY	NA	PRINTER PORT AND EXTENDED USER COMMAND TABLE
●	○	○	●	NA	28K	—	NA	—

ON ●
OFF ○

For example, if the ***third*** pattern is:

STS	CAR	BSY (1)	RDY (1)
○	●	○	○
(OFF)	(OFF)	(ON)	(ON)

this would indicate that the unit has two drives and the standby mode is installed.

Note 1: If an installed feature is not indicated by the Diagnostic, the associated component(s) either malfunctioned or is not properly installed. A faulty component should be replaced. ***If a feature is not detected by this check, it will not be tested in any of the Diagnostics.***

Note 2: RAM memory size is indicated by the first ***or*** second LED pattern. Therefore, one of these patterns will show ***all the LEDs OFF.*** For example, because the unit contains 28K of RAM memory, the first pattern will be:

○ ○ ○ ○

The second pattern will be:

● ○ ○ ●

Internal Tests: Memory/Diskette/Timer/Bit Rate

7.12

(a) Remove the diagnostic test plug or any cables from the rear panel.

(b) Set the modem switch to 2.

(c) Depress the RESTART button.

(d) The Diagnostic will immediately perform the visual LED test. The user may also perform the Switch Test or proceed to step e.

(e) Open and close the drive 1 door. The Diagnostic will execute the Internal tests. The tests will run about ***10*** minutes.

(f) Upon completion of the test for drive 1, the READY 1 and BUSY 1 lights will blink in unison. Remove the User Diagnostic diskette from drive 1; insert it into drive 2 and close the drive door. Drive 2 tests will last about ***3*** minutes.

Requirement: When the Internal tests are completed, all LED lights will blink in unison. The test results are stored in the tables in memory.

(g) Open and close the drive 2 door.

Requirement 1: If at any time the LEDs blink in unison, go to step (h).

Requirement 2: If a series of LEDs are lit, refer to Table D for the first test results. If ***no*** LEDs are lit, go to requirement 3.

Requirement 3: Open and close the drive door again. If a series of LEDs are lit, refer to Table E for the second group of test results. If ***no*** LEDs are lit, go to requirement 4.

Requirement 4: Open and close the drive door again. If a series of LEDs are lit, refer to Table F for the third group of test results. If ***no*** LEDs are lit, go to requirement 5.

Requirement 5: Open and close the drive door again. If a series of LEDs are lit, refer to Table G for the fourth group of test results. If ***no*** LEDs are lit, go to requirement 6.

Requirement 6: Open and close the drive door again. If a series of LEDs are lit, refer to Table H for the final group of test results. If ***no*** LEDs are lit, go to requirement 7.

Requirement 7: Open and close the door to end the test. All LEDs will blink in unison.

(h) If no further fault conditions exist, the test will end with the LEDs blinking in unison. Those fault tables bypassed by the Diagnostic procedure contain no reportable results.

TABLE D

RAM FAULTS

LIGHT	INTERPRETATION
READY or BUSY	The main memory is faulty. Random and unpredictable operating faults may occur. Replace the Comm-Stor II/ SMDR unit.
CARRIER or STATUS	The expanded memory is faulty. Replace the Comm-Stor II/SMDR unit.

TABLE E

CONFIGURATION MEMORY FAULTS

LIGHT	INTERPRETATION
READY	The main memory is faulty. Random and unpredictable operating faults may occur. Replace the Comm-Stor II/ SMDR unit.
BUSY	The Extended User Command Table is faulty. Replace the Comm-Stor II/SMDR unit.

TABLE F

ROM/TIMER/BIT RATE FAULTS

LIGHT	INTERPRETATION
READY	The main memory is faulty. Random and unpredictable operating faults may occur. Replace the Comm-Stor II/ SMDR unit.
BUSY	A timer fault has occurred. Replace the Comm-Stor II/ SMDR unit.
CARRIER	A bit rate generator is faulty. Replace the Comm-Stor II/ SMDR unit.

TABLE G

DRIVE 1 FAULTS

LIGHT	INTERPRETATION
READY or BUSY	Diskette drive 1 cannot read properly. Replace the Comm-Stor II/SMDR unit.
CARRIER or STATUS	Diskette drive 1 cannot write properly. Replace the Comm-Stor II/SMDR unit.

TABLE H

DRIVE 2 FAULTS

LIGHT	INTERPRETATION
READY or BUSY	Diskette drive 2 cannot read properly. Replace the Comm-Stor II/SMDR unit.
CARRIER or STATUS	Diskette drive 2 cannot write properly. Replace the Comm-Stor II/SMDR unit.

Terminal and Modem Ports Test

7.13

(a) Remove the Diagnostic diskette from drive 2; insert the diskette into drive 1.

(b) Mount the diagnostic test plug on the rear panel. Set switch 1 to the EIA position and switch 2 to the TERM position.

(c) Set the modem switch to 3.

(d) Depress the RESTART button.

(e) The Diagnostic will immediately perform the visual LED test. The user may also perform the Switch test or proceed to step f.

(f) Set the terminal switch, referring to Table I. The modem ***and*** terminal ports will be tested at the specified bit rate.

(g) Open and close the drive 1 door. The Diagnostic will execute the terminal and modem port tests.

(h) The tests will run about *3* minutes.

Requirement: When the tests are completed, all LED lights will blink in unison.

(i) Open and close the drive 1 door.

Requirement 1: If at any time the LEDs blink in unison, go to step (j).

Requirement 2: If a series of LEDs are lit, refer to Table J for the first test results. If ***no*** LEDs are lit, go to requirement 3.

Requirement 3: Open and close the drive door again. If a series of LEDs are lit, refer to Table K for the second group of test results. If ***no*** LEDs are lit, go to requirement 4.

Requirement 4: Open and close the drive door again. If a series of LEDs are lit, refer to Table L for the third group of test results. If ***no*** LEDs are lit, go to requirement 5.

Requirement 5: Open and close the drive door again. If a series of LEDs are lit, refer to Table M for the fourth group of test results. If ***no*** LEDs are lit, go to requirement 6.

Requirement 6: Open and close the door to end the test. All LEDs will blink in unison.

(j) If no further fault conditions exist, the test will end with the LEDs blinking in unison.

Those fault tables bypassed by the Diagnostic procedures contain no reportable results.

TABLE I

BIT RATE SPECIFICATION

This table specifies both the terminal and modem port bit rates. If the rates are different, run the test twice (once at each bit rate).

DESIRED BIT RATE	SWITCH SETTING
110	1
134	2
150	3
300	4
1200	5
2400	6
4800	7
7200	8
9600	

TABLE J

TERMINAL RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION
READY or BUSY	The terminal port cannot receive and/or transmit characters properly. Replace the Comm-Stor II/SMDR unit.
CARRIER	One or more of the following faults may occur: 1. The terminal port may not respond to a break (i.e., long space) from the terminal. 2. The terminal port cannot send a break to the terminal. 3. A terminal parity error indication may be falsely given. Replace the Comm-Stor II/SMDR unit.
STATUS	The STATUS light is not used.

TABLE K

TERMINAL EIA CONTROL FAULTS

LIGHT	INTERPRETATION
READY BUSY CARRIER or STATUS	The terminal port is faulty. Replace the Comm-Stor II/SMDR unit.

TABLE L

MODEM RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION
READY or BUSY	The modem port cannot receive and/or transmit characters properly. Replace the Comm-Stor II/SMDR unit.
CARRIER	One or more of the following faults may occur. 1. The modem port may not respond to a break (i.e., long space) from the modem. 2. The modem port cannot send a break to the modem. 3. A modem parity error indication may be falsely given. Replace the Comm-Stor II/ SMDR unit.
STATUS	Under certain conditions, transmission from the modem to the terminal may be faulty. Replace the Comm-Stor II/ SMDR unit.

TABLE M

MODEM EIA CONTROL FAULTS

LIGHT	INTERPRETATION
READY BUSY CARRIER or STATUS	The modem port is faulty. Replace the Comm-Stor II/ SMDR unit

Printer Port Test

7.14

(a) Mount the diagnostic test plug on the rear panel and set switches 1 and 2 to the EIA and PRINTER positions, respectively.

(b) Set the modem switch to 5.

(c) Depress the RESTART button.

(d) The Diagnostic will perform the visual LED test. The user may also perform the Switch test or proceed to step e.

(e) Set the terminal switch, referring to Table I.

(f) Open and close the drive 1 door. The Diagnostic will execute the Printer Port test.

(g) The test will run about ***3*** minutes.

Requirement: When the test is completed, all LED lights will blink in unison.

(h) Open and close the drive 1 door.

Requirement 1: If at any time the LEDs blink in unison, go to step (i).

Requirement 2: If a series of LEDs are lit, refer to Table N for the first test results. If ***no*** LEDs are lit, go to requirement 3.

Requirement 3: Open and close the drive door again. If a series of LEDs are lit, refer to Table O for the second group of test results. If ***no*** LEDs are lit, go to requirement 4.

Requirement 4: Open and close the drive door again. If a series of LEDs are lit, refer to Table L for the third group of test results. If ***no*** LEDs are lit, go to requirement 5.

Requirement 5: Open and close the drive door again. If a series of LEDs are lit, refer to Table M for the fourth group of test results. If ***no*** LEDs are lit, go to requirement 6.

Requirement 6: Open and close the door to end the test. All LEDs will blink in unison.

(i) If no further fault conditions exist, the test will end with all the LED lights blinking in unison. Those fault tables bypassed by the Diagnostic procedures contained no reportable results.

TABLE N

PRINTER RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION
READY or BUSY	The printer port cannot receive and/or transmit characters properly. Replace the Comm-Stor II/SMDR unit.
CARRIER	The printer port may not be able to send a break (i.e., long space). Replace the Comm-Stor II/SMDR unit.
STATUS	The STATUS light is not used.

TABLE O

PRINTER EIA CONTROL FAULTS

LIGHT	INTERPRETATION
READY BUSY CARRIER or STATUS	The printer port is faulty. Replace the Comm-Stor II/SMDR unit.

Configuration Memory Test

7.15

(a) Remove the diagnostic test plug from the back panel.

(b) Set the modem switch to 8. Set the terminal switch to 0.

(c) Depress the RESTART button.

(d) The Diagnostic will immediately perform the visual LED test. The user may also perform the Switch test or proceed to step e.

(e) Open and close the drive 1 door. The Diagnostic will execute the Configuration Memory test.

Requirement: When the BUSY LED comes on and stays on, turn the Comm-Stor II/SMDR unit OFF.

(f) Wait about 1 minute. Turn the Comm-Stor II/SMDR unit ON; the Diagnostic will again perform the visual LED test.

Requirement 1: Open and close the drive 1 door. If the BUSY LED or CARRIER LED begins blinking, refer to Table P.

Requirement 2: If no faults occur, the BUSY LED will come on and stay on. Turn the Comm-Stor II/SMDR unit OFF and proceed to step g.

(g) Wait about 1 minute. Turn the Comm-Stor II/SMDR unit ON; the Diagnostic will again perform the visual LED test. Open and close the drive 1 door.

Requirement: If no faults occur, all LEDs will blink in unison. If the BUSY LED or CARRIER LED begins blinking, refer to Table P.

Note: The user should wait at least 1 minute between steps e, f, and g. However, if the suspected Configuration Memory fault is time related, more or less time may be required between steps for the fault to appear.

If the problem is heat related, the user may depress the RESTART button between steps rather than turn the Comm-Stor II/SMDR unit off.

(h) The Diagnostic diskette may be removed at this time.

or

Leave the Diagnostic diskette in the drive and proceed to the ***Diskette Test.***

TABLE P

CONFIGURATION MEMORY FAULTS

BLINKING LIGHT:	INTERPRETATION
BUSY	The battery or the main configuration memory is faulty. Replace the Comm-Stor II/SMDR unit.
CARRIER	The battery or the Extended User Command Table memory is faulty. Replace the Comm-Stor II/SMDR unit.

Diskette Test

7.16

Note: The user should first verify the system's operation by running the Internal Tests.

(a) Set the modem switch to 9.

(b) Depress the RESTART button.

(c) The Diagnostic will immediately perform the visual LED test. The user may also perform the Switch test or proceed to step d.

(d) Open and close the drive 1 door.

Requirement 1: When the READY and BUSY LEDs begin blinking, remove the Diagnostic diskette. Insert the diskette to be tested into drive 1; close the drive door.

Requirement 2: The READY 1 and BUSY 1 LEDs will stop blinking but remain on while the test is performed. The test will run about 2 minutes.

Requirement 3: If the test is completed without errors, the READY 2 and BUSY 2 LEDs will start blinking. This indicates that data stored on the diskette can be read without errors. The diskette should be removed from drive 1; another diskette may be inserted and tested at this time. (Additional diskettes may be tested by alternating between drives 1 and 2.)

Requirement 4: If an error occurs, a CARRIER LED will blink; the faulty diskette should be removed. The user must insert the Diagnostic diskette and return to step (b) to perform additional diskette tests. The user may attempt to copy the faulty Data diskette in order to save valuable data. The faulty diskette should then be discarded as DISKETTE ERROR or READ ERROR messages may occur. This is usually caused by a scratch on the diskette. Review the diskette handling procedures.

7.17 This completes the Diagnostic test procedures. Proceed to Part 8.

TABLE Q

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	in

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.

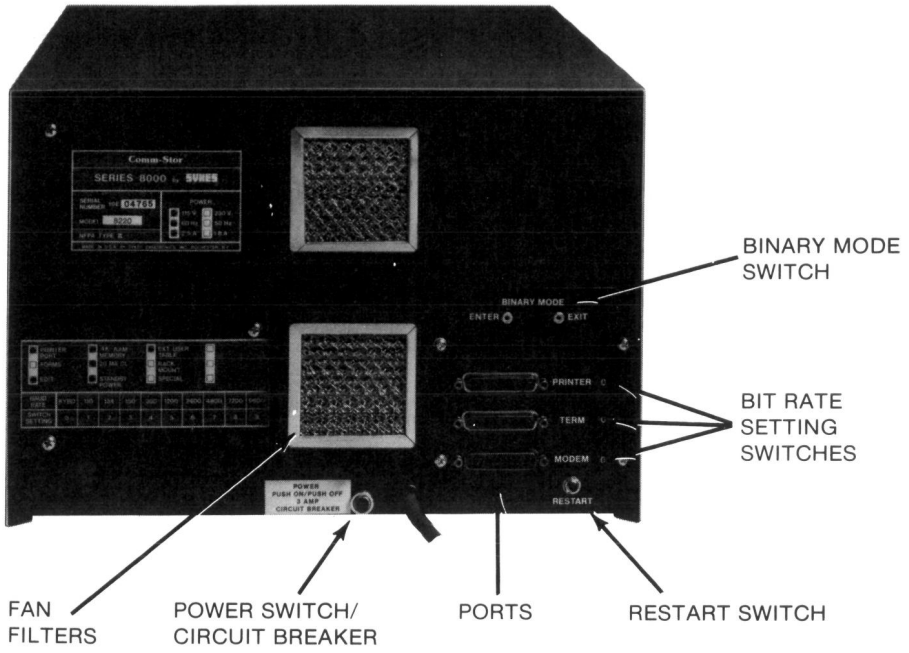


Fig. 5—Rear View of the Comm-Stor II/SMDR Unit

8. CABLE INSTALLATION

GENERAL

8.01 The terminal, Dimension PBX, and data set are connected to the Comm-Stor II/SMDR unit via industry standard connectors on the rear of the unit (Figure 5). These connectors commonly called "ports", conform to the Electronic Industries Association (EIA) specification RS-232C.

8.02 There are two methods of connecting the Comm-Stor II/SMDR unit. The first provides for direct connection to the Dimension output as shown in Figure 6. The second method allows for remote installation through private line asynchronous data sets. The Com-Stor II/SMDR unit and the terminal are located at a remote site (Figure 7).

8.03 Cables connect to the ports on the rear of the unit. No special wiring of the cables is necessary.

8.04 Table Q shows the EIA interface signal connectors for the terminal and printer ports. These ports are also described in paragraphs 8.05 to 8.08. The modem port is not used.

TERMINAL PORT

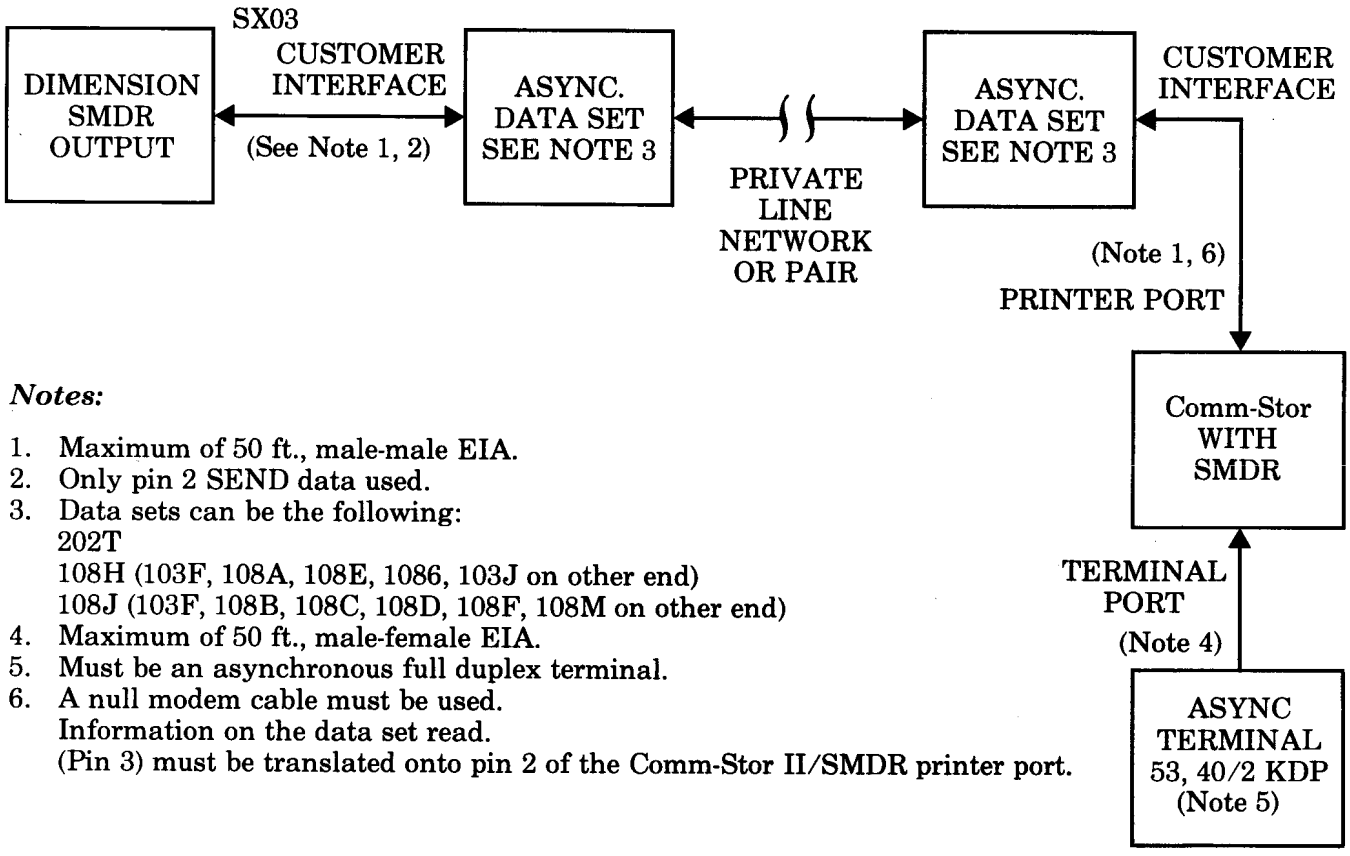
8.05 The cable from the terminal connects to the port labeled TERM. This cable should have a male plug in accordance with industry standard procedures.

8.06 Place the terminal in the full duplex mode for all operations. Place the terminal in the Send/Receive mode.

Notes:

1. Maximum 50 ft., male-male EIA cable.
2. Only pin 2—send data is used.
3. Maximum 50 ft., male-female EIA cable.
4. Must be an asynchronous full duplex terminal.

Fig. 6—Comm-Stor II/SMDR/Dimension Direct Connect



Notes:

1. Maximum of 50 ft., male-male EIA.
2. Only pin 2 SEND data used.
3. Data sets can be the following:
   202T
   108H (103F, 108A, 108E, 1086, 103J on other end)
   108J (103F, 108B, 108C, 108D, 108F, 108M on other end)
4. Maximum of 50 ft., male-female EIA.
5. Must be an asynchronous full duplex terminal.
6. A null modem cable must be used.
   Information on the data set read.
   (Pin 3) must be translated onto pin 2 of the Comm-Stor II/SMDR printer port.

Fig. 7—Comm-Stor II/SMDR/Dimension Remote Connect

PRINTER PORT

8.07 Using a cable with male connectors, connect the SX03 pin of the Dimension SMDR Direct Output interface to the printer port of the Comm-Stor II/SMDR unit as shown in Figures 6 and 7. Information on the Dimension output SX03, pin 2, must be connected to pin 2 of the Comm-Stor II/SMDR unit's printer port. For remote installations, a male cable is required between the data set and the Comm-Stor II/SMDR unit's printer port.

MODEM PORT

8.08 This port is not used.

9. SETTING TRANSMISSION RATES

GENERAL

9.01 The terminal should not have a lower transmission rate than the modem.

9.02 Transmission rates may be set from the thumbwheel switches on the back of the Comm-Stor II/SMDR unit. Each port on the rear of the unit has a corresponding thumbwheel switch which sets the transmission rate for that port. The switches contain the numbers 1 through 9 which relate to a particular bit rate in accordance with the table on the rear of the unit. To set the bit rate, rotate the thumbwheel switch until the proper number appears. The RESTART switch must be depressed after changing any of the bit rate switches as the Comm-Stor II/SMDR unit will not recognize the new bit rate setting until this is done.

10. CONFIGURATION PROCEDURES

10.01 Be sure that the terminal is placed in the on-line condition. All conversation with the Comm-Stor II/SMDR unit takes place with the terminal on-line. Before proceeding, be certain that the Comm-Stor II/SMDR unit is turned on.

10.02 Table R provides instructions for configuring the Comm-Stor II/SMDR unit.

TABLE R

CONFIGURING THE Comm-Stor II/SMDR UNIT

TERMINAL DISPLAY	PROCEDURE
	Insert the System Management diskette into drive 1.
PLEASE SELECT 1 OF THE FOLLOWING: 0 = EXIT 1 = CONFIGURE SYSTEM PARAMETERS 2 = COST ASSIGNMENT TABLE MAINTENANCE 3 = BUILD AUTOMATIC REPORT CONTROL FILE 4 = SELECT SUMMARY SUB REPORTS 5 = CREATE REFRESH DISKETTE 6 = COPY DISKETTE 7 = CHANGE COMPANY NAME 8 = UPDATE AREA CODE/EXCHANGE TABLE 9 = UPDATE RATE/DISCOUNT TABLES 10 = REFRESH TO FACTORY STANDARD	Enter 1[CR].

TABLE R (Cont)

CONFIGURING THE Comm-Stor II/SMDR UNIT

TERMINAL DISPLAY	PROCEDURE
PLEASE TYPE FRAMING CHARACTER:	The character entered here will be typed ***before*** and ***after*** responses to the configuration parameters. Any character is acceptable; however, it cannot be part of any response during configuration. The recommended character is the slash (/). Enter the framing character.
TYPE 'F[CR]' TO EXIT	The period (.) is a "prompt" character. Enter ***one*** of the commands listed in Table S.

TABLE S

CONFIGURATION COMMANDS

COMMAND	DESCRIPTION
C[CR]	Configure ***all*** parameters.
D[CR]	Display ***all*** parameters.
Cnn[CR]	Configure parameter number "nn".
Dnn[CR]	Display parameter number "nn".
[CR]	Configure or display the ***next*** parameter.
.[CR]	Reconfigure or redisplay the ***same*** parameter.
F	The configuration process is finished. The System Management menu is redisplayed.

The period prompt is displayed before an operation.

Enter C[CR] to configure ***all*** parameters.

TABLE R (Cont)

CONFIGURING THE Comm-Stor II/SMDR UNIT

TERMINAL DISPLAY	PROCEDURE
1: "End of Line" Character	The parameters will be displayed in sequential order, one at a time. When the cursor or printhead pauses, enter the required information. There are two types of parameters: those requiring a YES or NO response and those requiring specific characters or values. When responding YES or NO, enter only a Y or an N; do ***not*** type the full word YES or NO. For example: /Y/ When responding to all other parameters, enter the character or value between the framing characters as shown: /1/

11. OPERATIONAL CHECKOUT (ON-LINE TESTS)

11.01 An operational checkout should be performed after installation or when troubleshooting. Procedures for checkout and correction of operational difficulties are provided in Section 578-400-502, ***Test and Troubleshooting Procedures.*** Consult the appropriate Bell System practices for data sets and terminals.

12. MODEL 43 TELEPRINTER INTERFACE PROCEDURES

12.01 Table T lists the procedure required for interfacing the 43 Teleprinter. Although configuration information is given, the installer should not attempt to reconfigure the Comm-Stor II/SMDR unit. When required, the appropriate Refresh diskette will be supplied by the user.

INTERFACE PROCEDURES

(a) Connect the EIA cable(s) as follows:

Direct connection: Connect the female connector to the Teleprinter, and the male connector to the Comm-Stor II/SMDR unit's terminal port.

Remote connection: Connect the output of the Comm-Stor II/SMDR unit to the data set using a male-male connection ***less than 50 feet long.***

(b) Set the Comm-Stor II/SMDR unit's terminal bit rate switch to:

5 (1200 bits)—for 120 CPS operation*
4 (300 bits)—for 30 CPS operation
1 (110 bits)—for 10 CPS operation
0—permits bit rate selection from terminal keyboard.*

(c) Set terminal for full duplex operation.

(d) Enable or disable parity detection. If parity detection is ***enabled,*** configure Parameter #21:

Even Parity
7 Data Bits

*These options are not available on Model 43 terminals.

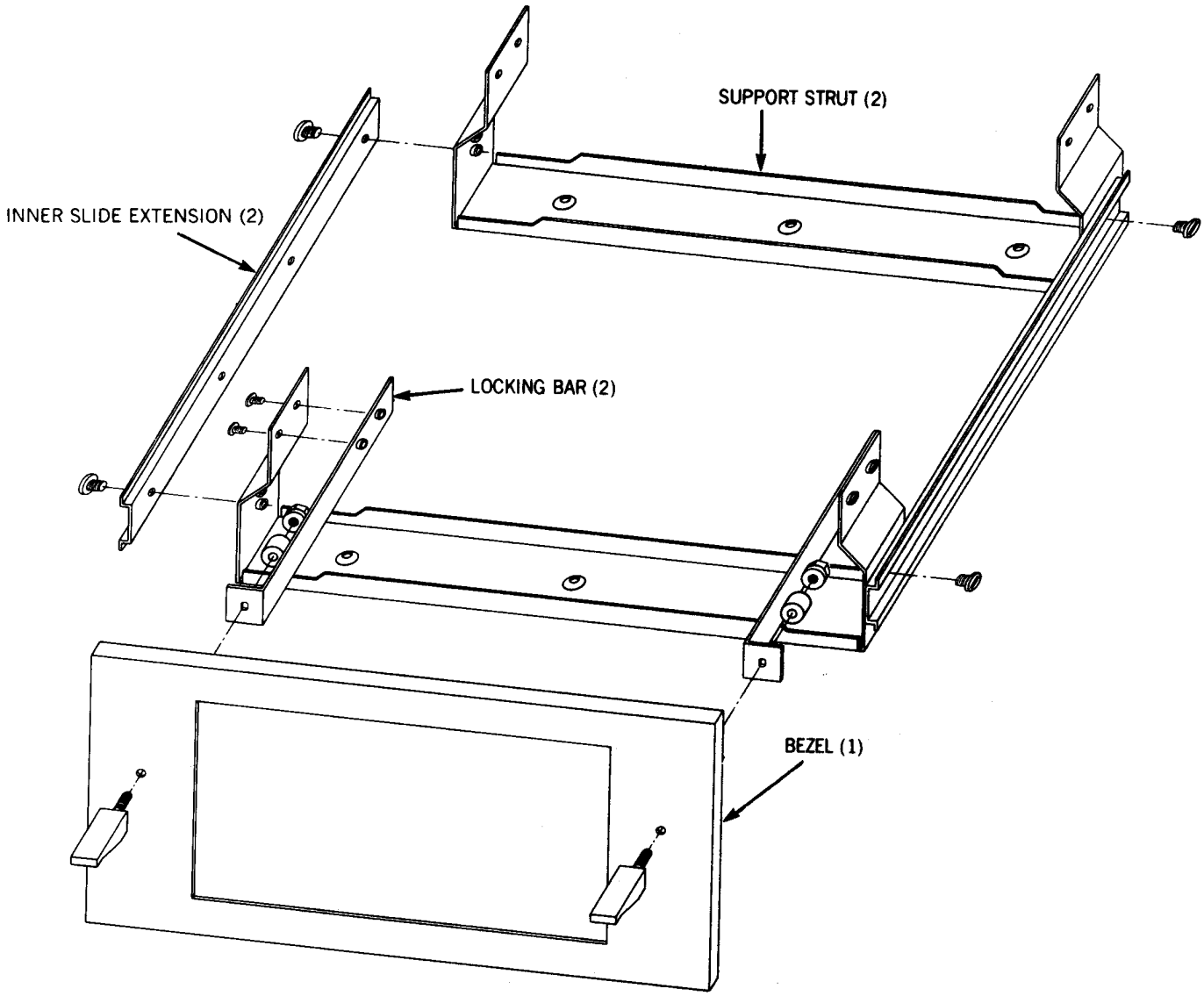


Fig. 8—Rack Slide Assembly Installation Components

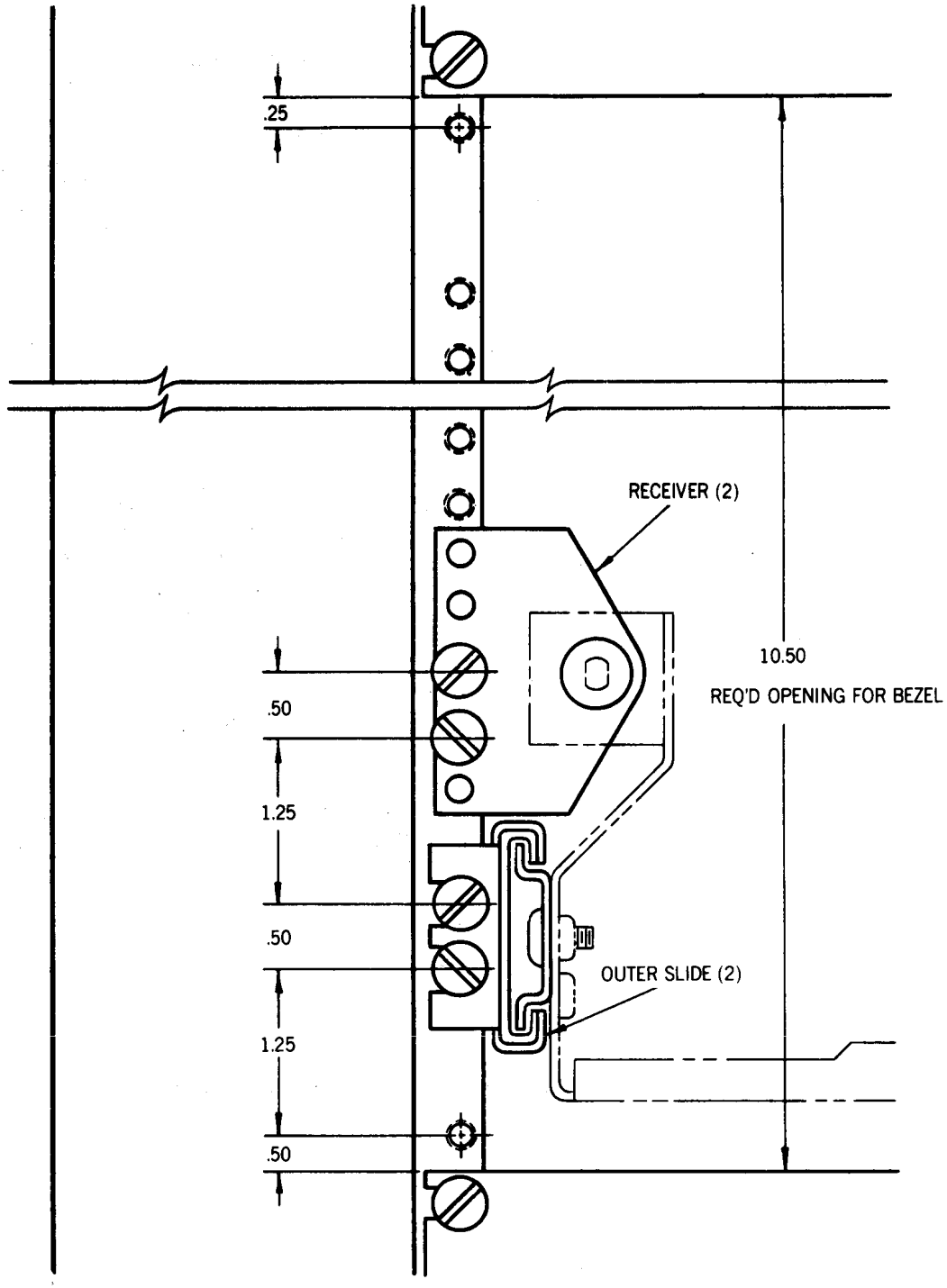


Fig. 9—Rack Slide Receiver Installation

TABLE T

Comm-Stor II/SMDR CONFIGURATION FOR MODEL 43 TELEPRINTERS

Comm-Stor II/SMDR PARAMETER NUMBER	DESCRIPTION	REQUIRED VALUE
18	Delete Character Entered	[RUB]
19	Delete Character Echoed	(\)
21	Terminal Parity*	Even, 7 bits
13	Modem Parity*	Even, 7 bits

*It is recommended that this parameter be set to the value required by the communications system in use.

(e) Set the Comm-Stor II/SMDR unit's ***printer*** bit rate switch to:

5 (1200 bits)—for 120 CPS operation*
4 (300 bits) operation
1 (110 bits)—for 10 CPS operation

If parity detection is ***disabled,*** configure Parameter #21 to factory standard values:

No Parity
8 Data Bits
8th Bit Deasserted

Note: The terminal must be ***faster*** than the printer port.

(f) Configure the parameters listed in Table T as indicated.

(g) Those parameters not specified above or in Table T should remain at factory standard values.

12.02 Table U lists the procedure required for interfacing a 40/2 KDP Teleprinter.

INTERFACE PROCEDURES

(a) Connect the EIA cable: Female to the Teleprinter, male to the Comm-Stor II/SMDR unit's terminal port.

(b) Set the Comm-Stor II/SMDR unit's terminal bit rates to 5 or 6 (1200 or 2400 bps).

(c) Set the 40/2 KDP for option 3b or 3c.

(d) Set the 40/2 to S/R FDX (option 41b).

(e) Set the 40/2 option 42a for even parity.

(f) Specify the Comm-Stor II/SMDR unit's configurable parameter #21 for: even parity—7 data bits.

TABLE U

Comm-Stor II/SMDR CONFIGURATION FOR MODEL 402/2 KDP

Comm-Stor II/SMDR	DESCRIPTION	REQUIRED VALUE
10	Delete Character Entered	(BS)
19	Delete Character Echoed	(BS)
16	Delay Factor (Terminal) 6 (180 ms)	6

13. INSTRUCTIONS FOR INSTALLATION OF RACK MOUNTED 8220 AS SYSTEM

13.01 To install the 19 inch flush rack mount and slides, proceed as follows (refer to Figures 8 and 9):

(a) Remove the inner section of the slide assemblies and attach to the support struts as shown (Figure 6) using four #10-32 × 3/8 screws. Use the upper thread inserts of the support strut.

(b) Attach the two locking bars in position using four #8-32 × 1/4 screws.

(c) Mount the bezel to the chassis assembly as follows. Remove the four screws from the bottom of the cover on the underside of the unit and slide the cover off from the rear of the unit.

*This option is not for use on Model 43 terminals.

Slide the bezel over the chassis from the rear of the unit until it mates with the recessed perimeter on the back of the front panel. Replace the top cover and four screws.

The bezel has two small holes on its face. These holes must be toward the bottom.

(d) Check that the two outer telescoping sections of the slide assemblies mate with the inner sections on the support assembly and install in the rack cabinet as shown (Figure 7) using either two #10-32 × 3/8 or #12-24 × 3/8" screws as required for each of the front brackets, and #10-32 × 3/8 screws and nut plates as required to secure the rear portions of the slides to the rack.

(e) Fasten the receives using two #10-32 × 3/8 or #12-24 × 3/8* screws as required. Observe the diagrams carefully as the mounting dimensions are very important. The locating dimensions should be followed to insure proper operation of the slide mechanism and latches. The receivers have a five hole pattern for mounting. Also, the receivers have an offset with a large single hole. This offset must be outermost (toward viewer) when mounted to the rack.

(f) The slide rack assembly may now be inserted into the cabinet. Check the alignment of the entire slide assembly to insure proper operation from the collapsed to the fully extended position. Make any necessary adjustments to the slide assembly and retighten all the screws.

(g) Remove the slide assembly and attach it to the bottom of the chassis/bezel assembly by aligning the chassis mounting holes with the support strut mounting holes. Each of the support struts has three mounting holes for this purpose. On the front support strut use only the two outermost holes. On the rear strut use only the center hole. Secure the chassis with three #8-32 × 5/8 flat head screws.

(h) Insert the threaded portion of a latch through one of the small holes on the face of the bezel and the locking bar behind it. Place the rubber bushing on the threaded portion of the latch behind the locking bar and install the special plastic nut finger tight only against the rubber bushing. Be certain the latch is in a released position, i.e., the latch is protruding ***away*** from the bezel face in a horizontal position.

Install the second latch assembly in the same manner.

(i) Insert rack-slide/chassis-bezel assembly into the cabinet. (Do not push the outer portions of the bezel as permanent damage may result. The latches or adjacent areas are better suited for this.)

The rubber bushings or the latch assemblies should engage with holes in the receivers. When the bezel is seated firmly against the rack, the unit is secured by firmly pressing down on the latches until they are resting against the face of the bezel.

(j) To open the unit, grasp the latches between the thumb and forefinger and lift upwards and away from the bezel face until both are released. The latches are then used as handles to pull the unit out to the fully extended position.

(k) The binary switch on the rear panel of the unit must be placed in the EXIT position and remain as such; the front switch will now override it.

14. TOOLS, SUPPLIES, AND DISKETTES

14.01 The following tools and supplies may be required for installing or servicing the Comm-Stor II/SMDR unit. Most of these items should normally be present in standard maintenance tool kits.

TOOLS

Nut Driver, 1/4"
Nut Driver, 11/32"
Wrench, Hex Key 3/32"
Wrench, Hex Key 1/16"
Wrench, Hex Key 5/64"
Subminiature Long Nose Pliers
Flat Needle File or Fine Emery Board
Screwdriver, Phillips 1/4", 4" blade, 2 point size
Screwdriver, Phillips 1/8", 2" blade, 0 point size
Screwdriver, Slotted 1/4", 4" blade
Screwdriver, Slotted 1/8", 2" blade
Tweezers
Static Ground Strap (Simco Neutrostat, 3M Velostat, or equivalent)

*Older racks may have #12-24 mounting holes. Hardware is not supplied with the kit.

IC Removal and Insertion Tool (Jensen #331B202 and #331B102)

SUPPLIES

Head Cleaner Solution (Miller Stephenson—MS200 or Isopropyl Alcohol)

Soft Wiping Cloth (Lint-free)

Contact Cleaner (Miller Stephenson MS230)

Fan Filter Spray Super Filter Coat #1, Research Products Corp.

Conductive Foam Blocks (for holding ICs)

DISKETTES

14.02 The following diskettes are required for installing or servicing the Comm-Stor II/SMDR unit:

User Diagnostic Diskette
(contained in Kit 1030A5298 comprising diskette and test plug)

Data Diskettes (Sykes part number 1030A5185)

Site Generation Diskette

System Management Diskette

Rate Center Diskette