"COMM-STOR*" II COMMUNICATIONS STORAGE UNIT

TESTING AND TROUBLESHOOTING PROCEDURES

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 578-400-500.

1.02 This section is reissued to provide information on improved diagnostic test procedures (Part 5).

1.03 Testing and troubleshooting procedures covering the COMM-STOR II Communications Storage Unit are contained in the attached reprint of the practice prepared by Sykes Datatronics, Incorporated. (No special equipment is required for the procedures described in the practice.)

1.04 This section does not apply to COMM-STOR II units equipped for 8A1/8B1 protocol operation on COMM-STOR II/SMDR (Station Message Detail Recording) units. Testing and troubleshooting procedures for 8A1/8B1 units are described in Sections 578-400-501 and -502 for COMM-STOR II SMDR units.

1.05 An operation checkout should be performed after installation or on trouble calls. It may be a brief checkout to ensure that the station is operable or a complete checkout to exercise all features and options. Since off-line checkout procedures do not check the interface or send and receive capabilities, an on-line checkout is also required to completely test the COMM-STOR II unit. (See Section 668-140-500, "Remote Test Procedures.")

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Comm-Stor* II

COMMUNICATIONS STORAGE ARRANGEMENT

TEST AND TROUBLESHOOTING PROCEDURES

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TABLES

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1. GENERAL

1.01 This section provides testing and troubleshooting procedures for the Comm-Stor® II Communications Storage Unit, hereafter referred to as the Comm-Stor II unit. No special equipment is required for the procedures described herein.

1.02 This section has been reissued to provide information on improved diagnostic test procedures (Part 5).

1.03 This section does not apply to Comm-Stor II units equipped for 8A1/8B1 protocol operation on Comm-Stor II/SMDR units. Test and troubleshooting procedures for 8A1/8B1 units are described in Section 578-400-501, and Section 578-400-502 for Comm-Stor II/SMDR units.

1.04 An operational checkout should be performed after installation or on trouble calls. It may be a brief checkout to make sure the station is operable, or a complete checkout to exercise all features and options. Since off-line checkout procedures do not check the interface or send and receive capabilities, an on-line checkout is also required to completely test the Comm-Stor II unit.

1.05 With the station arrangement properly interfaced to the system where it will be used, conduct a complete checkout of send and receive capabilities, taking into account all option and feature variables. Check all operational modes in sending to or receiving from another station in the system.

1.06 Use the local checkout for installation if a complete checkout has been performed prior to installation. Continue with a complete checkout, if needed, to check all features and options.

1.07 On maintenance or trouble calls at a location, confine the checkout to the specified trouble area. Use the local checkout to isolate poorly defined trouble areas. Perform a complete checkout after an extensive repair.

1.08 If the indicated response is not obtained in any step of a checkout procedure, repeat the step to make sure that the procedure has been performed correctly. If the results are still unsatisfactory, replace the module indicated as the possible cause.

1.09 As a further aid to troubleshooting, refer to the wiring diagrams for the Comm-Stor II unit in Section 578-400-400. For help in identifying components, refer to Section 578-400-700, Disassembly/Reassembly and Parts.

DANGER AND WARNINGS

1.10

Danger: Turn off all power and remove all EIA connectors from the rear of the Comm-Stor II unit before removing or replacing any module or component.

Warning 1: To avoid possible internal damage to circuitry, wear a static discharge strap (TP 346 392) 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:

- ***Never touch the exposed diskette surface. Handle the diskette only near the label.***
- ***Do not write on the diskette cover; write only on the label. If possible, write on the label before placing it on the diskette.***
- ***Do not attempt to clean a dirty or dusty diskette; such a diskette should be discarded.***

- *Keep the diskette away from potentially magnetic materials (paper clips, etc.) or magnetic sources (unshielded power supplies, CRT monitors, etc.).*
- *Do not bend the diskette.*
- *Do not expose the diskette to extremes of heat or cold.*
- *Keep the diskette in its protective cover when not in use.*
- *Store diskettes vertically in boxes when not in use.*

2. PRELIMINARY CHECK

2.01 Before turning on any equipment, check that the station is connected to a properly grounded AC service. Also check the seating of all circuit boards and cable connectors.

2.02 If there are operational difficulties with a Comm-Stor II unit, peripheral devices such as the terminal, data set, and printer should be checked, depending on the area of difficulty.

2.03 Also, a check of the Comm-Stor II unit's variable configuration data should be made. All configuration parameters should be checked and changed if required.

2.04 If difficulties are encountered with data transfers on and off a diskette, other diskettes should be tried and a check should be made of diskette handling procedures.

3. USER DIAGNOSTIC DESCRIPTION

3.01 The User Diagnostic Kit (SYKES Part No. 1030A5191) consists of a Diagnostic diskette and a 3-port EIA connector plug (Fig. 1). The test procedure is automatically loaded from the diskette into the Comm-Stor II unit's memory when the test is performed. In the first half of the test interval, tests are performed on the unit's memory, diskette drive, and other internal system devices.

3.02 The results of tests A - H are displayed on the front panel LEDs, allowing the tests to operate independently of the terminal.

USER DIAGNOSTIC TESTS

Test A — LED/Switch Test

Test B — Hardware Features Check

Test C — Internal Tests: Memory / Diskette / Timer/ Bit Rate

Test D — Terminal and Modem Ports Test

Test E — Printer Port Test

Test F — Isochronous Operation Test

Test G — Configuration Memory Test

Test H — Diskette Test

Test M — RAM Memory Test*

Test V — Drive/Diskette Verify Test*

Test CM — CMOS Volatility Test*

*These tests must be run with a terminal attached to the Comm-Stor II unit.

4. BASIC TROUBLESHOOTING PROCEDURE

4.01 All troubleshooting procedures should begin by loading or attempting to load the User Diagnostic diskette as described in Part 5.

4.02 Because of the complicated interconnection of circuitry, it is recommended that a spare set of modules be used to swap/verify the operation of questionable areas as described in the User Diagnostic Procedure.

4.03 If the unit is completely dead, or will not load and execute the User Diagnostic Procedure, refer to Table S, Checklist #1 in Part 6 of this section.

4.04 If the unit passes all tests in the diagnostic procedure, but other difficulties are still experienced, refer to Table T, Checklist #2 in Part 7 of this section.

5. USER DIAGNOSTIC PROCEDURE

5.01 If a Comm-Stor II unit malfunction prevents reading the User Diagnostic diskette, the READY light will blink.

5.02 The STATUS light will blink if one of the following conditions exists:

(1) the binary switch is set to EXIT and the modem switch is set to 0,

(2) the user has inserted the incorrect Diagnostic diskette for the system being tested.

5.03 The diagnostic test plug has two switches, numbered "1" and "2", for simulating peripheral cabling. The plug is placed over ***all three*** EIA ports. Figure 1 illustrates the test plug.

TABLE A

TEST SELECTIONS

MODEM SWITCH SETTING	TEST
1	LED/Switch Test
2	Internal Tests
3	Terminal and Modem Ports Tests
4	Reserved
5	Printer Port Test
6	Isochronous Operation Test
7	Hardware Features Check
8	Configuration Memory Test
9	Diskette Test

5.04 Tests are selected by setting the modem bit rate switch on the back of the unit (Table A). The LED/Switch test and the Hardware Features Check must be performed ***before*** any other diagnostic test. Furthermore, diagnostics should be performed in the order they are presented in this section.

DIAGNOSTIC TESTS

Note 1: The Refresh diskette required for the following tests must contain the factory standard configuration. If such a diskette is not available, use a Configuration diskette and reconfigure the unit to factory standard.

Note 2: The Diagnostic diskette may contain errors recorded from previous testing. Erase these errors from the diskette ***before*** proceeding further as follows:

(1) Place the binary switch on the rear of the Comm-Stor II unit in the EXIT position.

(2) Turn on the unit.

(3) Insert the Diagnostic diskette. Depress the RESTART button.

(4) When the BUSY light goes off, remove the Diagnostic diskette.

(5) Turn the Comm-Stor II unit off.

Test A — LED/Switch Test

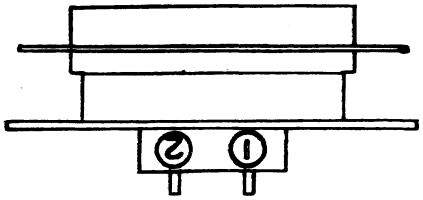
5.05

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.



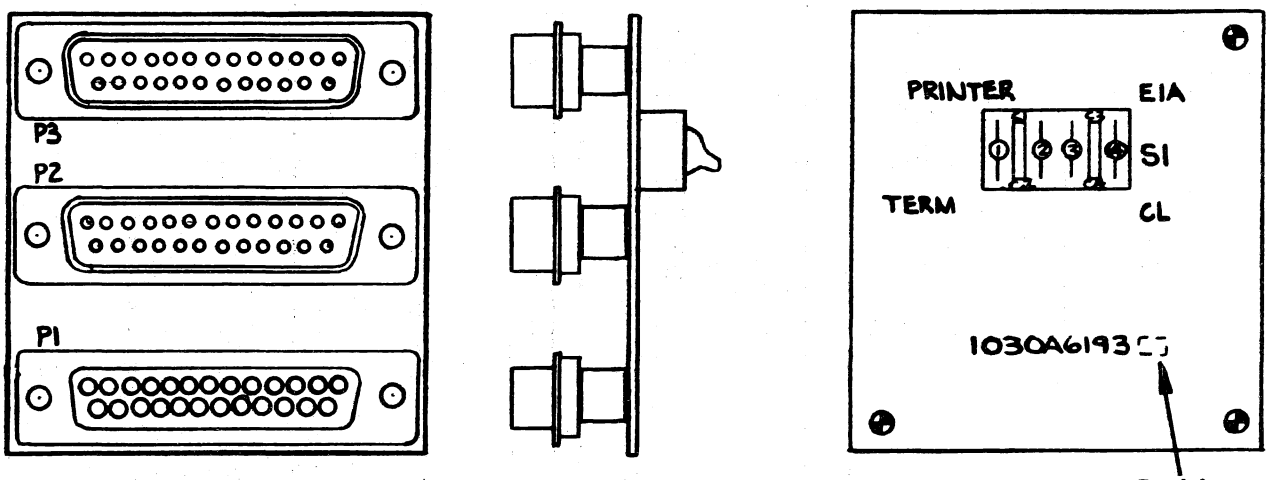


Figure 1 — Diagnostic Test Plug

TABLE B

LED DISPLAY (TEST A)

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 switch setting.

TABLE C

FAILURE INTERPRETATION

TEST FAILURE	PROBABLE CAUSE
LED Test	Replace the communications ports board (LED driver circuit). If the LED still fails, replace the defective LED.
Bit Rate Switch	Replace the defective bit rate switch on microprocessor-RAM board. If switch still fails, replace the MP-RAM board (bit rate switch multiplexer).
Binary Switch	Replace the "ENTER/EXIT" switch on I/O panel. If switch still fails, replace the communications ports board.

(e) Set the modem switch to 1.

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

(g) Depress the RESTART button.

(h) LED Test: The following LED patterns are displayed immediately:

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

Requirement 2: The READY (1) and BUSY (1) LEDs are lit (1 second).

Requirement 3: The LEDs will flicker randomly (15 seconds) then all will go off.

Requirement 4: Walking lights: each LED is lit independently and sequentially (1 second each).

Requirement 5: The READY (1) LED will come back on.

Note: This display is a binary representation of the bit rate switch settings (Table B).

(i) Switch Tests: The switch test values are in a logical "OR" state represented by the LED display.

Requirement 1: Set all bit rate switches to 0. All the LEDs should be off (not lit).

Requirement 2: Move the binary mode switch to ENTER; the STATUS LED should be lit. Move the switch to EXIT; the STATUS LED should be off.

Requirement 3: Move the printer switch through its settings of 0 to 9. (The other switches ***must be set to 0.)***

Examine the LEDs at each setting and compare the values displayed with the values in Table B. Each bit rate setting should generate a corresponding LED display. Return the printer switch to 0 and follow the same procedure for the terminal and modem bit rate switches.

TABLE D

HARDWARE FEATURES

LED PATTERN				PATTERN SEQUENCE				
				EXPANDED RAM MEMORY SIZE		NUMBER OF DRIVES/STANDBY MODE (3rd)	EDITOR/FORMS OPTIONS (4th)	PRINTER/PORT USER COMMAND TABLE OPTIONS (5th)
STS	CAR	BSY (1)	RDY (1)	(1st)	(2nd)			
○	○	○	○	– –	– –	– –	– –	– –
○	○	○	●	32K	0K	1 DRIVE NO STAND-BY	NO FORMS NO EDITOR	NO PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	○	36K	4K	2 DRIVES NO STAND-BY	EDITOR	PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	●	40K	8K	1 DRIVE STAND-BY	FORMS	NO PRINTER PORT EXTENDED USER COMMAND TABLE
○	●	○	○	*44K	12K	2 DRIVES STAND-BY	FORMS AND EDITOR	PRINTER PORT AND EXTENDED USER COMMAND TABLE
○	●	○	●	*48K	14K	1 DRIVE NO STAND-BY	EXTENDED EDITOR	– –
○	●	●	○	*52K	16K	2 DRIVES NO STAND-BY	EXTENDED FORMS	– –
○	●	●	●	*56K	20K	1 DRIVE STAND-BY	EDITOR AND EXTENDED FORMS	– –
●	○	○	○	*60K	24K	2 DRIVES STAND-BY	FORMS AND EXTENDED EDITOR	– –
●	○	○	●	N/A	28K	– –	EXTENDED FORMS AND EXTENDED EDITOR	– –

*Reserved for future expansion.

ON ●
OFF ○

(j) Refer to Table C for failure interpretation.

(k) Remove the Diagnostic diskette from the drive.

Test B — Hardware Features Check

5.06

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Set the modem switch to 7.
Set the printer switch to 0.
Set the terminal switch to 0.
Set the binary switch to EXIT.

(f) Depress the RESTART button.

Requirement: The LED test (Test A) is ***automatically*** performed. The user may perform the Switch test or proceed to step (g).

(g) Open and close the drive 1 door.

Requirement 1: All LEDs will blink in unison.

Requirement 2: The 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. Determine the hardware feature by locating the LED on/off pattern in the first column of Table D. Then read across to the first pattern of the sequence; record the feature. Open and close the drive 1 door again to obtain the second LED pattern and locate the associated feature in the second column. Follow this procedure until all five patterns have been obtained. When the last pattern has been displayed, all the LEDs will blink in unison.

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

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

This would indicate that the FORMs option 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 LEDs OFF.*** For example, if a unit contains 16K of RAM memory, the first pattern will be:

○ ○ ○ ○

The second pattern will be:

○ ● ○ ●

(h) Remove the Diagnostic diskette from the drive.

Test C — Internal Tests: Memory/Diskette/Timer/Bit Rate

5.07

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Remove all cables from the rear of the Comm-Stor II unit.

(f) Set the modem switch to 2.
Set the printer switch to 0.
Set the terminal switch to 0.
Set the binary switch to EXIT.

(g) Depress the RESTART button.

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

(i) Open and close the drive 1 door. The Diagnostic will execute the Internal Tests which will run about 10 minutes. This will vary according to the size of memory in the Comm-Stor II unit.

Note: Dual drive 8220A systems only: Upon completion of the Diskette test for drive 1, the READY (1) and BUSY (1) LEDs will blink in unison. Remove the User Diagnostic diskette from drive 1; insert it into drive 2 and close the door. The requirement stated above also applies to drive 2. Drive 2 tests will run about *3* minutes.

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

(j) Open and close the drive 1 door (or drive 2 door in a dual drive unit).

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

Requirement 2: If a series of LEDs are lit, refer to Table E 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 F 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 G 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 H 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 I for the last 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.

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

(l) Remove the Diagnostic diskette from the drive.

Test D — Terminal and Modem Ports Tests

5.08

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Mount the diagnostic test plug on the rear panel. Set switch 1 up (EIA) and switch 2 down (TERM).

(f) Set the modem port switch to 3.
Set the printer switch to 0.
Set the terminal switch to 0.
Set the binary switch to EXIT.

(g) Depress the RESTART switch.

Requirement: The LED Test (Test A) is ***automatically*** performed. The user may also perform the Switch Test or proceed to step (h).

TABLE E

RAM FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	The main memory is faulty. Random and unpredictable operating faults may occur.	Replace the MP-RAM board.
CARRIER or STATUS	The expanded memory is faulty.	Replace the Expanded RAM board.

TABLE F

CONFIGURATION MEMORY FAULTS — TEST B

LIGHT	INTERPRETATION	REMEDY
READY	The main memory is faulty. Random and unpredictable operating faults may occur.	Replace the MP-RAM board.
BUSY	The Extended User Command Table is faulty.	Replace the MP-RAM board.

TABLE G

ROM FAULTS

LIGHT	INTERPRETATION	REMEDY
READY	The main memory is faulty. Random and unpredictable operating faults may occur.	Replace the ROM board.

TABLE H

DRIVE 1 FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	Diskette drive 1 cannot read properly.	Replace the diskette drive assembly. If drive 1 still fails, replace the diskette controller board and cable. Continued failure of drive 1 indicates a bad User Diagnostic diskette.
CARRIER or STATUS	Diskette drive 1 cannot write properly.	(same as above)

TABLE I

DRIVE 2 FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	Diskette drive 2 cannot read properly.	Replace the diskette drive assembly. If drive 2 still fails, replace the drive controller board and cable. Continued failure of drive 2 indicates a bad user Diagnostic diskette.
CARRIER or STATUS	Diskette drive 2 cannot write properly.	(same as above)

(h) Refer to Table J and set the terminal port switch on the back of the Comm-Stor II unit. The terminal ***and*** modem ports will be tested at the selected bit rate.

(i) Open and close the drive 1 door to start the tests.

Requirement: The tests will run about 3 minutes. When completed, all LEDs will blink in unison.

(j) Open and close the drive 1 door to obtain the test results as displayed by the LEDs.

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

Requirement 2: If a series of LEDs are lit, refer to Table K 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

TABLE J

BIT RATE SPECIFICATION

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

DESIRED BIT RATE	TERM SWITCH SETTING
110	1
134	2
150	3
300	4
1200	5
2400	6
4800	7
7200	8
9600	9

TABLE K

TERMINAL RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	The terminal port cannot receive and/or transmit characters properly.	Replace the communications ports board.
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 communications ports board.
STATUS	The status light is not used.	

TABLE L

TERMINAL EIA CONTROL FAULTS

LIGHT	INTERPRETATION	REMEDY
READY BUSY CARRIER or STATUS	The terminal port is faulty.	Replace the communications ports board.

TABLE M

MODEM RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	The modem port cannot receive and/or transmit characters properly.	Replace the communications ports board.
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 data set. 2. The modem port cannot send a break to the data set. 3. A modem parity error indication may be falsely given.	Replace the communications ports board.
STATUS	Under certain circumstances, transmission from the modem to the terminal may be faulty.	Replace the communications ports boards.

TABLE N

MODEM EIA CONTROL FAULTS

LIGHT	INTERPRETATION	REMEDY
READY BUSY CARRIER or STATUS	The modem port is faulty.	Replace the communications ports board.

TABLE O

PRINTER RECEIVE/TRANSMIT FAULTS

LIGHT	INTERPRETATION	REMEDY
READY or BUSY	The printer port cannot transmit characters properly.	Replace the printer board.
CARRIER	The printer port may not be able to send a break (i.e., long space) to the printer.	Replace the printer board.
STATUS	The status light is not used.	

TABLE P

PRINTER EIA CONTROL FAULTS

LIGHT	INTERPRETATION	REMEDY
READY BUSY CARRIER or STATUS	The printer port is faulty.	Replace the printer board.

L for the second group of test results. If *no* LEDs are lit, go to requirement 4.

Reqirement 4: Open and close the drive door again. If a series of LEDs are lit, refer to Table M 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 N for the fourth group of test results. If *no* LEDs are lit, go to requirement 6.

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

(k) If no further faults exist, the test will end with all LEDs blinking in unison. Those tables bypassed by the diagnostic procedure contained no reportable results.

(l) Remove the diagnostic test plug from the unit, and the Diagnostic diskette from the drive.

Test E — Printer Port Test (if the option is installed)

5.09

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to the standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Mount the diagnostic test plug on the rear panel and set switches 1 and 2 up (EIA and PRINTER).

(f) Set the modem port switch to 5.
Set the printer switch to 0.
Set the terminal switch to 0.
Set the binary switch to EXIT.

(g) Depress the RESTART button.

Requirement: The LED test (Test A) is *automatically* performed. The user may also perform the Switch Test or proceed to step (h).

(h) Refer to Table J and set the terminal port switch on the back of the Comm-Stor II unit.

(i) Open and close the drive 1 door to start the test.

Requirement: The test will run about 3 minutes. When completed, all LEDs will blink in unison.

(j) Open and close the drive 1 door to obtain the test results as displayed by the LEDs.

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

Requirement 2: If a series of LEDs are lit, refer to Table O 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 P 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 M 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 N 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.

(k) If no further faults exist, the test will end with all LEDs blinking in unison. Those tables bypassed by the diagnostic procedures contained no reportable results.

(l) Remove the diagnostic test plug from the unit, and the Diagnostic diskette from the drive.

Test F — Isochronous Operation Test*

5.10

(a) Turn the Comm-Stor II unit ON.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to the standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Mount the diagnostic test plug on the rear panel. Set switch 1 UP (EIA) and switch 2 DOWN (TERM).

(f) Set the modem port switch to 6.
Set the printer switch to 0.
Set the terminal switch to 0.
Set the binary switch to EXIT.

(g) Depress the RESTART button.

Requirement: The LED test (Test A) is automatically performed. The user may also perform the Switch Test or proceed to step (h).

(h) Open and close the drive 1 door to start the test.

Requirement: The test will run about 3 minutes. When completed, all LEDs will blink in unison.

(i) Open and close the drive 1 door to obtain the test results as displayed by the LEDs.

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 K 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 L 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 M 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 N 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 faults exist, the test will end with all LEDs blinking in unison. Those tables bypassed by the diagnostic procedures contained no reportable results.

(k) Remove the diagnostic test plug from the unit, and the Diagnostic diskette from the drive.

*This test may be performed only on units containing the following hardware components at the indicated revision levels or higher:

Communications Board #1030A5162
I/O Panel #1030A6291D
Microprocessor Board #1030A6492N

Test G — Configuration Memory Test

5.11

(a) Turn the Comm-Stor II unit on.
Set the binary switch to ENTER.
Set the terminal switch to 0.
Set the printer switch to 0.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to the standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Remove all cables (and the test plug) from the ports of the Comm-Stor II unit.

(f) Set the modem switch to 8.

(g) Depress the RESTART button.

Requirement: The LED test (Test A) is automatically performed. The user may also perform the Switch test or proceed to step (h).

(h) Open and close the drive 1 door to start the test.

Requirement: When the BUSY LED comes on and stays on, turn the Comm-Stor II unit OFF. Wait about 1 minute.

(i) Turn the Comm-Stor II unit ON.

Requirement: The LED test is again automatically performed.

(j) Open and close the drive 1 door.

Requirement 1: If the BUSY *or* CARRIER LED begins ***blinking,*** refer to Table Q.

Requirement 2: If the BUSY LED comes on and stays on, no faults exist. Turn the Comm-Stor II unit OFF. Wait about 1 minute.

(k) Turn the Comm-Stor II unit ON.

Requirement: The LED test is again automatically performed.

(l) Open and close the drive 1 door.

Requirement 1: If the BUSY *or* CARRIER LED begins blinking, refer to Table Q.

Requirement 2: If ***all*** LEDs blink in unison, the test is finished and no further faults exist.

Note 1: Wait at least 1 minute where required. However, if the suspected configuration memory fault is time related, more or less time may be required between steps.

Note 2: If the problem is heat related, the user may depress the RESTART button between steps rather than turn the unit OFF.

(m) Remove the Diagnostic diskette from the drive.

Test H — Diskette Test

5.12

Note: Verify the system's operation first by running Test C: Internal Tests.

(a) Turn the Comm-Stor II unit ON.
Set the binary switch to ENTER.
Set the terminal switch to 0.
Set the printer switch to 0.

TABLE Q

CONFIGURATION MEMORY FAULTS - TEST G

BLINKING LIGHT:	INTERPRETATION
BUSY	The battery of the main configuration memory is faulty.
CARRIER	The battery or the Extended User Command Table memory is faulty.

(b) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(c) Depress the RESTART switch. The Refresh procedure ensures that the Comm-Stor II unit is set to the standard factory configuration.

(d) Remove the Refresh diskette. Insert the Diagnostic diskette into drive 1; close the drive door.

(e) Set the modem switch to 9.

(f) Depress the RESTART button.

Requirement: The LED test (Test A) is automatically performed. The user may also perform the Switch test or proceed to step (g).

(g) Open and close the drive 1 door.

Requirement 1: The READY *and* BUSY LEDs will begin blinking. Remove the Diagnostic diskette and insert the diskette to be tested into drive 1.

Requirement 2: The READY and BUSY LEDs will stop blinking but remain on during the test. The test will run about *2* minutes.

Requirement 3: If *no errors* occur, the BUSY and READY LEDs will start blinking again (READY 2 and BUSY 2 will blink on a dual drive unit). Another diskette may be inserted in the drive (drive 2 on a dual drive unit) and tested.

Note: In dual drive units additional diskettes are tested by alternating between drives 1 and 2.

Requirement 4: If an error occurs, the CARRIER LED will begin blinking. Remove the faulty diskette from the drive and discard it. To test additional diskettes, proceed as described in requirment 3.

Note: The user can attempt to copy a faulty diskette to save valuable data.

Test M — RAM Memory Test

5.13 The purpose of this test is to provide a detailed analysis of the problem area in RAM Memory (refer to Table R). This test need only be run if a RAM failure existed during Test B in Table D or E.

(a) Connect a terminal to the Comm-Stor II unit's terminal port.

(b) Set the terminal bit rate switch for the appropriate bit rate. Set the modem switch to 0.
Set the printer switch to 0.
Set the binary switch to ENTER.

(c) Turn the Comm-Stor II unit on. Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(d) Depress the RESTART switch. The refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(e) Remove the Refresh diskette. Insert the User Diagnostic diskette into drive 1; close the drive door.

(f) Depress the RESTART switch. The following message is displayed at the terminal:

USER DIAGNOSTIC, VER. E

ENTER A COMMAND FOLLOWED BY A RETURN #

(g) After the number sign prompt (#) appears, type the letter "M" on the terminal followed by a Carriage Return. After a slight delay, the letter M will be echoed to the terminal and the following statement will be displayed:

STANDARD RAM

Now type "Y".

(h) The system will respond by printing the following message at the terminal:

EXP RAM

TABLE R

USER DIAGNOSTIC MEMORY TEST

BANK	ADDRESS LOCATION	FUNCTION	PCB	IC LOCATION							
				0	1	2	3	4	5	6	7
00	0020-03FF	Standard System	MP-RAM	A1	A3	B1	B3	C3	C3	D1	D3
01	0400-07FF	1K Forms	MP-RAM	A2	A4	B2	B4	C2	C4	D2	D4
02	0800-0BFF	4K RAM	4K RAM/Printer	A1	B1	C1	D1	E1	F1	H1	J1
03	0C00-0FFF	4K RAM	4K RAM/Printer	A1	B1	C1	D1	E1	F1	H1	J1
04	1000-13FF	4K RAM	4K RAM/Printer	A1	B1	C1	D1	E1	F1	H1	J1
05	1400-17FF	4K RAM	4K RAM/Printer	A1	B1	C1	D1	E1	F1	H1	J1
10	4000-40FF	Standard CMOS RAM	MP-RAM	F3	F3	F3	F3	E2	E2	E2	E2

(1) Test M performs read/write tests on all memory addresses. The test procedure is loaded and executed in Bank 00. If FORMS and EXP RAM questions are answered NO, then Banks 01-05 are not tested.

(2) If an error occurs, the following information will be displayed: the bank number, the first address which failed within that bank, the value written, and the value read. The bits within these values are organized as follows: 7654.3210. Bit 7 is the MSB.

(3) Only the first 4K of RAM may be tested on the 16K RAM Board. If a failure occurs, use the table above and change the device in Row 1, even if 2, 3, or 4 is indicated.

Type "Y" if the optional 4K RAM board is installed or "N" if it is not. The memory test will now execute beginning at bank 00.

Requirement 1: The following table will be displayed at the terminal:

Global W/R Test

Bank	LOC	Write	Read
XX			
XX			

Where: BANK = hexadecimal RAM Bank number
LOC = hexadecimal memory address
WRITE = a 1 or a 0 indicates the logic level of each data bit written into RAM
READ = a 1 or a 0 indicates the logic level of each data bit read from RAM.

The Global Write/Read test writes a unique value (an ascending number) into each memory location. After the entire memory is written into, each location is read and compared to the expected value. This test will detect addressing faults in both the address logic and in the memory chips themselves. Only the first error in each bank is reported.

Requirement 2: After completing the above test, the Comm-Stor II unit will print GLOB

PAT and begin execution. This test writes a unique pattern into memory. After the entire memory is written, it is read back and a comparison is made. The test is repeated 7 times with a different pattern used each time. This test will detect pattern sensitivity and addressing faults.

Requirement 3: After completing the Global Pattern Test, the Comm-Stor II unit will respond with the following message:

PRESS RETURN KEY

Strike a Carriage Return to perform the final test, W/R ALL V.

This performs a write/read test at each location, writing and reading four different hexadecimal values in the following sequence:

(1) Write the value.
(2) Read the location (up to 6 tries) until the correct value is read.
(3) If the correct value cannot be read, go back and write it again.
(4) If it still cannot be read in six attempts, repeat the cycle up to 6 times until the correct value is read.

When an error is found (even if it disappears during retry), no more locations in that bank are tested. The test advances to the next bank.

A typical error display is:

BANK	LOC	WRITE	READ		
02	0801	1100.0010	1100.0000	5	4

The number of write tries.

The number of read tries after the last write.

If the value cannot be read after 6 read-write cycles, then an H (HARD ERROR) is displayed in place of the retry numbers.

At the completion of this test, the diagnostic will return to the beginning of Test M.

(i) Remove the Diagnostic diskette from the drive when the test is finished.

Test V — Drive/Diskette Verify Test

5.14 This test provides a means of reading and verifying track/sector identification fields (IDs) and data cyclical redundancy checks (CRC) characters for every sector on the diskette.

5.15 The purpose of this test is to check the diskette drive and the diskette drive electronics' ability to read. If marginal problems exist, it is imperative that the test be run with several other diskettes or a known good diskette.

5.16 This test can also be used to check and verify diskettes. After the diskette drive and electronics have been verified by successfully reading known good diskettes, the Verify Test can be used to verify questionable diskettes. Marginal or bad sectors are indicated by a display which indicates the track number (0-76), the sector number (01-26), and an "S" which indicates a search error or "CC" which indicates a CRC or data error.

(a) Connect a terminal to the Comm-Stor II unit's terminal port.

(b) Set the terminal bit rate switch for the appropriate bit rate. Set the modem switch to 0.
Set the printer switch to 0.
Set the binary switch to ENTER.

(c) Turn the Comm-Stor II unit ON.

(d) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(e) Depress the RESTART switch. The refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(f) Remove the Refresh diskette. Insert the User Diagnostic diskette into drive (1); close the door.

(g) Depress the RESTART button. The following message is displayed at the terminal:

USER DIAGNOSTIC, VER. E

ENTER A COMMAND FOLLOWED BY A RETURN
#

(h) After the number sign prompt (#) appears, type the letter "V" on the terminal followed by a Carriage Return. After a slight delay, the letter V will be echoed to the terminal and the following statement will be displayed:

INSERT IN

(i) Test the system's ability to read a diskette. Insert a known good scratch diskette into drive 1 or drive 2.

Note: Marginal diskettes can be tested in known good systems using the same procedure.

(j) After the scratch diskette has been inserted, the following message will be displayed on the terminal:

TRK

Answer this prompting message with the decimal number of the track to be tested (0-76), or answer it with an upper case "A" which designates all tracks and sectors on the diskette.

(k) Type a Carriage Return; the following prompt statement will be displayed on the terminal:

ID REVS (ID Revolutions)

Answer this message with a "C". The "C" causes the same search retry sequence used by the Comm-Stor II unit in normal operation (up to 12 search retries). If marginal diskettes are being tested, a number 1 through 9 can be entered to limit the number of search retries.

Limiting the number of retries will greatly increase the probability of an error indication when the diskette or diskette drive electronics are marginal.

Note: It is normal to have some search errors when ID REVS equal 1 or 2.

(l) The test will begin automatically after a Carriage Return has been entered following the ID REVS number.

The following table will be displayed:

TRK	SEC		TRK = track number
			SEC = sector number
RUN 1			RUN1 = test cycle 1
XX	YY	ZZ	If Read errors occur.

Read errors are indicated in the above table by the track (XX) and sector (YY) numbers where the error occurred. The third column (ZZ) describes the type of error: S = "search" or "diskette" type ID error; CC = "CRC" or "Bad Read" type data error.

If ***all*** tracks are tested, the beginning of each read cycle is indicated by the display RUN1, RUN2, RUN3, etc. Otherwise, only RUN1 is indicated.

The test will run continuously until interrupted. Striking the space bar on the terminal stops the test and brings the procedure back to the TRK message. Striking the character "I" brings the procedure back to the INSERT IN message.

(m) Remove the Diagnostic diskette from the drive when the test is finished.

Test CM — CMOS Volatility Test

5.17 The CMOS Volatility Test will confirm:

- the ability of CMOS memory devices to be addressed and read,
- the ability of CMOS memory and associated devices to retain information when main power is disconnected.

5.18 The purpose of this test is to determine the Comm-Stor II unit's ability to retain all configurable parameters. This test should be run if the

unit fails to configure properly or loses parameters after refresh.

5.19 The test procedure will:

- Read the previous CMOS page 0 (and 1 if equipped) into RAM memory from the diskette.
- Compare this image with the contents of page 0 (and 1 if equipped) beginning at location 4000.
- Report if the compare was "Good" or "Bad" for page 0 (and 1 if equipped).
- Write the contents of both CMOS pages out to the diskette.

(a) Connect a terminal to the Comm-Stor II unit's terminal port.

(b) Set the terminal bit rate switch for the appropriate rate. Set the modem switch to 0.
Set the printer switch to 0.
Set the binary switch to ENTER.

(c) Turn the Comm-Stor II unit ON.

(d) Remove any diskettes from the drives. Insert a Refresh diskette into drive 1; close the drive door.

(e) Depress the RESTART switch. The refresh procedure ensures that the Comm-Stor II unit is set to standard factory configuration.

(f) Remove the Refresh diskette. Insert the User Diagnostic diskette into drive 1; close the drive door.

(g) Depress the RESTART button. The following message is displayed at the terminal:

USER DIAGNOSTIC, VER. E

ENTER A COMMAND FOLLOWED BY A RETURN
#

(h) After the number sign prompt (#) appears, type the letter "C" on the terminal followed by a Carriage Return. After a slight delay, the letter C will be echoed to the terminal and the following statement will be displayed:

EXT TABLE?

Respond by typing "Y".

Requirement: The test will execute and print the following information:

PAGE 1 (GOOD or BAD)
EXT TABLE (GOOD or BAD)

Note: The test results should be ignored the first time the test is run. This enables the system to write the contents of CMOS memory onto the diskette. When the question "EXT TABLE?" is asked again, the results will be valid.

(i) Two test sequences are possible:

Sequence 1: (a) Run the test.
(b) Turn power OFF, wait 5 seconds, restore power.
(c) Repeat the test immediately.

Sequence 1 will confirm the following hardware components:

- The CMOS chips in their power down mode.
- The CMOS support chips.
- The on-board filter capacitor (which acts as a short-term power source for the CMOS system).

Sequence 2: (a) Run the test.
(b) Turn power OFF.
(c) Wait until the next day to repeat the test.

Sequence 2 will confirm the previous hardware as well as the operation of the battery on the motor board.

The CMOS test will not alter CMOS memory.

6. CHECKLIST #1 — DIAGNOSTIC DOES NOT RUN

6.01 Table S lists the most common causes for Comm-Stor II unit failure. Observe the symptoms and proceed with the indicated remedies.

TABLE S

CHECKLIST #1

SYMPTOM	REMEDY
	Note: The voltmeter used in the following procedures must contain the following ranges: 0 - 50 VDC 0 - 115 VAC
Unit is completely dead. Cooling fan is not spinning, drive motor is not spinning, no illumination of power switch, no front panel LED illumination.	(a) Reset the circuit breaker by pushing the power/switch circuit breaker button located on back panel. (b) Check the power outlet for 115 VAC. (c) Remove the top cover. Check the power harness connectors to make sure they are mated together properly and there are no loose wires. (d) Check the AC power connections at the power switch/circuit breaker, and the harnessing. (e) With the unit unplugged, check the continuity of the power switch/circuit breaker, and the harnessing.
No power indication. No illumination of power switch. No illumination of LEDs when system powered ON or RESTARTed.	(a) Check DC power supply voltages at base card edge connectors (Figure 2): +5.1 – +5.2 VDC @ pin 6 +23 – +25 VDC @ pin 8 +11 – +13 VDC @pin 100 –11 – –13 VDC @ pin 98 Ground @ pins 2,66

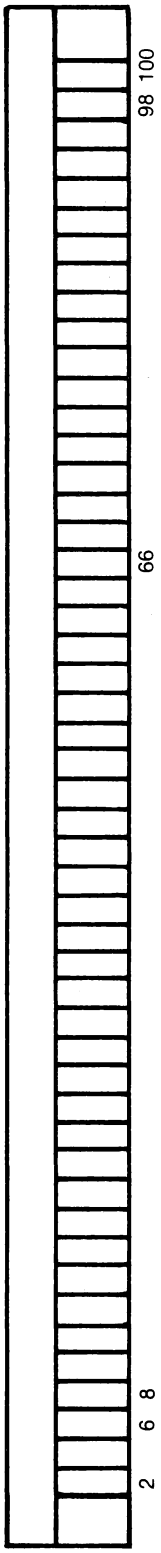


Figure 2 — Base Board Pin Locations

TABLE S (Cont)

CHECKLIST #1

SYMPTOM	REMEDY
	If one or more of the DC voltages are not present at the base card edge connector, refer to Section 578-400-750, "Routine Maintenance Procedures" for power supply adjustment procedure. (b) If one or more of the power supply voltages are low, the power supply may be defective; or a defective component on one of the circuit boards could be loading down a particular voltage. Swap/verify the circuit boards one at a time.
LEDs do not illuminate when system RESTARTed. No head load solenoid activity when system RESTARTed with diskette inserted.	(a) Check DC voltages (refer to section B, above) at base card edge connector. (b) Check battery voltage for 3.5 VDC minimum. (c) Check battery connections. (d) Check front panel LED harness connection at EIA board. (e) If all the DC voltages appear to be normal, follow the sequences below: (1) Power-off, remove Diskette Controller board, and power back on. If LEDs come on, problem is in Diskette Controller board or diskette drive assembly. Swap/verify these assemblies one at a time. (2) Power-off, remove printer option board if installed, power back on. If LEDs come on, problem is in printer option board. (3) Power-off, swap/verify MR-RAM board. (4) Power-off, swap/verify ROM board. (5) Power-off, swap/verify base card.

TABLE S (Cont)

CHECKLIST #1

SYMPTOM	REMEDY
LEDs light for one second and go off, but User Diagnostic Program does not load off the diskette.	(a) Check User Diagnostic diskette on another system. (b) Check for motor drive rotation. (c) Swap/verify drive ribbon wire cables. (d) Swap out the diskette drive assembly and restart the test. (e) Swap/verify the Diskette Controller board. (f) Swap/verify the remaining circuit boards one at a time.

7. CHECKLIST #2 — OTHER DIFFICULTIES

7.01 This part applies to Comm-Stor II units which have passed the User Diagnostic tests without failure. Table T lists potential trouble symptoms and recommended remedies. Observe the symptoms and proceed with the indicated remedy.

TABLE T

CHECKLIST #2

SYMPTOM	REMEDY
System will not respond to certain keyboard commands.	(a) Using a Configuration diskette, display all parameters and check for valid configuration responses. Change invalid parameters if necessary and recheck. This can be done by "Refreshing" the unit. If over the course of time Configuration parameters change, check the battery voltage; if OK, replace the MP-RAM board. (b) Swap/verify ROM board.

TABLE T (Cont)

CHECKLIST #2

SYMPTOM	REMEDY
Unit does not respond with a "Carriage Return," "Line Feed," or "Asterisk" when RESTARTed.	(a) Terminal bit rate not set the same as terminal. (b) Parity of the terminal and the Comm-Stor II unit not set the same. (c) System not refreshed after MP-RAM board removal/replacement. (d) Check Configuration parameters as described in Section A, above.
"Error Diskette" Message	(a) Probable worn or damaged diskette. Check system with other diskettes. (b) Check diskette drive assembly head-to-track alignment. (Refer to the ***Comm-Stor Service Manual.)*** (c) Swap/verify Diskette Controller board.
"Error-Bad Read" Message	(a) Probable worn or damaged diskette. Check system with other diskettes. (b) Check head-to-track alignment of system which wrote data on the diskette and the system which is reading the diskette. (c) Swap/verify Diskette Controller board of system which wrote on the diskette as well as system reading the diskette. (d) Check read/write compatability. Write (.E_____) and then read (.D_____) a diskette. If successful, attempt reading the same diskette on another system. Check FDD Head/Track alignment.

TABLE T (Cont)

CHECKLIST #2

SYMPTOM	REMEDY
"Error-System" Message	(a) Caused by a User diskette with a bad directory. (b) Swap/verify ROM board. (c) Swap/verify MP—RAM board. (d) Swap/verify Diskette Controller board. (e) Swap/verify EIA board.
Errorneous data transfer between the Comm-Stor II unit and the peripheral terminal, modem or printer	(a) Check for proper bit rate adjustment of the Comm-Stor II unit and peripheral device. (b) Check for proper parity adjustment of the Comm-Stor II unit and terminal. (c) Swap/verify EIA board for terminal or modem data transfer porblems. (d) Swap/verify printer board for printer option data transfer problems. (e) Swap/verify MR-RAM board if erroneous data transfer exists through ***all*** I/O ports.

8. COMMUNICATIONS CHECKOUT

8.01 The following on-line check should be performed immediately after installing the Comm-Stor II unit and whenever send/receive problems are indicated. This procedure will determine whether the Comm-Stor II unit can communicate with the remote device through the modem port.

STEP	PROCEDURE	TROUBLE ANALYSIS
1	Power on the Comm-Stor II unit and insert a User diskette.	
2	Check to be sure the data set is properly connected to the Comm-Stor II unit's modem port.	
3	Place a telephone call to the Test Center. Advise the desk that an ***on-line test*** of the Comm-Stor II unit is being performed and that the FOX message is to be sent.	
4	Establish the data connection.	
5	(The Test Center will send a FOX test message by entering: [CR] [LF] .R FOX[CR] [LF])	
6	(The Test Center will cause FOX to be displayed on the station terminal by entering: [CR] [LF] .D FOX[CR] [LF]) FOX should be displayed on the terminal as follows: THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890[CR] THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890[CR] THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890[CR] THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890[CR] THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890[CR] [ETX] ***Requirement:*** FOX is displayed at shown above. ***Note:*** Carriage Returns [CR] may appear as = on Dataspeed 40/1, and 40/2 terminals, and not at all on Model 43 Teleprinters.	If the Comm-Stor II unit does not respond to .D command: (1) Check EIA cables and connections. (2) Check bit rate settings. (3) User diskette not inserted or bad User diskette. (4) Check data set operation. (5) Check Comm-Stor II Configuration Parameters 3, 5, 77, 86, 101, 67, 58, 37, 41-46.

STEP	PROCEDURE	TROUBLE ANALYSIS
		(6) Check data terminal operation. (7) Obtain test from another test center. (8) Replace the Comm-Stor II unit.
7	The station operator will send FOX to the Test Center by entering: [CR].S FOX[CR] ***Requirement:*** Test Center will verbally verify that FOX has been received.	Same as Step 6.
8	The Test Center will transmit the following option message: [CR] [LF] .R TESTFILE [CR] [LF] ←≡ 5SpNULLSNuNuNuNuNu←≡ 5SpDELETES←≡ 5SpCRS←←←←← ≡ 5SpBADSpPARITY12345←≡ (each sent with odd parity) 5SpBELLS$B_L B_L B_L B_L B_L$EX (test set stops sending at this point)	
9	After TESTFILE has been sent, the station operator will cause TESTFILE to be displayed on the station terminal by entering: .D TESTFILE[CR]	(1) Proceed as described in analysis of Step 6. (2) If trouble persists, check the Comm-Stor II Configuration Parameters #58, 55, 52, 53.

STEP	PROCEDURE	TROUBLE ANALYSIS
	Requirement: On ***Dataspeed 40/1 and 40/2 terminals*** the following display will appear followed by the terminal bell: ≡ 5 NULLS ≡ 5 DELETES ≡ 5 CRS ≡ ≡ ≡ ≡ ≡ 5 BAD PARITY????? 5 BELLS $B_L B_L B_L B_L B_L$ On ***Model 43 Teleprinters,*** the following display will appear followed by the terminal bell: 5 NULLS 5 DELETES 5 CRS 5 BAD PARITY????? 5 BELLS	
10	Display the Directory listing of TESTFILE by entering: .DD TESTFILE[CR] ***Requirement:*** On ***Dataspeed 40/1 and 40/2 terminals,*** the following display will appear: TESTFILE 65 = On ***Model 43 Teleprinters,*** the following display will appear: TESTFILE 65	Same as Step 6.